adani

Cement

ACC

**Ref. No.: ACC/ENV/CUD- MoEFCC/12-24/02** **Date: 10.12.2024**

To,

**The Director (Industry - I) - IA Division**

Ministry of Environment, Forests & Climate Change,

Indira Paryavaran Bhawan,

Jor Bagh Road, New Delhi - 110003

**Subject:** Proposed 5.0 Million TPA Clinkerisation Plant, 8.0 Million TPA Cement Grinding Unit and 100 MW Captive Power Plant at Village: Gollapalle, Mandal: Mylavaram, District: Kadapa (YSR), Andhra Pradesh by M/s. ACC Limited- ***Reg. Submission of ADS Reply***

**Ref:** 1. Proposal Number - IA/AP/IND/62090/2012 & MoEFCC File No. J-11011/265/2012-IA.II.(I)
2. MoEFCC Letter dated 30th March, 2017

Respected Sir,

With reference to the aforesaid subject, we would like to apprise your good self that M/s. ACC Limited has proposed 5.0 Million TPA Clinkerisation Plant, 8.0 Million TPA Cement Grinding Unit and 100 MW Captive Power Plant at Village: Gollapalle, Mandal: Mylavaram, District: Kadapa (YSR), Andhra Pradesh.

The company had obtained ToR for "Proposed 5.0 MTPA Integrated Cement Clinkerisation Plant, 8.0 MTPA Cement Grinding Unit and 100 MW Captive Power Plant and 7.0 MTPA Captive Limestone Mine with mining lease area of 997.08 ha at Gollapalle, Village of Mylavaram Mandal, Kadapa (YSR) District, Andhra Pradesh" from MoEFCC, New Delhi *vide* Letter No. J-11011/265/2012-IA II (I) dated 20th February 2013; Validity extended *vide* Letter dated 18th Feb., 2016. After that, corrigendum in ToR validity extension letter was obtained on 27th April, 2016.

Baseline monitoring for the project was conducted during Summer Season (March to May, 2013) and Public Hearing was conducted on 20th October, 2016. ***Final EIA/EMP Report excluding the mining components and including the outcomes of Public Hearing was submitted to MoEF&CC for obtaining Environmental Clearance to the Ministry online on 27th Jan., 2027 vide Online Application No. IA/AP/IND/62090/2012. Thereafter, the project was considered for appraisal in 16th EAC (Industry - I) Meeting held on 6th March, 2017 and after detailed deliberations, the committee advised to submit few additional details (ADS) for further consideration of project.***

ADS could not be submitted due to unavailability of mining lease deed; and the lease deed has been executed on 14th May, 2024. Since, it is the captive mine for proposed cement plant, hence, both the projects got struck.

ACC Limited
Cement House,
121, Maharshi Karve Road,
Mumbai 400 020, India
www.acclimited.com

adani
Cement

ACC

After merger & acquisition with Adani Group, the management reviewed and proposed to complete the EC process for execution of both the proposals.

The company has changed the EIA Consultant from Vimta Labs Limited to JM. EnviroNet Pvt. Ltd. for further execution of the project. JMEPL has conducted fresh Baseline Study during Summer Season (March to May, 2024) and prepared updated Final EIA / EMP Report along with incorporating the reply of Additional Details Sought. The change of consultant letter from Project Proponent is enclosed as ***Annexure - 1.***

Earlier total land area proposed for the project was approx. 275.028 ha (Including Plant, Colony & CPP). ToR was obtained from MoEF&CC for the same area on 20th February, 2013 and Public Hearing has also conducted for the same area and same configuration.

However, due to the existence of Village Gollapalle and unavailability of land, Company dropped the proposal for colony and exclude specific part of the project site from the earlier submitted proposal which results in reduction of proposed project area, from 275.028 ha to 187.1 ha.

Now, in line with the reduction of the project area within the project boundary for which ToR has been obtained and Public Hearing was conducted and addressing the additional details sought (ADS) points, company has updated the Final EIA / EMP Report with one season fresh Baseline data. The point wise reply of the additional details sought (ADS) is enclosed as ***Annexure - 2.***

Therefore, we are submitting the ADS reply along with Updated Final EIA / EMP Report for your kind consideration.

We request your good self to kindly consider our proposal for further proceedings.

Thanking you and with regards,

**For M/s. ACC Limited**

**Sanjay Prasad**
**Head Environment and Authorized Signatory**

***Enclosure: as above***

ACC Limited
Cement House,
121, Maharshi Karve Road,
Mumbai 400 020, India
www.acclimited.com

adani Cement

ACC

**Ref. No.: ACC/ENV/CUD- MoEFCC/12-24/02** **Date: 10.12.2024**

**To**
**Member Secretary (Industry - 1) - IA Division,**
Ministry of Environment, Forest & Climate Change,
Indira Paryavaran Bhawan, Jor Bagh Road,
New Delhi - 110 003

**Sub.:** Proposed 5.0 Million TPA Clinkerisation Plant, 8.0 Million TPA Cement Grinding Unit and 100 MW Captive Power Plant at Village: Gollapalle, Mandal: Mylavaram, District: Kadapa (YSR), Andhra Pradesh by M/s. ACC Limited - **Reg. Change of consultant**

**Ref.:** 1. Proposed Number - IA/AP/IND/62090/2012
2. MoEFCC Letter dated 30.03.2017

Dear Sir,

With reference to the subject cited matter and reference, we would like to submit that M/s. ACC Limited proposes to produce 7.0 Million TPA limestone from Captive Limestone Mining project at Village Gollapalli, Mylavaram Mandalam, District Kadapa (YSR), Andhra Pradesh (997.08 ha) and to establish Cement Plant with production capacity of 5.0 Million TPA Clinker, 8.0 Million TPA Cement and 100 MW Captive Power Plant at Village: Gollapalle, Mandal: Mylavaram, District: Kadapa (YSR), Andhra Pradesh.

ToR of the said project has been issued by MoEFCC *vide* Letter No. J-11011/265/2012-IA II (I) dated 20th February 2013. Further, Validity extended *vide* letter dated 18.02.2016. Accordingly, the Public Hearing conducted on 20.10.2016.

Final EIA/EMP Report after incorporation of PH proceedings and action plan to address the issues raised for Cement Plant submitted *vide* online application no. IA/AP/IND/62090/2012 dated 27.01.2017 for obtaining EC.

The project considered for appraisal in 16th EAC (Industry - I) Meeting held on 06.03.2017 and after detailed deliberations, the Hon'ble Committee raised Additional Details (ADS) for further consideration.

After the merger & acquisition of ACC Limited with Adani Group in the year 2022, the management reviewed and proposed to complete the EC process for execution of the project proposal.

Now, M/s. J.M. EnviroNet Pvt. Ltd. (JMEPL) at Unit No. 1517, Tower - B, Emaar Digital Greens, Golf Course Ext. Road, Sector- 61, Gurugram - 122001 (Haryana) are associated with us for the further process of obtaining Environment clearance of the project activity. JMEPL will submit the reply of Additional Details sought (ADS) along with updated EIA / EMP Report with fresh baseline data conducted during Summer Season (March to May, 2024).

This is for your kind information & necessary action.

Thanking you and with regards,

**For M/s. ACC Limited**

**Sanjay Prasad**

**Head Environment and Authorized Signatory**

ACC Limited
Cement House,
121, Maharshi Karve Road,
Mumbai 400 020, India
www.acclimited.com

**Reply of Additional Details Sought**

The company had obtained ToR for "Proposed 5.0 MTPA Integrated Cement Clinkerisation Plant, 8.0 MTPA Cement Grinding Unit and 100 MW Captive Power Plant and 7.0 MTPA Captive Limestone Mine with mining lease area of 997.08 ha at Gollapalle, Village of Mylavaram Mandal, Kadapa (YSR) District, Andhra Pradesh" from MoEFCC, New Delhi v*ide* Letter No. J-11011/265/2012-IA II (I) dated 20th February 2013; Validity extended v*ide* Letter dated 18th Feb., 2016. After that, corrigendum in ToR validity extension letter was obtained on 27th April, 2016.

Baseline monitoring for the project was conducted during Summer Season (March to May, 2013) and Public Hearing was conducted on 20th October, 2016. ***Final EIA/EMP Report excluding the mining components and including the outcomes of Public Hearing was submitted to MoEF&CC for obtaining Environmental Clearance to the Ministry online on 27th Jan., 2027 vide Online Application No. IA/AP/IND/62090/2012. Thereafter, the project was considered for appraisal in 16th EAC (Industry - I) Meeting held on 6th March, 2017 and after detailed deliberations, the committee advised to submit few additional details (ADS) for further consideration of project.***

ADS could not be submitted due to unavailability of mining lease deed; and the lease deed has been executed on 14th May, 2024. Since, it is the captive mine for proposed cement plant, hence, both the projects got struck.

After merger & acquisition with Adani Group, the management reviewed and proposed to complete the EC process for execution of both the proposals.

The company has changed the EIA Consultant from Vimta Labs Limited to JM. EnviroNet Pvt. Ltd. for further execution of the project. JMEPL has conducted fresh Baseline Study during Summer Season (March to May, 2024) and prepared updated Final EIA / EMP Report along with incorporating the reply of Additional Details Sought**.**

Earlier total land area proposed for the project was approx. 275.028 ha (Including Plant, Colony & CPP). ToR was obtained from MoEF&CC for the same area on 20th February, 2013 and Public Hearing has also conducted for the same area and same configuration.

However, due to the existence of Village Gollapalle and unavailability of land, Company dropped the proposal for colony and exclude specific part of the project site from the earlier submitted proposal which results in reduction of proposed project area, from 275.028 ha to 187.1 ha.

Now, in line with the reduction of the project area within the project boundary for which ToR has been obtained and Public Hearing was conducted and addressing the additional details sought (ADS) points, company has updated the Final EIA / EMP Report with one season fresh Baseline data. ***The Updated EIA / EMP Report has been enclosed with ADS Reply.***

The reply of the additional details sought vide MoEFCC letter dated 30th March, 2017 is given below -

| ADS Point No. | Additional Details Sought | Reply by the Project Proponent | Reference in Final EIA/EMP Report |
|---|---|---|---|
| (i) | Use of pet coke in the CPP shall be withdrawn in the proposal for power generation. | Coal will be used as fuel in the CPP for the Power generation.<br>Pet coke will not be used in Captive Power Plant. | Chapter - 2,<br>Table - 2.7,<br>Page no. 77 |
| (ii) | Pollution control measures at all unit operations shall be indicated as proposed in the process flow diagram. | Process flow diagram indicating pollution control measures at all unit operations has been incorporated in this EIA/EMP Report. | Chapter - 2,<br>Figure - 2.7<br>Page no. 91 |
| (iii) | The site plan shall be re-drawn showing the details of mining area, raw material stacking area, crusher, cement plant, colony parking area, greenbelt etc. The features like road, canal/water body, entry into the plant, internal roads, pathways etc. shall be indicated. | The detailed engineering Plant Layout showing proposed unit, storage area, greenbelt area, parking facility, utilities etc. is incorporated in this EIA/EMP Report. | Chapter - 2,<br>Figure no. - 2.3(a) & (b)<br>Page no. 72 & 73 |
| (iv) | Air quality Impact Assessment shall be done considering of emissions from mining, cement plant, captive power plant, transportation, fugitive emissions increase in traffic in the area and resubmitted. The emission estimations for the all components/ activities shall be clearly outlined in the study. Worst scenarios shall be analyzed for particulate and gaseous emissions on the villages/ habitations in the study area. | Air quality modeling for proposed cement plant captive power plant and mines for specific pollutants has been done.<br>Cumulative impacts of cement plant, captive power plant transportation, fugitive emissions and mines has also been assessed.<br>Details of the same have been incorporated in this EIA/EMP Report.<br>Worst case scenarios has been done and incorporated in this EIA/EMP Report. | Chapter - 4<br>Section No. 4.6<br>Page no: 204 - 220 |
| (v) | Environmental Monitoring Plan (post EC) including number of monitoring stations, location, schedule w.r.t stock ambient air, ground water, surface water, noise, soil shall be submitted. | EMP including number of monitoring stations, location, schedule w.r.t stock ambient air, ground water, surface water, noise, soil has been incorporated in this EIA/EMP Report. | Chapter - 6<br>Section: 6.2.3<br>Page No. 250 |
| (vi) | Designed efficiencies of the proposed pollution control equipment shall be clearly mentioned with designed flow frates. Proposed bag filters shall be with adequate air to cloth ratios to | Details of Bag house bag filters has been incorporated in this EIA/EMP Report. | Chapter 2<br>Section 2.2<br>Page No. 104 |

| ADS Point No. | Additional Details Sought | Reply by the Project Proponent | Reference in Final EIA/EMP Report |
|---|---|---|---|
| | minimize the emissions well below the standards prescribed. | | |
| (vii) | The budget earmarked for Enterprise Social Commitment and point wise and time bound action plan for issues raised in public hearing along with budget provision shall be clearly mentioned within the CAPEX and not in any other head. | Company has allocated Rs. 355 Crores (Rs. 184 Crore in phase-I and 171 Crore in phase-II), i.e. 5% of the total Project cost, towards the Enterprise Social Commitment and details of the same along with item wise - timebound action plan have been incorporated in this EIA/EMP Report. | Chapter - 8, Section 8.2 Page no. 308 |
| (viii) | Risk Assessment study shall be conducted based on the Maximum Credible Loss Scenarios and Disaster Management/Emergency Preparedness Plan shall be prepared including administrative mechanisms, infrastructure facilities including onsite and offsite. | Risk Assessment study based on the Maximum Credible Loss Scenarios and Disaster Management/Emergency Preparedness plan has been prepared and incorporated in this EIA/EMP Report. | Chapter - 7, Section 7.3 Page no. 283 |
| (ix) | Provisions shall be clearly furnished for setting up of bio-gas generation plants using of Kitchen waste/ canteen. | Bio-gas generation plants using of Kitchen waste/ canteen has been investigated. Details for the same is given in this EIA/EMP Report. | Chapter - 2, Section - 2.11.4, Page no. 111 |
| (x) | The green plan shall be clearly indicated with proper legend, type of species, year of development, etc. Greenbelt Development Plan shall be as per the prescribed guidelines of CPCB. Timelines of plantation for the greenbelt development before construction phase shall be furnished ensuring the 80% development in the first year leaving those areas intervene with construction activity. | The total project area is 187.1 ha, out of which ~ 42.65 % of the total project area i.e., 79.8 ha has been earmarked to be developed as greenbelt development & plantation.<br>The proposed greenbelt development & plantation area will be developed in upcoming 3 years with 199,500 numbers of trees with density of plantation is 2500 trees per ha. Native & fruits bearing species, medical value types will be planted as per CPCB guidelines in consultation with DFO.<br>Detailed greenbelt plan has been incorporated in this EIA/EMP Report. | Chapter - 10, Section 10.2 Page no. 338 |

| ADS Point No. | Additional Details Sought | Reply by the Project Proponent | Reference in Final EIA/EMP Report |
|---|---|---|---|
| (xi) | Skill Development programme shall be prepared in line with the modules of the Skill Council of India for implementation of the same in due course of implementation of the project. | Skill Development programme has been prepared in line with the modules of the Skill Council of India and incorporated in the final EIA/EMP report. | Chapter 8<br>Table: 8.3 - 8.4<br>Page no.312 - 314 |
| (xii) | Certified list of flora and fauna from DFO for the study area shall be submitted. | List of flora & fauna has been submitted for authentication to Chief Wildlife Warden, Guntur, Andhra Pradesh, 20th Sept., 2024. Copy of the submission receipt is enclosed as ***Annexure - 3*** along with this EIA/EMP report. | *Annexure - 3,*<br>*Page no. 418 - 419* |
| (xiii) | Water requirement per day for construction and operation phases including dust suppression, greenbelt development shall be furnished in the report component wise. | 500 KLD water will be required during construction phase, which will be sourced from ground water/water tanker.<br>During operation phase, 2922 KLD water will be required for plant process, domestic purpose, greenbelt & dust suppression. (Treated water/Recycled water will be used for dust suppression and part will be for greenbelt. | - |
| (xiv) | Permission for withdrawal of groundwater from Competent Authority shall be submitted. | Permission for 1325 KLD for phase I has already been obtained from Ground Water and Ground Water Audit Department vide Letter No. 408-11/CDP/Hg-II/2015, dated 22nd Feb., 2018. The copy of the same is enclosed as ***Annexure - 9*** along with this EIA / EMP Report. For the balance water requirement, application will be applied to CGWA. | *Annexure - 9,*<br>*Page no 574 - 587* |
| (xv) | Detailed Hydrography of the site including mines shall incorporate in hydrological study. Locations of the groundwater recharging pits and ground water monitoring locations shall be identified based on the hydrogeological and geohydrological study. | Detailed hydrogeological studies including mines were conducted and report has been enclosed as ***Annexure - 8*** with the EIA/EMP Report. | *Annexure - 8,*<br>*Page no. 518 - 573* |

*******

# FINAL ENVIRONMENTAL IMPACT ASSESSMENT REPORT

# &

# ENVIRONMENTAL MANAGEMENT PLAN

For

# Proposed 5.0 Million TPA Integrated Cement Clinkerisation Plant, 8.0 Million TPA Cement Grinding Unit and 100 MW Captive Power Plant

At
Village: Gollapalle, Mandal: Mylavaram,
District: Kadapa (YSR), Andhra Pradesh

Baseline Study Period: Summer Season (March to May, 2024)

Public Hearing Date: 20.10.2016

APPLICANT

ACC

M/s. ACC Limited

Adani Corporate House.
Shantigram, Near Vaishno Devi Circle,
SG Highway, Khodiyar,
Ahmedabad 382 421,
Gujarat, India

EIA CONSULTANT

J.M. EnviroNet Pvt. Ltd.

(Registered EIA Consultant Organization from NABET-QCI)
Certificate No.:NABET/EIA/2326/RA 0308 valid upto 7th August, 2026
Emaar Digital Greens, Tower – B, Unit No. 1517,
Golf Course Ext. Road, Sector – 61, Gurugram (Haryana) – 122 011
E-mail: jmenviron@hotmail.com
NABL Approved Lab: JM EnviroLab Pvt. Ltd.
(Certificate No.:TC-6821)

adani
Cement

ACC

**UNDERTAKING**

I, Sanjay Prasad, (Head - Environment & Authorized Signatory) of M/s. ACC Limited give this undertaking to the effect for Final EIA/EMP Report has been prepared as per Terms of reference (ToR) issued by MoEFCC, New Delhi *Vide* Letter No. J-11011/265/2012-IA II(I) dated 20th February, 2013 and validity extended *Vide* Letter dated 18th Feb., 2016 for carrying out the Environmental Impact Assessment (EIA) study for "Proposed 5.0 Million TPA Integrated Cement Clinkerisation Plant, 8.0 Million TPA Cement Grinding Unit and 100 MW Captive Power Plant at Village: Gollapalle, Mandal: Mylavaram, District: Kadapa (YSR), Andhra Pradesh" have been compiled with, and the data submitted are factually correct.

Date: 10.12.2024
Place: Ahmedabad

**For & behalf of M/s. ACC Limited**

**Sanjay Prasad**
**Head Environment & Authorized Signatory**

ACC Limited
Cement House,
121, Maharshi Karve Road,
Mumbai 400 020, India
www.acclimited.com

**Undertaking**

We, J.M. EnviroNet Pvt. Ltd., JMEPL, Emaar Digital Greens, Tower- B, Unit No. 1517, Golf Course Ext. Road, Sector - 61, Gurugram (Haryana) - 122011, Environmental Consultants of **Proposed 5.0 Million TPA Integrated Cement Clinkerisation Plant, 8.0 Million TPA Cement Grinding Unit and 100 MW Captive Power Plant at Village: Gollapalle, Mandal: Mylavaram, District: Kadapa (YSR), Andhra Pradesh by M/s. ACC Limited** give this undertaking to the effect that this Final EIA/EMP Report has been prepared as per ToR Letter issued by MoEF&CC, New Delhi *Vide* Letter No. J-11011/265/2012-IA II(I) dated 20th February, 2013; validity extended *Vide* Letter dated 18th Feb., 2016 & as per data/details provided by the Project Proponent and the data submitted are factually correct.

Date: 04.12.2024

Place: Gurugram

For & behalf of J.M EnviroNet Pvt. Ltd.

Deepa Taneja

Dr. Deepa Taneja
Managing Director

**Regd. Office**
Jaipur Centre, 403, 4th Floor,
B2 Bye pass, Tonk Road, Jaipur-302018 (Rajasthan) India
E-mail: jmenviron@hotmail.com www.jmenvironet.org

**Corporate Office**
Emaar Digital Greens, Tower-B,
Unit No.1517, Golf Course Ext. Road,
Sector-61, Gurugram-122011 (Haryana) India

## *Declaration of Association in the Final EIA/EMP Report*

**File No.:** J-11011/265/2012-IA II(I)

Declaration by Experts contributing to the Final EIA for Proposed 5.0 Million TPA Integrated Cement Clinkerisation Plant, 8.0 Million TPA Cement Grinding Unit and 100 MW Captive Power Plant at Village: Gollapalle, Mandal: Mylavaram, District: Kadapa (YSR), Andhra Pradesh by M/s. ACC Limited.

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

**JM File no.:** JMEPL/JM-2467/ACC/Final EIA/Dec., 2024/ Final Revision No. 01 (Copy No. 0)

| | Name | Period of involvement | Signature & Date |
|---|---|---|---|
| EIA Coordinator: | Mr. B. K. Rao | Feb., 2024 to till date | |
| Contact information: | Unit No. 1517, Tower B, Emaar Digital Greens, Golf Course Extension Road, Sector 61, Gurugram- 122 001 (Haryana) Email: jmenviron@hotmail.com | | |

Functional Area Experts:

| S. No. | Functional areas | Name of the expert/s | | Involvement (Period and task**) | Signature & Date |
|---|---|---|---|---|---|
| 1 | AP | FAE | Mr. B.K. Rao | Feb., 2024 to till date | |
| 2 | WP | FAE | Mr. Dinesh Singh | Feb., 2024 to till date | |
| 3 | SHW | FAE | Ms. Nisha Sharma | Feb., 2024 to till date | 03/12/2024 |
| 4 | SE | FAE | Ms. Geetanjali Saini | Feb., 2024 to till date | 03-12-24 |
| 5 | EB | FAE | Mr. Akshay Singh | Feb., 2024 to till date | 03-12-24 |
| 6 | AQ | FAE | Ms. Ekta Arora | Feb., 2024 to till date | 03/12/24 |
| 7 | Noise | FAE | Ms. Nisha Sharma | Feb., 2024 to till date | 03/12/2024 |
| 8 | LU | FAE | Ms. Geetanjali Saini | Feb., 2024 to till date | 03-12-24 |
| 9 | RH | FAE | Dr. Suresh Chandra Jain | Feb., 2024 to till date | |

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

***Declaration of Association in the Final EIA/EMP Report***

I, Dr. Deepa Taneja, Managing Director, J.M. EnviroNet Pvt. Ltd., hereby, confirm that the above-mentioned experts prepared the EIA/EMP Report for Proposed 5.0 Million TPA Integrated Cement Clinkerisation Plant, 8.0 Million TPA Cement Grinding Unit and 100 MW Captive Power Plant at Village: Gollapalle, Mandal: Mylavaram, District: Kadapa (YSR), Andhra Pradesh by M/s. ACC Limited.

I also confirm that the consultant organization shall be fully accountable for any mis-leading information mentioned in this statement.

| | |
|---|---|
| Signature: | |
| Name: | **Dr. Deepa Taneja** |
| Designation: | **Managing Director** |
| Name of the EIA consultant organization: | **JM EnviroNet Pvt. Ltd.** |
| NABET Certificate no. & issue date: | **NABET/EIA/23-26/RA 0308 dated 29th Nov., 2023 and valid upto 7th August, 2026** |

## Certificate of Plagiarism check

| | |
|---|---|
| Title of EIA Report | Proposed 5.0 Million TPA Integrated Cement Clinkerisation Plant, 8.0 Million TPA Cement Grinding Unit and 100 MW Captive Power Plant at Village: Gollapalle, Mandal: Mylavaram, District: Kadapa (YSR), Andhra Pradesh by M/s. ACC Limited. |
| Name of Accredited Organization | J.M. EnviroNet Pvt. Ltd. |
| Unique Identification Number | **Project** – MoEFCC File No. J-11011/265/2012-IA II (I)<br>**Consultant** - JMEPL/JM-2467 /ACC/Final EIA/Nov., 2024/ Final Revision No. 01 (Copies No. 0) |
| Name of EIA Co-ordinator (EC) | Mr. B.K Rao |
| Name of the software | Paid plagiarism software - Plagiarism Checker X<br>https://plagiarismcheckerx.com/ |
| Date of check | 02.12.2024 |
| Time of check | 03:45 PM |

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

I hereby certify that this EIA report has been evaluated using online software viz., **Plagiarism Checker X** (https://plagiarismcheckerx.com/). The report produced has been analysed by the system and based on it, I certify that the EIA Report produced in accordance with good scientific practice.

Date and Sign of EIA Co-ordinator: 02.12.2024

Name: Mr. B.K Rao

Designation: Advisor / EIA Coordinator

Date and sign of Head of Accredited Organization:

Dr. Deepa Taneja (Managing Director)

Name of the EIA consultant organization: J.M. EnviroNet Pvt. Ltd.

NABET Certificate No. & Issue Date: NABET/EIA/23-26/RA 0308 dated 29th Nov., 2023 and valid upto 7th August, 2026

**TABLE OF CONTENTS**


| S. NO. | PARTICULARS | PAGE NO. |
|---|---|---|
| **A.** | **TOR LETTER & TOR REPLY** | |
| 1. | ToR Letter | **1 - 6** |
| 2. | ToR Reply | **7 - 31** |
| 3. | Executive Summary | **32 - 58** |
| **B.** | **Final EIA / EMP REPORT** | |
| Chapter -1 | Introduction | **59 - 65** |
| Chapter -2 | Project Description | **66 - 112** |
| Chapter -3 | Description of the Environment | **113 - 194** |
| Chapter -4 | Anticipated Environmental Impacts and Mitigation Measures | **195 - 245** |
| Chapter -5 | Analysis of Alternatives (Technology & Site) | **246 - 247** |
| Chapter -6 | Environmental Monitoring Programme | **248 - 256** |
| Chapter -7 | Additional Studies | **257 - 304** |
| Chapter -8 | Project Benefits | **305 - 315** |
| Chapter -9 | Environmental Cost Benefit Analysis | **316** |
| Chapter -10 | Environmental Management Plan | **317 - 351** |
| Chapter -11 | Summary & Conclusion | **352 - 366** |
| Chapter -12 | Disclosure of Consultant Engaged | **367 - 368** |
| **ANNEXURES** | | |
| Annexure - 1 | Coal linkage document | **369** |
| Annexure - 2 | Questionnaire for environmental appraisal | **370 - 417** |
| Annexure - 3 | Submission receipt of Flora & fauna | **418 - 419** |
| Annexure - 4 | Land Documents | **420 - 450** |
| Annexure - 5 | Non forest Certificate Kadapa Plant & Mine | **451** |
| Annexure – 6 | HMD | **452 - 499** |
| Annexure - 7 | Detailed AAQM table | **500 - 517** |
| Annexure - 8 | HG Report | **518 - 573** |
| Annexure - 9 | Ground water permission | **574 - 587** |
| Annexure – 10 | Submission receipt of Wildlife conservation Plan | **588 - 589** |
| Annexure - 11 | Public hearing proceedings | **590 - 712** |
| Annexure - 12 | Brief summary of limestone mine | **713 - 726** |
| Annexure - 13 | Submission receipt of NOC for seasonal Nallah | **727** |
| Annexure - 14 | Old Isopleths | **728 - 730** |
| Annexure - 15 | In principle approval of railway siding | **731- 732** |
| Annexure - 16 | NABET Certificate | **733** |

## INDEX


| S.NO. | PARTICULARS | PAGE NO. |
|---|---|---|
| **Chapter- 1** | **Introduction** | **59 - 65** |
| 1.1 | Purpose of the report | 59 |
| 1.2 | Identification of the project and project proponent | 59 |
| 1.3 | Brief Description of nature, size, location of the project and its importance to the country and region | 61 |
| 1.4 | Scope of EIA study {Details of Regulatory Scoping Carried out (As per ToR)} | 64 |
| 1.5 | Regulatory Scoping | 65 |
| | | |
| **Chapter - 2** | **Project Description** | **66 - 112** |
| 2.0 | Introduction | 66 |
| 2.1 | Type of Project | 66 |
| 2.2 | Need for the project | 66 |
| 2.3 | Location of the project | 67 |
| 2.4 | Size or magnitude of operation | 74 |
| 2.5 | Requirements for the proposed project | 75 |
| 2.6 | Proposed Schedule for Approval and Implementation | 82 |
| 2.7 | Technology and Process Description | 82 |
| 2.8 | Other Project Associated Activities | 95 |
| 2.9 | Details of Proposed Major Equipment& Machineries | 102 |
| 2.10 | Infrastructure Facilities | 105 |
| 2.11 | Description of Mitigation Measures | 105 |
| 2.12 | Assessment of New & Tested Technology for the Risk of Technology Failure | 112 |
| 2.13 | Summary and Conclusion | 112 |
| | | |
| **Chapter - 3** | **Description of the Environment** | **113 - 194** |
| 3.0 | Introduction | 113 |
| 3.1 | Environment Settings of the Study Area | 113 |
| 3.2 | Study period | 116 |
| 3.3 | Environmental components | 116 |
| 3.4 | Establishment of baseline for valued environmental components | 117 |
| 3.5 | Baseline status of the various environmental components | 121 |
| 3.6 | Conclusion | 194 |
| | | |
| **Chapter - 4** | **Anticipated Environmental Impacts and Mitigation Measures** | **195 - 245** |
| 4.1 | Environmental Impact Study | 195 |
| 4.2 | Methodology of Impact Assessment | 195 |
| 4.3 | Basis of Impact Assessment | 195 |
| 4.4 | Interaction Matrix | 198 |
| 4.5 | Anticipated Impact on Topography & Land Use Pattern and Mitigation Measures | 201 |
| 4.6 | Anticipated Impact on Air Quality and Mitigation Measures | 204 |

| S.NO. | PARTICULARS | PAGE NO. |
|---|---|---|
| 4.7 | Anticipated Impact on Noise Environment and Mitigation Measures | 221 |
| 4.8 | Anticipated Impact on Water Quality and Mitigation Measures | 223 |
| 4.9 | Anticipated Impact on Soil Quality and Mitigation Measures | 224 |
| 4.10 | Anticipated Impact on Biological Environment and Mitigation Measures | 226 |
| 4.11 | Anticipated Impact on Socio-Economic Environment and Mitigation Measures | 228 |
| 4.12 | Anticipated Impact on Occupational Health and Mitigation Measures | 232 |
| 4.13 | Anticipated Impact Due to Transportation of Raw Material and Finished Product and Mitigation Measures | 234 |
| 4.14 | Impact Due to Solid and Hazardous Waste Generation | 242 |
| 4.15 | Aspect Impact Analysis with Mitigation Measures | 243 |
| 4.16 | Summary & Conclusion | 245 |
| | | |
| **Chapter - 5** | **Analysis of Alternatives (Technology and Site)** | **246 - 247** |
| 5.1 | Introduction | 246 |
| 5.2 | Analysis of Alternatives w.r.t Technology | 246 |
| 5.3 | Analysis of Alternatives w.r.t Site | 247 |
| | | |
| **Chapter - 6** | **Environmental Monitoring Programme** | **248 - 256** |
| 6.1 | Introduction | 248 |
| 6.2 | Measurement Methodologies | 248 |
| 6.3 | Data Analysis | 255 |
| 6.4 | Reporting Schedule | 255 |
| 6.5 | Emergency procedures | 256 |
| 6.6 | Detailed Budget | 256 |
| | | |
| **CHAPTER- 7** | **ADDITIONAL STUDIES** | **257 - 304** |
| 7.1 | Introduction | 257 |
| 7.2 | Public Consultation | 257 |
| 7.3 | Risk Assessment and Disaster Management Plan | 283 |
| 7.4 | Conclusion | 304 |
| | | |
| **Chapter - 8** | **Project Benefits** | **305 - 315** |
| 8.1 | Introduction | 302 |
| 8.2 | Proposed Project benefits | 302 |
| 8.3 | Motion of Social and economic status | 309 |
| 8.4 | Proposed action plan for socio-economic development | 309 |
| 8.5 | Conclusion | 315 |
| | | |
| **Chapter - 9** | **Environmental Cost Benefit Analysis** | **316** |
| 9.1 | Environmental Cost Benefit Analysis | 316 |
| | | |

| S.NO. | PARTICULARS | PAGE NO. |
|---|---|---|
| **Chapter – 10** | **Environment Management Plan** | **317 - 351** |
| 10.1 | Introduction | 317 |
| 10.2 | Corporate Environment Policy | 318 |
| 10.3 | Formation of Environmental Management Cell (EMC) | 320 |
| 10.4 | Air quality management | 321 |
| 10.5 | Compliance of CREP recommendations | 326 |
| 10.6 | Noise Quality Management | 328 |
| 10.7 | Concept of waste minimization, 3r's (Reuse, Recycle and Recover Techniques) | 329 |
| 10.8 | Energy & Natural Resource Conservation Measures | 329 |
| 10.9 | Solid Hazardous Waste Management Plan | 334 |
| 10.10 | Rain / Storm Water Management Plan | 335 |
| 10.11 | Greenbelt Development and Plantation Programme | 338 |
| 10.12 | Occupational Health and safety measures | 342 |
| 10.13 | Budgetary Provision for Environment Management | 350 |
| 10.14 | Conclusion | 351 |
| | | |
| **Chapter - 11** | **Summary & Conclusion** | **352 - 366** |
| 11.0 | Project description | 352 |
| 11.1 | Introduction | 352 |
| 11.2 | Site selection for the Project | 353 |
| 11.3 | Details of the Project | 353 |
| 11.4 | Process description | 357 |
| 11.5 | Description of environment | 358 |
| 11.6 | Anticipated environmental impacts and mitigation measures | 360 |
| 11.7 | Cost for environment Management Plan | 362 |
| 11.8 | Environmental monitoring programme | 363 |
| 11.9 | Additional Studies | 363 |
| 11.10 | Public hearing | 364 |
| 11.11 | Project benefits | 364 |
| 11.12 | Environment management plan | 364 |
| 11.13 | Occupational health hazard | 366 |
| 11.14 | Conclusion | 366 |
| | | |
| **Chapter – 12** | **Disclosure of Consultant Engaged** | **367 - 368** |
| 12.1 | Disclosure of the Consultant Engaged | 367 |
| | | |


## LIST OF TABLES


| TABLE NO. | PARTICULARS | PAGE NO. |
|---|---|---|
| 1.1 | Production Capacities of the Proposed Integrated Plant | 61 |

| TABLE NO. | PARTICULARS | PAGE NO. |
|---|---|---|
| 1.2 | Status of the Proposed Project with respect to Environment Clearance | 61 |
| 1.3 | Brief Description of Nature, Size and Location of Project | 62 |
| 1.4 | Cement Demand Forecast | 64 |
| 2.1 | GPS Co- ordinates of the Project Site | 70 |
| 2.2 | Proposed Project Area Break-up | 71 |
| 2.3 | Size or magnitude of operations in terms of capacity | 74 |
| 2.4 | Magnitude of cost for the project | 75 |
| 2.5 | Scope of proposed project | 75 |
| 2.6 | Raw material requirement | 76 |
| 2.7 | Fuel & Feedstock | 77 |
| 2.8 | Basic Requirements for the project | 78 |
| 2.9 | Breakup of Water requirement | 79 |
| 2.10 | Breakup of power requirement | 81 |
| 2.11 (a) | Break-up of Manpower Requirement for construction phase (24 months) | 81 |
| 2.11 (b) | Break-up of Manpower Requirement for operation phase (per annum) | 81 |
| 2.12 | Details of Waste Co-processing in Plant | 85 |
| 2.13 | Major List of Equipment's for Green Fuel installation | 89 |
| 2.14 | Details of Captive Power plant | 92 |
| 2.15 | Expected Waste Water Characteristics of STP | 100 |
| 2.16 | Proposed Equipment Details of Cement Plant, WHRS, CPP | 102 |
| 2.17 | Proposed Storage Facilities | 103 |
| 2.18 | Proposed control equipment (Cement Plant & CPP) | 103 |
| 2.19(a) | List of Bag Dust Collectors (Pyro-Section) | 107 |
| 2.19(b) | List of Bag Dust Collectors in Grinding Section | 108 |
| 2.19(c) | List of Bag Dust Collectors (CPP) | 110 |
| 3.1 | Environmental Settings Details | 113 |
| 3.2 | Major industries falling nearby to the plant area | 116 |
| 3.3 | Baseline Data collection | 117 |
| 3.4 | Land Use / Land Cover Details of Study Area | 131 |
| 3.5 | Seismic Zones in India | 136 |
| 3.6 | Rainfall Data for last 10 Years | 140 |
| 3.7 | Micro-Meteorology at Site Study Period: Summer Season (March, 2024 to May, 2024) | 142 |
| 3.8 | Mixing Height & Inversion Levels | 144 |
| 3.9 | Details of Test Procedures | 146 |
| 3.10 | Composite Locations of Ambient Air Quality Monitoring Stations for Summer season (March, 2024 to May, 2024) | 147 |
| 3.11 | Ambient Air Quality Monitoring Results for Study Period: Summer Season (March, 2024 to May, 2024) | 150 |
| 3.12 | Composite Locations of Ambient Noise Monitoring Stations: Summer Season (March, 2024 to May, 2024) | 154 |
| 3.13 | Ambient Noise Level Monitoring Results for Study Period: Summer Season (March, 2024 to May, 2024) | 156 |
| 3.14 | Composite Location of Surface water Quality Monitoring Locations for Study Period: Summer Season (March, 2024 to May, 2024) | 157 |

| TABLE NO. | PARTICULARS | PAGE NO. |
|---|---|---|
| 3.15 | Composite Locations of Ground Water station for Study Period Summer Season (March, 2024 to May, 2024) | 159 |
| 3.16 | Ground Water Analysis for Study Period: Summer Season (March, 2024 to May, 2024) | 161 |
| 3.17 | Locations of Soil Sampling for Study Period Summer Season (March, 2024 to May, 2024) | 166 |
| 3.18 | Soil Analysis Results for Study Period: Summer Season (March, 2024 to May, 2024) | 168 |
| 3.19 | Standard Soil Classification | 170 |
| 3.20 | Chemical & Trace Element Analysis of raw mix | 172 |
| 3.21 | Trace Metal Analysis | 173 |
| 3.22 | Inventory of floral diversity in Buffer & Core zone of Plant Site | 175 |
| 3.23 | Inventory of faunal diversity in Buffer & Core Zone of Plant Site | 176 |
| 3.24 | Demographic Profile | 183 |
| 3.25 | Village Wise Demographic Profile of the Study Area | 184 |
| 3.26 | Zone Wise Demographical Profile of Study Area | 186 |
| 3.27 | Summary of Vulnerable Group in the Study area | 187 |
| 3.28 | Literacy Rate of Surveyed Villages | 188 |
| 3.29 | Working Population of the Study Area | 189 |
| 3.30 | Educational Facilities in the Study Area | 190 |
| 3.31 | Health Facilities in the Study Area | 191 |
| 4.1 | Impact Characteristics | 196 |
| 4.2 | Significance of Impact | 197 |
| 4.3 | Irreversible and Irretrievable commitments of environmental components | 197 |
| 4.4 | Interaction Matrix | 199 |
| 4.5 | Likely Impacted Resources / Receptors | 201 |
| 4.6 | Proposed Stack Emission Details for Proposed Integrated Cement Plant | 206 |
| 4.7 (a) | Cumulative Ground Level Concentrations (Incremental & Resultant) due to Integrated Cement Plant | 208 |
| 4.7 (b) | Cumulative GLC due to for Integrated Cement Plant, captive mines and vehicular transportation | 208 |
| 4.8 | Traffic Volume Count Survey (SH – 57) | 236 |
| 4.9 | Traffic Volume Count: | 237 |
| 4.10 (a) | Inward Traffic due to Raw Material & Fuel Transportation - Considering 100 % by Road | 238 |
| 4.10 (b) | Outward Traffic due to Finished Product Transportation - Considering 100 % by Road* | 239 |
| 4.10(c) | Inward Traffic due to Raw Material & Fuel Transportation | 240 |
| 4.10(d) | Inward Traffic due to Raw Material & Fuel Transportation | 240 |
| 4.11 | Aspect Impact Analysis and Mitigation Measures | 243 |
| 6.1 | Parameters for Post-Project Monitoring | 250 |
| 6.2 | Frequency for Post-Project Monitoring | 254 |
| 7.1(a) | Issues / Points / Opinions of Local Public raised verbally during the Public Hearing | 261 |
| 7.2(b) | *Issues / Points / Opinions of Local Public raised by written representations in detail* | 267 |
| 7.2 | Hazard Identification and Risk Assessment (HIRA) and Safety measures to be adopted at Cement Plant | 284 |
| 7.3 | Summary of Recommended Personal Protective Equipment according to hazard onsite | 301 |

| TABLE NO. | PARTICULARS | PAGE NO. |
|---|---|---|
| 8.1 | Enterprise Social Commitment / CER for Phase - 1 | 310 |
| 8.2 | Enterprise Social Commitment / CER for Phase - 1 | 311 |
| 8.3 | Skill Development Programme (ACC DISHA) (Phase - I) | 312 |
| 8.4 | Skill Development Programme (ACC DISHA) (Phase - II) | 313 |
| 10.1 | Implementation of CREP guideline | 326 |
| 10.2 | Solid Waste Generation and their end use | 334 |
| 10.3 | Hazardous Waste Generation | 335 |
| 10.4 | Proposed Action Plan for Greenbelt Development & Plantation within Plant Area | 339 |
| 10.5 | Fund allocation for Occupational and Safety Hazards | 350 |
| 10.6 | Cost Break up of EMP | 350 |
| 11.1 | Brief Description of the project | 353 |
| 11.2 | Proposed Project Area Break-up | 355 |
| 11.3 | Raw Material Requirement | 356 |
| 11.4 | Fuel & Feedstock Requirement | 356 |
| 11.5 | Basic Requirements for the Project | 357 |
| 11.6 | Cost Break up of EMP | 362 |
| 11.7 | Post Project Monitoring | 363 |


## LIST OF FIGURES


| FIGURE NO | PARTICULARS | PAGE NO. |
|---|---|---|
| 2.1 | Location Map (Not to the Scale) | 68 |
| 2.2 | Google Earth Downloaded Map of the Project Site along with Corner Co-ordinates of the Project Site | 69 |
| 2.3(a) | Layout showing plant and machinery | 72 |
| 2.3 (b) | Plant Layout showing Greenbelt development / plantation | 73 |
| 2.4 | Photographs showing Proposed Project Site | 74 |
| 2.5 | Mass Balance Diagram (OPC &PPC) | 77 |
| 2.6 | Water Balance Diagram | 80 |
| 2.7 | Typical Cement Manufacturing Process Flow Diagram | 91 |
| 2.8 | Flow chart showing the process in captive power plant | 94 |
| 2.9 | Energy balance | 95 |
| 2.10 | Process Flow Diagram for WHRS | 96 |
| 2.11 | Schematic Diagram for Sewage Treatment Plant | 100 |
| 2.12 | Schematic Diagram for Reverse Osmosis | 101 |
| 3.1 | Map Showing Environmental Settings of 10 km radius from the project site | 115 |
| 3.2 | Geological Map of the study area | 122 |
| 3.3 | Drainage Map of the Study Area | 124 |
| 3.4 (a) | False Color Composite (FCC) Satellite Imagery of the Buffer Zone | 127 |
| 3.4 (b) | False Color Composite (FCC) Satellite Imagery of the Study area | 128 |
| 3.5 (a) | Land Use / Land Cover Map of Core Zone | 129 |
| 3.5 (b) | Land Use / Land Cover Map of the Study area | 130 |
| 3.6 (a) | 3-D Digital Elevation Model of 10 km radius from the project site | 134 |

| FIGURE NO | PARTICULARS | PAGE NO. |
|---|---|---|
| 3.6 (b) | 2-D Digital Elevation Model with contours of 10 km radius from the project site | 135 |
| 3.7 (a) | GSHAP Hazard Map of Andhra Pradesh | 137 |
| 3.7 (b) | Seismic Zone Map Showing Project Site falls in Zone II | 138 |
| 3.8 | Flood Hazard Zonation Map of the Area | 139 |
| 3.9 (a) | Wind Rose based on secondary Meteorological data for Summer Season & Annual | 141 |
| 3.9 (b) | Wind rose Diagram (Study Period: Summer Season (March, 2024 to May., 2024) | 143 |
| 3.10 | Mixing depth and Inversion layer | 145 |
| 3.11 | Key Plan showing Ambient Air Quality Monitoring Locations for Summer season (March, 2024 to May, 2024) | 149 |
| 3.12 | Key Plan showing Ambient Noise Monitoring Locations for Study Period: Summer Season (March, 2024 to May, 2024) | 155 |
| 3.13 | Key Plan showing Ground Water sampling Locations for Study Period: Summer Season (March, 2024 to May, 2024) | 160 |
| 3.14 (a) | Piper Diagram showing Ground water quality | 164 |
| 3.14 (b) | Durov Diagram showing Ground water Quality | 165 |
| 3.15 | Key Plan showing Soil Sampling Locations | 167 |
| 3.16 | General view of fine-grained limestone with pyrite grains in microcrystalline calcareous matrix, x 32 crossed polars | 174 |
| 3.17 | General view of fine-grained limestone with opaque vein in microcrystalline calcareous matrix, x80 crossed polars. | 174 |
| 3.18 | General view of fine- grained limestone with microcrystalline calcareous matrix. | 174 |
| 3.19 | General view of fine-grained limestone with opaque veins in microcrystalline calcareous matrix | 174 |
| 3.20 | Population Distribution | 186 |
| 3.21 | Vulnerable groups | 187 |
| 3.22 | Gender Wise Literacy Rate in the Study Area | 188 |
| 3.23 | Working Force in the Study Area | 189 |
| 3.24 | Education facilities in the study area | 191 |
| 3.25 | Healthcare facility distribution | 192 |
| 4.1(a) | Isopleth showing the incremental GLCs of PM2.5 due to Integrated Cement Plant | 210 |
| 4.1(b) | Isopleth showing the incremental GLCs of PM10 due to Integrated Cement Plant | 211 |
| 4.1(c) | Isopleth showing the incremental GLCs of $SO_2$ due to Integrated Cement Plant | 212 |
| 4.1(d) | Isopleth showing the incremental GLCs of $NO_2$ due to Integrated Cement Plant | 213 |
| 4.1(e) | Isopleth showing the incremental GLCs of CO due to Integrated Cement Plant | 214 |
| 4.2(a) | Isopleth showing the incremental GLCs of PM2.5 due to Integrated Cement Plant, Captive Limestone Mine and Vehicular Transportation | 215 |
| 4.2(b) | Isopleth showing the incremental GLCs of PM10 due to Integrated Cement Plant, Captive Limestone Mine and Vehicular Transportation | 216 |
| 4.2(c) | Isopleth showing the incremental GLCs of $SO_2$ due to Integrated Cement Plant, Captive Limestone Mine and Vehicular Transportation | 217 |
| 4.2(d) | Isopleth showing the incremental GLCs of NOx due to Integrated Cement Plant, Captive Limestone Mine and Vehicular Transportation | 218 |
| 4.3 | Isopleth showing the incremental GLCs of PM in worst case | 219 |
| 7.1 | Risk Analysis Strategy | 283 |
| 7.2 | Emergency Command Structure | 297 |
| 10.1 | Corporate Environment Policy | 319 |
| 10.2 | Structure of EMC at M/s. ACC | 320 |

| FIGURE NO | PARTICULARS | PAGE NO. |
|---|---|---|
| 10.3 | Contour Drainage Map | 337 |
| 10.4 | Typical Road side plantation | 339 |


**ABBREVIATIONS**

| | | |
|---|---|---|
| AAQM | : | Ambient Air Quality Monitoring |
| AAQMS | : | Ambient Air Quality Monitoring Stations |
| AAS | : | Atomic Absorption Spectrometer |
| AERMOD | : | Atmospheric Dispersion Modelling |
| APCE | : | Air Pollution Control Equipment's |
| APM | : | Air Particulate Matter |
| AMSL | : | Above Mean Sea Level |
| AvRc | : | Average run-off coefficient |
| BDL | : | Below Detection Limit |
| BGL | : | Below Ground Level |
| BIS | : | Bureau of Indian Standards |
| BOD | : | Bio-chemical Oxygen Demand |
| CEMS | : | Continuous Emission Monitoring System |
| CPCB | : | Central Pollution Control Board |
| CO | : | Carbon Monoxide |
| CA | : | Cellulose Acetate |
| CREP | : | Corporate Responsibility for Environment Protection |
| CSR | : | Corporate Social Responsibility |
| CTE | : | Consent to Establish |
| CTO | : | Consent to Operate |
| D.G | : | Diesel Generator |
| DL | : | Detection Limit |
| DO | : | Dissolved Oxygen |
| DMP | : | Disaster Management Plan |
| EC | : | Environmental Clearance |
| ECC | : | Emergency Control Centre |
| EIA | : | Environmental Impact Assessment |
| EMC | : | Environment Management Cell |
| EMP | : | Environmental Management Plan |
| ERDAS | : | Earth Resources Data Analysis System |
| ERT | : | Emergency Response Team |
| ESE | : | East of South East |
| ESC | : | Enterprise Social Commitment |
| FC | | Forest Clearance |
| FCC | : | False Color Composite |
| FSE | : | Full-scale exercise |
| FE | : | Functional exercise |

| | | |
|---|---|---|
| FICCI | : | Federation of Indian Chambers of Commerce and Industry |
| FPS | : | Fine Particulate Sampler |
| FY | : | Financial Year |
| GDP | : | Gross Domestic Product |
| GES | : | Groundwater Estimation Committee |
| GIS | : | Geographic Information System |
| GOI | : | Government of India |
| GOVT. | : | Government |
| GPS | : | Global Positioning System |
| GLC | : | Ground Level Concentration |
| Ha | : | Hectare |
| HAZID | : | Hazard Identification |
| HP | : | High Pressure |
| HC: | : | Hydrocarbons |
| HES | : | High efficiency separator |
| HSE | : | Health, Safety & Environment |
| ISO | : | International Organization for Standardization |
| ISRO | : | Indian Space Research Organization |
| IMD | : | India Meteorological Department |
| IWPA | : | Indian Wildlife protection Act |
| IS | : | Indian Standards |
| JMEPL | : | J.M. EnviroNet Private Limited |
| KLD | : | Kilo Litre per Day |
| Km | : | Kilometer |
| KWH | : | Kilo Watt Hour |
| LULC | : | Land Use/Land Cover |
| LP | : | Low Pressure |
| MSDS | : | Material Safety Data Sheets |
| MT | : | Metric Tonnes |
| MTPA | : | Million Tonnes Per Annum |
| MoEFCC | : | Ministry of Environment and Forest & Climate Change |
| MW | : | Mega Watt |
| NAAQS | : | National Ambient Air Quality Standards |
| NABARD | : | National Bank for Agriculture and Rural Development |
| NABL | : | National Accreditation Board for Testing And Calibration Laboratories |
| NABET | : | National Accreditation Board for Education & Training |
| NGO | : | Non- Governmental Organization |
| NGT | | National Green Tribunal |
| NATMO | : | National Atlas Thematic Mapping Organization |
| NDIR | : | Non-dispersive Infrared Detector |
| NE | : | North East |
| NW | | North West |

| | | |
|---|---|---|
| NH | : | National Highway |
| NIDM | : | National Institute of Disaster Management |
| NOC | : | No Objection Certificate |
| NNW | : | North of Northwest |
| NOx | : | Oxides of Nitrogen |
| NRSA | : | National Remote Sensing Agency |
| NTU | : | Nephelometric Turbidity Unit |
| NW | : | North West |
| OHS | : | Occupational Health & Safety |
| OPC | : | Ordinary Portland Cement |
| PAT | : | Perform Achieve Trade Scheme |
| PAS | : | Public address system |
| PA | : | Polyamide |
| PCU | : | Passenger Car unit |
| PF | : | Protected forest |
| pH | : | Potential Hydrogen |
| PHC | : | Public Health Centers |
| PM | : | Particulate Matter |
| PMGSY | : | Pradhan Mantri Gram Sadak Yojana |
| PPE | : | Personal Protective Equipment's |
| PPC | : | Pozzolana Portland cement |
| PPM | : | Parts Per Million |
| PVC | : | Poly Vinyl Chloride |
| RDS | : | Respiratory Dust Sampler |
| RI | : | Rainfall Infiltration |
| RO | : | Reverse Osmosis |
| RSPM | : | Respirable Suspended Particulate Matter |
| R & R | : | Rehabilitation & Resettlement |
| S | : | South |
| SAR | : | Specific Absorption Rate |
| SC | : | Scheduled Caste |
| SE | : | South East |
| SELC | : | South Eastern Coalfields Limited |
| SH | : | State Highway |
| SHE | : | Safety, Health and Environmental Protection |
| SOP | : | safe operating procedure |
| SIC | : | Site Incident Controller |
| SOI | : | Survey of India |
| SRTM | : | Shuttle Radar Topographic Mission |
| SSE | : | South of South East |
| SW | : | South West |
| SSW | | South of Southwest |

| | | |
|---|---|---|
| ST | : | Scheduled Tribes |
| SHMP | : | Sodium hexametaphosphate |
| STP | : | Sewage treatment Plant |
| TTE | : | Table-top exercise |
| TDS | : | Total Dissolved Solids |
| ToR | : | Terms of Reference |
| TPD | : | Tonnes Per Day |
| TPH | : | Tonnes Per Hour |
| USEPA | : | United States Environmental Protection Agency |
| USDA | : | United States Department of Agriculture |
| VAT | : | Value Added Tax |
| VRM | : | Vertical Rolling Mill |
| WMC | : | Works Main Controller |
| WSW | : | West of South West |
| µg/m3 | : | Micro gram per metre cube |
| µS/cm | : | Micro Siemens per centimeter |
| dB | : | Decibel |
| g | : | Gram |
| gm/sec | : | Gram per second |
| ha | : | Hectare |
| Kcal/kg | : | Kilo calorie per gram |
| kg/ha | : | Kilogram per hectare |
| kg/cm | : | Kilogram per centimeter |
| Kj/kg | : | Kilojoule per kilogram |
| km | : | Kilometer |
| kg/Nm3 | : | Kilogram per Newton cubic metre |
| mg/Nm3 | : | Milligram per Newton metre cube |
| m | : | Metre |
| mg/kg | : | Milligram per kilogram |
| mg/l | : | Milligram per Litre |
| mm | : | Millimeter |
| m3/hr | : | Meter cube per hour |
| m/s | : | Meter per second |
| sq. km | : | Square kilometer |

**F. No. J-11011/265/2012-IA II (I)**
Government of India
Ministry of Environment, Forest and Climate Change
(I.A. Division)

Indira Paryavaran Bhawan
Jor Bagh Road, Aliganj,
New Delhi - 110003
**E-mail: ad.raju@nic.in**
**Tele: 011: 246952365316**

Dated: 18th February, 2016

To

**M/s M/s ACC Ltd.**
Village Gollapalli, Myalavaram, Mandalam
District Kadappa (YSR),Andhra Pradesh

**Subject: Proposed 5.0 MTPA integrated cement clikerisation plant, 8.0 MTPA cement grinding unit, 100 MW Captive Power Plant and 7.0 MTPA captive lime stone mine with mining lease area of 997.08 ha. at gollapalli village, Myalavaram, Mandalam of Kadappa (YSR) District, Andhra Pradesh by M/s ACC Ltd. - Extension of ToR regarding.**

This has reference to your letter No. ACC/EECC/KDP/IND/4 dated 17th August, 2015 for Extension of validity of ToR for the project mentioned above. The ToRs for the proposal were earlier prescribed by the Ministry vide letter No. J-11011/265/2012-IA.II (I) dated 20th February 2013.

2.0 It has been mentioned by the Project Proponent that due to unforeseen circumstances of law and order situation owing to bifurcation of the State of Andhra Pradesh, the land acquisition process and baseline data collection was delayed and resulted in delay of submission of Draft EIA report to APPCB for public hearing. The Project Proponent mentioned that they have completed baseline data collection during the summer season (March-May, 2013) and also completed various studies as per ToRs including R&R study. The Proponent had requested for extension of validity of ToRs for further period of 1 year i.e up to 19th February, 2017.

3.0 The above proposal was considered by the Expert Appraisal Committee (Industry-I) in its 1st meeting held during 18th -20th November, 2015. Based on the presentation made and discussions held, the Committee recommended the proposal for extension of validity of ToRs for another period of one year, with effect from 20th February, 2016 in accordance with the Office Memorandum No. J-11013/41/2006-IA-II(I)(part) dated 08.10.2014.

4.0 The Ministry accepts the recommendation of the EAC (Industry) and hereby extend the validity of ToR No. J-11011/265/2012-IA-II(I) dated 20.02.2013 for further period of 1 years i.e. upto 20.02.2016 under the provisions of EIA Notification, 2006, as amended.

5.0 All the conditions stipulated in the ToR letter No. J-11011/265/2012-IA-II(I) dated 20.02.2013 shall remain the same.

This issues with the approval of the Competent Authority.

**(Amardeep Raju)**
**Scientist 'D'**

**Copy to:-**

1. The Secretary, Department of Environment, Government of Andhra Pradesh.
2. The Additional Principal Chief Conservator of Forests (C), Ministry of Environment, Forest and Climate Change, Regional Office (SEZ), I$^{st}$ and II$^{nd}$ Floor, Handloom Export Promotion Council, 34, Cathedral Garden Road, Nungambakkam, Chennai – 600034.

**(Amardeep Raju)**
**Scientist 'D'**

**F. No. J-11011/265/2012-IA II (I)**
**Government of India**
**Ministry of Environment and Forests**
**(I.A. Division)**

**Paryavaran Bhawan**
**CGO Complex, Lodhi Road**
**New Delhi – 110 003**

**E-mail: vp.upadhyay@nic.in**
**Telefax: 011: 2436 2875**
**Dated: 20th February, 2013**

To

Shri Ramit Budhraja
Chief Executive- South West
ACC Limited, Connaught Place
313 Bund Garden Road
Pune, Maharashtra – 411001.

**Email:** ramit.budhraja@acclimited.com **Fax: 020-66271090**

**Subject : Proposed 5.0 MTPA integrated cement clinkerisation plant, 8.0 MTPA cement grinding unit, 100 MW Captive power plant and 7.0 MTPA captive lime stone mine with mining lease area of 997.08 ha. At Gollapalli Village, Myalavaram Mandalam of Kadappa (YSR) District, Andhra Pradesh by M/s ACC Ltd.- regarding ToRs.**

Sir,

This has reference to your letter no. DL/ACC/RO-PUNE/KADAPA dated 5.7.2012 along with Form-I, Pre-feasibility report and proposed TORs as per the EIA Notification, 2006.

2. The above proposal was considered by the Reconstituted Expert Appraisal Committee (Industry) in its 4th meeting held during 8-9 January, 2013 for prescribing TORs for undertaking detailed EIA /EMP study. Based on the information furnished and presentation made by you and your consultant M/s Vimta Labs, Hyderabad, the Committee prescribed the following TORs for preparation of EIA/EMP Report:

1. Executive summary of the project
2. Photographs of the proposed plant area.
3. Copies of coal linkage documents
4. A line diagram/flow sheet for the process and EMP
5. The earlier questionnaire for industry sector should be submitted while submitting EIA/EMP.
6. A site location map on Indian map of 1:10, 00,000 scale followed by 1:50,000/1:25,000 scale on an A3/A2 sheet with at least next 10 Kms of terrains i.e. circle of 10 kms and further 10 kms on A3/A2 sheets with proper longitude/latitude/heights with min. 100/200 m. contours should be included. 3-D view i.e. DEM (Digital Elevation Model) for the area in 10 km radius from the proposal site.
7. Present land use should be prepared based on satellite imagery. High-resolution satellite image data having 1m-5m spatial resolution like quickbird, Ikonos, IRS P-6 pan sharpened etc. for the 10Km radius area from proposed site. The same should be used for land used/land-cover mapping of the area.

8. Break up of small, medium and large farmers from whom the land is being acquired. If small farmers are involved, a detailed R&R plan.
9. Location of national parks / wildlife sanctuary / reserve forests within 10 km. radius should specifically be mentioned. A map showing land use / land cover, reserved forests, wildlife sanctuaries, national parks, tiger reserve etc. in 10 km of the project site.
10. Project site layout plan to scale using AutoCAD showing raw materials, fly ash and other storage plans, bore well or water storage, aquifers (within 1 km.) dumping, waste disposal, green areas, water bodies, rivers/drainage passing through the project site should be included.
11. Details and classification of total land (identified and acquired) should be included.
12. Proposal should be submitted to the Ministry for environment clearance only after acquiring total land. Necessary documents indicating acquisition of land should be included.
13. Rehabilitation & Resettlement (R & R) should be as per policy of the State Govt. and a detailed action plan should be included.
14. Permission and approval for the use of forest land and recommendations of the State Forest Department regarding impact of proposed expansion on the surrounding reserve forests, if applicable, should be included.
15. A list of industries containing name and type in 10 km radius shall be incorporated.
16. Residential colony should be located in upwind direction.
17. List of raw material required and source along with mode of transportation should be included. All the trucks for raw material and finished product transportation must be “Environmentally Compliant”.
18. Petrological and Chemical analysis and other chemical properties of raw materials used (with GPS location of source of raw material) i.e. ores, minerals, rock, soil, coal, iron, dolomite quartz etc. using high definition and precision instruments mentioning their detection range and methodology such Digital Analyzers, AAS with Graphite furnace, ICPMS, MICRO-WDXRF, EPMA, XRD, Nano studies or at least as per I30-10500 and WHO norms. These analysis should include trace element and metal studies like Cr (vi) Ni, Fe, As, Pb, Zn, Hg, Se, S etc. Presence of radioactive elements (U, Th etc.).
19. Petrography, grain size analysis and Major element analysis of raw material and soil from project site and raw material should be done on the same parameters along with analysis for $SiO_2$, $Al_2O_3$, MgO, MnO, $K_2O$, CaO, FeO, $Fe_2O_3$, $P_2O_5$, $H_2O$, $CO_2$.
20. If the rocks, ores, raw material has trace elements their petrography, ore microscopy, XRD, elemental mapping EPMA, XRF is required to quantify the amount present in it and hence future risk involved while using it and management plan.
21. Studies for fly ash, muck disposal, slurry, sludge material and solid waste generated should also be included, if the raw materials used has trace elements and a management plan.
22. Manufacturing process details for all the cement plant, captive power plant and mine should be included.
23. Possibility of installation of WHRB will be explored and details included
24. Mass balance for the raw material and products should be included.
25. Energy balance data for all the components including proposed power plant should be incorporated.
26. Site-specific micro-meteorological data using temperature, relative humidity, hourly wind speed and direction and rainfall should be collected.

27. Sources of secondary emissions, its control and monitoring as per the CPCB guidelines should be included. A full chapter on fugitive emissions and control technologies should be provided.
28. An action plan to control and monitor secondary fugitive emissions from all the sources as per the latest permissible limits issued by the Ministry vide G.S.R. 414(E) dated 30th May, 2008.
29. Vehicular pollution control and its management plan should be submitted.
30. A write up on use of high calorific hazardous wastes from all the sources in kiln and commitment regarding use of hazardous waste should be included.
31. Ambient air quality at 8 locations within the study area of 10 km., aerial coverage from project site with one AAQMS in downwind direction should be carried out.
32. The suspended particulate matter present in the ambient air must be analyzed for the presence of poly-aromatic hydrocarbons (PAH), i.e. Benzene soluble fraction. Chemical characterization of RSPM and incorporating of RSPM data.
33. Determination of atmospheric inversion level at the project site and assessment of ground level concentration of pollutants from the stack emission based on site-specific meteorological features.
34. Air quality modeling for all the plants proposed including mine for specific pollutants needs to be done. APCS for the control of emissions within 50 mg/$Nm^3$ should be included. Cumulative impacts of cement plant, Captive Power Plant and mines located at a distance of 2.0 km on the ambient air quality shall be assessed.
35. Action plan to follow National Ambient Air Quality Emission Standards issued by the Ministry vide G.S.R. No. 826(E) dated 16th November, 2009 should be included.
36. Ambient air quality monitoring along with cumulative impact should be included for the day (24 hrs) for maximum GLC along with following :
    i) Emissions (g/second) with and without the air pollution control measures
    ii) Meteorological inputs (wind speed, m/s), wind direction, ambient air temperature, cloud cover, relative humidity & mixing height using SODAR on hourly basis
    iii) Model input options for terrain, plume rise, deposition etc.
    iv) Print-out of model input and output on hourly and daily average basis
    v) A graph of daily averaged concentration (MGLC scenario) with downwind distance at every 500 m interval covering the exact location of GLC.
    vi) Details of air pollution control methods used with percentage efficiency that are used for emission rate estimation with respect to each pollutant
    vii) Applicable air quality standards as per LULC covered in the study area and % contribution of the proposed plant to the applicable Air quality standard. In case of expansion project, the contribution should be inclusive of both existing and expanded capacity.
    viii) No. I-VII are to be repeated for fugitive emissions and any other source type relevant and used for industry
    ix) Graphs of monthly average daily concentration with down-wind distance
    x) Specify when and where the ambient air quality standards are exceeded either due to the proposed plant alone or when the plant contribution is added to the background air quality.
    xi) Fugitive dust protection or dust reduction technology for workers within 30 m of the plant active areas.
37. Impact of the transport of the raw materials and end products on the surrounding environment should be assessed and provided.
38. One season data for gaseous emissions other than monsoon season is necessary.
39. Presence of aquifer(s) within 1 km of the project boundaries and management plan for recharging the aquifer should be included.

40. Source of surface/ground water level, site (GPS), cation, anion (Ion Chromatograph), metal trace element (as above) chemical analysis for water to be used along with a Piper and Piper Duro-V diagram. If surface water is used from river, rainfall, discharge rate, quantity, drainage and distance from project site should also be included.
41. Ground water analysis with bore well data, litho-logs, drawdown and recovery tests to quantify the area and volume of aquifer and its management.
42. Ground water modelling showing the pathways of the pollutants should be included
43. Column leachate study for all types of stockpiles or waste disposal sites, at 20 $^{o}$C-50 $^{o}$C should be conducted and included.
44. Action plan for rainwater harvesting measures at plant site should be submitted to harvest rainwater from the roof tops and storm water drains to recharge the ground water and also to use for the various activities at the project site to conserve fresh water and reduce the water requirement from other sources. Rain water harvesting and groundwater recharge structures may also be constructed outside the plant premises in consultation with local Gram Panchayat and Village Heads to augment the ground water level. Incorporation of water harvesting plan for the project is necessary, if source of water is bore well.
45. Permission for the drawl of water from the concerned authority and water balance data including quantity of effluent generated, recycled and reused and discharged is to be provided. Methods adopted/to be adopted for the water conservation should be included.
46. A note on the impact of drawl of water on the nearby River during lean season.
47. Surface water quality of nearby River (60 m upstream and downstream) and other surface drains at eight locations must be ascertained.
48. If the site is within 10 km radius of any major river, Flood Hazard Zonation Mapping is required at 1:5000 to 1;10,000 scale indicating the peak and lean river discharge as well as flood occurrence frequency.
49. A note on treatment of wastewater from different plants, recycle and reuse for different purposes should be included.
50. Provision of traps and treatment plants are to be made, if water is getting mixed with oil, grease and cleaning agents.
51. If the water is mixed with solid particulates, proposal for sediment pond before further transport should be included. The sediment pond capacity should be 100 times the transport capacity.
52. The pathways for pollution via seepages, evaporation, residual remains are to be studied for surface water (drainage, rivers, ponds, lakes), sub-surface and ground water with a monitoring and management plans.
53. Ground water monitoring minimum at 8 locations and near solid waste dump zone, Geological features and Geo-hydrological status of the study area are essential as also. Ecological status (Terrestrial and Aquatic) is vital.
54. Action plan for solid/hazardous waste generation, storage, utilization and disposal. A note on the treatment, storage and disposal of all type of solid waste should be included. End use of solid waste viz. fly ash etc. and its composition should be covered.
55. All stock piles will have to be on top of a stable liner to avoid leaching of materials to ground water.
56. Action plan for the green belt development plan in 33 % area should be included. The green belt should be around the project boundary and a scheme for greening of the travelling roads should also be incorporated. All rooftops/terraces should have some green cover.
57. A scheme for rainwater harvesting has to be put in place. Incorporation of water harvesting plan for the project is necessary, if source of water is bore well. Efforts should be made to make use of rain water harvested. If needed, capacity of the

reservoir should be enhanced to meet the maximum water requirement. Only balance water requirement should be met from other sources.

58. Detailed description of the flora and fauna (terrestrial and aquatic) should be given with special reference to rare, endemic and endangered species.
59. Action plan for the green belt development plan in 33 % area should be included. The green belt should be around the project boundary and a scheme for greening of the travelling roads should also be incorporated. All rooftops/terraces should have some green cover.
60. Detailed description of the flora and fauna (terrestrial and aquatic) should be given with special reference to rare, endemic and endangered species.
61. Disaster Management Plan including risk assessment & damage control needs to be addressed and included. Landslide hazard map and mitigation plan, Earthquake history and management plan should be submitted.
62. Details regarding expected Occupational & Safety Hazards. Protective measures for Occupational Safety & Health hazards so that such exposure can be kept within permissible exposure level so as to protect health of workers. Health of the workers with special reference to Occupational Health. Plan of exposure specific health status evaluation of workers; pre placement and periodical health status of workers; plan of evaluation of health of workers by pre designed format, chest x ray, Audiometry, Spirometry Vision testing (Far & Near vision, colour vision and any other ocular defect) ECG, during pre placement and periodical examinations and plan of monthly and yearly report of the health status of workers with special reference to Occupational Health and Safety.
63. Plan for the implementation of the recommendations made for the cement plant in the CREP guidelines must be prepared.
64. <u>Corporate Environment Policy</u>
    i. Does the company have a well laid down Environment Policy approved by its Board of Directors? If so, it may be detailed in the EIA report.
    ii. Does the Environment Policy prescribe for standard operating process / procedures to bring into focus any infringement / deviation / violation of the environmental or forest norms / conditions? If so, it may be detailed in the EIA.
    iii. What is the hierarchical system or Administrative order of the company to deal with the environmental issues and for ensuring compliance with the environmental clearance conditions? Details of this system may be given.
    iv. Does the company have system of reporting of non compliances / violations of environmental norms to the Board of Directors of the company and / or shareholders or stakeholders at large? This reporting mechanism should be detailed in the EIA report.
65. At least 5 % of the total cost of the project should be earmarked towards the Enterprise Social Commitment based on Public Hearing issues and item-wise details along with time bound action plan should be prepared and incorporated.
66. A note on identification and implementation of Carbon Credit project should be included.
67. Total capital cost and recurring cost/annum for environmental pollution control measures.
68. Public hearing issues raised and commitments made by the project proponent on the same should be included separately in EIA/EMP Report in the form of tabular chart with financial budget for complying with the commitments made.
69. Any litigation pending against the project and / or any direction / order passed by any Court of Law against the project, if so, details thereof.

The following general points should be noted:

(i) All documents should be properly indexed, page numbered.

(ii) Period/date of data collection should be clearly indicated.
(iii) Authenticated English translation of all material in Regional languages should be provided.
(iv) The letter/application for environmental clearance should quote the MOEF file No. and also attach a copy of the letter.
(v) The copy of the letter received from the Ministry should be also attached as an annexure to the final EIA-EMP Report.
(vi) The index of the final EIA-EMP report must indicate the specific chapter and page no. of the EIA-EMP Report
(vii) While preparing the EIA report, the instructions for the proponents and instructions for the consultants issued by MoEF vide O.M. No. J-11013/41/2006-IA.II (I) dated 4th August, 2009, which are available on the website of this Ministry should also be followed.
(viii) The consultants involved in the preparation of EIA/EMP report after accreditation with Quality Council of India (QCI) / National Accreditation Board of Education and Training (NABET) would need to include a certificate in this regard in the EIA/EMP reports prepared by them and data provided by other organization/Laboratories including their status of approvals etc.

It was decided that 'TORs' prescribed by the Reconstituted Expert Appraisal Committee (Industry) should be considered for preparation of EIA / EMP report for the above mentioned project in addition to all the relevant information as per the 'Generic Structure of EIA' given in Appendix III and IIIA in the EIA Notification, 2006. The draft EIA/EMP report shall be submitted to the Andhra Pradesh Pollution Control Board for public hearing. The issues emerged and response to the issues shall be incorporated in the EIA report. The final EIA report shall be submitted to the Ministry for obtaining environmental clearance.

The TORs prescribed shall be valid for a period of two years for submission of the EIA/EMP report including public hearing proceedings.

**(Dr.V.P.Upadhyay)**
**Director(S)**

**Copy to :-**

1. The Chief Conservator of Forests, Ministry of Environment & Forests, Kendriya Sadan, 4th Floor, E&F Wing, II Block Koramangala, Banglore-560034.

2. The Chairman, Andhra Pradesh Pollution Control Board, Paryavaran Bhawan, A-III, Industrial Estate, Sanath Nagar, Hyderabad, Andhra Pradesh.

**(Dr.V.P.Upadhyay)**
**Director(S)**

**F. No. J-11011/265/2012-IA.II (I)**
Government of India
Ministry of Environment, Forest and Climate Change
(Impact Assessment Division)

Indira Paryavaran Bhawan
Jor Bagh Road, Aliganj,
New Delhi - 110003
E-mail: sharath.kr@gov.in
Tel: 011-24695319

Dated: 30 March, 2017

To

**M/s ACC Ltd.,**
**Environment & Energy Conservation Cell**
**ACC Thane Complex LBS Marg,**
**Thane 400 604, India**
**Phone +91-22-39248339 +91-22-25837379**

**Subject: Proposed 5.0 MTPA Integrated Cement Clinkerisation Plant, 8.0 MTPA Cement Grinding Unit,100 MW Captive Power Plant and 7.0 MTPA Captive Limestone Mine with mining lease of 997.08 ha. at Gollapalli village, Mylavaram Mandal of Kadapa (YSR) district, Andhra Pradesh by M/s ACC Ltd. – Additional information for further consideration regarding.**

**Sir,**

This has reference to your online application No. **IA/AP/IND/62090/2012** dated 27.01.2017 along with copies of EIA/EMP report seeking environmental clearance under the provisions of the EIA Notification, 2006 for the project mentioned above. The ToRs to the project were prescribed by the Ministry vide letter of even number dated 20.02.2013. The proposed project activity is listed at Sl.No. 3(b) Cement Plants under Category 'A' of the Schedule of EIA Notification 2006.

2.0 The proposed 5.0 MTPA Integrated Cement Clinkerisation Plant, 8.0 MTPA Cement Grinding Unit, 100 MW Captive Power Plant and 7.0 MTPA Captive Limestone Mine with mining lease of 997.08 ha. of M/s ACC Ltd. located in Village Gollapalli, Tehsil Mylavaram, District Kadapa (YSR), State Andhra Pradesh was initially received in the Ministry on 05.07.2012 for obtaining Terms of Reference (ToR) as per EIA Notification, 2006. The project was appraised by the Expert Appraisal Committee (Industry) [EAC(I)] during its 4th meeting held during 8th – 9th January 2013 and prescribed ToRs to the project for undertaking detailed EIA study for obtaining environmental clearance. Accordingly, the Ministry of Environment, Forest and Climate Change had prescribed ToRs to the project on 20.02.2013 vide Lr. No J-11011/265/2012-IA.II(I). Further an application has been submitted for validity extension of ToR stating that due to unforeseen circumstances of law and order situation owning to bifurcation of state of Andhra Pradesh, delay in collection of BLD and land acquisition, etc. The request was considered in EAC (Industry-I) held during 18th – 20th November 2015 and recommended for extension validity of ToR for another period of one year w.e.f. 20th February 2016 in accordance with OM No. J-11013/41/2006-IA(I) (Pt.) dated 8th October 2014. The extension validity of ToR was granted on 18th February 2016 read with corrigendum dated 27th April 2016. Based on the ToRs prescribed to the project, the project proponent applied for environmental clearance to the Ministry online on 27.01.2017.

3.0 The EIA/EMP document submitted was excluding the mining component 7.0 MTPA Captive Limestone Mine with mining lease of 997.08 ha. The proponent explained that the proposed mining project was appraised in EAC (non-coal mining) as a separate project. However, the cumulative impacts were addressed in the present EIA/EMP.

4.0 The project of M/s ACC Ltd. in Village Gollapalli, Tehsil Mylavaram, District Kadapa (YSR), State Andhra Pradesh is for setting up of green field Cement Plant Complex having clinkering capacity of 5 MTPA (Phase-I: 2.5 MTPA, Phase-II: 2.5 MTPA), cement production of capacity 8 MTPA (Phase-I: 4.0 MTPA, Phase-II: 4.0 MTPA) and Captive Power Plant of capacity 100 MW (Phase-I: 50 MW, Phase-II: 50 MW).

5.0 The total land required for the project is 275.028 ha, which is a barren land and partly single crop rain fed agriculture land. No forestland involved. The entire land has been purchased for the project and under possession of M/s ACC Ltd. No river passes through the project area and no modification / diversion in the existing natural drainage pattern at any stage has not been proposed.

6.0 The topography of the area is undulated and reported to lies between 14° 58' 06" to 14° 59' 59" N Latitude and 78° 16' 50" to 78° 18' 38" E Longitude in Survey of India topo sheet No. 57 I/4, I/8, J/1 and J/5 at an elevation of 200 m above MSL. The ground water table reported to 16 m below the land surface during the post-monsoon season and 19 m below the land surface during the pre-monsoon season in the core zone. The ground water table reported to ranges between 3 to 19 m below the land surface during the post-monsoon season and 6 to 20 m below the land surface during the pre-monsoon season in the buffer zone. Further, the stage of groundwater development is reported to be 0.21% and 52% in core and buffer zone respectively and thereby these are designated as safe areas.

7.0 No National Park / wildlife sanctuary / biosphere reserve / tiger reserve / elephant reserve etc. are reported to be in the core and buffer zone of the project. The application has been submitted to DFO for authenticating list of flora and fauna.

8.0 The major raw material requirement for proposed plant will be limestone sourced from captive mine located adjacent to the plant and transported through covered conveyor from pit head; clay from captive mine and transported by road; coal is sourced from Singareni Collieries Company Limited and transported through rail; gypsum sourced from Mineral gypsum/PG from CFL transported by Rail/road; and fly ash sourced from the Captive Power Plant and nearby Power Plants.

9.0 The water requirement of the project is estimated as 2922 $m^3$/day (Phase-I- 1461 $m^3$/day & Phase-II 1461 $m^3$/day), Initially water will be sourced from ground water and later from the captive limestone mine pit. The power requirement of the project is estimated as 100 MW for Phase-I & Phase-II which will be met from Captive Power Plant. Additional power requirement will be met through grid power.

10.0 Ambient air quality monitoring has been carried out at 12 locations during 1st March to 31st May, 2013. And the data submitted indicated: $PM_{10}$ (28.3 to 42.5 µg/$m^3$), $PM_{2.5}$ (19.1 to 23.6 µg/$m^3$), $SO_2$ (8.1 to 13.8 µg/$m^3$) and NOx (10.4 to 16.7 µg/$m^3$). The results of the modelling study indicate that the maximum increase of GLC for the proposed project is 5.825 µg/$m^3$ with respect to the $PM_{10}$, 14.0553 µg/$m^3$ with respect to the $SO_2$ and 2.63 µg/$m^3$ with respect to the NOx.

11.0 Ground water quality has been monitored in 9 locations in the study area and analysed. pH: 7.2 to 7.8, Total Hardness: 51 to 480 mg/L; Chlorides: 22.1 to 340 mg/L,

Fluoride: 0.6 to 0.9 mg/L. Heavy metals are within the limits. Noise levels are in the range of 43.6 to 49.1 dB(A) for daytime and 40.4 to 44.3 dB(A) for night time.

12.0 M/s ACC Ltd. has done the R&R study during November and December 2014. As per the R&R study, there is no displacement of any family within the proposed project area. M/s ACC Ltd. purchased lands directly from individual land owners on mutually agreed compensation higher than the prevailing market rates and government scheduled rate at that point of time.

13.0 Total of 0.3104 MTPA of fly ash and bottom ash of 0.0776 MTPA from CPP will be generated due to the project and will be utilised in manufacture of PPC & utilised in raw mill. It has been envisaged that an area of 33% i.e. 90.756 ha will be developed as green belt around the project site to attenuate the noise levels and trap the dust generated due to the project development activities.

14.0 The Public hearing of the project was held on 20th October 2016 at Gollapalli Village of Mylavaram Mandal of Kadapa (YSR) District for production of 5.0 MTPA Integrated Cement Clinkerisation Plant, 8.0 MTPA Cement Grinding Unit, 100 MW Captive Power Plant. The issues raised during public hearing are mainly on compensation, employment, education, community development activities, air pollution, etc.

15.0 The capital cost of the project is Rs. 7100 Crores and the capital cost for environmental protection measures is proposed as Rs. 362 Crores for Phase-I and Rs. 336 Crores for Phase-II. The annual recurring cost towards the environmental protection measures is proposed as Rs. 3.1 Crores for Phase-I and Rs. 2.9 Crores for Phase-II. M/s ACC has earmarked Rs. 2 crore per annum for 4 years towards immediate area development plan apart from Rs. 184 crore for implementing CSR activities for Phase-I and Rs. 171 crore for Phase-II. The manpower required during constriction will be 2400 and operation phase will be 499.

16.0 The proposal was considered in the 16th EAC meeting held during 6th – 7th March 2017. After detailed deliberations, the committee has observed the issues regarding combined ToR for integrated project including mine, integrated EIA/EMP, Land use maps of site and study area, raw material, source of coal, process flow diagram, pollution control systems and equipment, Enterprise Social Commitment based on Public hearing issues, greenbelt, need based social assessment study, Risk Assessment and Disaster Management, water availability, permission from the competent authority for withdrawal of groundwater, authenticated list of flora and fauna, etc. The committee advised to submit following aspects for further consideration of project.

i. Use of pet coke in the CPP shall be withdrawn in the proposal for power generation.

ii. Pollution control measures at all unit operations shall be indicated as proposed in the process flow diagram.

iii. The site plan shall be re-drawn showing the details of mining area, raw material stacking area, crusher, cement plant, colony, parking area, greenbelt etc. The features like road, canal/water body, entry into the plant, internal roads, pathways etc. shall be indicated.

iv. Air Quality Impact Assessment shall be done considering of emissions from mining, cement plant, captive power plant, transportation, fugitive emissions, increase in traffic in the area and resubmitted. The emission estimations for the all components/ activities shall be clearly outlined in the study. Worst scenarios shall be analysed for particulate and gaseous emissions on the villages/habitations in the study area.

v. Environmental Monitoring Plan (post EC) including number of monitoring stations, location, schedule w.r.t. stock, ambient air, ground water, surface water, noise, soil shall be submitted.

vi. Designed efficiencies of the proposed pollution control equipment shall be clearly mentioned with designed flow rates. Proposed bag filters shall be with adequate air to cloth ratios to minimise the emissions well below the standards prescribed.

vii. The budget earmarked for Enterprise Social Commitment and point wise and time bound action plan for issues raised in public hearing along with budget provision shall be clearly mentioned within the CAPEX and not in any other head.

viii. Risk Assessment study shall be conducted based on the Maximum Credible Loss Scenarios and Disaster Management / Emergency Preparedness Plan shall be prepared including administrative mechanisms, infrastructure facilities including onsite and offsite.

ix. Provisions shall be clearly furnished for setting up of bio-gas generation plants using of Kitchen waste/canteen.

x. The green plan shall be clearly indicated with proper legend, type of species, year of development, etc. Greenbelt Development Plan shall be as per the prescribed guidelines of CPCB. Timelines of plantation for the greenbelt development before construction phase shall be furnished ensuring the 80% development in the first year leaving those areas intervene with construction activity.

xi. Skill Development programme shall be prepared in line with the modules of the Skill Council of India for implementation of the same in due course of implementation of the project.

xii. Certified list of flora and fauna from DFO for the study area shall be submitted.

xiii. Water requirement per day for construction and operation phases including dust suppression, greenbelt development shall be furnished in the report component wise.

xiv. Permission for withdrawal of groundwater from Competent Authority shall be submitted.

xv. Detailed Hydrography of the site including mines shall incorporate in hydrological study. Locations of the groundwater water recharging pits and ground water monitoring locations shall be identified based on the hydrogeological and geohydrological study.

17.0 Therefore, you are requested to submit point wise information on the above-mentioned issues for further consideration of the proposal.

30/3/17

**(Sharath Kumar Pallerla)**
**Scientist 'F'**

## ***Point - wise Reply of ToR***

Point-wise reply to *the* ToR issued by MoEF&CC, New Delhi *vide* letter No. J-11011/265/2012-IA II(I) dated 20th February, 2013; validity extended *vide* Letter dated 18th Feb., 2016 for carrying out the Environmental Impact Assessment (EIA) study for the Proposed 5.0 Million TPA Clinkerisation Plant, 8.0 Million TPA Cement Grinding Unit and 100 MW Captive Power Plant at Village: Gollapalle, Mandal: Mylavaram, District: Kadapa (YSR), Andhra Pradesh by M/s. ACC Limited.

| ToR Point No. | ToR Point | ToR Reply | Reference in Final EIA/EMP Report |
|---|---|---|---|
| 1. | Executive Summary | Executive Summary of the project has been given in this EIA/EMP Report. | Page no. 32- 58 |
| 2. | Photographs of the proposed plant area. | Photographs of the proposed project site have been incorporated in this EIA/EMP Report. | Chapter - 2, Section - 2.3.4 Page no. 74 |
| 3. | Copies of coal linkage documents | The copy of Coal linkage documents is enclosed as ***Annexure - 1*** with this EIA/EMP Report. | Annexure - 1, Page no.369 |
| 4. | A line diagram/flow sheet for the process and EMP. | A line diagram / flow sheet for the process incorporating EMP for Cement Plant has been incorporated in this EIA/EMP Report | Chapter – 2, Figure - 2.7 Page no. 91 |
| 5. | The earlier questionnaire for industry sector should be submitted while submitting EIA/EMP. | Questionnaire for industry sector has been enclosed as ***Annexure - 2*** along with this EIA/EMP Report. | Annexure - 2, Page no. 370-417 |
| 6. | A site location map on Indian map of 1:10,00,000 scale followed by 1:50,000/1:25,000 scale on an A3/A2 sheet with at least next 10 Kms of terrains i.e. circle of 10 kms and further 10 kms on A3/A2 sheets with proper longitude/latitude/heights with min. 100/200 m. contours should be included. 3-D view i.e. DEM (Digital Elevation Model) for the area in 10 km radius from the proposal site. | A site location map on Indian map of 1:50,000 scale with 10 km of terrains i.e., circle of 10 km has been prepared and incorporated in this EIA/EMP Report.<br>3-D view i.e., DEM (Digital Elevation Model) with contour map (contour interval of 10 m) for the area in 10 km radius from the proposed project site has also been prepared and incorporated in this EIA/EMP Report. | Chapter - 3, Figure no. 3.1, Figure no. 3.6 (a) & Figure no. 3.6 (b) Page no. 115, Page no. 134 & Page no.135 |
| 7. | Present land use should be prepared based on satellite imagery. High-resolution satellite image data having 1m-5m spatial resolution like quickbird, Ikonos, IRS P- 6 pan sharpened etc. for the 10Km radius area from proposed site. The same should be used for land used/land-cover mapping of the area. | Present land use / land cover map has been prepared, based on satellite imagery, using RESOUCESAT 2A (LISS IV) digital data which was procured from National Remote Sensing Centre, Hyderabad and details of the same have been incorporated in this EIA/EMP Report. | Chapter - 3, Figure 3.5 (a), 3.5 (b) Page no. 129- 130 |
| 8. | Break up of small, medium and large farmers from whom the land is being | A detailed R&R plan was included in the earlier EIA/EMP report, which categorized small, | - |

| ToR Point No. | ToR Point | ToR Reply | Reference in Final EIA/EMP Report |
|---|---|---|---|
| | acquired. If small farmers are involved, a detailed R&R plan. | medium, and large farmers whose land was being acquired. However, since the project area has been reduced from 275.028 ha to 187.1 ha, and all land has now been acquired through private negotiations with the landowners, with appropriate compensation provided as per mutual agreements. | |
| 9. | Location of national parks / wildlife sanctuary / reserve forests within 10 km. radius should specifically be mentioned. A map showing land use / land cover, reserved forests, wildlife sanctuaries, national parks, tiger reserve etc. in 10 km of the project site. | No National Park, Wildlife Sanctuary, Biosphere Reserve, Reserved Forests falls within 10 km radius of the project site.<br>Map showing Environment Settings of 10 km radius study area has been incorporated in this EIA/EMP Report.<br>Location map showing the same has been submitted for authentication to Chief Wildlife Warden, Guntur, Andhra Pradesh, on 20th Sept., 2024. Copy of the submission receipt is enclosed as ***Annexure - 3*** along with this EIA/EMP Report<br>A map showing land use / land cover within 10 km radius of the project site has also been incorporated in this EIA/EMP Report. | Chapter - 3,<br>Section 3.1,<br>Page no. 113<br><br>*Annexure - 3,*<br>*Page no.418-419*<br><br>Chapter - 3,<br>Section 3.5.3,<br>Page no. 125 – 135 |
| 10 | Project site layout plan to scale using AutoCAD showing raw materials, fly ash and other storage plans, bore well or water storage, aquifers (within 1 km.) dumping, waste disposal, green areas, water bodies, rivers/drainage passing through the project site should be included. | o The detailed engineering Plant Layout showing proposed unit, storage area, greenbelt area, parking facility, utilities etc. has been incorporated in this EIA/EMP Report.<br>o Plant layout showing Contour & RWH structure of project site has also been incorporated in this EIA/EMP Report. | Chapter - 2,<br>Figure 2.3 (a) & (b)<br>Page no. 72 - 73<br>Chapter - 10, Figure: 10.3.,<br>Page no. 337 |
| 11 | Details and classification of total land (identified and acquired) should be included. | Earlier total land area proposed for the Project was approx. 275.028 ha (Including Plant, Colony & CPP). ToR was obtained from MoEF&CC for the same area on 20th February, 2013 and Public Hearing has also conducted for the same area and same configuration.<br>However, due to the existence of Village Gollapalle and unavailability of land, ACC intends to exclude the specific part of the project site form the earlier submitted proposal which in turn the proposed project area reduce from 275.028 ha to 187.1 ha. Total land area is private agricultural land and in under the possession of the company. | Chapter - 2,<br>Section 2.3.4,<br>Page no. 70 |
| 12 | Proposal should be submitted to the Ministry for environment clearance | The proposed project area reduces from 275.028 ha to 187.1 ha. Total land area is private | *Annexure - 4,*<br>*Page no. 420-450* |

| ToR Point No. | ToR Point | ToR Reply | Reference in Final EIA/EMP Report |
|---|---|---|---|
| | only after acquiring total land. Necessary documents indicating acquisition of land should be included. | agricultural land and in under the possession of the company Copy of land documents along has been enclosed as ***Annexure - 4*** along with EIA/EMP Report. | |
| 13 | Rehabilitation & Resettlement (R & R) should be as per policy of the State Govt. and a detailed action plan should be included. | The total project area is 187.1 ha (earlier 275.028 ha); which is private Agricultural land; and has been acquired through mutual consents. | - |
| 14 | Permission and approval for the use of forest land and recommendations of the State Forest Department regarding impact of proposed expansion on the surrounding reserve forests, if applicable, should be included | No Forest land is involved in the proposed project activity.<br>There is no Reserved Forests within 10 km radius of the study area.<br>Permission Letter from Government of Andhra Pradesh has been issued by Forest Range officer, Muddanur *Vide* Letter no. RC.No.105/2016 dated. 11th Nov., 2024 confirming that no Forest area falls in the proposed project area. Copy of the same is enclosed as ***Annexure - 5*** along with this EIA/EMP Report. | *Annexure - 5,*<br>*Page no. 451* |
| 15 | A list of industries containing name and type in 10 km radius shall be incorporated. | List of major industries within study area (10 km radius) has been incorporated in this EIA/EMP Report. | Chapter - 3,<br>Table no. 3.2,<br>Page no.124 |
| 16 | Residential colony should be located in upwind direction. | The earlier proposal for colony has now been dropped and that specific area of the project site has now been excluded from the proposed project site. | - |
| 17 | List of raw material required and source along with mode of transportation should be included. All the trucks for raw material and finished product transportation must be "Environmentally Compliant". | Details related to raw material quantity, its source and mode of transportation has been incorporated in this EIA/EMP Report.<br>All the trucks used for raw material and finished product transportation will be "Environmentally Compliant". All the vehicles used for the transportation of raw material and finished product including trucks will be maintained regularly and checked for Pollution under Control. Before transportation, all trucks will be weighed to ensure that no overloading is being done. Also, it will also be ensured that transportation of raw material and product is done in closed trees, to avoid any spillage of material. Safe speed limits will be determined for transportation and workers/ drivers will be advised to follow the same during transportation. | Chapter - 2,<br>Section 2.5.1,<br>Page no. 76<br><br>Chapter - 4,<br>Section, 4.13<br>Page no.234 |

| ToR Point No. | ToR Point | ToR Reply | Reference in Final EIA/EMP Report |
|---|---|---|---|
| 18 | Petrological and Chemical analysis and other chemical properties of raw materials used (with GPS location of source of raw material) i.e. ores, minerals, rock, soil, coal, iron, dolomite quartz etc. using high definition and precision instruments mentioning their detection range and methodology such Digital Analyzers, AAS with Graphite furnace, ICPMS, MICRO-WDXRF, EPMA, XRD, Nano studies or at least as per I30-10500 and WHO norms. These analysis should include trace element and metal studies like Cr (vi) Ni, Fe, As, Pb, Zn, Hg, Se, S etc. Presence of radioactive elements (U, Th etc.) | Petrological and Chemical analysis of the raw material (i.e limestone) to be used, has been done and the same has been incorporated in this EIA/EMP Report.<br>The analysis was also done for trace element and metal studies and the same has been incorporated in this EIA/EMP Report. | Chapter - 3,<br>Section 3.5.11<br>Page No: 171 |
| 19 | Petrography, grain size analysis and Major element analysis of raw material and soil from project site and raw material should be done on the same parameters along with analysis for $SiO_2$, $Al_2O_3$, MgO, MnO, $K_2O$, CaO, FeO, $Fe_2O_3$, $P_2O_5$, $H_2O$, $CO_2$. | Petrography, grain size analysis and major element analysis of raw material has been done and incorporated in this EIA/EMP Report. | Chapter - 3,<br>Section., 3.5.12<br>Page no 173 |
| 20 | If the rocks, ores, raw material has trace elements their petrography, ore microscopy, XRD, elemental mapping EPMA, XRF is required to quantify the amount present in it and hence future risk involved while using it and management plan. | Chemical analysis and trace elements results of raw material has been incorporated in this EIA/EMP Report. | Chapter - 3<br>Section - 3.5.11<br>Page No. - 171 - 173 |
| 21 | Studies for fly ash, muck disposal, slurry, sludge material and solid waste generated should also be included, if the raw materials used has trace elements and a management plan. | Trace metals present in the raw materials will dissolve during the cement manufacturing process; hence, studies and management plan for fly ash, muck disposal, slurry, sludge material and solid waste generated are not required.<br>Entire ash generated at CPP will be 100% utilized by the cement plant. Thus, at any point of time, there will not be any disposal or stacking of the fly ash.<br>Solid waste in the form of sludge is generated from the Sewage Treatment Plant (STP). The sludge will used as manure for greenbelt development. | - |

| ToR Point No. | ToR Point | ToR Reply | Reference in Final EIA/EMP Report |
|---|---|---|---|
| 22 | Manufacturing process details for all the cement plant, captive power plant and mine should be included. | Manufacturing Process detail for Cement plant and CPP has been incorporated in this EIA/EMP Report. Mine is not included in the proposed Integrated Proposal. | Chapter - 2, Section 2.7 Page no. 82 - 99 |
| 23 | Possibility of installation of WHRB will be explored and details included. | M/s. ACC Ltd. has explored the possibility of installation of WHRB and proposed WHRB of 25 MW (Phase I: 12.5 MW & Phase II: 12.5 MW) capacity along with the proposed project. Details of the same has been incorporated in this EIA/EMP Report. | Chapter - 2, Section 2.8.1, Page no. 95 |
| 24 | Mass balance for the raw material and products should be included. | Mass balance for the raw material and products has been incorporated in this EIA/EMP Report. | Chapter - 2, Figure 2.5, Page no. 77 |
| 25 | Energy balance data for all the components including proposed power plant should be incorporated. | Energy balance for all components including proposed power plant has been incorporated in this EIA/EMP Report. | Chapter - 2, Section 2.7.2, Page no. 102 |
| 26 | Site-specific micro-meteorological data using temperature, relative humidity, hourly wind speed and direction and rainfall should be collected. | Site-specific micro-meteorological data (Temperature, Relative humidity, Wind speed and Direction) was earlier collected during Summer Season (March to May, 2013) by earlier consultant Vimta Labs Ltd. As the baseline data was 3 years old which is already expired & thereby, a fresh Baseline was conducted during Summer Season (March to May, 2024) in compliance to the MoEFCC OM dated 8th June, 2022. Summary of earlier data and details of latest collected data has been incorporated in this EIA/EMP Report.<br>Rainfall data has also been incorporated in this EIA/EMP Report.<br>Hourly meteorological data latest collected has been enclosed as ***Annexure - 6*** with this EIA/EMP Report. | Chapter - 3, Section,3.5.6.1 Page no. 141<br>*Annexure - 6, Page No. 452 - 499* |
| 27 | Sources of secondary emissions, its control and monitoring as per the CPCB guidelines should be included. A full chapter on fugitive emissions and control technologies should be provided. | Information related to sources of secondary emissions, its control and monitoring as per the CPCB guidelines and related fugitive emissions and control technologies have been incorporated in this EIA/EMP Report. | Chapter – 10 Section: 10.4.1.20 Page no 322-325 |
| 28 | An action plan to control and monitor secondary fugitive emissions from all the sources as per the latest permissible limits issued by the Ministry vide G.S.R. 414(E) dated 30th May, 2008. | An action plan to control and monitor secondary fugitive emissions from all the sources as per the latest permissible limits has been incorporated in this EIA/EMP Report. | Chapter - 4, Section 4.6 Page no. 204- 221 |

| ToR Point No. | ToR Point | ToR Reply | Reference in Final EIA/EMP Report |
|---|---|---|---|
| 29 | Vehicular pollution control and its management plan should be submitted. | Vehicular pollution control and its management plan have been incorporated in this EIA/EMP Report. | Chapter - 4, Section - 4.13., Page no.234 - 242 |
| 30 | A write up on use of high calorific hazardous wastes from all the sources in kiln and commitment regarding use of hazardous waste should be included. | Hazardous waste will be used as AFR in the kiln after getting necessary approval from State Pollution Control Board and details for the same is incorporated in this EIA/EMP Report. | Chapter - 2, Section 2.11.4 Page no. 110 |
| 31 | Ambient air quality at 8 locations within the study area of 10 km., aerial coverage from project site with one AAQMS in downwind direction should be carried out. | Ambient Air Quality (AAQ) monitoring was carried out earlier at 8 locations during Summer Season (March to May, 2013) by earlier consultant Vimta Labs Ltd. as the baseline data was 3 years old & hence expired; Summary of the same is given in this EIA /EMP report<br>In compliance to the MoEFCC OM dated 8th June, 2022 a fresh AAQ monitoring was again carried out at 8 locations during Summer Season (March to May 2024) within 10 km radius of the project site to assess the ambient air quality.<br>The dominant wind direction during the study period is from SE direction and therefore, locations were selected in downwind direction. Details of the same have been incorporated in this EIA/EMP Report.<br>Detailed AAQM tables have been enclosed as ***Annexure - 7*** along with this EIA/EMP Report. | Chapter - 3, Section .3.5.7 Page no.145 - 153<br>*Annexure - 7, Page no 500 - 517* |
| 32 | The suspended particulate matter present in the ambient air must be analyzed for the presence of poly-aromatic hydrocarbons (PAH), i.e. Benzene soluble fraction. Chemical characterization of RSPM and incorporating of RSPM data. | Particulate matter found in the ambient air was analyzed for the presence of PAH for all the AAQM stations and it was found below detection limit (1.0 µg/$m^3$).<br>Details regarding chemical characterization of RSPM have been incorporated in this EIA/EMP Report. | Chapter - 3, Section .3.5.7.1 Page no.152 |
| 33 | Determination of atmospheric inversion level at the project site and assessment of ground level concentration of pollutants from the stack emission based on site-specific meteorological features. | The incremental ground level concentration of pollutants from the stack emissions based on site-specific meteorological features has been predicted via computation done through mathematical modeling.<br>Details of the same have been incorporated in this EIA/EMP Report. | Chapter - 3, Section.3.5.6.2 Page no. 144-145 |
| 34 | Air quality modeling for all the plants proposed including mine for specific pollutants needs to be done. APCS | Air quality modeling for proposed cement plant captive power plant and mines for specific pollutants has been done. | Chapter - 4 Fig:4.1(a), 4.1(b),4.1(c),4.1(d),4.1(e), |

| ToR Point No. | ToR Point | ToR Reply | Reference in Final EIA/EMP Report |
|---|---|---|---|
| | for the control of emissions within 50 mg/Nm$^3$ should be included. Cumulative impacts of cement plant, Captive Power Plant and mines located at a distance of 2.0 km on the ambient air quality shall be assessed. | Cumulative impacts of cement plant, captive power plant and mines has also been assessed. Details of the same have been incorporated in this EIA/EMP Report.<br>APCE for the control of emissions from all the sources have also been incorporated in this EIA/EMP Report. | 4.2(a),4.2(b),4.1(c),4.2(d)and 4.3 Page No. 210 - 219 |
| 35 | Action plan to follow National Ambient Air Quality Emission Standards issued by the Ministry vide G.S.R. No. 826(E) dated 16$^{th}$ November, 2009 should be included. | Action plan to follow National Ambient Air Quality Emission Standards issued by the Ministry *vide* G.S.R. No. 826(E) dated 16$^{th}$ November, 2009 has been incorporated in EIA/EMP report. | Chapter - 6<br>Section 6.2.4<br>Page No. 254 |
| 36 | Ambient air quality monitoring along with cumulative impact should be included for the day (24 hrs) for maximum GLC along with following: | Ambient air quality modelling has been done to predict the maximum GLC for the day (24 hr) due to the proposed project. | Chapter - 4<br>Fig:4.1(a), 4.1(b),4.1(c),4.1(d),4.1(e), 4.2(a),4.2(b),4.1(c),4.2(d)and 4.3 Page No. 210 - 219 |
| i | Emissions (g/second) with and without the air pollution control measures. | Ambient air quality modelling has been done to predict the maximum GLC for the day (24 hr) due to the proposed project for which meteorological inputs (wind speed, m/s), wind direction, ambient air temperature, cloud cover, relative humidity & mixing height, model input options for terrain, plume rise, deposition, etc., has been considered.<br><br>Details of air pollution control methods used with percentage efficiency has been incorporated in this EIA/EMP Report | Chapter - 4<br>Section - 4.6<br>Page No. - 204 |
| ii | Meteorological inputs (wind speed, m/s), wind direction, ambient air temperature, cloud cover, relative humidity & mixing height using SODAR on hourly basis | | |
| iii | Model input options for terrain, plume rise, deposition etc. | | |
| iv | Print-out of model input and output on hourly and daily average basis. | | |
| v | A graph of daily averaged concentration (MGLC scenario) with downwind distance at every 500 m interval covering the exact location of GLC. | | |
| vi | Details of air pollution control methods used with percentage efficiency that are used for emission rate estimation with respect to each pollutant. | | |
| vii | Applicable air quality standards as per LULC covered in the study area and % contribution of the proposed plant to the applicable Air quality standard. In case of expansion project, the contribution should be | | |

| ToR Point No. | ToR Point | ToR Reply | Reference in Final EIA/EMP Report |
|---|---|---|---|
| | inclusive of both existing and expanded capacity. | Fugitive dust protection measures have been incorporated in this EIA/EMP Report. | |
| viii | No. I-VII are to be repeated for fugitive emissions and any other source type relevant and used for industry. | | |
| ix | Graphs of monthly average daily concentration with down-wind distance. | | |
| x | Specify when and where the ambient air quality standards are exceeded either due to the proposed plant alone or when the plant contribution is added to the background air quality. | | |
| xi | Fugitive dust protection or dust reduction technology for workers within 30 m of the plant active areas | | |
| 37 | Impact of the transport of the raw materials and end products on the surrounding environment should be assessed and provided. | Impact of the transport of the raw materials and end products on the surrounding environment has been assessed and it is concluded that surrounding environment will not be affected due to the transportation of materials for the proposed project as proper mitigation measures will be adopted.<br>All the vehicles used for the transportation of raw material and finished product including trucks will be maintained regularly and checked for pollution under Control. Internal and nearby road will be maintained to facilitate transportation.<br>Details of the same have been incorporated in this EIA/EMP Report. | Chapter - 4<br>Section 4.3<br>Page no. 417 |
| 38 | One season data for gaseous emissions other than monsoon season is necessary. | Gaseous emissions data for Summer season (March to May, 2024) have been incorporated in this EIA/EMP Report. | Chapter - 3,<br>Section -3.5.7<br>Page no. 145- 152 |
| 39 | Presence of aquifer(s) within 1 km of the project boundaries and management plan for recharging the aquifer should be included. | Details reg. aquifer(s) within 1 km of the plant boundary and its management plan has been given in Hydro-geological Study Report incorporated in this EIA/EMP Report.<br>Copy of the same is enclosed as ***Annexure - 8*** with this EIA/EMP Report. | *Annexure - 8*<br>*Page no.518 - 573* |
| 40 | Source of surface/ground water level, site (GPS), cation, anion (Ion Chromatograph), metal trace | Source of Water for proposed project will be Ground Water and Mine pits (after development of pits). | Chapter - 3<br>Section – 3.5.9<br>Page No. – 157- 165 |

| ToR Point No. | ToR Point | ToR Reply | Reference in Final EIA/EMP Report |
|---|---|---|---|
| | element (as above) chemical analysis for water to be used along with a Piper and Piper Duro-V diagram. If surface water is used from river, rainfall, discharge rate, quantity, drainage and distance from project site should also be included. | Chemical analysis of ground water samples has been incorporated in this EIA/EMP Report. | |
| 41 | Ground water analysis with bore well data, litho-logs, drawdown and recovery tests to quantify the area and volume of aquifer and its management. | Detailed hydrogeological studies were conducted and report has been enclosed as **Annexure - 8** with the EIA/EMP Report. | *Annexure - 8, Page no..518-573* |
| 42 | Ground water modelling showing the pathways of the pollutants should be included. | Not applicable. | - |
| 43 | Column leachate study for all types of stockpiles or waste disposal sites, at 20° C - 50° C should be conducted and included. | Not applicable; as there will be no stockpiles of raw materials or products in open areas; everything will be stored in closed or covered storage areas. | - |
| 44 | Action plan for rainwater harvesting measures at plant site should be submitted to harvest rainwater from the roof tops and storm water drains to recharge the ground water and also to use for the various activities at the project site to conserve fresh water and reduce the water requirement from other sources. Rain water harvesting and groundwater recharge structures may also be constructed outside the plant premises in consultation with local Gram Panchayat and Village Heads to augment the ground water level. Incorporation of water harvesting plan for the project is necessary, if source of water is bore well. | Action plan for rainwater harvesting at project site has been prepared to harvest rainwater from the roof tops and storm water drains to recharge the ground water and also to use for the various activities at the plant site; to conserve fresh water and reduce the water requirement from other sources. Details of the same has been given in this EIA/EMP Report. | Chapter 10<br>Section no.10.10.2<br>Page No: 336 |
| 45 | Permission for the drawl of water from the concerned authority and water balance data including quantity of effluent generated, recycled and reused and discharged is to be provided. Methods adopted/to be adopted for the | • Permission for 1325 KLD for phase I has already been obtained from Ground Water and Ground Water Audit Department vide Letter No. 408-11/CDP/Hg-II/2015, dated 22nd Feb., 2018. The copy of the same is enclosed as ***Annexure - 9*** along with this EIA / EMP | Annexure - 9,<br>Page no 574 - 587 |

| ToR Point No. | ToR Point | ToR Reply | Reference in Final EIA/EMP Report |
|---|---|---|---|
| | water conservation should be included. | Report. For the balance water requirement, application will be applied to CGWA.<br>• No effluent will be generated from the plant operation and zero discharge will be maintained.<br>• Water balance diagram including quantity of effluent generated, recycled and reused water has been provided in EIA/EMP Report.<br>• Methods to be adopted for the water conservation have also been incorporated in this EIA/EMP Report. | Chapter - 2<br>Section - 2.11.3<br>Page No. - 110<br><br>Chapter - 10<br>Section: 10.3 |
| 46 | A note on the impact of drawl of water on the nearby River during lean season. | Not applicable, as the source of water for the proposed project will be Ground Water and Mine Sump Water (after development of pits). | - |
| 47 | Surface water quality of nearby River (60 m upstream and downstream) and other surface drains at eight locations must be ascertained. | There are seven surface water bodies present in the study area; however, all were found dry during the study period. | Chapter - 3<br>Page No. 157 |
| 48 | If the site is within 10 km radius of any major river, Flood Hazard Zonation Mapping is required at 1:5000 to 1;10,000 scale indicating the peak and lean river discharge as well as flood occurrence frequency. | No major river falls within 10 km radius of the proposed project site. As per the "Vulnerability Atlas - 3rd Edition; Peer Group, MoH & UPA; based on digitized data of SOI, GOI; Census of India 2011; Flood Atlas (1987), Task Force Report (2004), C.W.C., G.O.I." the plant site does not fall under "area liable to flood'.<br>Details reg. the same have been given in this EIA/EMP Report. | Chapter - 3<br>Section 3.5.4<br>Page no.136 - 139 |
| 49 | A note on treatment of wastewater from different plants, recycle and reuse for different purposes should be included. | No industrial waste water will be generated from the proposed project as the proposed cement plant will be based on the dry process. In Cement Plant process, water will be partially absorbed in the process or will be subjected to evaporation, hence, no wastewater generation. The waste water generated from the captive power plant will be treated in neutralization pit and the treated water will be utilized for dust suppression.<br>Domestic waste water generated from plant and colony will be treated in STP and treated water will be used for greenbelt development and dust suppression. | Chapter - 2<br>Section - 2.11.3<br>Page No. - 110-111 |
| 50 | Provision of traps and treatment plants are to be made, if water is | The proposed plant will be a zero effluent discharge unit. No water will be mixed with oil, | - |

| ToR Point No. | ToR Point | ToR Reply | Reference in Final EIA/EMP Report |
|---|---|---|---|
| | getting mixed with oil, grease and cleaning agents. | grease and cleaning agents. Storm water will be harvested for the ground water recharge. | |
| 51 | If the water is mixed with solid particulates, proposal for sediment pond before further transport should be included. The sediment pond capacity should be 100 times the transport capacity. | The proposed plant will be based Zero Liquid Discharge (ZLD). Therefore, there will be no possibility of mixing of water with solid particles, as the raw materials in the cement plant will be stored in covered shed / silo and also, the plant will be based on dry process. Hence, no sediment pond will be required. | Chapter - 2<br>Section - 2.11.3<br>Page No. - 110 |
| 52 | The pathways for pollution via seepages, evaporation, residual remains are to be studied for surface water (drainage, rivers, ponds, lakes), sub-surface and ground water with a monitoring and management plans. | The proposed cement plant will be a zero effluent discharge system; there will be no possibilities of seepage of pollutants or carriage of pollutants to the water bodies existing within the study area. | Chapter - 2<br>Section - 2.11.3<br>Page No. - 110 |
| 53 | Ground water monitoring minimum at 8 locations and near solid waste dump zone, Geological features and Geo-hydrological status of the study area are essential as also. Ecological status (Terrestrial and Aquatic) is vital. | Ground water monitoring was carried out at 9 locations during earlier baseline i.e. Summer Season (March to May, 2013) by earlier consultant Vimta Labs Ltd. as the baseline data was 3 years old & hence expired; Summary of the same is given in this EIA /EMP report.<br>In compliance to the MoEFCC OM dated 08$^{th}$ June, 2022 a fresh Ground water monitoring was again carried out at 9 locations during Summer Season (March to May 2024) within 10 km radius of the project site.<br>Details of the same have been incorporated in the EIA/EMP Report.<br>Details regarding Geological features and Geo-hydrological status have also been incorporated in this EIA/EMP Report.<br>Ecological status was also studied during biological survey. Details of the same have been incorporated in this EIA/EMP Report. | Chapter 3,<br>Section 3.5.9.2<br>Page no. -158 - 165 |
| 54 | Action plan for solid/hazardous waste generation, storage, utilization and disposal. A note on the treatment, storage and disposal of all type of solid waste should be included. End use of solid waste viz. fly ash etc. and its composition should be covered. | Details regarding solid & hazardous waste generation, utilization and its disposal have been incorporated in this EIA/EMP Report. | Chapter 2,<br>Section - 2.11.4<br>Page no.- 110 |
| 55 | All stock piles will have to be on top of a stable liner to avoid leaching of materials to ground water. | No such stock piles will be developed, which will cause leaching of materials to ground water. | - |

| ToR Point No. | ToR Point | ToR Reply | Reference in Final EIA/EMP Report |
|---|---|---|---|
| 56 | Action plan for the green belt development plan in 33 % area should be included. The green belt should be around the project boundary and a scheme for greening of the travelling roads should also be incorporated. All rooftops/terraces should have some green cover. | The total project area is 187.1 ha, out of which ~ 42.65 % of the total project area i.e., 79.8 ha has been earmarked to be developed as greenbelt development & plantation.<br>The proposed greenbelt development & plantation area will be developed in upcoming 3 years with 199,500 numbers of trees with density of plantation is 2500 trees per ha. Native & fruits bearing species, medical value types will be planted as per CPCB guidelines in consultation with DFO.<br>Action plan for the green belt development is incorporated in the EIA/EMP Report. | Chapter 10,<br>Section 10.11<br>Page no 338 |
| 57 | A scheme for rainwater harvesting has to be put in place. Incorporation of water harvesting plan for the project is necessary, if source of water is bore well. Efforts should be made to make use of rain water harvested. If needed, capacity of the reservoir should be enhanced to meet the maximum water requirement. Only balance water requirement should be met from other sources. | Rainwater harvesting has been planned for the proposed project activity.<br>Details of the same have been given in Hydro-geological Study Report incorporated in this EIA/EMP Report. | Chapter 10,<br>Section no.10.10.2<br>Page No: 336 |
| 58 | Detailed description of the flora and fauna (terrestrial and aquatic) should be given with special reference to rare, endemic and endangered species. | Details of the flora and fauna found within the study area have been given in this EIA/EMP Report.<br>16 schedule - I Species were found in the study area of the proposed project site as per the Primary & Secondary Survey done by Greentech Solutions Consultancy.<br>List of flora & fauna has been submitted for authentication to Chief Wildlife Warden, Guntur, Andhra Pradesh, on 20$^{th}$ Sept., 2024. Copy of the submission receipt is enclosed as ***Annexure - 3*** along with this EIA/EMP report. | Chapter 3,<br>Section -3.5.13.1<br>Page no. 175-181<br><br>Annexure - 3,<br>Page no. 418 - 419 |
| 59 | Action plan for the green belt development plan in 33 % area should be included. The green belt should be around the project boundary and a scheme for greening of the travelling roads should also be incorporated. All rooftops/terraces should have some green cover. | The total project area is 187.1 ha, out of which ~ 42.65 % of the total project area i.e., 79.8 ha has been earmarked to be developed as greenbelt development & plantation.<br>The proposed greenbelt development & plantation area will be developed in upcoming 3 years with 199,500 numbers of trees with density of plantation is 2500 trees per ha. Native & fruits bearing species, medical value | Chapter 10,<br>Section 10.11<br>Page no. 338 |

| ToR Point No. | ToR Point | ToR Reply | Reference in Final EIA/EMP Report |
|---|---|---|---|
| | | types will be planted as per CPCB guidelines in consultation with DFO.<br>Action plan for the green belt development is incorporated in the EIA/EMP Report. | |
| 60 | Detailed description of the flora and fauna (terrestrial and aquatic) should be given with special reference to rare, endemic and endangered species. | **Flora:** Within the Core and buffer zone of proposed project site, a total of 21 species of trees, 10 species of Shrubs, 9 species of Herbs were recorded and observed within the studied area based on primary observation as well as based on information collected from the secondary data.<br>**Fauna:** Among faunal diversity, within the 10 km radius of buffer zone, 20 species of mammals, 8 species of reptiles & 7 species of amphibians, 66 species of Avi fauna and 36 species of Butterfly were reported in 10 km radius of project sites.<br>List of flora & fauna has been submitted for authentication to Chief Wildlife Warden, Guntur, Andhra Pradesh, on 20th Sept., 2024. Copy of the submission receipt is enclosed as ***Annexure - 3*** along with this EIA/EMP report<br>16 schedule - I species viz. Four horned Antelope, Asiatic Wild Dog, Bonnet Macaque, Sambar, Sloth Bear, Indian Grey Mongoose, Small Indian Civet, Masked Palm Civet, Golden Jackel, Bengal Monitor Lizard, Indian Star Tortoise, Indian rat snake, Checkered Keeback, Grey Junglefowl, Shikra, Indian Peafowl Indian Species were found in the study area of the proposed project site as per the Primary & Secondary Survey done by Greentech Solutions.<br>Company has prepared Wildlife Conservation for the proposed integrated cement plant and allocated Rs. 5.07 Crores for conservation of schedule - I species. Wildlife Conservation Plan has been submitted to Chief Wildlife Warden, Guntur, Andhra Pradesh, on 20th Sept., 2024 for further approval. Copy for conservation plan along with the submission receipt is enclosed as ***Annexure - 10*** along with this EIA/EMP report. | Chapter 3,<br>Section -3.5.13.1<br>Page no. 175-181<br><br>*Annexure - 3,*<br>*Page no*<br>*418 - 419*<br><br>*Annexure - 10,*<br>*Page no 588 - 589* |
| 61 | Disaster Management Plan including risk assessment & damage control needs to be addressed and included. | Disaster Management Plan including risk assessment and damage control has been | Chapter 7,<br>Section 7.2,<br>Page no.257 - 282 |

| ToR Point No. | ToR Point | ToR Reply | Reference in Final EIA/EMP Report |
|---|---|---|---|
| | Landslide hazard map and mitigation plan, Earthquake history and management plan should be submitted. | prepared and incorporated in this EIA/EMP Report.<br>The project site as well as study area lies in Zone II of Seismic Zoning Map, and thus, can be said to be located in an area of low seismic hazard by national standards. Hence, the risk of earthquake at the site is minimal and thus, the site is safe. | |
| 62 | Details regarding expected Occupational & Safety Hazards. Protective measures for Occupational Safety & Health hazards so that such exposure can be kept within permissible exposure level so as to protect health of workers. Health of the workers with special reference to Occupational Health. Plan of exposure specific health status evaluation of workers; pre placement and periodical health status of workers; plan of evaluation of health of workers by pre designed format, chest x ray, Audiometry, Spirometry Vision testing (Far & Near vision, colour vision and any other ocular defect) ECG, during pre-placement and periodical examinations and plan of monthly and yearly report of the health status of workers with special reference to Occupational Health and Safety. | Details regarding Occupational & Safety Hazards including pre-placement and periodical examinations such as Spirometry, Audiometry, Vision etc., have been incorporated in this EIA/EMP Report. | Chapter 10,<br>Section 10.13.4<br>Page no. 346 |
| 63 | Plan for the implementation of the recommendations made for the cement plant in the CREP guidelines must be prepared. | Plan for the implementation of the recommendations made for the cement plants in the CREP guidelines have been prepared and incorporated in this EIA / EMP Report. | Chapter 10,<br>Section 10.5,<br>Page no. 326 |
| 64 | Corporate Environment Policy | | |
| i | Does the company have a well laid down Environment Policy approved by its Board of Directors? If so, it may be detailed in the EIA report. | Yes, the company has a well laid down Environment Policy approved by its Board of Directors has been incorporated in this EIA/EMP Report. | Chapter 10,<br>Section, 10.5<br>Page no 326 |
| ii | Does the Environment Policy prescribe for standard operating process / procedures to bring into focus any infringement / deviation / violation of the environmental or | Yes, the Corporate Environment Policy prescribes for standard operating process to implement the environmental standards. | |

| ToR Point No. | ToR Point | ToR Reply | Reference in Final EIA/EMP Report |
|---|---|---|---|
| | forest norms / conditions? If so, it may be detailed in the EIA. | | |
| iii | What is the hierarchical system or administrative order of the company to deal with the environmental issues and for ensuring compliance with the environmental clearance conditions? Details of this system may be given. | The hierarchical system or administrative order of the company to deal with the environmental issues and for ensuring compliance with the environmental clearance conditions is given in the Corporate Environment Policy. | |
| iv | Does the company have system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the company and / or shareholders or stakeholders at large? This reporting mechanism should be detailed in the EIA report. | Yes, the company has system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the company.<br>The same has been incorporated under roles & responsibilities of Corporate Environment Policy. | |
| 65 | At least 5 % of the total cost of the project should be earmarked towards the Enterprise Social Commitment based on Public Hearing issues and item-wise details along with time bound action plan should be prepared and incorporated. | Company has allocated Rs. 355 Crores (Rs. 184 Crore in phase-I and 171 Crore in phase-II), i.e. 5% of the total Project cost, towards the Enterprise Social Commitment and details of the same along with item wise - timebound action plan have been incorporated in this EIA/EMP Report. | Chapter 8,<br>Section - 8.3<br>Page no. 309 |
| 66 | A note on identification and implementation of Carbon Credit project should be included. | Identification and implementation of Carbon Credit project have been incorporated in this EIA/EMP Report | Chapter 10,<br>Section -10.8.3<br>Page no. 331 |
| 67 | Total capital cost and recurring cost/annum for environmental pollution control measures. | Cost for Environmental Protection Measures:<br>• Capital Cost: Rs. 698 Crores (Phase I: Rs. 362 Crores, Phase - II: Rs. 336 Crores)<br>• Recurring Cost: Rs. 14 Crores/ annum (Phase I: Rs. 7.1 Crores/annum, Phase - II: Rs. 6.9 Crores/annum)<br>Detailed breakup of cost has been given in this EIA/EMP report. | Chapter - 2<br>Table no. 2.4<br>Page no. 75 |
| 68 | Public hearing issues raised and commitments made by the project proponent on the same should be included separately in EIA/EMP Report in the form of tabular chart with financial budget for complying with the commitments made. | Public hearing for the proposed project has been conducted on 19th Sep., 2026.<br>*Copy of PH Proceedings has been enclosed as* ***Annexure - 11*** along *with this EIA/EMP Report.*<br>Issues raised and commitments made by the project proponent during Public hearing along with financial budget for complying with the commitments made, have been prepared and | Chapter 7,<br>Section 7.2,<br>Page no.257 – 282<br><br>*Annexure - 11*<br>*Page No. 590 - 712* |

| ToR Point No. | ToR Point | ToR Reply | Reference in Final EIA/EMP Report |
|---|---|---|---|
| | | the same have been incorporated in this EIA/EMP Report. | |
| 69 | Any litigation pending against the project and / or any direction / order passed by any Court of Law against the project, if so, details thereof. | No litigation is pending against the project and/or any direction/order passed by any Court of Law against the project. | - |

| **Additional Details Sought by MoEFCC dated 30th March, 2017** | | | |
|---|---|---|---|
| (i) | Use of pet coke in the CPP shall be withdrawn in the proposal for power generation. | Coal will be used as fuel in the CPP for the Power generation.<br>Pet coke will not be used in Captive Power Plant. | Chapter - 2,<br>Table - 2.7,<br>Page no. 77 |
| (ii) | Pollution control measures at all unit operations shall be indicated as proposed in the process flow diagram. | Process flow diagram indicating pollution control measures at all unit operations has been incorporated in this EIA/EMP Report. | Chapter - 2,<br>Figure - 2.7<br>Page no. 91 |
| (iii) | The site plan shall be re-drawn showing the details of mining area, raw material stacking area, crusher, cement plant, colony parking area, greenbelt etc. The features like road, canal/water body, entry into the plant, internal roads, pathways etc. shall be indicated. | The detailed engineering Plant Layout showing proposed unit, storage area, greenbelt area, parking facility, utilities etc. is incorporated in this EIA/EMP Report. | Chapter - 2,<br>Figure no. - 2.3(a) & (b)<br>Page no. 72 & 73 |
| (iv) | Air quality Impact Assessment shall be done considering of emissions from mining, cement plant, captive power plant, transportation, fugitive emissions increase in traffic in the area and resubmitted. The emission estimations for the all components/ activities shall be clearly outlined in the study. Worst scenarios shall be analysed for particulate and gaseous emissions on the villages/ habitations in the study area. | Air quality modeling for proposed cement plant captive power plant and mines for specific pollutants has been done.<br>Cumulative impacts of cement plant, captive power plant transportation, fugitive emissions and mines has also been assessed.<br>Details of the same have been incorporated in this EIA/EMP Report.<br>Worst case scenarios has been done and incorporated in this EIA/EMP Report. | Chapter - 4<br>Section No. 4.6<br>Page no: 204 - 220 |

| **Additional Details Sought by MoEFCC dated 30th March, 2017** | | | |
|---|---|---|---|
| (v) | Environmental Monitoring Plan (post EC) including number of monitoring stations, location, schedule w.r.t stock ambient air, ground water, surface water, noise, soil shall be submitted. | EMP including number of monitoring stations, location, schedule w.r.t stock ambient air, ground water, surface water, noise, soil has been incorporated in this EIA/EMP Report. | Chapter - 6<br>Section: 6.2.3<br>Page No. 250 |
| (vi) | Designed efficiencies of the proposed pollution control equipment shall be clearly mentioned with designed flow frates. Proposed bag filters shall be with adequate air to cloth ratios to minimize the emissions well below the standards prescribed. | Details of Bag house bag filters has been incorporated in this EIA/EMP Report. | Chapter 2<br>Section 2.2<br>Page No. 104 |
| (vii) | The budget earmarked for Enterprise Social Commitment and point wise and time bound action plan for issues raised in public hearing along with budget provision shall be clearly mentioned within the CAPEX and not in any other head. | Company has allocated Rs. 355 Crores (Rs. 184 Crore in phase-I and 171 Crore in phase-II), i.e. 5% of the total Project cost, towards the Enterprise Social Commitment and details of the same along with item wise - timebound action plan have been incorporated in this EIA/EMP Report. | Chapter - 8,<br>Section 8.2<br>Page no. 308 |
| (viii) | Risk Assessment study shall be conducted based on the Maximum Credible Loss Scenarios and Disaster Management/Emergency Preparedness Plan shall be prepared including administrative mechanisms, infrastructure facilities including onsite and offsite. | Risk Assessment study based on the Maximum Credible Loss Scenarios and Disaster Management/Emergency Preparedness plan has been prepared and incorporated in this EIA/EMP Report. | Chapter - 7,<br>Section 7.3<br>Page no. 283 |
| (ix) | Provisions shall be clearly furnished for setting up of bio-gas generation plants using of Kitchen waste/ canteen. | Bio-gas generation plants using of Kitchen waste/ canteen has been investigated. Details for the same is given in this EIA/EMP Report. | Chapter - 2,<br>Section - 2.11.4,<br>Page no. 111 |
| (x) | The green plan shall be clearly indicated with proper legend, type | The total project area is 187.1 ha, out of which ~ 42.65 % of the total project area i.e., 79.8 ha | Chapter - 10,<br>Section 10.2 |

| **Additional Details Sought by MoEFCC dated 30th March, 2017** | | | |
|---|---|---|---|
| | of species, year of development, etc. Greenbelt Development Plan shall be as per the prescribed guidelines of CPCB. Timelines of plantation for the greenbelt development before construction phase shall be furnished ensuring the 80% development in the first year leaving those areas intervene with construction activity. | has been earmarked to be developed as greenbelt development & plantation.<br>The proposed greenbelt development & plantation area will be developed in upcoming 3 years with 199,500 numbers of trees with density of plantation is 2500 trees per ha. Native & fruits bearing species, medical value types will be planted as per CPCB guidelines in consultation with DFO.<br>Detailed greenbelt plan has been incorporated in this EIA/EMP Report. | Page no. 338 |
| (xi) | Skill Development programme shall be prepared in line with the modules of the Skill Council of India for implementation of the same in due course of implementation of the project. | Skill Development programme has been prepared in line with the modules of the Skill Council of India and incorporated in the final EIA/EMP report. | Chapter 8<br>Table: 8.3 - 8.4<br>Page no. 312 - 314 |
| (xii) | Certified list of flora and fauna from DFO for the study area shall be submitted. | List of flora & fauna has been submitted for authentication to Chief Wildlife Warden, Guntur, Andhra Pradesh, 20th Sept., 2024. Copy of the submission receipt is enclosed as ***Annexure - 3*** along with this EIA/EMP report. | *Annexure - 3,*<br>*Page no. 418 - 419* |
| (xiii) | Water requirement per day for construction and operation phases including dust suppression, greenbelt development shall be furnished in the report component wise. | 500 KLD water will be required during construction phase, which will be sourced from ground water/water tanker.<br>During operation phase, 2922 KLD water will be required for plant process, domestic purpose, greenbelt & dust suppression. (Treated water/Recycled water will be used for dust suppression and part will be for greenbelt). | - |
| (xiv) | Permission for withdrawal of groundwater from Competent Authority shall be submitted. | Permission for 1325 KLD for phase I has already been obtained from Ground Water and Ground Water Audit Department vide Letter No. 408-11/CDP/Hg-II/2015, dated 22nd Feb., 2018. The copy of the same is enclosed as ***Annexure - 9*** along | *Annexure - 9,*<br>*Page no 574 - 587* |

| **Additional Details Sought by MoEFCC dated 30th March, 2017** | | | |
|---|---|---|---|
| | | with this EIA / EMP Report. For the balance water requirement, application will be applied to CGWA. | |
| (xv) | Detailed Hydrography of the site including mines shall incorporate in hydrological study. Locations of the groundwater recharging pits and ground water monitoring locations shall be identified based on the hydrogeological and geohydrological study. | Detailed hydrogeological studies including mines were conducted and report has been enclosed as ***Annexure - 8*** with the EIA/EMP Report. | *Annexure - 8,*<br>*Page no 518 - 573* |

# EXECUTIVE SUMMARY

**i) Project name and location (Village, District, State, Industrial Estate (if applicable)**

The company had obtained ToR for "Proposed 5.0 MTPA Integrated Cement Clinkerisation Plant, 8.0MTPA Cement Grinding Unit and 100 MW Captive Power Plant and 7.0 MTPA Captive Limestone Mine with mining lease area of 997.08 ha at Gollapalle, Village of Mylavaram Mandal, Kadapa (YSR) District, Andhra Pradesh" from MoEFCC, New Delhi vide letter No. J-11011/265/2012-IA II (I) dated 20th February 2013; Validity extended vide Letter dated 18th Feb., 2016. After that, corrigendum in ToR validity extension letter was obtained on 27th April, 2016.

Baseline monitoring for the project was conducted during Summer Season (March to May, 2013) and Public Hearing was conducted on 20th October, 2016. ***Final EIA/EMP Report excluding the mining components and including the outcomes of Public Hearing was submitted to MoEF&CC for obtaining Environmental Clearance to the Ministry online on 27th Jan., 2027 vide Online Application No. IA/AP/IND/62090/2012.***

***Thereafter, the project was considered for appraisal in 16th EAC (Industry - I) Meeting held on 6th March, 2017 and after detailed deliberations, the committee advised to submit few additional details (ADS) for further consideration of project.***

ADS could not be submitted due to unavailability of mining lease deed; and the lease deed has been executed on 14th May, 2024. Since, it is the captive mine for proposed cement plant, hence, both the projects got struck.

After merger & acquisition with Adani Group, the management reviewed and proposed to complete the EC process for execution of both the proposals.

The company has changed the EIA Consultant from Vimta Labs Limited to JM. EnviroNet Pvt. Ltd. for further execution of the project. JMEPL has conducted fresh Baseline Study during Summer Season (March to May, 2024) and prepared updated Final EIA / EMP Report along with incorporating the reply of Additional Details Sought.

Earlier total land area proposed for the project was approx. 275.028 ha (Including Plant, Colony & CPP). ToR was obtained from MoEF&CC for the same area on 20th February, 2013 and Public Hearing has also conducted for the same area and same configuration.

However, due to the existence of Village Gollapalle and unavailability of land, Company dropped the proposal for colony and exclude specific part of the project site from the earlier submitted proposal which results in reduction of proposed project area, from 275.028 ha to 187.1 ha.

Now, in line with the reduction of the project area within the project boundary for which ToR has been obtained and Public Hearing was conducted and addressing the additional details sought (ADS) points, company has updated the Final EIA / EMP Report with one season fresh Baseline data.

**ii) Products and capacities - If expansion is proposed, then existing products with capacities and reference to earlier EC.**

Production capacities of the proposed project are given in Table - 1.1:

**Table - 1.1**
**Production Capacities of the Proposed Project**

| Sr. No. | Particulars | Unit | Proposed Capacity | | |
|---|---|---|---|---|---|
| | | | **Phase - I** | **Phase - II** | **Total** |
| 1. | Clinker | Million TPA | 2.5 Million TPA | 2.5 Million TPA | 5.0 Million TPA |
| 2. | Cement | Million TPA | 4.0 Million TPA | 4.0 Million TPA | 8.0 Million TPA |
| 3. | CPP | MW | 50 MW | 50 MW | 100 MW |
| 4. | WHRS | MW | 12.5 MW | 12.5 MW | 25 MW |
| 5. | DG Sets | KVA | 1000 KVA | 1000 KVA | 2000 KVA |
| 6. | Railway Siding | - | Part of Project | | |

**iii) Requirement of land, raw material, water, power, fuel with source of supply (Quantitative)**

**a) Land requirement –** Earlier total land area proposed for the Project was approx. 275.028 ha (Including Plant, Colony & CPP). ToR was obtained from MoEF&CC for the same area on 20th February, 2013 and Public Hearing has also conducted for the same area and same configuration. However, due to the existence of Village Gollapalle and unavailability of land ACC dropped the proposal for colony and exclude specific part of the project site from the earlier submitted proposal which results in reduction of proposed project area reduce from 275.028 ha to 187.1 ha.

Out of the total Project area; ~42.65% area i.e. 79.8 ha will be developed under greenbelt & plantation along the periphery and inside the plant premises, truck parking area & colony with tree density 2500 per ha. Native & fruits bearing species, medicinal plants will be planted as per CPCB guidelines in consultation with DFO.

**b) Raw material Requirement & Fuel requirement**

| S. No. | Material | Quantity MTPA | | | Source | Mode of Transportation with approx. distance |
|---|---|---|---|---|---|---|
| | | Phase-I | Phase-II | Total | | |
| 1. | Limestone | 3.5 | 3.5 | 7.0 | Captive Limestone Mine Lease | Belt Conveyor / 0.5 km |
| 2. | Clay | 0.14 | 0.14 | 0.28 | Open Market | Road / 0.5 km |
| 3. | Bauxite | 0.025 | 0.025 | 0.05 | Andru Minerals & AP/Belgaum Minerals-Karnataka and Bellary | Rail & Road, 250 - 500 km |

| S. No. | Material | Quantity MTPA | | | Source | Mode of Transportation with approx. distance |
|---|---|---|---|---|---|---|
| | | Phase-I | Phase-II | Total | | |
| 4. | Iron ore | 0.02 | 0.02 | 0.04 | Sai Sindhu industries-AP/KEJ Minerals Pvt. Ltd. & Janaki Corporation Ltd Karnataka | Rail & Road / 250 km |
| 5. | Gypsum / Phospho gypsum | 0.24 | 0.24 | 0.48 | CFL, Spic, Sterlite, Fact | Rail & Road / 450 km |
| 6. | Fly ash* | 1.40 | 1.40 | 2.80 | CPP, KPCL Raichur Thermal Power Plant, Kothagudem Thermal Power Station VII stage | Rail / Road / 250 km to 550 km |

** Out of Total Fly ash requirement of 2.80 Million TPA, 0.339 Million TPA will be generated from CPP which will be 100% utilized for PPC production.*

**c) Fuel Requirement**

Details regarding quantity of fuel required, their source along with distance and mode of transportation are given below -

| S. No. | Name of Fuel | Quantity in Million TPA | | | Source | Calorific Value | Ash (in %) | Sulphur (in %) | Distance & Mode of Transportation |
|---|---|---|---|---|---|---|---|---|---|
| | | Phase-I | Phase-II | Total | | | | | |
| **Cement Plant** | | | | | | | | | |
| 1. | Coal | 0.55 | 0.55 | 1.10 | Singareni Coalfields (SCCL) in Andhra Pradesh | 4200-4800 | 30-35 | 0.4-0.5 | Road / Rail 590 km |
| 2. | Petcoke requirement in cement plant (100% uses) | 0.27 | | 0.27 | US/ Saudi/ RIL / Essar/ IOCL *via* Krishnapatnam Port | 7800 -8300 | 0.5-2.0 | 6-9 | Road / Rail 250 km |
| 3 | AFR | 0.20 | | 0.20 | Nearby area of Telangana and Andhra Pradesh | 2500 - 4000 | 30-35 | <2 | Road 100 to 300 km |
| **Captive Power Plant** | | | | | | | | | |
| 3. | Coal (Indian / Imported) | 0.485 | 0.485 | 0.97 | Indigenous: Singareni Coalfields (SCCL) in Andhra Pradesh. Imported: | Indigenous | | | Rail /Road 590 km Sea route & then by rail 250 km |
| | | | | | | 4200-4800 | 30-35 | 0.4-0.5 | |
| | | | | | | Imported | | | |
| | | | | | | 5000-5800 | 6-10 | 0.5-0.6 | |

| S. No. | Name of Fuel | Quantity in Million TPA | | | Source | Calorific Value | Ash (in %) | Sulphur (in %) | Distance & Mode of Transportation |
|---|---|---|---|---|---|---|---|---|---|
| | | Phase-I | Phase-II | Total | | | | | |
| | | | | | Indonesian coal/ South African Coal | | | | |

**d) Basic requirement for the project**

| S. No. | Particular | | Requirement | Source |
|---|---|---|---|---|
| 1. | Water (KLD) | | 2922 | Initially groundwater and later on from captive limestone mine pit & rainwater harvesting |
| 2. | Power (MW) | | 125 | CPP (100 MW), WHRS (25 MW) & State Grid Power Supply |
| 3. | Manpower (No. of Persons) | Construction phase | 2400 | Skilled & unskilled labour from local/outside |
| | | Operation Phase | 499 | |

**iv) Process description in brief, specifically indicating the gaseous emission, liquid effluent and solid and hazardous wastes. Material balance shall be presented.**

Cement Plant: The Cement Plant is based on Dry Process Technology for Cement manufacturing the proposed project comprises of equipment such as raw mill, Pre- heater & pre -calciner, Rotary Kiln, Clinker Cooler, Coal Mill and Cement Mill & Packers which will be used for cement (OPC & PPC as per market demand) manufacturing. The cement manufacturing process largely comprises of the following steps:

- Transport of crushed limestone from limestone mine to the crusher, use of stacker and reclaimer.
- Raw Mix Preparation & Homogenization
- Preheating, Calcination and Clinkerization
- Clinker cooling.
- Clinker storage in silos & part Transport of surplus to split located Grinding Units
- Cement Grinding, Storage, Packing & Dispatch

**Captive Power Plant (2 x 50 MW)**

In proposed Captive Power Plant Power will be generated by the utilization of thermal energy of steam in turbine that in turn rotates an alternator. The steam will be generated in the CFBC boiler by burning of various fuels. In proposed Power Plant, Coal (Indian/Imported) will be used as the fuel a7 it will burn in the boiler to generate steam. The generated steam will utilize to rotate the Steam Turbine, which in turns rotates an alternator.

**Waste Heat Recovery System**

M/s. ACC Cement Ltd. is also proposing to install Waste Heat Recovery System (WHRS) of 25 MW (Phase I: 12.5 MW & Phase II: 12.5 MW) for re-utilization of the exhaust gases from the Pre-heater & Cooler to

generate electric power and consequently reduce consumption of grid power. The project will contribute to the more efficient use of energy and will reduce reliance on exhaustible fossil fuel.

**a) Gaseous emission, liquid effluent and solid and hazardous wastes**

| Emissions | Source | | Proposed Mitigation measures |
|---|---|---|---|
| | **Plant Unit** | **Section** | |
| PM | Cement Plant | Raw Mill & Kiln | Bag House (2nos.) |
| | | Coal Mill | Bag house |
| | | Clinker Cooler | ESP |
| | | Cement Mill | Bag house |
| | CPP | CPP Boiler | ESP |
| $SO_2$ | Cement Plant | Raw Mill & Kiln | Due to the interaction of raw materials and kiln gases, rotary kiln systems have inherent SO2 removal efficiencies ranging between 40-99% of the Sulphur input to the system. |
| | CPP | CPP Boiler | o Installation of boiler<br>o Lime dozing in boiler.<br>o Stack height (as per CPCB guidelines) will be provided |
| $NO_x$ | Cement Plant | Raw Mill & Kiln | o Low NOx burners / De $NO_x$ will be used<br>o Incline Calciner for low $NO_x$<br>o formation<br>o Installation of analyzer at the inlet of kiln to monitor & control O2 & $NO_x$ |
| | CPP | CPP Boiler | o Boiler improved combustion efficiency<br>o Stack height (as per CPCB guidelines) will be provided |
| Fugitive Emission | Cement Plant & CPP | Raw Material Handling & Storage | o Bag filters (168 nos.) at various material handling & transfer points will be provided.<br>o Clinker, fly ash and Cement will be stored in the silos<br>o Gypsum, Coal and Petcoke will be stored in the covered storage yard<br>o Greenbelt will be developed around/ within the premises of the plant site to control the fugitive emissions.<br>o Unloading of trucks and railway wagons will be carried out with proper care avoiding dropping of the materials from height.<br>o Sprinkling of water will be done along the internal roads in the plant in order to control the dust arising due to the movement of vehicles<br>o Only PUC certified vehicles will be allowed inside the plant premises.<br>o Proper maintenance of vehicles will be done to reduce gaseous emissions<br>o All the movement area will be concreted.<br>o Vacuum sweeping machine (1 large & 2 small) for better housekeeping will be used. |
| | | Transportation activity | |

| Emissions | Source | | Proposed Mitigation measures |
|---|---|---|---|
| | Plant Unit | Section | |
| | | | o Greenbelt development & plantation will be done in 42.65 % of the total project area in and around the plant boundary and avenue plantation to attenuate air pollution.<br>o Preference to rail transportation. |

**Details of Effluent and their mitigation**

| Effluents | Plant Unit | Proposed Mitigation measures |
|---|---|---|
| Process Waste Water | RO Plant | • As the cement manufacturing is based on dry process technology hence, no waste water will be generated and "Zero Liquid Discharge" will be maintained.<br>• Blow down and RO / DM reject water (235 KLD) will be used for dust suppression (210 KLD) after treated in Neutralization pit. |
| | CPP & WHRS | |
| Sewage | Plant | o Sewage Treatment Plant (STP) of capacity 300 KLD will be installed for the treatment of domestic waste water from plant.<br>o 100% STP treated water (206 KLD) will be used in greenbelt development & plantation. |

**Details of Solid and Hazardous Waste Generation and their mitigation**

| Plant Unit | Section | Type of Waste | Waste | Estimated Quantity | Treatment / Disposal |
|---|---|---|---|---|---|
| Cement Plant | APCE | SW | Dust | 500 TPD | Dust collected from various APCEs will be totally recycled back into the process. |
| CPP | - | SW | Fly ash | 1029 TPD | Used in manufacturing of PPC. |
| STP | - | SW | STP Sludge | 30 Kg/Month | Used as manure in horticulture and greenbelt development. |
| Maintenance | Different sections | HW | Used or spent Oil (Cat. 5.1) | 120 KL / annum | Will be generated as per Schedule- I of Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016; which will be sold to CPCB/ SPCB authorized recycler. Used Oil/ Spent oil will be filled in Empty barrels and further sold to CPCB/ SPCB authorized recycler/Will be used in Co-processing in Kiln. |
| | | | Contaminated cotton rags or other cleaning materials (Cat. 33.2) | 2.0 Tonnes/ Annum | |
| | | | Empty barrels/containers/liners | 300 Barrels/ Annum | |
| | | | Wastes or residues containing oil (Cat. 5.2) | 2.0 Tonnes/ Annum | |
| | | | Used Lead Acid Batteries | 100 Nos./Annum | Will be stored in the designated storage area and will be disposed-off/ sold to registered vendors as per Battery Waste Management Rules 2020. |
| Plant | - | SW | Bottles, paper, cans, | 100 Tonnes / | Municipal solid waste generated |

| Plant Unit | Section | Type of Waste | Waste | Estimated Quantity | Treatment / Disposal |
|---|---|---|---|---|---|
| | | | etc. | annum | from plant canteen & residential colony will be disposed after segregating into bio- degradable and non-biodegradable waste in compliance of solid waste management rules 2016. Bio-degradable waste will be composted and non-biodegradable wastes will be disposed of suitably. Concept of waste minimization 3R's (Recycle, Reduce, Recover) will be adopted. |
| | | | Kitchen and canteen/ Horticulture waste | | |
| Cement Plant | Different sections | SW | Redundant machinery, Scrap | 850 Tonnes / annum | Will be Sold to recyclers |
| Cement Plant | Packing section | PW | Plastic bag & other packing materials | 20 Tonnes / annum | Authorized vendor/AFR |
| Cement Plant | Plant & office | e-Waste | Discarded electrical equipment, Cables, CFL/ LED Lights | 15 Tonnes / annum | Sold to registered vendors as per e-Waste Management Rules, 2016. |
| Construction of Cement plant | -- | C & D | Construction & fabrication waste | 200 Tonnes / annum | Fabrication waste-to scrap dealers; other construction waste-land levelling/ road construction. |

**b) Material balance**

Material / Mass Balance Diagram for manufacturing of OPC & PPC Cement, is shown below –

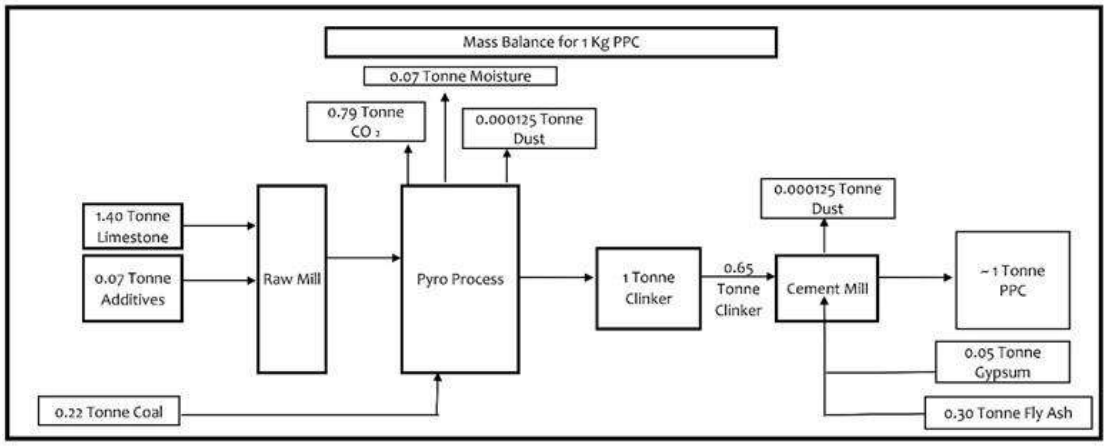



**Figure 1: Mass Balance Diagram PPC**

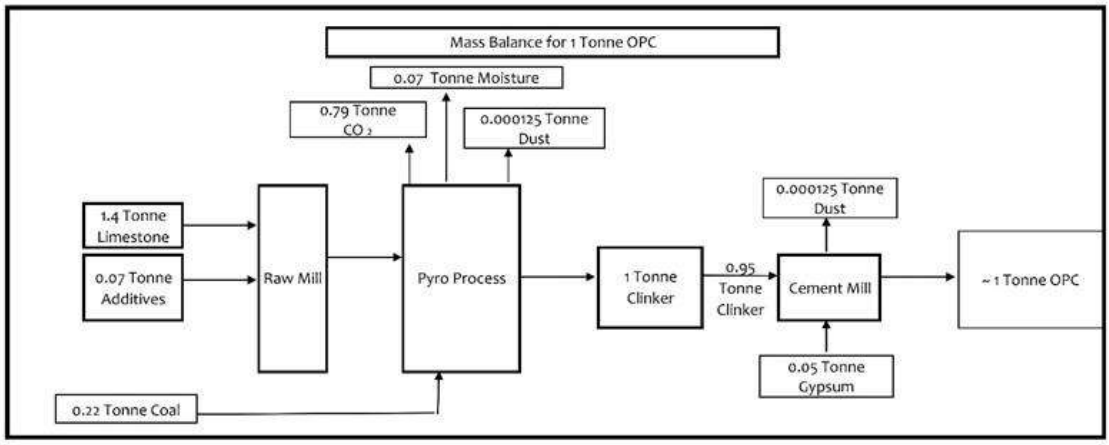



**Figure 2: Mass Balance Diagram OPC**

**v) Measures for mitigating the impact on the environment and mode of discharge or disposal.**

| Particulars | Details |
|---|---|
| *Air Quality Management* | ℘ Efficient APCEs will be installed at all major stacks to keep the PM emission level within prescribed limit of 30 mg/Nm$^3$.<br>℘ Bag filters will be provided to control dust released from various dust generating points in the plant and at all material transfer points<br>℘ Low $NO_x$ burners and De-NOx System will be installed.<br>℘ Dry fly ash will be transported in closed tankers<br>℘ Clinker, Fly Ash and Cement will be stored in silos and Gypsum, Coal, AFR, in covered sheds<br>℘ Greenbelt will be developed around/ within the premises of the plant site to arrest the fugitive emissions<br>℘ Unloading of trucks will be carried out with avoiding dropping of the materials from height<br>℘ Sprinkling of water will be done along the internal roads in the plant in order to control the dust arising due to the movement of vehicles<br>℘ Regular maintenance of vehicles will be done to reduce gaseous emissions<br>℘ Regular ambient air quality and stack emission monitoring will be carried out as per CPCB / APPCB norms to ensure that ambient air quality standards will be met all the time. |
| *Water Management* | ℘ RO reject water from CPP &WHRS will be reused for dust suppression after neutralization.<br>℘ Domestic wastewater (252 KLD) generated from plant will be treated in STP (Capacity - 300 KLD) and the treated water (206 KLD) will be utilized for greenbelt development/ plantation.<br>℘ Rain water harvesting will be done. |
| *Noise Management* | ℘ Personal Protective Equipment (PPEs) viz. earplugs and earmuffs will be provided to the employees exposed to high noise level.<br>℘ Proper maintenance, oiling and greasing of machines at regular intervals will be done to reduce generation of noise.<br>℘ Silencer will be provided to all safety valves of the plant and Turbine vent valves to control the Noise level.<br>℘ Installation of compressors and turbine in closed building<br>℘ Greenbelt will be developed all along the plant boundary. |

| Particulars | Details |
|---|---|
| | ➢ Regular monitoring of noise levels will be carried out and corrective measures in concerned machinery will be adapted accordingly to the possible extent. |
| *Solid & Hazardous Waste Management* | ➢ Dust collected from various air pollution control equipment will be 100% recycled into the process.<br>➢ Sewage sludge (30 kg/month) generated from STP will be used as manure in greenbelt development/ plantation.<br>➢ Municipal solid waste generated from plant & colony will be disposed after segregating the waste into bio-degradable and non-degradable. Bio-degradable waste will be composted and manure will be used for greenbelt development / plantation; and non-degradable wastes will be disposed off suitably.<br>➢ Used Oil / Spent Oil (120 KL / annum) will be used in Kiln as co-processing as per Hazardous Waste Management Rules, 2016 and Used Grease & Waste residue, Lead acid batteries &<br>➢ Lead acid batteries (100 no's/annum) & e-waste (15 TPA) Will be stored in the designated storage area and will be disposed-off/ sold to registered vendors as per Battery Waste Management Rules 2020. |
| *Greenbelt Development / Plantation* | ➢ Out of the total Project area; ~42.65% area i.e. 79.8 ha will be developed under greenbelt & plantation along the periphery and inside the plant premises, truck parking area & colony with tree density 2500 per ha. Native & fruits bearing species, medicinal plants will be planted as per CPCB guidelines in consultation with DFO.<br>➢ It is proposed to plant about 2500 saplings per hectare considering the survival rate of 85 - 90%.<br>➢ Plant species like *Azadirachta indica* (Neem), *Ficus religiosa* (Peepal), *Polyalthia longifolia* (Ashok), *Pithecellobium dulce* (Jungle jalebi), *Tectona grandis* (Teak), *Delonix regia* (Gulmohar), *Mangifera indica* (Mango), *Nerium indicum* (Kaner), *Cassia fistula* (Amaltas) and will be planted. |

**vi) Capital cost of the project, estimated time of completion.**

| S. No. | Particular | Details |
|---|---|---|
| 1. | Total Cost of the Project | Rs. 7100 Crores |
| 2. | Cost for Environmental Protection Measures | Capital Cost: Rs. 698 Crores (Phase I: Rs. 362 Crores, Phase - II: Rs. 336 Crores) |
| | | Recurring Cost: Rs. 14 Crores/ annum (Phase I: Rs. 7.1 Crores/annum, Phase - II: Rs. 6.9 Crores/annum) |
| 3. | Cost for PH issues addressed | Rs. 355 crores (Phase - I: 184 crores in phase-I and Phase - II: 171 crores) |
| 3. | Time of completion of the project | 24 months (after getting all the regulatory approvals) |

**vii) Site selected for the Project-Nature of land- agricultural (single/double crop), barren, Govt./private land, status of its acquisition, nearby (in 2-3 km) water body, population, within 10 km other industries, forest, eco-sensitive zones, accessibility (Note- in case of industrial estate this information may not be necessary).**

a) **Nature of land**

The land area required for the proposed plant is 187.1 ha which is Pvt. Agriculture land.

**b) Status of its acquisition**

Earlier total land area proposed for the Project was approx. 275.028 ha (Including Plant, Colony & CPP). ToR was obtained from MoEF&CC for the same area on 20th February, 2013 and Public Hearing has also conducted for the same area and same configuration.

However, due to the existence of Village Gollapalle and unavailability of land, ACC intends to exclude the specific part of the project site form the earlier submitted proposal which in turn the proposed project area reduce from 275.028 ha to 187.1 ha. Total 187.1 ha land area has been purchased in the name of applicant company i.e. ACC Limited.

**c) Nearby (in 2-3 km) water body, forest, eco-sensitive zones, accessibility**

| S. No. | PARTICULARS | DETAILS<br>*(With approximate aerial distance & direction from the nearest project boundary)* |
|---|---|---|
| 1. | Nearest Village | Gollapalle (0.25 km in SSE direction) |
| 2. | Nearest Town/ City | Kadapa (79 km in SE direction) |
| 3. | National / State Highways within 10 km radius | SH - 57 (0.5 km in SSW direction) |
| 4. | Nearest Railway Station | ○ S. Uppalapadu (11.5 km in SE direction)<br>○ Kondapuram (24.0 km, SSW direction) |
| 5. | Nearest Airport | ○ Kadapa Airport (70.5 km in SE direction)<br>○ Tirupati Airport (195 km in SE direction) |
| 6. | National Parks, Wildlife Sanctuaries, Biosphere Reserves within 10 km radius | No National Park, Wildlife Sanctuary, Biosphere Reserve falls within 10 km radius of the plant site. |
| 7. | Reserve Forests (RF) / Protected Forests (PF) etc. within 10 km radius | No Reserved Forests (RF) / Protected Forests (PF) etc. within 10 km. radius of the plant site. |
| 8. | Rivers/Water Bodies within 10 km radius | ○ Nallah (Adjacent in south)<br>○ Nallah Cheruvu (6.5 km in NW direction)<br>○ Tigaleru River (7.0 km in ESE direction)<br>○ Pond (3.0 km in North direction)<br>○ Pond Near Kallutla (2.5 km in ENE direction)<br>○ Pond (4.0 km in South direction)<br>○ Pond (4.1 km in South direction) |
| 9. | Seismic Zone | Zone - II [as per IS 1893 (Part-I): 2002] |

**d) List of industries/Mines within 10 km radius study area**

| S. No. | Name of the Company | Type of Industry | Approx. Distance and Direction from the Project site |
|---|---|---|---|
| 1. | Cement Plant (Dalmia Cement Bharat Ltd.) | Cement Plant | ~3.5 km in ESE Direction |

**viii) Baseline environmental data- air quality, surface and ground water quality, soil characteristic, flora and fauna, socio economic condition of the nearby population.**

**a) Baseline Environmental Data (Air, Noise, Water & Soil)**

The baseline study was conducted during the Summer Season (March, 2013 to May, 2013) by earlier consultant Vimta Labs Ltd. as the baseline data was 3 years old & hence expired; therefore, in compliance to the MoEFCC OM dated 8th June, 2022 a fresh baseline study has been conducted during Summer Season (March, 2024 to May, 2024) in the study area covering an area of 10 km radius from the proposed project site in accordance with the guidelines of MoEF&CC. The dominant wind direction of the area was from the SE during Summer Season (March, 2024 to May, 2024).

| **Parameters** | **Summer Season (March, 2024 to May, 2024)** | | **Standards** |
|---|---|---|---|
| | **No. of Location** | **Description** | |
| Ambient Air Quality Monitoring | 13 Locations | PM10 - 36.4 to 76.5 µg/m³ | 100 µg/m³ (24 hours) |
| | | PM2.5 - 20.1 to 41.8 µg/m³ | 60 µg/m³ (24 hours) |
| | | SO2 - 4.1 to 11.7 µg/m³ | 80 µg/m³ (24 hours) |
| | | NO2 - 8.9 to 22.2 µg/m³ | 80 µg/m³ (24 hours) |
| | | CO - BDL to 0.67 mg/m³ | 4 mg/m³ (1 hours) |
| Noise Level Monitoring | 11 Locations | Noise Level During Day Time - 47.5 to 53.9 Leq dB (A) | 75 Leq dB (A) |
| | | Noise Level During Night Time - 37.7 to 42.6 Leq dB(A) | 70 Leq dB (A) |
| Surface Water | 7 Location | Surface water sample was not collected as all the water bodies were found dry during the study period | - |
| Ground Water Sampling | 9 locations | pH - 7.38 to 7.78 | 6.5 to 8.5 |
| | | Total Hardness - 239.17 to 736.4 mg/l | 600 mg/l |
| | | Alkalinity - 185.6 to 585.9 mg/l | 600 mg/l |
| | | TDS - 475 to 1582 mg/l | 2000 mg/l |
| Soil Sampling | 10 Locations | Soil nature - Slightly Alkaline<br>pH - 8.0 to 8.63, Organic Matter - 0.55 to %, Nitrogen - 174.02 to 318.18 kg/ha, Phosphorous 8.93 to 37.76 kg/ha, Potassium - 300.63 to 591.96 kg/ha | - |

***Cumulative Max. GLC due to Proposed Integrated Cement Project and Proposed Captive Kadapa Limestone Mine and Transportation -***

Ground Level Concentration has also been predicted composite for Proposed Integrated Cement Plant and Proposed Captive Kadapa Limestone Mine and Vehicular transportation. Details are given in table below:

**Table - 1.2**

**Cumulative Ground Level Concentrations (Incremental & Resultant) due to Integrated Cement Plant**

| Particular | Concentration (µg/m³) | | | Approx. Distance in km | CPCB NAAQS Standards (µg/m³) |
|---|---|---|---|---|---|
| | Baseline | Incremental | Resultant | | |
| $PM_{2.5}$ | 28.0 | 1.95 | 29.95 | Within Mining Lease boundary | 60 |
| $PM_{10}$ | 50.2 | 2.93 | 53.13 | Within Mining Lease boundary | 100 |
| $SO_2$ | 6.8 | 3.37 | 10.17 | Within the Plant Boundary | 80 |
| $NO_x$ | 12.3 | 3.99 | 15.69 | Within the Plant Boundary | 80 |
| CO | 0 | 33.5 | 33.5 | Within the Plant Boundary | 4 mg/m³ |

- Maximum GLC due to Integrated Cement Plant for PM10 is found to be 2.93 µg/m³ {Figure 4.1 (a)}.
- Maximum GLC due to Integrated Cement Plant for PM2.5 is found to be 1.95 µg/m3 {Figure 4.1 (b)}.
- Maximum GLC due to Integrated Cement Plant for SO2 is found to be 3.37 µg/m3. {Figure 4.1 (c)}.
- Maximum GLC due to Integrated Cement Plant for NOx is found to be 3.99 µg/m3 {Figure 4.1 (d)}.
- Maximum GLC due to Integrated Cement Plant for CO is found to be 33.5 µg/m3 {Figure 4.1 (e)}.

The maximum GLC's after implementation of the Proposed Integrated Cement Plant are very much likely to be within the prescribed NAAQ standards.

**Table - 1.3**

**Cumulative GLC due to for Integrated Cement Plant, captive mines and vehicular transportation**

| Particular | Concentration (µg/m³) | | | Approx. Distance in km | CPCB NAAQS Standards (µg/m³) |
|---|---|---|---|---|---|
| | Baseline | Incremental | Resultant | | |
| $PM_{2.5}$ | 28.0 | 1.95 | 29.95 | Within Mining Lease boundary | 60 |
| $PM_{10}$ | 50.2 | 2.93 | 53.13 | Within Mining Lease boundary | 100 |
| $SO_2$ | 6.8 | 3.37 | 10.17 | Within the Plant Boundary | 80 |
| $NO_x$ | 12.3 | 3.99 | 15.69 | Within the Plant Boundary | 80 |

- Cumulative maximum GLC due to Integrated Cement Plant, captive mines and vehicular transportation for PM10 for is found to be 2.93 µg/m3.
- Cumulative maximum GLC due to Integrated Cement Plant, captive mines and vehicular transportation for PM2.5 is found to be 1.95 µg/m3.
- Cumulative maximum GLC due to Integrated Cement Plant, captive mines and vehicular transportation for SO2 is found to be 3.37 µg/m3.

Cumulative maximum GLC due to Integrated Cement Plant, captive mines and vehicular transportation for $NO_x$ is found to be 3.99 µg/m³.

**Biological Environment (Flora & fauna)**

**Flora:** Within the Core and buffer zone of proposed project site, a total of 21 species of trees, 10 species of Shrubs, 9 species of Herbs were recorded and observed within the studied area based on primary observation as well as based on information collected from the secondary data.

**Fauna:** Among faunal diversity, within the 10 km radius of buffer zone, 20 species of mammals, 8 species of reptiles & 7 species of amphibians, 66 species of Avi fauna and 36 species of Butterfly were reported in 10 km radius of project sites.

List of flora & fauna has been submitted for authentication to Chief Wildlife Warden, Guntur, Andhra Pradesh, on 20th Sept., 2024.

16 schedule - I species viz. Four horned Antelope, Asiatic Wild Dog, Bonnet Macaque, Sambar, Sloth Bear, Indian Grey Mongoose, Small Indian Civet, Masked Palm Civet, Golden Jackel, Bengal Monitor Lizard, Indian Star Tortoise, Indian rat snake, Checkered Keeback, Grey Junglefowl, Shikra, Indian Peafowl Indian Species were found in the study area of the proposed project site as per the Primary & Secondary Survey done by Greentech Solutions.

Company has prepared Wildlife Conservation for the proposed integrated cement plant and allocated Rs. 5.07 Crores for conservation of schedule - I species. Wildlife Conservation Plan has been submitted to Chief Wildlife Warden, Guntur, Andhra Pradesh, on 20th Sept., 2024 for further approval.

**b) Socio-Economic Environment**

The 10 km radius study area from plant and mine site, comprises of District YSR, Andra Pradesh is covered under 10 km radius. Total no. of villages observed within the 10 km radius from the project area are 36.

As per 2011 Census, the population recorded is 70,693 (for 10 km radius buffer zone). Total no. of household is 2575, 6081 and 8930 respectively in primary, secondary and outer zone. Sex ratio is 1001, 998 and 1000 (females per 1000 males) observed in primary, secondary and outer zone respectively. SC population distribution is 1522, 2856 and 7059 respectively in primary, secondary and outer zone. ST population distribution is 299, 671 and 439 respectively in primary, secondary and outer zone respectively. Average household size is 5 which is the standard family size in India. The literacy rate of the study area is 60.4% which is lower than the District Average i.e., 67.88 %. The sex ratio of the study area is 1000.

**ix) Identification of hazards in handling, processing and storage of hazardous material and safety system provided to mitigate the risk.**

**Risk Assessment table along with mitigation measures**

| S. No. | Activity | Associated hazards | Associated risk/ health impact | Mitigation Measures |
|---|---|---|---|---|
| 1. | Storage & handling of raw material & chemicals | Heat, Fire& dust | Exposure, physical injuries, burning, air pollution due to fugitive emissions | o Use of PPEs.<br>o Continuous water sprinkling<br>o Training to workers for proper handling<br>o Proper system for loading & unloading operations<br>o Firefighting & first aid facility<br>o Storage should be away from ignition source<br>o Proper housekeeping facilities |
| 2. | Working in Cement Plant | Heat, Fire, Dust, Smoke & | Physical injuries, burning, air pollution, | o Firefighting & first aid facility<br>o Use of PPEs. |

| S. No. | Activity | Associated hazards | Associated risk/ health impact | Mitigation Measures |
|---|---|---|---|---|
| | | Explosion | CO poisoning | ○ Use of proper APCEs like Bag house ESP/Bag Filters<br>○ Covered conveyor belts<br>○ Inspection & regular monitoring<br>○ Training to workers for proper handling of raw materials |
| 3. | APCD failure | Release of PM in ambient air | Air pollution | ○ Regular monitoring & inspection will be done.<br>○ The plant shall immediately shut down on APCE failure |
| 4. | Working at height | Slip, trips & falls of operators | Physical injuries | ○ Individual alertness of the workers.<br>○ First aid boxes shall be provided |
| 5. | Electrical maintenance work | Electric shock, short circuits in power room | Electrical shocks, Injury or burn | ○ Regular checking and maintenance of electrical units<br>○ Use of PPEs<br>○ Provision of First aid box |
| 6. | Working near D.G. sets during emergency | High noise | Noise induced hearing losses | ○ Provision of PPEs to the workers. |

**x) Likely impact of the project on air, water, land, flora-fauna and nearby population.**

| S. No. | Project Activity | Aspect | Impact | Mitigation Measures |
|---|---|---|---|---|
| 1. | Transportation of Limestone by Covered Conveyor Belt | Fugitive Dust Emission | ▪ There will be no major impact<br>▪ Only, there will be increase in the concentration of fugitive dust in very lesser quantity | • Water spray nozzles over the conveyor belt in the stacker feed point<br>• Installation of Bag Filters at all material transfer points<br>• Greenbelt & Plantation development along the sides of covered conveyor belt and periphery of plant |
| 2. | Transportation of other raw materials by road | Fugitive Dust Emission | ▪ Increase in the fugitive dust concentration in the ambient air which will affect the biotic environment | • Use of PUC Certified vehicles<br>• Vehicles will be covered with tarpaulin and not over loaded<br>• Speed limit will be maintained<br>• Paved road inside the plant premises |
| 3. | Raw Material & Finished Product - storage and handling | | ▪ Increase in the fugitive dust concentration in the ambient air<br>▪ Workers affected by respiratory diseases due to working in the high dust-zone area | • Covered yard for storage of Iron Ore, Bauxite, Pond Ash, Gypsum, Coal & Petcoke.<br>• Personal Protective Equipment to the workers |
| 4. | Raw Mix Preparation | Particulate Matter Emission | Increase in the concentration of particulate matter in the ambient air | • Transportation of material to the raw mill by covered conveyor belt<br>• Installation of Bag Filters (168 Nos) at all material transfer points in Clinkerization & Pyro section. |
| 5. | Clinkerization | Particulate Matter | Increase in Particulate | • Installation of adequate APCEs such as Bag House |

| S. No. | Project Activity | Aspect | Impact | Mitigation Measures |
|---|---|---|---|---|
| | (Calcination) | Emission, Gaseous Emission & Fugitive Dust Emission | Matter, $SO_2$ & $NO_2$ and fugitive dust concentration in air environment | & ESP.<br>• Installation of Bag Filters at transfer points.<br>• Low $NO_x$ burners<br>• Installation of De-NOx system.<br>• Development of greenbelt / plantation<br>• Personal Protective Equipment (Goggles, Mask, Helmet, Boots, Gloves & Earmuffs/ Earplugs etc.) to workers |
| 6. | Clinker Grinding / Cement Mill (including Fly ash handling) | Particulate Matter Emission & Fugitive Dust Emission | Increase in Particulate Matter and fugitive dust concentration in air environment | • Installation of Bag House (6 Nos.)<br>• Installation of Bag Filters (168 Nos) at all material transfer points in Clinkerization & Pyro section<br>• Fly ash received through closed bulkers & fed into Silo through pneumatic system.<br>• Development of greenbelt & plantation. |
| | | Noise generation due to Exhaust fans and Cement grinding | ▪ Increase in noise levels near source generation<br>▪ Hearing impairments<br>▪ Other health effects | • Earmuffs/ Earplugs to persons working in high noise zone.<br>• Proper lubrication & maintenance of machinery<br>• Development of greenbelt & plantation within the plant premises<br>• Periodic Occupational Health Surveillance of worker |
| 7. | Cement Packing & Dispatch | Fugitive Dust Emission | ▪ Area source - Increase in fugitive dust concentration in air environment<br>▪ Respiratory Diseases | • Dust extraction arrangement<br>• Spilled cement collected and recycled<br>• Installation of Bag Filters (168 Nos) in both Cement Mills) at all material transfer points<br>• Development of greenbelt & Plantation (42.65 ha)<br>• Personal Protective Equipment (Goggles, Mask, Helmet, Boots, Gloves & Earmuffs/ Earplugs etc.) to worker.<br>• Periodic Occupational Health Surveillance |
| 8. | Coal handling & Grinding | Fugitive Dust Emission | Increase in fugitive dust concentration in air environment | • Dust extraction arrangement by Installation of Bag Filters (168 Nos) at material transfer points, Coal mill hopper & storage<br>• Development of greenbelt & Plantation. |
| 9. | CPP Boiler | Particulate Matter Emission, Gaseous Emission & Fugitive Dust Emission | Increase in Particulate Matter, $SO_2$ & $NO_2$ and fugitive dust concentration in air environment | • 2 Nos ESPs for both CFBC boiler for PM & gaseous emissions.<br>• Installation of Bag Filters at all material transfer points<br>• Lime dozing in CFBC boilers for control of SO2 emissions<br>• Low NOx burners for NOx Control<br>• Development of greenbelt & plantation. |

**xi) Emergency preparedness plan in case of natural or in plant emergencies.**

M/s. ACC Limited. will have an Emergency Plan (Onsite & offsite) at the plant site. Suitable Risk Control Measures with respect to Risk Assessment will be implemented to minimize the risk to an acceptable level. Regular Training, Implementation of SOPs and compliance of relevant Personal Protective Equipment's (PPEs) will help to minimize the health hazards and incidental casualties.

**xii) Issues raised during public hearing (if applicable) and response given.**

Public Hearing for the proposed Integrated Cement Plant was conducted on 20th October, 2016 at 10:30 AM at near proposed project site, near Gollapalli village, Malyavaram Mandal of YSR District and in the presence of District Collector, Environment Officers, Regional Office, Andhra Pradesh Pollution Control Board, Tirupati. Issues raised in Public Hearing and its action plan is summarized in below table:

| S. No. | Issue | Issues / Points / Opinions of Local Public | Reply by Project Proponent | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| 1. | ***Employment*** | • Provide job opportunities to the local people according to the qualification.<br>• Establish skill development institute to train the unskilled/ agriculture labour for getting suitable jobs.<br>• Fulfil the promises made during land alienation in the year 1996 viz., providing of jobs.<br>• Provide good no. of jobs to local people.<br>• Give written commitment on the job opportunities to the local public.<br>• Give a written assurance for providing 500 nos. of jobs<br>• Employment should be provided to those who have lost their land, including educational opportunities for the uneducated.<br>• If the factory is built employment opportunities will arise, particularly for youth. | • The proposed project will provide employment to about 499 persons during operation phase and to about 2400 persons during construction phase.<br>• The company will provide jobs to the land losers / their children on top priority based on qualification, if not, by skill development programme.<br>• ACC will establish DISHA Skill Development Centre (which is common for both plant and mine) to facilitate employability training under its skill development initiative (i.e. ACC DISHA initiative) and enhance their skill for employability and placement elsewhere | ▪ The total manpower requirement (regular) during operation phase for the proposed project is 499 persons; and during construction phase, about 70 persons will be employed.<br>▪ In addition to this, approx. employment for 2330 persons will be generated for various contract labour work and approx. 500 persons will be benefited with indirect employment i.e. Transport business, vehicle drivers and attendants, repair workshops, grocery and retail stores, school, coaching centers, restaurants, self-employed persons like tailors, carpenters, plumbers, electricians, etc.<br>• ACC has allocated Rs. 35.5 Crore for establishment of DISHA Skill Development Centre. |
| 2. | ***Environmental Pollution*** | • Adopt latest technology and install latest pollution control systems.<br>• Give written assurance regarding zero pollution<br>• Sustainable development without causing any damage to the surrounding environment.<br>• Establishment of green buffers through tree planting before construction to mitigate dust and | • The company will install efficient pollution control equipment of latest available technology to control emissions within the stipulated standards.<br>• M/s. ACC Limited is a law-abiding Corporate that has existed for more than | Company has earmarked an amount of Rs. 698 Crores as capital cost and Rs. 14.0 Crores/annum as recurring cost for Environment Protection measures; out of which,<br>Rs. 559 Crores will be spent on air pollution |

| S. No. | Issue | Issues / Points / Opinions of Local Public | Reply by Project Proponent | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| | | air pollution.<br>• ACC should implement control measures during construction, and before the factory opens, they should plant trees to prevent environmental pollution.<br>• Cement plants are among the most polluting industries. This plant creates a situation where we have to live with polluted air. What is your response regarding the financial implications driven by a profit - oriented industry?<br>• The air pollution meeting should only be held after addressing the issues of land dwellers | 80 years with a track record of compliance. ACC is fully committed to all the commitments given in response to queries raised during Public Hearing.<br>• Greenbelt will be developed in ~42.65% of the total plant area to arrest dust | control technologies as capital cost and Rs. 6.2 Crores/annum as recurring cost.<br>Rs. 63 Crores will be spent on water pollution control technologies as capital cost and Rs. 2.3 Crores/annum as recurring cost.<br>Rs. 13.9 Crores will be spent on greenbelt development as capital cost and Rs. 1.27 Crores/annum as recurring cost. |
| 3. | ***Socio-Economic Development*** | • Establish corporate level educational facilities, hospitals etc. as they have incurred huge losses in last 20 years.<br>• Farmer's issues/demands should address with the CSR funds.<br>• Fulfil the promises made during land alienation in the year 1996 viz., village development, provide health and education facilities to the surrounding villages.<br>• Provide education & health facilities to the local people.<br>• Spend CSR amounts on education of the children hailing surrounding villages.<br>• Help surrounding villages for all round development<br>• Provide training for sheep farming.<br>• We Seek investments in local infrastructure, including water and health facilities, to support communities | • Medical facilities will be extended to all the nearby communities through ACC Plant hospital.<br>• The company will take various initiatives for the development of the villages.<br>• M/s. ACC Limited will improve the quality of education under ACC Vidya Utkarsh initiative.<br>• Medical facilities will be extended to all the nearby communities through ACC Plant hospital.<br>• ACC will provide training for sheep farming in proposed DISHA Skill Development Centre. | • ACC has allocated Rs. 106.5 Crores for improving Quality of Education under ACC vidya Utkarsh initiative.<br>• The company has allocated Rs. 355 Crore for development of the surrounding villages.<br>• ACC has allocated Rs. 35.5 Crore for establishment of DISHA Skill Development Centre. |

| S. No. | Issue | Issues / Points / Opinions of Local Public | Reply by Project Proponent | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| 4. | ***Health*** | • Health study could have been conducted by the project consultant | Medical facilities will be extended to all the nearby communities through ACC Plant hospital. The management has also proposed to conduct Health audit of the employers of the industry and also of the surrounding villagers. | - |
| 5. | ***Land*** | • Provide compensation to the surrounding farmers (land losers).<br>• Insisted that if any drilling or blasting occurs, proper compensation for damages to our homes be provided as per current rates.<br>• Every farmer who has lost their land deserves compensation according to current rates for each acre lost.<br>• We Urge that an environmental referendum be conducted after meaningful discussions with the affected farmers who have lost their land to ACC Limited.<br>• Compensation for every house surveyed by R&B in Gollapalle village in 2010, at prevailing rates.<br>• Compensation of Rs 50,000 and Rs 1,25,000 should be provided for the loss of land at the rate of Rs 4,00,300 per acre<br>• According to the land acquisition Act of 2013 30% of the company's production benefits should be allocated to the displaced farmers.<br>• Surplus land next to those purchased by ACC before the construction of the factory and the lands within the factory area should be acquired at current market rate | The PP agreed to pay compensation to the house losers on par with the market<br>ACC informed during public hearing that, the main demand of the surrounding farmers i.e additional compensation to the land losers will be discussed in the ensuring board meeting (M/s ACC cement ltd) and he expressed his belief for finding out amicable solution in the interest of surrounding farmers within 3 months. | ACC proposes the following additional financial support under rehabilitation package to the land owners of 187 families (covering 195 ha area purchased till date and similar additional financial support under rehabilitation package will be extended to the families of balance 80.028 ha of plant area):<br>• Option 1: One time compensation of Rs. 1.5 lakhs/acre (on pro rata basis) to the land owners owning the land in the plant area of 187.1 ha.<br>**OR**<br>• Option 2: One time compensation of Rs.1.5 Lakhs/acre (on pro rata basis) to the land owners (owning land in the plant area) bifurcated into 60 instalments (with annual correction as per the prevailing price index rate) and provided in the form of Monthly Income Scheme (MIS). A MIS would help to ensure financial discipline and better usage of compensation money.<br>**OR**<br>• Option 3: ACC shall facilitate to provide suitable job to one member of the family |

| S. No. | Issue | Issues / Points / Opinions of Local Public | Reply by Project Proponent | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| | | | | either in the mines or in the proposed cement/power plant based on the qualification and skill possessed by the candidate from project affected family. Since the proposed project is a state of art project, there will be limited opportunity for the direct employment in the company operations at the location<br>Note: Project affected families which opt for financial rehabilitation package (option 1& 2) will not be eligible for employment option (option 3). |
| 6. | ***Water*** | • Depletion of water in surrounding area due to excessive water use by the industry. | The company will take up groundwater development programmes (rain water harvesting, water shed development etc.) in a big way to increase the ground water table of the surrounding area. | - |
| 7. | ***Others*** | • Solve the demands of surrounding farmers as they have given their irrigated lands to the proposed industry with great hope.<br>• Solve the issues of local farmers on top priority.<br>• We Request regular updates and open communication regarding the factory's status and expected timeline for development. | The issue will be considered and the company will work accordingly.<br>ACC will always available for communication and Plant will be establish after necessary clearance | - |

**xiii) Socio-economic Development Plan**

ACC proposes to spend Rs. 184 crores in phase-I and 171 crores in phase-II towards the Enterprise Social Commitment. The company has developed a comprehensive Skill Development Programme under the ACC DISHA initiative and allocated ₹35.5 crores as part of its Enterprise Social Commitment:

**Table 1.4**

**Enterprise Social Commitment / CER for Phase - 1**

| Interventions | Total 10-year Budget | 1st Year | 2nd Year | 3rd Year | 4th Year | 5th Year | 6th Year | 7th Year | 8th Year | 9th Year | 10th year |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **ACC Vidya Utkarsh** - Improving Quality and Reach of Education | **55.20** | 3.31 | 5.52 | 6.62 | 7.18 | 7.73 | 6.62 | 6.07 | 4.42 | 3.86 | 3.86 |
| **ACC DISHA** - Skill Development of Youth and Placement | **18.40** | 1.10 | 1.84 | 2.21 | 2.39 | 2.58 | 2.21 | 2.02 | 1.47 | 1.29 | 1.29 |
| **ACC LEISA** - Low External Input for Sustainable Agriculture | **18.40** | 1.10 | 1.84 | 2.21 | 2.39 | 2.58 | 2.21 | 2.02 | 1.47 | 1.29 | 1.29 |
| **ACC Swawlamban** - Women Empowerment through SHGs and facilitating Micro Enterprises | **36.80** | 2.21 | 3.68 | 4.42 | 4.78 | 5.15 | 4.42 | 4.05 | 2.94 | 2.58 | 2.58 |
| **ACC Arogyam** - Enhancement of health and wellbeing | **9.20** | 0.55 | 0.92 | 1.10 | 1.20 | 1.29 | 1.10 | 1.01 | 0.74 | 0.64 | 0.64 |
| **ACC Sampoorn Swachchata** - Promote hygiene, ODF environment and safe disposal of waste | **18.40** | 1.10 | 1.84 | 2.21 | 2.39 | 2.58 | 2.21 | 2.02 | 1.47 | 1.29 | 1.29 |
| **ACC Sanrakshit Paryavaran** - Sustainability of resources for posterity | **18.40** | 1.10 | 1.84 | 2.21 | 2.39 | 2.58 | 2.21 | 2.02 | 1.47 | 1.29 | 1.29 |
| **ACC Drona** - Promotion of local Sports, Arts and Culture | **9.20** | 0.55 | 0.92 | 1.10 | 1.20 | 1.29 | 1.10 | 1.01 | 0.74 | 0.64 | 0.64 |
| **Total** | **184.00** | **11.04** | **18.40** | **22.08** | **23.92** | **25.76** | **22.08** | **20.24** | **14.72** | **12.88** | **12.88** |

**Table 1.5**

**Enterprise Social Commitment / CER for Phase - 1**

| Interventions | Total 10-year Budget (in Crores) | 1st Year | 2nd Year | 3rd Year | 4th Year | 5th Year | 6th Year | 7th Year | 8th Year | 9th Year | 10th Year |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **ACC Vidya Utkarsh** - Improving Quality and Reach of Education | **51.30** | 3.08 | 5.13 | 6.16 | 6.67 | 7.18 | 6.16 | 5.64 | 4.10 | 3.59 | 3.59 |
| **ACC DISHA** - Skill Development of Youth and Placement | **17.10** | 1.03 | 1.71 | 2.05 | 2.22 | 2.39 | 2.05 | 1.88 | 1.37 | 1.20 | 1.20 |
| **ACC LEISA** - Low External Input for Sustainable Agriculture | **17.10** | 1.03 | 1.71 | 2.05 | 2.22 | 2.39 | 2.05 | 1.88 | 1.37 | 1.20 | 1.20 |
| **ACC Swawlamban** - Women Empowerment through SHGs and facilitating Micro Enterprises | **34.20** | 2.05 | 3.42 | 4.10 | 4.45 | 4.79 | 4.10 | 3.76 | 2.74 | 2.39 | 2.39 |
| **ACC Arogyam** - Enhancement of health and wellbeing | **8.55** | 0.51 | 0.86 | 1.03 | 1.11 | 1.20 | 1.03 | 0.94 | 0.68 | 0.60 | 0.60 |
| **ACC Sampoorn Swachchata** - Promote hygiene, ODF environment and safe disposal of waste | **17.10** | 1.03 | 1.71 | 2.05 | 2.22 | 2.39 | 2.05 | 1.88 | 1.37 | 1.20 | 1.20 |
| **ACC Sanrakshit Paryavaran** - Sustainability of resources for posterity | **17.10** | 1.03 | 1.71 | 2.05 | 2.22 | 2.39 | 2.05 | 1.88 | 1.37 | 1.20 | 1.20 |
| **ACC Drona** - Promotion of local Sports, Arts and Culture | **8.55** | 0.51 | 0.86 | 1.03 | 1.11 | 1.20 | 1.03 | 0.94 | 0.68 | 0.60 | 0.60 |
| **Total** | **171.00** | **10.26** | **17.10** | **20.52** | **22.23** | **23.94** | **20.52** | **18.81** | **13.68** | **11.97** | **11.97** |

**Table No. 1.6**

**Skill Development Programme (ACC DISHA) (Phase - I)**

| S. No | Particulars | Details | Cost (in crores) |
|---|---|---|---|
| 1. | Programme Design & Development | • Curriculum development, Enhancement of qualifications, skills, knowledge, and behavior and to ensure that the training provided meets the needs of the industry.<br>• Spoken English course in the locality with the help of a graduate teacher.<br>• Providing coaching for competitive examinations for NEET / JEE. | 2.5 |
| 2. | Infrastructure & Facilities | • Infrastructure development, including construction or renovation of physical training centres.<br>• Construction/ renovation of boundary walls, construction of separate toilets for boys & girls, drinking water facility.<br>• Installation of smart classes in the Government schools to promote Digital education and development of an e-learning platform for delivering theoretical training.<br>• Development of libraries in nearby Govt. Schools in consultation with Gram Panchayat/concerned authorities. | 4.4 |
| 3. | Training Programs to villagers | • Training programs to specific needs within the construction industry, addressing both skilled and unskilled workers.<br>• Give workers basic skill training in areas including material handling, safety procedures, and the use of simple tools.<br>• Provide computer training to the unemployed youth. | 2.5 |
| 3. | Training & Facilitators | • Hiring of trainers who are certified in the relevant sectors.<br>• Hiring of SMEs for specialized knowledge and expert training delivery in sectors where deeper expertise is required.<br>• Ongoing professional development programs for trainers to keep them updated with the latest industry trends. | 3.5 |
| 4. | Training Materials & Resources | Distribution of Textbooks, stationary, sports kits, e-learning contents to the students. | 1.0 |
| 5. | Assessment & Certification | • Creating and putting into practice a system for evaluating students' proficiency in both theoretical and practical areas. This includes exam creation, practical assessments, and online evaluation.<br>• Establishing systems for monitoring and assessing each student's development to | 2.5 |

| S. No | Particulars | Details | Cost (in crores) |
|---|---|---|---|
| | | make sure they fulfil the requirements for certification. | |
| 6. | Placement & Post-Training Support | • Organizing internships with affiliated groups.<br>• Mentorship, and funding resources for facilitating Micro Enterprises. | 2 |
| **Total Cost** | | | **18.40** |

**Table No. 1.7**

**Skill Development Programme (ACC DISHA) (Phase - II)**

| S. No | Particulars | Details | Cost (in crores) |
|---|---|---|---|
| 1. | Programme Design & Development | • Curriculum development, Enhancement of qualifications, skills, knowledge, and behavior and to ensure that the training provided meets the needs of the industry.<br>• Spoken English course in the locality with the help of a graduate teacher.<br>• Providing coaching for competitive examinations for NEET / JEE. | 2.0 |
| 2. | Infrastructure & Facilities | • Infrastructure development, including construction or renovation of physical training centres.<br>• Construction/ renovation of boundary walls, construction of separate toilets for boys & girls, drinking water facility.<br>• Installation of smart classes in the Government schools to promote Digital education and development of an e-learning platform for delivering theoretical training.<br>• Development of libraries in nearby Govt. Schools in consultation with Gram Panchayat/concerned authorities. | 3.5 |
| 3. | Training Programs to villagers | • Training programs to specific needs within the construction industry, addressing both skilled and unskilled workers.<br>• Give workers basic skill training in areas including material handling, safety procedures, and the use of simple tools.<br>• Provide computer training to the unemployed youth. | 2.5 |
| 3. | Training & Facilitators | • Hiring of trainers who are certified in the relevant sectors.<br>• Hiring of SMEs for specialized knowledge and expert training delivery in sectors where deeper expertise is required. | 3.1 |

| S. No | Particulars | Details | Cost (in crores) |
|---|---|---|---|
| | | • Ongoing professional development programs for trainers to keep them updated with the latest industry trends. | |
| 4. | Training Materials & Resources | Distribution of Textbooks, stationary, sports kits, e-learning contents to the students. | 1.0 |
| 5. | Assessment & Certification | • Creating and putting into practice a system for evaluating students' proficiency in both theoretical and practical areas. This includes exam creation, practical assessments, and online evaluation.<br>• Establishing systems for monitoring and assessing each student's development to make sure they fulfil the requirements for certification. | 3.0 |
| 6. | Placement & Post-Training Support | • Organizing internships with affiliated groups.<br>• Mentorship, and funding resources for facilitating Micro Enterprises. | 2 |
| **Total Cost** | | | **17.10** |

**xiv) Occupational Health Measures**

| | |
|---|---|
| **Dust** | ▪ Implementation of adequate dust control systems and good housekeeping.<br>▪ Water sprinkling in the places where dust dispersion can occur.<br>▪ Regular sweeping of roads within plant premises<br>▪ Providing dust masks to employees working in handling and storage yards.<br>▪ Periodic work zone monitoring |
| **Noise** | ▪ Proper maintenance of machineries<br>▪ Installation of compressors& DG sets in closed buildings<br>▪ Regular monitoring of noise level<br>▪ Display of noise level with permission level<br>▪ Display instructions for using PPEs at high noise level area<br>▪ Periodic health checkup for Audiometry for the individuals working in high noise area |
| **Heat stress** | ▪ Scheduling hot jobs in cooler part of the day<br>▪ Monitor those workers who are at risk of heat stress<br>▪ Provide rest periods with water breaks<br>▪ Use of personal protective equipment |
| **Electrical Hazards** | ▪ Proper Earthing as per IS 3043 will be done<br>▪ Low Voltage Supply will be ensured<br>▪ Isolating Transformers<br>▪ Double Insulated Tools<br>▪ Over Load Protection<br>▪ Protection Against Leakages (G.F.C.I.)<br>▪ Flame- Proof Equipment<br>▪ Lightning Protection<br>▪ Protection against Static Electricity and safely using ladders and scaffolds |
| **Fire and Explosion** | ▪ Suitable fire extinguisher, fire buckets and fire hydrant system. Dry power type in oil and fire buckets will be kept near transformer, cable, general store and office area. Hydrant line at all location in plant area along with coal, clinker storage area. Fire tender is to be kept ready at plant main gate.<br>▪ Oil and Flammable Gases storage area will be fenced and declared as Fire Hazardous Area-No Smoking Area"<br>▪ Permit and safety instruction will be given to use welding / gas cutting in the area of oil, gas, coal and bag go down.<br>▪ Predictive interlock in transformers so as to give alarm and trip the system.<br>▪ Adequate height of brick walls for separation of all transformers, soak pits for storage of oil leakages from transformers will be done. |

| | |
|---|---|
| **Other Hazards** | ▪ Structural soundness of silos and buildings.<br>▪ Installing light arrestors at all tall buildings.<br>▪ Permit to be taken to work at height with work instruction to use safety belts etc.<br>▪ Testing of all lifting tools, tackles and pressure vessel to avoid failure.<br>▪ Safe working pressure maintained in air receiver.<br>▪ Safe working load on cranes and ropes etc.<br>▪ Good housekeeping & Speed limit of vehicles will be 10 km/hr. inside the proposed plant area.<br>▪ Display of emergency number at all suitable location.<br>▪ Fire tender, ambulance and emergency staff ready at the plant main gate at all the time<br>▪ First aid kits are kept at the sites and training provided<br>▪ Use of mobile while driving, alcohol, smoking etc. are ban inside the proposed plant area.<br>▪ Proper illumination in plant area,-office and road area |

**xv) Post project monitoring plan**

**Frequency and location for post-project monitoring**

| S. No. | Description | Frequency of Monitoring | Location |
|---|---|---|---|
| 1. | Meteorological Data | Hourly | Plant Site |
| 2. | Ambient Air Quality | Twice a Week & Continuous Online Monitoring | Near to the entrance Gate of Plant Site and towards the Villages in upwind & downwind direction from the plant site, as per the max. GLC obtained and as per EC / CTO conditions. |
| 3. | Fugitive Monitoring | Quarterly | Cement Mill, Packing Plant, Raw Materials Handling Area & Coal Yard |
| 4. | Stack Monitoring | Monthly/ Continuous Online Monitoring | Raw Mill & Kiln, Coal Mill, Cement Mill, Clinker Cooler & CPP Boiler |
| 5. | Water Quality | Quarterly / as per EC/ CTE/ CTO | Plant Site, Nearby Ground water sources and as per CTO conditions |
| 6. | Waste Water Monitoring (STP outlet) | Monthly & as per CTO | Inlet & Outlet |
| 7. | Water Level | Monthly /as per EC/ CTE/CTO | Plant Site, Nearby Ground water sources and as per CTO conditions. |
| 8. | Noise Level Monitoring | Quarterly & as per EC/CTO | Plant Boundary, High noise generating areas within the plant Boundary and as per CTO conditions |
| 9. | Soil Quality Analysis | Quarterly | 04 locations in and around plant site |
| 10. | Medical Checkup of Employee | Yearly / As per applicable norms | Pre-placement Medical Checkup & Periodical Examination at Dispensary / Health Centre |
| 11. | Performance evaluation of PCE's | Six Monthly | Raw Mill / Klin Bag house, Coal Mill Bag house, Cement Mill Bag house, Clinker Cooler ESP and CPP ESP. |

# *CHAPTER - 1*
# *INTRODUCTION*

## 1.1 PURPOSE OF THE REPORT

This report has been prepared in reference to the ToR letter issued by MoEF&CC, New Delhi *vide* letter No. J-11011/265/2012-IA II(I) dated 20th February, 2013; validity extended *vide* letter dated 18th Feb., 2016 for carrying out the Environmental Impact Assessment (EIA) study for the Proposed 5.0 Million TPA Integrated Cement Clinkerisation Plant, 8.0 Million TPA Cement Grinding Unit and 100 MW Captive Power Plant at Village: Gollapalle, Mandal: Mylavaram, District: Kadapa (YSR), Andhra Pradesh by M/s. ACC Limited.

The main purpose of this report is to provide a coherent statement after analyzing all significant impacts of the project and measures that should be taken to eliminate and mitigate them. It contains essential information for:

- Assess the existing status of environment.
- Assess the impacts due to the proposed project.
- Suggest pollution control and mitigative measures to minimize impact.
- Prepare an action plan for implementation of suggested mitigative measures.
- To undertake environmental monitoring so as to establish the baseline environmental status of the study area
- To prepare an Environment Management Plan (EMP) outlining the measures for improving the environmental quality and scope for future expansions for environmentally sustainable manner.
- The public to understand the project proposal and its likely impacts on people and the surrounding environment.
- Assess financial considerations for suggested environment management and control plans.

## 1.2 IDENTIFICATION OF PROJECT AND PROJECT PROPONENT

### 1.2.1 Identification of the Project

#### A. Background of the Project

The company had obtained ToR for "Proposed 5.0 MTPA Integrated Cement Clinkerisation Plant, 8.0 MTPA Cement Grinding Unit and 100 MW Captive Power Plant and 7.0 MTPA Captive Limestone Mine with mining lease area of 997.08 ha at Gollapalle, Village of Mylavaram Mandal, Kadapa (YSR) District, Andhra Pradesh" from MoEFCC, New Delhi *vide* Letter No. J-11011/265/2012-IA II (I) dated 20th February 2013; Validity extended *vide* Letter dated 18th Feb., 2016. After that, corrigendum in ToR validity extension letter was obtained on 27th April, 2016.

Baseline monitoring for the project was conducted during Summer Season (March to May, 2013) and Public Hearing was conducted on 20th October, 2016. ***Final EIA/EMP Report excluding the mining components and including the outcomes of Public Hearing was submitted to MoEF&CC for obtaining Environmental Clearance to the Ministry online on 27th Jan., 2027 vide Online Application No. IA/AP/IND/62090/2012.***

***Thereafter, the project was considered for appraisal in 16th EAC (Industry - I) Meeting held on 6th March, 2017 and after detailed deliberations, the committee advised to submit few additional details (ADS) for further consideration of project.***

ADS could not be submitted due to unavailability of mining lease deed; and the lease deed has been executed on 14th May, 2024. Since, it is the captive mine for proposed cement plant, hence, both the projects got struck.

After merger & acquisition with Adani Group, the management reviewed and proposed to complete the EC process for execution of both the proposals.

The company has changed the EIA Consultant from Vimta Labs Limited to JM. EnviroNet Pvt. Ltd. for further execution of the project. JMEPL has conducted fresh Baseline Study during Summer Season (March to May, 2024) and prepared updated Final EIA / EMP Report along with incorporating the reply of Additional Details Sought.

Earlier total land area proposed for the project was approx. 275.028 ha (Including Plant, Colony & CPP). ToR was obtained from MoEF&CC for the same area on 20th February, 2013 and Public Hearing has also conducted for the same area and same configuration.

However, due to the existence of Village Gollapalle and unavailability of land, Company dropped the proposal for colony and exclude specific part of the project site from the earlier submitted proposal which results in reduction of proposed project area, from 275.028 ha to 187.1 ha.

Now, in line with the reduction of the project area within the project boundary for which ToR has been obtained and Public Hearing was conducted and addressing the additional details sought (ADS) points, company has updated the Final EIA / EMP Report with one season fresh Baseline data.

**B. Project Proposal**

M/s. ACC Limited is proposing a 5.0 MTPA Integrated Cement Clinkerisation Plant, 8.0 MTPA Cement Grinding Unit, 100 MW Captive Power Plant & 25 MW WHRS at Village: Gollapalle, Mandal: Mylavaram, District: Kadapa (YSR), Andhra Pradesh.

Details of production capacities of the proposed project are given in Table - 1.1:

**Table - 1.1**

**Production Capacities of the Proposed Integrated Plant**

| Sr. No. | Particulars | Unit | Proposed Capacity | | |
|---|---|---|---|---|---|
| | | | Phase - I | Phase - II | Total |
| 1. | Clinker | Million TPA | 2.5 Million TPA | 2.5 Million TPA | 5.0 Million TPA |
| 2. | Cement | Million TPA | 4.0 Million TPA | 4.0 Million TPA | 8.0 Million TPA |
| 3. | CPP | MW | 50 MW | 50 MW | 100 MW |
| 4. | WHRS | MW | 12.5 MW | 12.5 MW | 25 MW |
| 5. | DG Sets | KVA | 1000 KVA | 1000 KVA | 2000 KVA |
| 6. | Railway Siding | - | Part of Project | | |

***C. Screening Category***

As per EIA Notification dated 14th Sept., 2006 as amended thereof; this project falls under Category "A", Project or Activity '3(b)' Cement Plants and minor activity - '1 (d) 'Thermal Power Plants.

***D. Status of the Proposed Project with respect to Environmental Clearance***

The chronology of the project activities undertaken so far with respect to the process of getting Environment Clearance for Cement Plant are as given in Table - 1.2:

**Table - 1.2**

**Status of the Proposed Project with respect to Environment Clearance**

| S. No. | Project Activity | Details |
|---|---|---|
| 1. | Application (Form- 1, Proposed ToR and Pre-Feasibility Report) submitted to MoEF&CC (Plant & Mine) | 05th July, 2012 |
| 2. | First Technical Presentation (for ToR approval) held before R-EAC (Industry - I) | 08th Jan., 2013 |
| 3. | ToR Letter issued by MoEF&CC, New Delhi *Vide Letter* No. J-11011/265/2012-IA II (I) | 20th Feb., 2013 |
| 4. | Baseline Monitoring & Data collection | Summer season (March to May, 2013) |
| 5. | Validity extension of ToR Letter *Vide Letter* No. J-11011/265/2012-IA II (I) obtained from MOEFCC. | 18th Feb., 2016 |
| 6. | Corrigendum in ToR validity extension letter obtained from MOEFCC. | 27th April, 2016 |
| 7. | Public hearing conducted on | 20th Oct., 2016 |
| 8. | EC Application uploaded on Parivesh Portal | 27th Jan., 2017 |
| 9. | Final Technical Presentation (for EC approval) held before EAC (Industry - I) | 07th March, 2017 |
| 10. | ADS raised by MoEFCC as per Minutes of Meeting issues by EAC (Industry - I) | 21st March, 2017 |
| 11. | Fresh Baseline Monitoring & Data Collection | Summer Season (March to May, 2024) |

### 1.2.2 Introduction of the Project Proponent

***Project Proponent***

ACC Limited ("ACC", "the Company") is a leading player in the Indian building materials space, with a pan-India manufacturing and marketing presence.

With 16 cement plants across 12 states with a total installed cement capacity of 38.55 MTPA (Million Tonne Per Annum) ("MTPA") and 85+ ready mix concrete plants across 17 states, a vast distribution network of 50,000+ dealers & retailers and a countrywide spread of sales offices, it contributes tremendously to the landscape of the country.

For over 80 years, ACC has been synonymous with cement, establishing its reputation as a pioneer organization that consistently sets new benchmarks in research and innovative product development. ACC was among the first Indian companies to include commitment to environmental protection as one of its corporate objectives. Since inception, ACC has integrated commitment into all activities of our value chain, from mining to sales to promoting the use of alternative fuels and resources, resulting in one of the lowest carbon footprints in the cement industry.

In 2022, ACC became a part of Adani Group - the largest and fastest-growing portfolio of diversified sustainable businesses.

## 1.3 BRIEF DESCRIPTION OF NATURE, SIZE, LOCATION OF THE PROJECT AND ITS IMPORTANCE TO THE COUNTRY, REGION

### 1.3.1 Brief Description of Nature, Size and Location of Project

Brief Description of Nature, Size and Location of the Project is given in Table - 1.3 for Proposed Integrated Cement Plant:

**Table - 1.3**
**Brief Description of Nature, Size and Location of the Project**

| S. NO. | PARTICULARS | DETAILS | |
|---|---|---|---|
| **A.** | ***Nature of the Project*** | Greenfield Project | |
| **B.** | ***Size of the Project*** | • Clinker (5.0 Million TPA)<br>• Cement (8.0 Million TPA)<br>• CPP (100 MW)<br>• WHRS (25 MW) -<br>• DG Sets - 2000 KVA<br>• Railway siding: Part of the Project | |
| | ***Project Area*** | ***As per ToR (Project Site)*** | ***As per applied EC (Project Site)*** |
| | | 275.028 ha | 187.1 ha |
| **C.** | ***Location Details*** | | |
| 1. | Village | Gollapalle, G.Uppalapadu & Besthavemula | |
| 2. | Tehsil | Mylavaram | |
| 3. | District | Kadapa (YSR) | |
| 4. | State | Andhra Pradesh | |

| S. NO. | PARTICULARS | DETAILS | |
|---|---|---|---|
| 5. | GPS Coordinates | ***As per ToR (Project Site)*** | ***As per applied EC (Project Site)*** |
| | Latitude | 14°58'06" N to 14°59'59" N | 14°57'56.36" N to 14°58'58.08" N |
| | Longitude | 78°16'50" E to 78°18'38" E | 78°16'21.07" E to 78°18'07.46" E |
| 6. | SOI Toposheet No. | Core Zone: D44G5 (57J/5)<br>Buffer Zone: D44G5 (57J/5), D44G1 (57J/1), D44A4 (57I/4) & D44A8 (57I/8) | |
| 7. | Sy. No. (Khasra No.) | **Gollapalle:** 135, 139/1, 139/2, 139/3, 139/4, 139/5, 134/1, 134/2, 134/3, 130/1, 130/2, 130/3, 130/4, 133, 132, 131/1, 131/3, 42, 41/3A, 41/3B, 41/4, 41/5, 43, 44/1, 44/2, 87, 88/1, 88/2, 89/1, 89/1, 78/1A, 78/1B, 78/2, 78/3A, 78/3B, 78/4, 94/2, 46/3, 46/3, 46/2, 72/1, 72/2, 72/3, 73/1, 73/2, 73/3, 76/3, 76/4, 77, 85, 83/1, 83/2, 83/3, 83/4, 83/5, 83/6, 83/7, 82/1, 82/3, 82/5, 82/6, 82/7, 82/8, 82/9, 82/9, 81/2, 81/3, 81/4, 81/5, 81/6, 81/7, 81/8A, 81/8B, 71/1, 71/2, 71/3, 80/1, 80/2, 80/3, 80/4, 80/5, 80/6, 80/7, 80/10, 80/11, 80/12A, 80/12B, 80/13, 80/14, 74/1, 74/2, 74/2, 74/3, 75/8, 75/9, 75/10, 75/11, 75/12, 75/13, 75/14, 84/1, 79.<br>**G. Uppalapadu:** 74/1, 74/2, 72, 75, 76, 76, 79/1, 79/2, 77, 78, 127, 128, 129, 130, 132, 133, 137, 139/1, 139/2, 140, 136, 138, 144/1, 144/2, 145, 43, 44, 45, 46/1A, 46/1B, 46/1C, 46/2, 47/1, 47/2, 47/3, 48, 146, 147, 148, 150, 151/1, 42, 152, 153, 154, 155, 29, 30, 31, 32, 33, 34/1A, 34/1B, 34/1C, 34/2, 35/1, 35/2, 35/3, 36, 156, 158/1, 158/2, 161/1, 161/2, 162/1A, 162/1B, 162/2, 163/1, 163/2, 163/2, 164, 165/1, 165/2, 166/1, 166/2, 61, 60/1, 60/2, 59/1, 59/2, 55, 56/1, 56/2, 57/1, 57/2A, 57/2B, 58, 54, 20, 25, 21, 26, 28/A, 24, 27, 23, 37, 38, 39, 40, 41, 49, 50, 51, 52, 52, 141/1, 141/2A, 141/2B, 142/1, 142/2, 143, 131/1, 131/2, 135, 80, 134, 172, 173/1, 173/2, 174, 175/1, 175/2, 177/1, 177/2, 178/1, 178/2, 179, 53, 66, 67/1, 67/2, 67/3, 67/4, 67/5, 68/1, 68/2, 69/1, 69/2, 69/3, 70/1, 70/2, 70/3, 70/4, 70/5, 71, 65, 65, 64/1<br>**Besthavemula:** 103/1, 103/2, 103/3, 64/1, 64/2, 64/3, 63/1, 63/2, 63/3, 63/4, 62, 61, 60. | |

### 1.3.2 Importance to the Country and Region

***National Importance***

Ever since it was regulated in 1982, the Indian Cement industry has attracted huge investments both from India as well as foreign Investors. India has a lot of potential for development in the infrastructure and construction site and the cement sector is expected to largely benefit from it/ some of the recent major government initiatives such as development of 100 smart cities are expected to provide a major boost to the sector.

Indian government has set a target to invest INR 100 Billion on developing infrastructure from 2024-2026. In view of INR 100 billion investment on infrastructure, Indian cement industry is estimated to have cement consumption of 570 Million TPA and industry consumption is expected to cross 85% capacity utilization after 2022-23. The execution of government development of infrastructure is observed is high and even in many sectors it is found to be touching 90% level. Therefore, the cement demand is expected to touch 725 MT by 2028 in high growth scenario. All India projected cement demand in difference economic scenario is as under:

**Table: 1.4**
**Cement Demand Forecast**

| Year | Economic Scenario | | |
|---|---|---|---|
| | Present Growth (MT) | Modern Growth | High Growth (INR 100 Billion Infra (MT) |
| 2024-25 | 418 | 455 | 529 |
| 2025-26 | 422 | 499 | 593 |

The demand forecast gives a future prospect of Indian Cement industry and cement industry is expected to grow CAGR growth scenario 9.8% till 2028 in high growth scenario. The forecasted cement demand and industry capacity utilization shows that by 2024-25 industry will cross capacity utilization of 90%. Therefore, there is a scope for Indian cement industry to start new capacity addition projects to get advantage of future market demand.

***Regional Importance***

The state has an industrial zone specially marked for the cement industry. The proposed project will generate both direct & indirect employment. The project will require about 2400 personnel during construction of plant and 499 during operation. Local people will be preferred for jobs, depending upon their skill and experience. The integrated cement project will result in the growth of the surrounding areas by increasing direct and indirect employment opportunities to approx. 2000 people in the region including ancillary development and supporting infrastructure. Also, enhanced revenue will be generated to the Central & State exchequers in the form of Revenues. Apart from the above, various indirect employment opportunities are envisaged by way of transportation, workshops, petty contractors; shopkeepers, network of retailers (cement stockists) throughout the state and in its marketing regions. Special emphasis on Financial and Social benefits will be given to the local people in the area. Development of social amenities will be in the form of medical facilities, education to underprivileged and creation of self-help groups. In addition, various rural development initiatives for the upliftment of the nearby communities will be undertaken under Social Economic Developmental activities and Corporate Social Responsibilities (CSR).

## 1.4 SCOPE OF EIA STUDY {DETAILS OF REGULATORY SCOPING CARRIED OUT (AS PER TOR)}

Scope of this study covers all the points given in the Terms of Reference (ToR) prescribed by the MoEF&CC, New Delhi *vide Letter* no. J-11011/265/2012-IA II(I) dated 20th February, 2013; validity extended *vide letter* dated 18th Feb., 2016 and ADS points raised by EAC. The regulatory scoping of the project as per the ToR letter & ADS has been covered and mentioned in *"Point-wise reply of ToR"* on Page No. 7 to 22 This EIA/EMP Report includes total twelve chapters as per Appendix-III of the EIA Notification, 2006 and as amended thereof.

| Chapter | Description |
|---|---|
| Chapter - 1 | Introduction |
| Chapter - 2 | Project Description |
| Chapter - 3 | Description of the Environment |

| Chapter | Description |
|---|---|
| Chapter - 4 | Anticipated Environmental Impacts and Mitigation Measures |
| Chapter - 5 | Analysis of Alternatives (Technology & Site) |
| Chapter - 6 | Environmental Monitoring Plan |
| Chapter - 7 | Additional Studies |
| Chapter - 8 | Project Benefits |
| Chapter - 9 | Environment Cost Benefit Analysis |
| Chapter - 10 | Environment Management Plan |
| Chapter - 11 | Summary & Conclusion |
| Chapter - 12 | Disclosure of Consultants Engaged |

## 1.5 Regulatory Scoping

The study covers the requirements of various acts and rules applicable for Cement industry related to air pollution, water pollution, solid waste management and CREP guidelines etc. as mentioned below -

- Factory Act, 1948
- The Environment (Protection) Act, 1986, as amended thereof
- Environmental (Protection) Rules, 1986, as amended thereof
- EIA Notification dated 14$^{th}$ September, 2006, as amended thereof
- Air (Prevention and Control of Pollution) Act, 1981 as amended 1987
- Water (Prevention and Control of Pollution) Act, 1974 as amended 1988
- Water (Prevention and Control of Pollution) Rules, 1975 as amended thereof
- Hazardous Waste (Management & Handling) Rules, 1989 as amended 2000, 2003 & 2016 etc.
- Noise (Prevention and Control of Pollution) Rule, 2000
- National Ambient Air Quality Standards, 2009
- CPCB guidelines for greenbelt, air & water etc.
- Corporate Responsibility for Environmental Protection March, 2003

# *CHAPTER - 2*
# *PROJECT DESCRIPTION*

## 2.0 INTRODUCTION

This chapter deals with details of project which includes need of the project, location of the project site, size or magnitude of operation, requirements of the project, Schematic representation of the feasibility drawings which give information for EIA purpose (e.g. process flow chart; material balance; water balance; etc.), proposed schedule for approval and implementation, technology & process description, major equipment & machineries, infrastructural facilities, description of mitigation measures and assessment of new & tested technology for the risk of technological failure.

## 2.1 TYPE OF THE PROJECT

As mentioned in the previous chapter, this is a proposed project (Greenfield) - which falls under Category "A", Project or Activity '3(b)' Cement Plants. It is also proposed to install CPP and WHRS in the Integrated Cement Plant premises under minor category which falls under S. No. 1 (Thermal Power Plants), Project Activity '1 (d)' Thermal Power Plants. The Proposed 5.0 Million TPA Clinkerisation Plant, 8.0 Million TPA Cement Grinding Unit and 100 MW Captive Power Plant at Village: Gollapalle, Mandal: Mylavaram, District: Kadapa (YSR), Andhra Pradesh by M/s. ACC Limited.

## 2.2 NEED FOR THE PROJECT

India is the second largest producer of cement in the world. It accounts for more than 8% of the global installed capacity. India has a lot of potential for development in the infrastructure and construction site and the cement sector is expected to largely benefit from it. Centre has given huge infra boost with mega projects and demand for cement will grow at around 10% through to 2030 from these infrastructures such as the ambitious Bharatmala Pariyojana, Sagarmala Project, Smart Cities Mission, AMRUT (Atal Mission for Rejuvenation and Urban Transformation) and PMAY (Pradhan Mantri Awas Yojana) detailed hereunder: such as -

- In October 2021, Prime Minister, Mr. Narendra Modi, launched the 'PM Gati Shakti - National Master Plan (NMP)' for multimodal connectivity. Gati Shakti will bring synergy to create a world-class, seamless multimodal transport network in India. This will boost the demand for cement in the future.
- Under the housing for all segment, 8 million households will be identified according to the Budget 2022-23 with Rs. 48,000 crore (US$ 6.44 billion) set aside for PM Awas Yojana.
- As per the Union Budget 2022-23, the government approved an outlay of Rs. 1,99,107 crore (US$ 26.74 billion) for the Ministry of Road Transport and Highways, and this step is likely to boost the demand for cement.

- The Union Budget allocated Rs. 13,750 crore (US$ 1.88 billion) and Rs. 12,294 crore (US$ 1.68 billion) for Urban Rejuvenation Mission: AMRUT and Smart Cities Mission and Swachh Bharat Mission.

Looking into the increasing demand of Cement in the marketed regions such as, Andhra Pradesh, Chhattisgarh, Orrisa and to provide upliftment of the nearby area, M/s. ACC Ltd. is proposing Integrated Cement Plant at Village: Gollapalle, Mandal: Mylavaram, District: Kadapa (YSR), Andhra Pradesh.

## 2.3 LOCATION OF THE PROJECT

The Project Site is located at Gollapalle Village of Mylavaram Mandal of Kadapa (YSR) District in the state of Andhra Pradesh.

### 2.3.1 General Location Map

The map showing general location of the plant site is as given below:

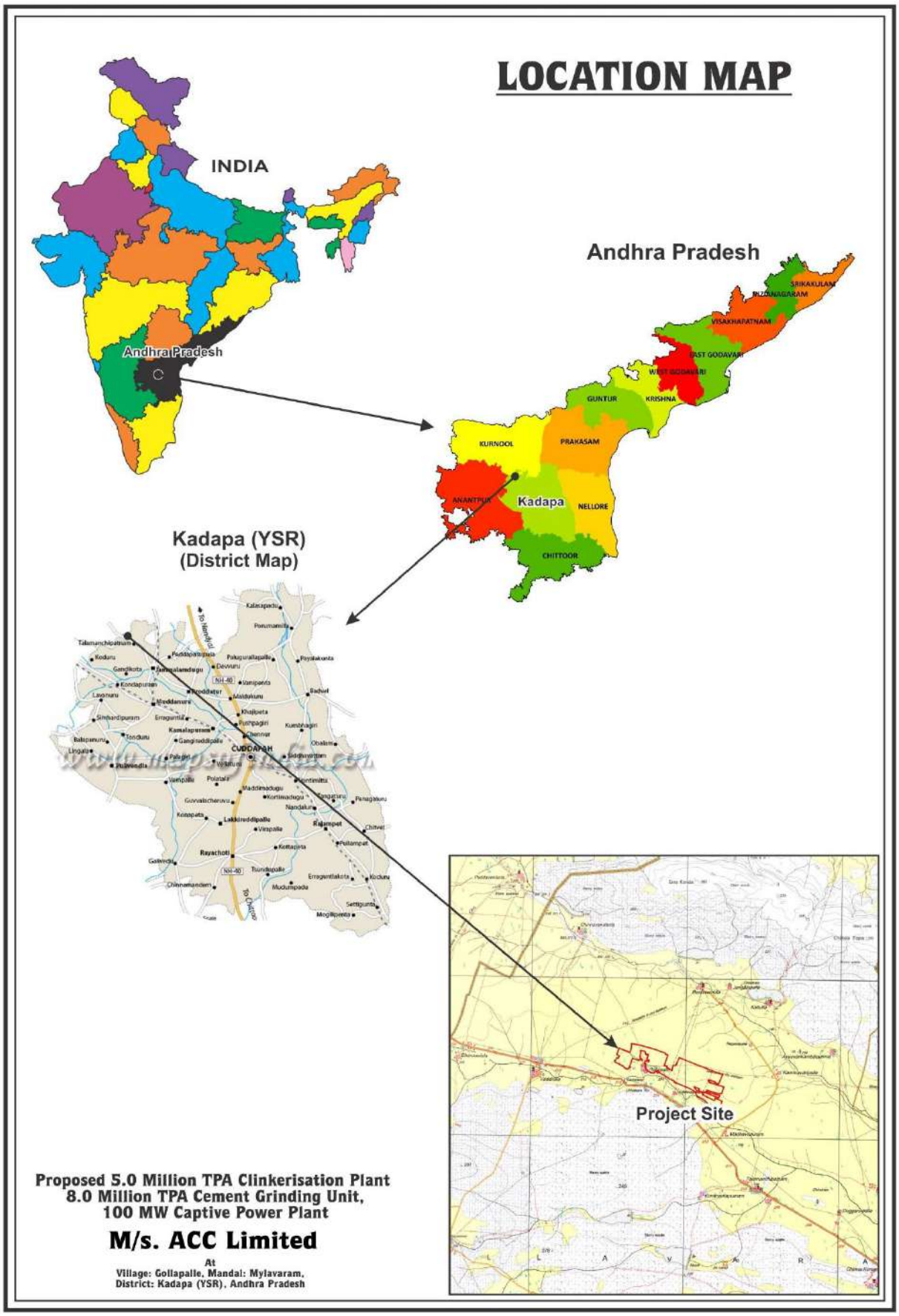
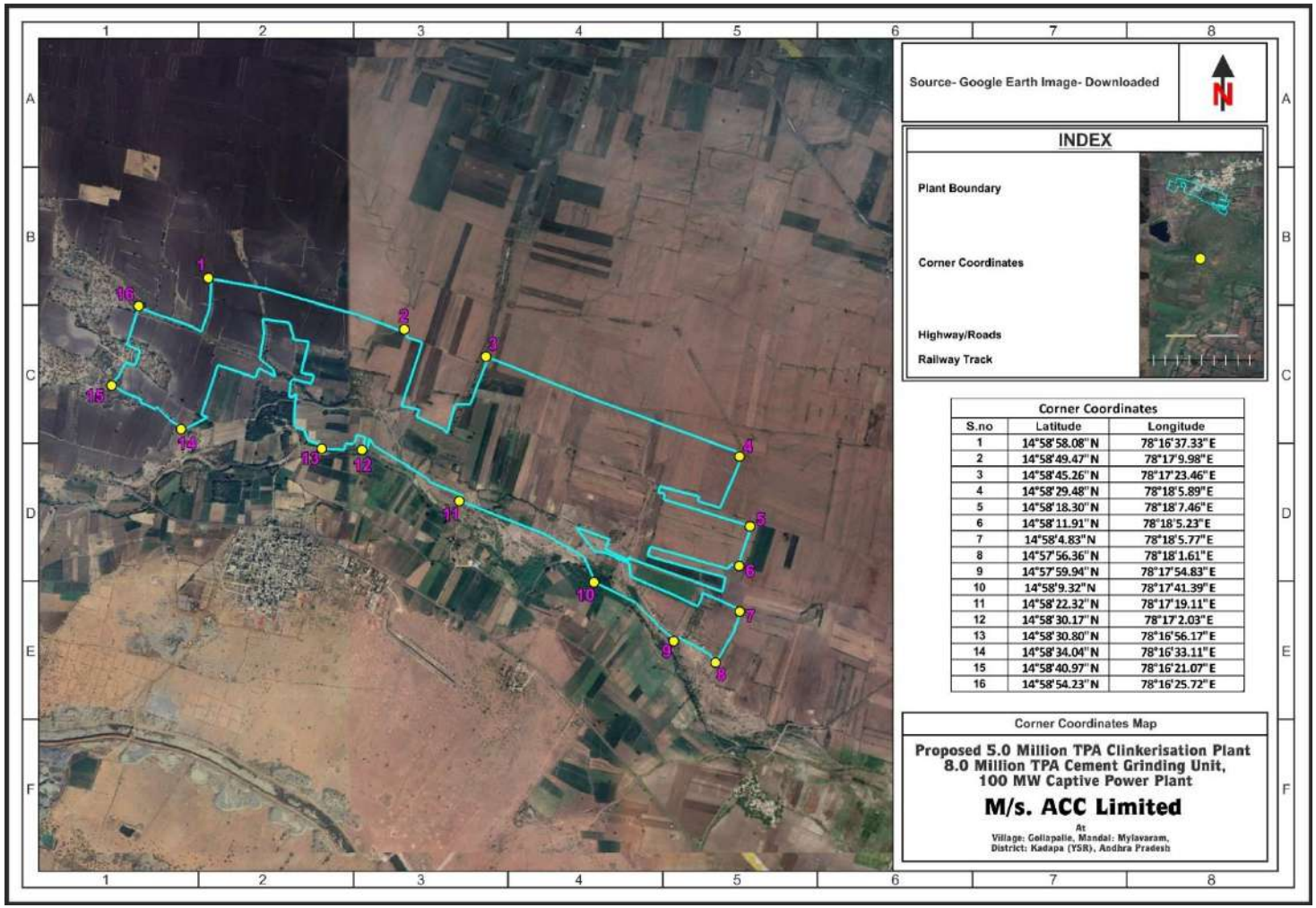



**Figure 2.1: Location Map (Not to the scale)**

### 2.3.2 Specific Location Map

The map showing specific location of the project on Google Earth downloaded image along with geographical coordinates is given in Figure - 2.2.




*Source: Google Earth*

**Figure 2.2: Google Earth Downloaded Image of the proposed project site along with Corner Co-ordinates *(Not to the scale)***

***GPS Coordinates of the Project Site:***

**Table - 2.1**
**GPS Co-ordinates of the Project Site**

| S. No | Latitude | Longitude |
|---|---|---|
| 1 | 14°58'58.08"N | 78°16'37.33"E |
| 2 | 14°58'49.47"N | 78°17'9.98"E |
| 3 | 14°58'45.26"N | 78°17'23.46"E |
| 4 | 14°58'29.48"N | 78°18'5.89"E |
| 5 | 14°58'18.30"N | 78°18'7.46"E |
| 6 | 14°58'11.91"N | 78°18'5.23"E |
| 7 | 14°58'4.83"N | 78°18'5.77"E |
| 8 | 14°57'56.36"N | 78°18'1.61"E |
| 9 | 14°57'59.94"N | 78°17'54.83"E |
| 10 | 14°58'9.32"N | 78°17'41.39"E |
| 11 | 14°58'22.32"N | 78°17'19.11"E |
| 12 | 14°58'30.17"N | 78°17'2.03"E |
| 13 | 14°58'30.80"N | 78°16'56.17"E |
| 14 | 14°58'34.04"N | 78°16'33.11"E |
| 15 | 14°58'40.97"N | 78°16'21.07"E |
| 16 | 14°58'54.23"N | 78°16'25.72"E |

### 2.3.3 Site Features

Present land use of the project site is private agriculture, which will be used for industrial purpose after its conversion into Industrial land use. Keeping in view of proximity to the Limestone Mine, accessibility to SH- 57 and other Raw material sources, the proposed site has been selected for setting up of Cement Plant at Village: Gollapalle, Mandal: Mylavaram, District: Kadapa (YSR), (Andhra Pradesh). No Forest land is involved in the project area.

### 2.3.4 Project Site Layout

Earlier total land area proposed for the Project was approx. 275.028 ha (Including Plant, Colony & CPP). ToR was obtained from MoEF&CC for the same area on 20$^{th}$ February, 2013 and Public Hearing has also conducted for the same area and same configuration.

However, due to the existence of Village Gollapalle and unavailability of land, ACC intends to exclude the specific part of the project site form the earlier submitted proposal which in turn the proposed project area reduce from 275.028 ha to 187.1 ha. Total 187.1 ha land area has been purchased in the name of applicant company i.e. ACC Limited. Project Site is located nearby to Limestone Mine. There is no forest land involved in the project site. Present land use of the project site is Private Agriculture land.

A proper parking area will be provided for trucks. Limestone will be transported to proposed cement plant via covered belt conveyor. Transportation of raw material and products will be done by Road or Rail transportation The nearest Railway Station is Kondapuram at a distance of ~ 24 Km

in SW direction. Own Private railways siding shall be developed at plant site by taking a branch from the proposed new crossing station and take off is planned from Noosam railway station**.**

Out of the total Project area; ~42.65% area i.e. 79.8 ha will be developed under greenbelt & plantation along the periphery and inside the plant premises, truck parking area & colony with tree density 2500 per ha. Native & fruits bearing species, medicinal plants will be planted as per CPCB guidelines in consultation with DFO.

Details of the proposed project area breakup for the major units are summarized in table 2.2:

**Table - 2.2**

**Proposed Project Area Break-up**

| S. No. | Particulars | Area (ha) | Area (%) |
|---|---|---|---|
| i | Plant and Machinery | 46.8 | 25.01 |
| ii | Railway line and wagon tippler | 7.7 | 4.12 |
| iii | WHRS Area | 1 | 0.53 |
| iv | Road & Paved area | 12.7 | 6.80 |
| v | Greenbelt development /plantation area | 79.8 | 42.65 |
| vi | Open area for Future Expansion | 29.7 | 15.87 |
| vii | Truck Parking | 9.4 | 5.02 |
| **Total Project area** | | **187.10** | **100** |

*Source: Plant Layout*

There is no existing structures at the site; as it is a Greenfield project.

The plant layout showing proposed units indicating Clinkerization Unit, Cement Mill, CPP, WHRS, Storage Areas, Greenbelt & Plantation area, Truck parking etc. is given on the next page {(Figure - 2.3 (a & b)}.

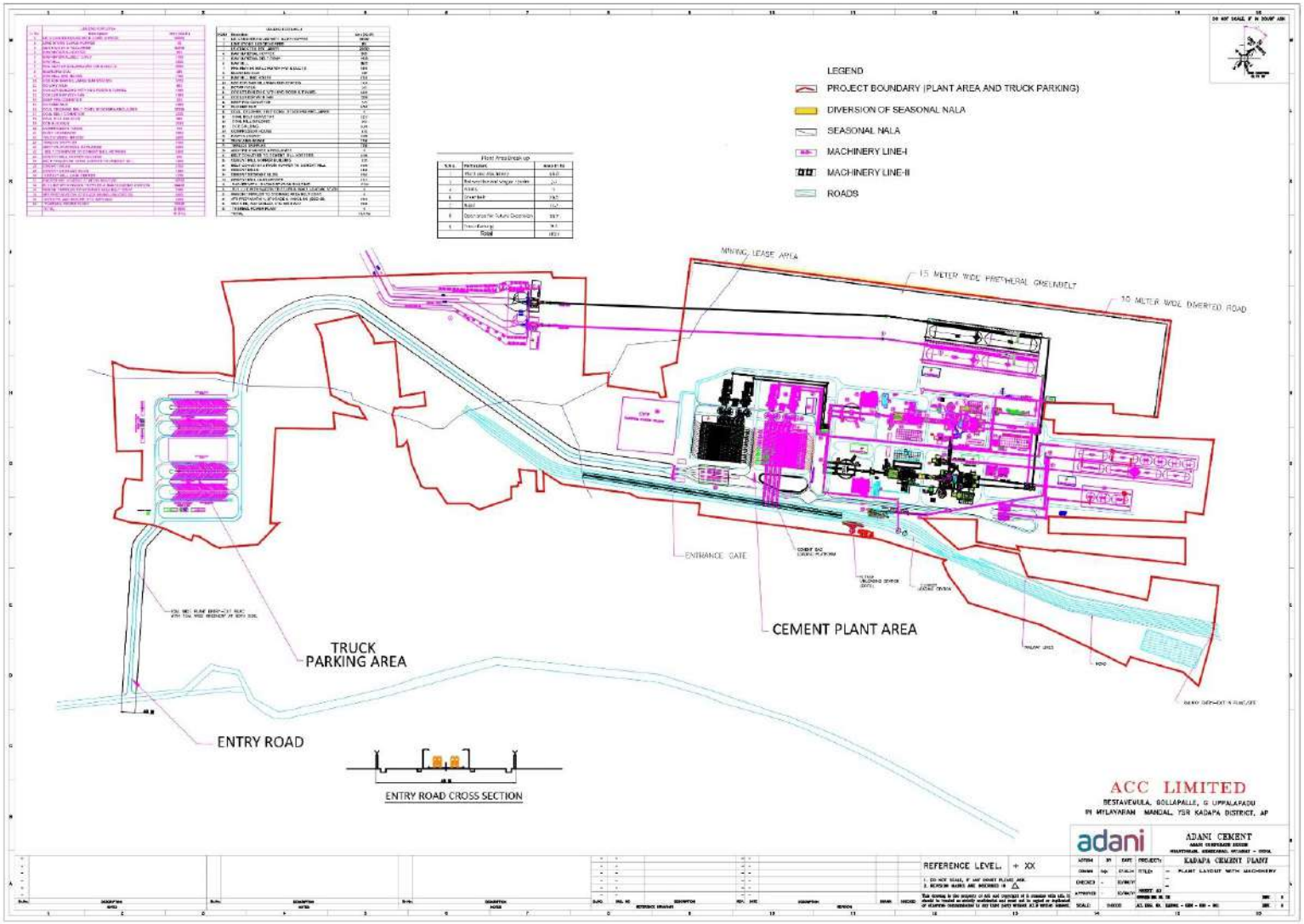



**Figure 2.3 (a): Layout showing plant and machinery**

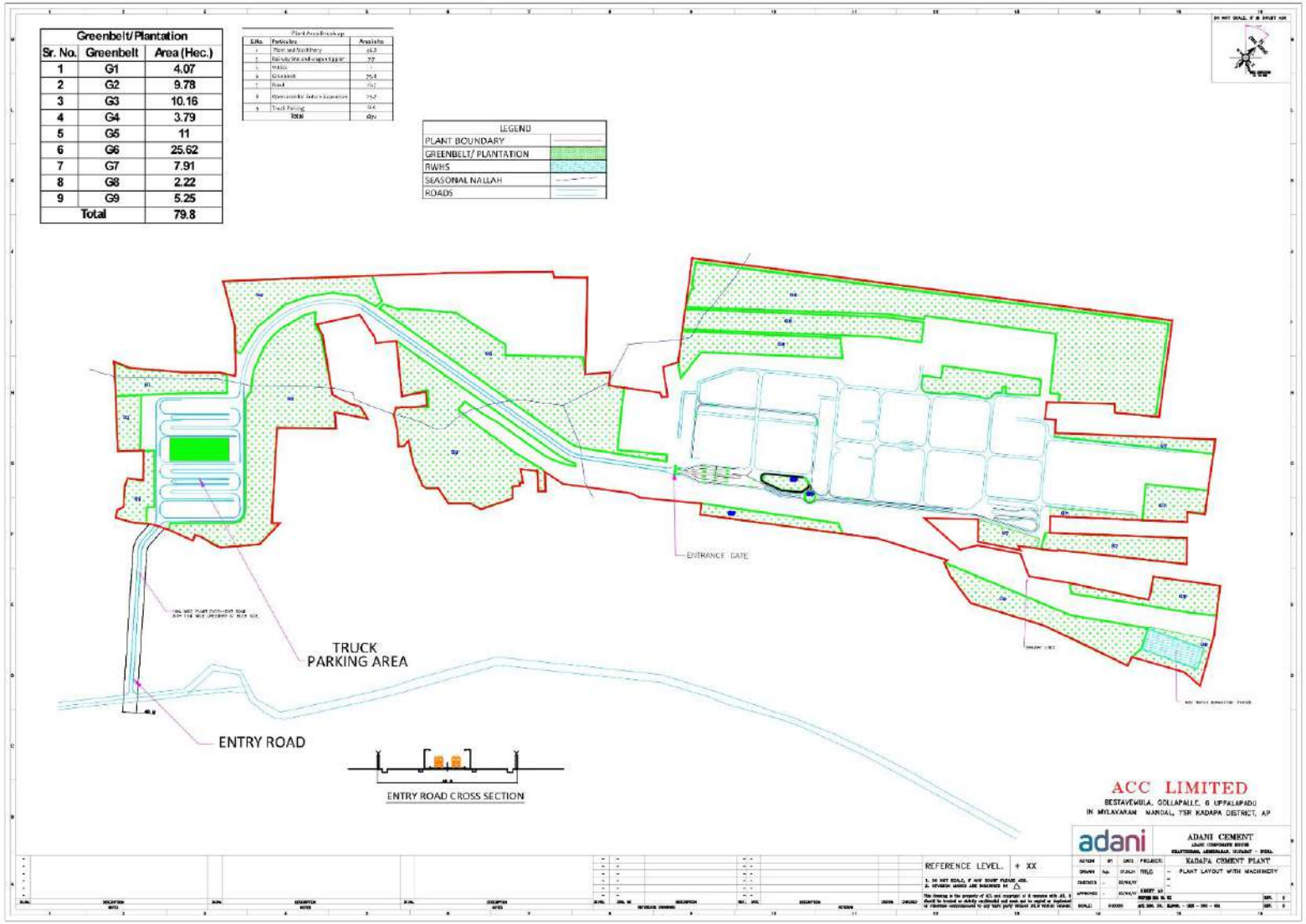



**Figure 2.3 (b): Plant Layout showing Greenbelt development / plantation**

### 2.3.4 Project Site Photographs

**Figure 2.4: Photographs showing proposed project site**

## 2.4 Size or Magnitude of Operation

M/s. ACC Limited is proposing 5.0 MTPA Clinkerisation Plant, 8.0 MTPA Cement Grinding Unit, 100 MW Captive Power Plant & 25 MW WHRS at Village: Gollapalle, Mandal: Mylavaram, District: Kadapa (YSR), Andhra Pradesh.

Size or Magnitude of Operation in terms of Capacity and Cost for the proposed Cement Plant are given in Table -2.3 and Table - 2.4.

**Table - 2.3**

**Size or Magnitude of Operation in terms of Capacity**

| S. No. | Particular | Proposed Capacity (Units) | |
|---|---|---|---|
| | | Phase - I | Phase - II |
| 1. | Clinker* | 2.5 Million TPA | 2.5 Million TPA |
| 2. | Cement (OPC, PPC) | 4.0 Million TPA | 4.0 Million TPA |
| 3. | Captive Power Plant | 50 MW | 50 MW |
| 4. | WHRS | 12.5 MW | 12.5 MW |
| 5. | D.G. Set | 1000 KVA | 1000 KVA |
| 6. | Railway Siding | Part of the Project | |

**Note: Part of the clinker will be transported to split Grinding Units.*

**Table - 2.4**

**Magnitude of Cost for the project**

| S. No. | Particular | Details |
|---|---|---|
| 1. | Estimated Cost of the Project | Rs. 7100 Crores |
| 2. | Cost for Environmental Management Plan | Capital Cost: Rs. 698 Crores (Phase I: Rs. 362 Crores, Phase - II: Rs. 336 Crores) |
| | | Recurring Cost: Rs. 14 Crores/ annum (Phase I: Rs. 7.1 Crores/annum, Phase - II: Rs. 6.9 Crores/annum) |
| 3. | Cost for implementation of commitments made during PH | Rs. 355 Crores (Phase I: Rs. 184 Crores, Phase - II: (171 Crores) |
| 4. | Cost for Wildlife Conservation Plan | Rs. 5.07 Crores |

***Proposed Facilities / Activities***

The major facilities and associated activities proposed as a part of proposed Integrated Cement Plant are as given below in Table 2.5:

**Table - 2.5**

**Scope of Proposed Project**

| S. No. | Unit | Proposed Major facilities and associated activities |
|---|---|---|
| 1. | Cement Plant | – Limestone stacker and Reclaimer<br>– Corrective Crusher<br>– Storage yard & Silos<br>– Raw Mill (VRM / Roller Press)<br>– Coal / Petcoke Mill<br>– Rotary Kiln (Pyro-processing)<br>– Clinker Cooler<br>– Cement Mill (VRM)<br>– Packing Plant<br>– Railway Siding<br>– Conveyor Belt to crusher in truck parking area |
| 2. | WHRS | – Waste Heat Recovery Boilers with Pre-heaters and Clinker Cooler<br>– Steam Turbine<br>– Generator |
| 3. | CPP | – Fluidized Bed Combustion Boiler<br>– Steam Turbine<br>– Generator<br>– Air Cooled Condensers |
| 5. | Others | – Sewage Treatment Plant, Neutralization pit, Reverse Osmosis / DM Plant, Digester, Rain water harvesting pond, Infrastructure Facilities. |

## 2.5 REQUIREMENTS FOR THE PROPOSED PROJECT

The project requirements such as raw material, fuel, water, power, manpower with source of supply is described in the sub-sections below:

### 2.5.1 Raw Material Requirement

Major raw material required for Clinker and Cement Production is Limestone, clay, bauxite, Iron ore Gypsum/ phospo gypsum & Fly ash.

The type of Cement product will be manufactured is OPC & PPC. Details regarding quantity of raw materials required, their source along with distance and mode of transportation are given below in Table - 2.6.

**Table - 2.6**
**Raw Material Requirement**

| S. No. | Material | Quantity MTPA | | | Source | Mode of Transportation with approx. distance |
|---|---|---|---|---|---|---|
| | | Phase-I | Phase-II | Total | | |
| 1. | Limestone | 3.5 | 3.5 | 7.0 | Captive Kadapa Limestone Mine | Belt Conveyor / 0.5 km |
| 2. | Clay | 0.14 | 0.14 | 0.28 | Open Market | Road / 0.5 km |
| 3. | Bauxite | 0.025 | 0.025 | 0.05 | Andru Minerals & AP/Belgaum Minerals-Karnataka and Bellary | Rail & Road, 250 - 500 km |
| 4. | Iron ore | 0.02 | 0.02 | 0.04 | Sai Sindhu industries-AP/KEJ Minerals Pvt. Ltd. & Janaki Corporation Ltd Karnataka | Rail & Road / 250 km |
| 5. | Gypsum / Phospho gypsum | 0.24 | 0.24 | 0.48 | CFL, Spic, Sterlite, Fact | Rail & Road / 450 km |
| 6. | Fly ash* | 1.40 | 1.40 | 2.80 | CPP, KPCL Raichur Thermal Power Plant, Kothagudem Thermal Power Station VII stage | Rail / Road / 250 km to 550 km |

***Out of Total Fly ash requirement of 2.80 Million TPA, 0.339 Million TPA will be generated from CPP which will be 100% utilized for PPC production***

***Interlinked Project:***

Kadapa Limestone Mine (ML Area: 997.08 ha) with Limestone Production capacity of 7.0 million TPA at Villages Dhannawada, Chinna Venturla, Vaddarala, Bestavemula, Gollaapalle, G. Uppalapadu of Mylavaram Mandal, District (YSR) Kadapa, (Andhra Pradesh) by M/s. ACC Limited. The summary of the Mining project is enclosed as ***Annexure - 12*** along with this EIA / EMP Report.

Application for Environmental Clearance of the Kadapa Limestone Mine has been submitted on 23$^{rd}$ Oct., 2016 and Final Technical presentation held in 12$^{th}$ EAC meeting of Non-Coal Mining Sector on 23$^{rd}$ to 25$^{th}$ Nov. 2016. Now, the company is in process to submit the Additional Details Sought by EAC (Non- Coal Mining).

***Mass Balance***

Mass Balance Diagram for manufacturing of OPC & PPC is shown in Figure - 2.5.

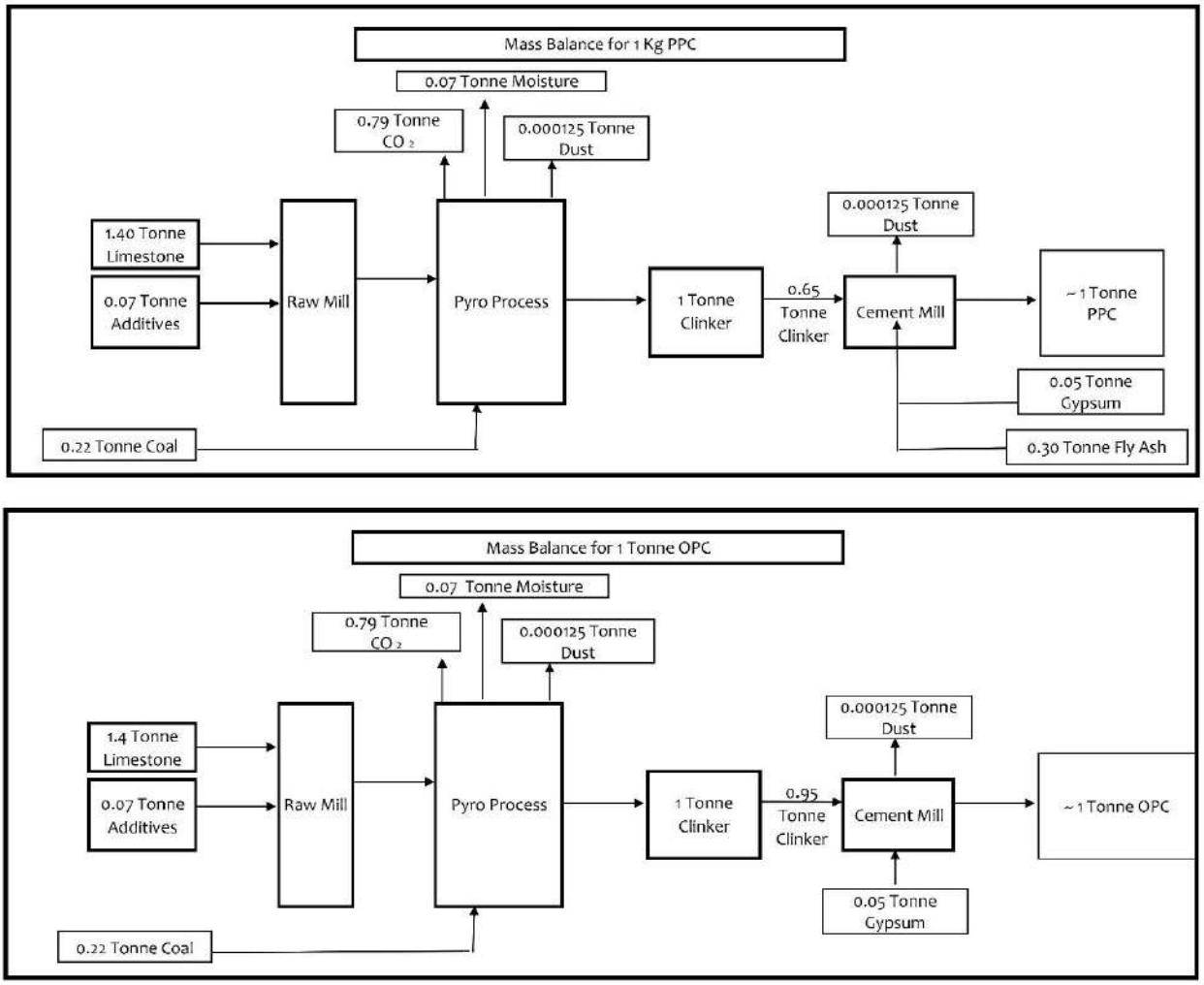



**Figure 2.5: Mass Balance Diagram (OPC & PPC)**

### 2.5.2 Fuel and Feed Stock Requirement

Details regarding quantity of Fuel and Feed Stock required, their source along with distance and mode of transportation for proposed project are given in Table - 2.7.

**Table - 2.7**

**Fuel & Feedstock Requirement**

| S. No. | Name of Fuel | Quantity in Million TPA | | | Source | Calorific Value | Ash (in %) | Sulphur (in %) | Distance & Mode of Transportation |
|---|---|---|---|---|---|---|---|---|---|
| | | Phase -I | Phase-II | Total | | | | | |
| **Cement Plant** | | | | | | | | | |
| 1. | Coal | 0.55 | 0.55 | 1.10 | Singareni Coalfields (SCCL) in Andhra Pradesh | 4200-4800 | 30-35 | 0.4-0.5 | Road / Rail 590 km |
| 2. | Petcoke requirement in cement plant (100% uses) | 0.27 | | 0.27 | US/ Saudi/ RIL / Essar/ IOCL *via* Krishnapatnam Port | 7800 - 8300 | 0.5-2.0 | 6-9 | Road / Rail 250 km |

| S. No. | Name of Fuel | Quantity in Million TPA | | | Source | Calorific Value | Ash (in %) | Sulphur (in %) | Distance & Mode of Transportation |
|---|---|---|---|---|---|---|---|---|---|
| | | Phase -I | Phase-II | Total | | | | | |
| 3 | AFR | 0.20 | | 0.20 | Nearby area of Telangana and Andhra Pradesh | 2500 - 4000 | 30-35 | <2 | Road 100 to 300 km |
| **Captive Power Plant** | | | | | | | | | |
| 3. | Coal (Indian / Imported) | 0.485 | 0.485 | 0.97 | Indigenous: Singareni Coalfields (SCCL) in Andhra Pradesh. Imported: Indonesian coal/ South African Coal | Indigenous | | | Rail /Road 590 km Sea route & then by rail 250 km |
| | | | | | | 4200-4800 | 30-35 | 0.4-0.5 | |
| | | | | | | Imported | | | |
| | | | | | | 5000-5800 | 6-10 | 0.5-0.6 | |

### 2.5.3 Other Basic Requirement

Other basic requirements for the proposed project are given in Table - 2.8.

**Table - 2.8**
**Basic Requirements for the Project**

| S. No. | Particular | | Requirement | Source |
|---|---|---|---|---|
| 1. | Water (KLD) | | 2922 | Initially groundwater and later on from captive limestone mine pit & rainwater harvesting |
| 2. | Power (MW) | | 125 | CPP (100 MW), WHRS (25 MW) & State Grid Power Supply |
| 3. | Manpower (No. of Persons) | Construction phase | 2400 | Skilled & unskilled labour from local/outside |
| | | Operation Phase | 499 | |

#### 2.5.3.1 Water Requirement

The total water requirement for Integrated Cement Plant & CPP including colony was about 7,750 $m^3$/day. The water requirement has been reworked and optimized water requirement to 2,922 m3/day. The requirement will be met initially from the ground water once the mine pits will get developed same will be used to fulfill the water requirements. Rainwater harvesting will be done inside the premises.

Status of Approval: Permission for 1325 KLD has already been obtained from Ground Water and Ground Water Audit Department vide Letter No. 408-11/CDP/Hg-II/2015, dated 22nd Feb., 2018. The copy of the same is enclosed as ***Annexure - 9*** along with this EIA / EMP Report. For the balance water requirement, application will be applied to CGWA.

Break-up of the water requirement is given in Table - 2.9

**Table - 2.9**

**Break-up of Water requirement**

| **Purpose** | **Proposed Requirement (KLD)** | | | **Source** |
|---|---|---|---|---|
| | **Phase - I** | **Phase - II** | **Total** | |
| Cement plant | 811 | 811 | 1622 | Initially groundwater and later on from limestone mine pit & rainwater harvesting |
| CPP | 420 | 420 | 840 | |
| Domestic | 30 | 30 | 60 | |
| Domestic Utilities | 150 | 150 | 300 | |
| Greenbelt* | 50 | 50 | 100 | |
| **Total** | **1461** | **1461** | **2922** | |
| *Fresh water (100 KLD) for greenbelt development will be required in initial stage only thereafter, treated water (206 KLD) from STP will be sufficient to meet the requirement for greenbelt development & Plantation. Later, 100 KLD fresh water will be utilized in fire frightening & other miscellaneous work (as & when required) | | | | |

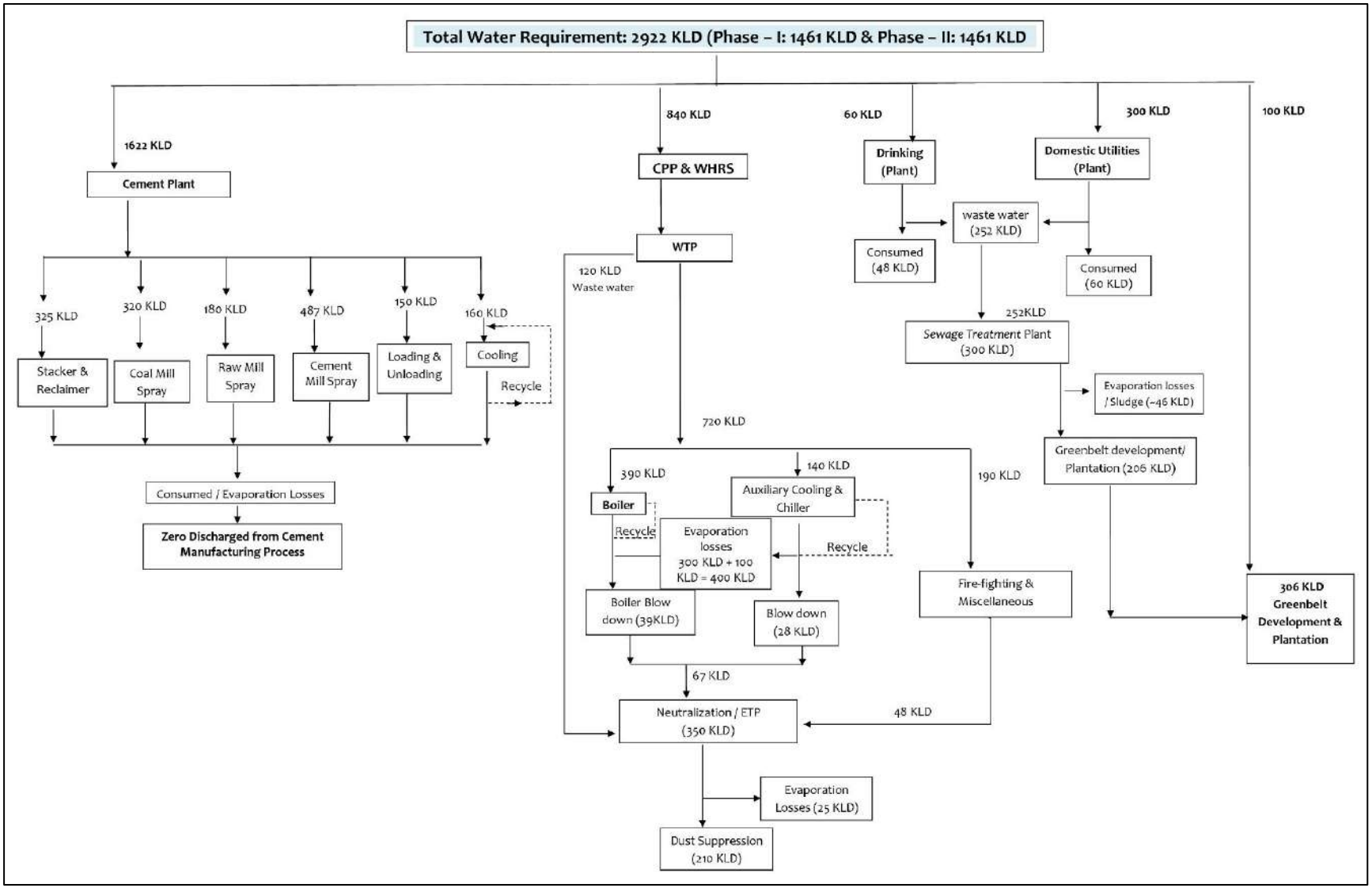



**Figure 2.6: Water Balance Diagram**

### 2.5.3.2 Power Requirement

The estimated total power requirement for the proposed Integrated Cement Project will be approx. 125 MW; which will be sourced from Proposed CPP (100 MW), WHRS (25 MW). Power agreement for the State Grid will be done during the implementation phase.

Details regarding Breakup for power requirement are given in Table - 2.10.

**Table - 2.10**
**Breakup for Power Requirement**

| S. No. | Purpose | Quantity Required (MW) | Source |
|---|---|---|---|
| 1. | Cement Plant | 108 | Captive Power Plant, WHRS & State Grid |
| 2. | Captive Power Plant | 10 | |
| 3. | WHRS | 3.0 | |
| 4. | Plant Lighting/ Mining | 2.0 | |
| 5. | Miscellaneous / Utility | 2.0 | |
| **Total*** | | **125** | |

Energy consumption per ton of:

- ✓ Clinker - 57 Kwh / Tonne
- ✓ Cement Grinding - 80 Kwh / Tonne for OPC, 65 kWh (PPC) (Including Clinker)

### 2.5.3.3 Manpower Requirement

The proposed project will generate both direct & indirect employment. The Integrated Cement Plant will generate direct employment of about 2400 persons during implementation phase and during operational phase the employment within the plant will be around 499 employees.

Apart from the above, various indirect employment opportunities are envisaged by way of transportation, workshops, petty contractors; shopkeepers, network of retailers (cement stockists) throughout the state and in its marketing regions.

*Source:* Suitable local/outside people will be given preference in employment as per their eligibility criteria. Detailed manpower requirement is given in table: 2.11.

**Table - 2.11 (a)**
**Break-up of Manpower Requirement for construction phase (24 months)**

| Manpower Requirement | No. of permanent employment (Nos.) [A] | Period of employment (No. Of days) [B] | No. of man-days [X]=[A]*[B] |
|---|---|---|---|
| **Construction phase** | | | |
| Permanent employment | 70 | 520 | 36400 |
| Contractual employment | 2330 | 520 | 12,11,600 |
| **Total** | **2400** | | 12,48,000 |

**Table - 2.11 (b)**
**Break-up of Manpower Requirement for operation phase (per annum)**

| Manpower Requirement | No. of permanent employment (Nos.) [A] | Period of employment (No. Of days) [B] | No. of man-days [X]=[A]*[B] |
|---|---|---|---|
| **Operation phase** | | | |
| Permanent employment | 499 | 330 | 1,64,670 |

| Manpower Requirement | No. of permanent employment (Nos.) [A] | Period of employment (No. Of days) [B] | No. of man-days [X]=[A]*[B] |
|---|---|---|---|
| Contractual employment | 500 | 330 | 1,65,000 |
| **Total** | **999** | | 3,29,670 |

## 2.6 PROPOSED SCHEDULE FOR APPROVAL AND IMPLEMENTATION

The Construction work will be started after getting Environmental Clearance from MoEF&CC, New Delhi and Consent to Establish from APPCB.

***A. Proposed Schedule for Approval:***

- *Environment Clearance from MoEFCC, New Delhi*: Feb., 2025
- *Consent for Establish (CFE) from* APPCB: Approx. 3 months after getting EC.
- *Consent for Operate (CFO) from* APPCB: After completion of construction work.

***B. Proposed Schedule for Implementation:***

Implementation schedule for the project is approx. 24 months; detail of which is given below:

| PROJECT IMPLEMENTATION SCHEDULE | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project activities after Main Machinery Order Placement for Integrated Cement Plant** | | | | | | | | | | | | | | | | | | | | | | | | |
| **S. No** | **Project Activity** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 1. | Detail Engineering | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. | Plant Machine & Auxiliary order placement | | | | | | | | | | | | | | | | | | | | | | | | |
| 3. | Civil Construction | | | | | | | | | | | | | | | | | | | | | | | | |
| 4. | Equipment Delivery | | | | | | | | | | | | | | | | | | | | | | | | |
| 5. | Fabrication | | | | | | | | | | | | | | | | | | | | | | | | |
| 6. | Erection | | | | | | | | | | | | | | | | | | | | | | | | |
| 7. | Final Commissioning | | | | | | | | | | | | | | | | | | | | | | | | |

**Proposed Schedule for Implementation of Integrated Cement project**

## 2.7 Technology and process description

### 2.7.1 Cement Plant

***<u>Technology Description</u>***

The proposed Integrated Cement Plant will be based on the dry process technology for Cement manufacturing with Pre-Heating and Pre-Calciner Technology. The dry process used will offer more advantages, particularly in fuel & water consumption. In the dry process, the raw materials are dried in a combined drying-cum-grinding installation to reduce the moisture content to below 1%. The drying in the grinding unit is achieved by using kiln exhaust gases for normal moisture and is supplemented by auxiliary hot air furnace for rainy season etc. for high moisture. The ground raw mix is then homogenized in silos and fed into the rotary kiln. Heat required for evaporation of added

moisture is eliminated in this process. The latest technological innovation is to replace the conventional suspension pre-heater by well-designed suspension pre-heater having high efficiency, low pressure drop cyclone and pre-calciner.

***Process Description***

Broadly, the proposed project comprises of equipment such as raw mill, Pre- heater & pre -calciner, Rotary Kiln, Clinker Cooler, Coal Mill and Cement Mill & Packers which will be used for cement (OPC & PPC as per market demand) manufacturing.

The process involved in cement production largely comprises of the following steps:

- Transport of crushed limestone from limestone mine to the crusher, use of stacker and reclaimer.
- Raw Mix Preparation & Homogenization
- Preheating, Calcination and Clinkerization
- Clinker cooling.
- Clinker storage in silos & part Transport of surplus to split located Grinding Units
- Cement Grinding, Storage, Packing & Dispatch.

**a)** ***Transport of crushed limestone from mining lease.***

Limestone of required size will be transported to Cement Plant from proposed Limestone Mine through Covered Belts Conveyor.

**b) Raw mix preparation and homogenization**

- ***Raw Material Reclaiming and Transport***- The crushed limestone will be transported to limestone yard through a series of covered belt conveyors and stored in a pile through automatic stacker machine. Once the pile of required quantity and quality is achieved then reclaimer is used to reclaim the stockpile material. By using stacker and reclaimer machines, pre-blending takes place to minimize fluctuation in crushed limestone quality. The pile of limestone will be continuously reclaimed, when raw mill will be in operation and stored in hopper at raw mill section. Magnetic separators will be installed over the belt conveyers to remove any foreign materials.
- ***Raw Mill Feed*** - The Limestone along with additives will be transported from their respective feed bins via weigh feeders and belt conveyor to the raw mill system.
- ***Raw Meal Grinding Process*** - Raw Mill will be used to grind the raw mix which will be capable to meet the production needs. The raw grinding section will comprise of Mills, fans, separators & cyclones as well as all ductwork and control dampers. The ground product from raw mill is known as 'Raw Meal'.
- ***Raw Meal Transport and Storage*** - From the separator cyclones, the raw meal will be transported via air slides and a bucket elevator to the homogenizing silo.

  Homogenizing silo will be prerequisite for raw meal blending to achieve consistent quality of Kiln feed. This will also ensure regulated feed with minimum variation in quality for smooth

operation of Kiln. A continuous blending silo of RCC construction of required capacity will be used for the same. The silo capacity would be suitable for the required daily clinker production

**c) Clinkerization and Clinker Production**

- ***Raw Meal Transport to Kiln Feed -*** From the homogenizing silo the raw meal will be extracted to the Kiln feed bin below the silo.
- ***Kiln Feed -*** From the Kiln feed bin the material will be transported through mechanical conveyors with measurement and control of kiln feed rate.
- ***Pre-heating -*** The pre-heating equipment will be comprised of the multi stage cyclone with pre-calciner system connected with gas ducts and meal chutes, the down comer duct and the ID fan. In cyclone pre-heater system, an efficient heat transfer will take place to finally disperse the raw material particles, when they will come in contact with hot gases from kiln.

  The raw meal, which will be fed into the top stage gas duct, will be carried by hot gas into cyclone. The material will get separated from gas in cyclones and then will travel downwards and through meal chute will be discharged into next lower stage gas duct. In this way, material will come into contact with high temperature gases and will get pre-heated and partially calcined and then will enter the pre-calciner.

  The calciner will provide sufficient residence time for efficient combustion of not only conventional coal but also for Petcoke and other alternate fuels which will be difficult to handle. The calciner will be equipped with multi firing points for the above said requirements.

  The preheater will be equipped with induced draught fan for ensuring counter current heat transfer from the kiln through the calciner & the series of cyclones.

  The exit hot gas from the preheater will be utilized for Waste Heat Power recovery system and drying of raw material in Raw Mill & drying of coal / Petcoke in Coal Mill and for Clinker grinding with/ fly ash/gypsum for Cement production.
- ***Pre - calcining and Kiln -*** These groups will consist of an in-line low $NO_2$ pre-calciner, tertiary air duct from the kiln hood and a rotary kiln.

  In the pre-calciner, further Calcination will take place by firing pulverized coal/pet coke to provide the necessary heat in the kiln and the Pre-calciner located at the bottom of the pre-heater. Calcined material from bottom stage cyclone is fed to the kiln. The feed travels down as the kiln rotates. The complete chemical reaction takes place when the material reaches the burning zone and cement clinker is formed.

***Use of High Calorific Hazardous Waste in Cement Plant***

The co-processing of waste in cement industry is much beneficial option, whereby wastes are not only incinerated at a higher temperature of around 1400 ºC and longer residence time but its inorganic content gets fixed within the clinker apart from using the energy content of the wastes. Apart from this, no residues are left, which in case of incineration still requires being land filled as incinerator ash. Further the acidic gases, if any generated during co-processing gets neutralized,

since the raw material is alkaline in nature. Such phenomenon also reduces resources requirements such as coal and limestone.

Taking the cognizance of above advantages of co-processing the waste, ACC has explored few hazardous wastes & non-hazardous wastes in the area generated by other units for use as AFR based on the feasibility and availability of the waste in the area during the operation of the plant.

**Table - 2.12**
**Details of Waste Co-processing in Plant**

| List of Hazardous wastes Proposed for Co-processing | | | | |
|---|---|---|---|---|
| **S. No.** | **Name of waste** | **Nature of waste** | **Category** | **Source Details** |
| 1. | Furnace or reactor residue and debris | Solid | 2.1 | Through Petrochemical Industries/Industries adopting Pyritic Process. |
| 2. | Tarry residue and still bottoms from distillation | Solid | 2.2 | |
| 3. | Oily sludge emulsion | Semi Solid | 2.3 | |
| 4. | Organic residues | Liquid/ Solid | 2.4 | |
| 5. | Residues from alkali wash of fuels | Solid | 2.5 | |
| 6. | Spent catalyst and molecular sieves | Solid | 2.6 | |
| 7. | Oil from waste water treatment | Liquid | 1.7 | |
| 8. | Drill Cutting excluding those from water-based mud | Solid | 3.1 | Through oil Exploration industries. |
| 9. | Sludge containing oil | Liquid/ Solid | 3.2 | |
| 10. | Drilling mud containing oil | Liquid/ Solid | 3.3 | |
| 11. | Cargo Residue, washing water and sludge containing oil | Liquid/ Solid | 3.1 | Cleaning, emptying and maintenance of petroleum oil storage tanks including ships |
| 12. | Cargo Residue and sludge containing chemicals | Liquid/ Solid | 3.2 | |
| 13. | Sludge and filters contaminated with oil | Solid | 3.3 | |
| 14. | Ballast water containing oil from ships | Semi Solid | 3.4 | Through Oil Refineries |
| 15. | Oil emulsion sludge | Semi Solid | 4.1 | |
| 16. | Spent Catalyst | Solid | 4.2 | |
| 17. | Slope Oil | Liquid | 4.3 | |
| 18. | Organic residue from process | Liquid | 4.4 | |
| 19. | Spent clay containing oil | Liquid/ Solid | 4.5 | |
| 20. | Used or Spent Oil | Liquid | 5.1 | Industrial operations using mineral/synthetic oil as lubricant in hydraulic systems or other applications |
| 21. | Waste or Residue containing oil | Liquid | 5.2 | |
| 22. | Waste cutting oil | Liquid | 5.3 | |
| 23. | Phosphate sludge | Solid | 12.5 | Through Industries having Process of Metal surface treatment, such as etching, staining, polishing, galvanizing, |
| 24. | Plating metal sludge | Solid | 12.8 | |

| List of Hazardous wastes Proposed for Co-processing | | | | |
|---|---|---|---|---|
| **S. No.** | **Name of waste** | **Nature of waste** | **Category** | **Source Details** |
| | | | | cleaning, degreasing, plating, |
| 25. | Sludge from Acid recovery unit | Liquid | 13.2 | Through Iron and Steel Industry |
| 26. | Spent catalyst | Solid | 18.1 | Through Fertilizer and Pesticide Producing Industries. |
| 27. | Carbon Residue | Solid | 18.2 | |
| 28. | Contaminated Aromatic, Aliphatic or Naphthenic Solvents may or may not fit for reuse | Liquid | 20.1 | Respective Industries generating this category waste. |
| 29. | Spent Solvents | Liquid | 20.2 | |
| 30. | Distillation Residue | Liquid | 20.3 | |
| 31. | Process Sludge | Solid | 20.4 | |
| 32. | Process waste, residue and sludge | Liquid/ Solid | 21.1 | Industries having production and/or industrial use of paints, pigments, lacquers, varnishes, plastics and inks |
| 33. | Spent Solvents | Liquid | 21.2 | |
| 34. | Spent Catalyst | Solid | 22.1 | Industries engaged in Production of Plastic Raw Materials |
| 35. | Process Residue | Solid | 22.2 | |
| 36. | Waste/ Residues Not made with Animal/ Vegetable material | Solid | 23.1 | Industries engaged in Production and/or industrial use of glues, cements, adhesive and resins |
| 37. | Spent Solvents | Liquid | 23.2 | |
| 38. | Process waste sludge/residues containing acid or other toxic metals, or organic compounds | Solid | 26.1 | Production or industrial use of synthetic dyes, dye-intermediates and pigments. |
| 39. | Spent Solvents | Liquid | 26.4 | |
| 40. | Spent catalyst | Solid | 26.5 | |
| 41. | Process Residues and wastes | Solid | 28.1 | Through Pharmaceutical Units. |
| 42. | Spent catalyst | Solid | 28.2 | |
| 43. | Spent carbon | Solid | 28.3 | |
| 44. | Off specification products | Solid | 28.4 | |
| 45. | Date Expired Products (Pharma Industries) | Solid | 28.5 | |
| 46. | Spent Solvent (Pharma Industries) | Liquid | 28.6 | |
| 47. | Process Waste or residues | Solid | 29.1 | |

| List of Hazardous wastes Proposed for Co-processing | | | | |
|---|---|---|---|---|
| **S. No.** | **Name of waste** | **Nature of waste** | **Category** | **Source Details** |
| 48. | Sludge Containing Residual Pesticides | Solid | 29.2 | Through Pharma Industries in Andhra Pradesh Region |
| 49. | Spent Solvents | Liquid | 29.4 | |
| 50. | Spent catalyst | Solid | 29.5 | |
| 51. | Spent Acid | Liquid | 29.6 | |
| 52. | Contaminated cotton rags or other cleaning materials | Solid | 33.2 | Industries doing Disposal of barrels / containers used for handling of hazardous wastes / chemicals |
| 53. | Exhaust air or gas cleaning residue | Solid | 35.1 | Industries having process of purification process for organic compounds/solvents |
| 54. | Spent Ion Exchange Resin Containing Toxic Metals | Solid | 35.2 | |
| 55. | Chemical sludge from waste water treatment | Solid | 35.3 | |
| 56. | Oil and Grease Skimming | Semi Solid | 35.4 | |
| 57. | Any process or distillation residue | Liquid | 36.1 | Through Industries having Waste treatment processes, e.g., incineration, distillation, separation and concentration techniques |
| 58. | Spent carbon or filter medium | Solid | 36.2 | |
| 59. | Alternative fuels & raw material preparation from authorized waste treatment facility | Solid | -- | Through Preprocessing Facilities located at Andhra Pradesh region. |
| 60. | Waste exhibits any of the Hazardous characteristics listed in Class-C due to the presence of any hazardous constituents in the substances or wastes | Solid | Schedule II- Class-C | Respective units generating this category Waste |
| 61. | Waste Clothes/ Cotton waste/ Fibre etc. | Solid | Schedule III- B3030 | |
| 62. | Tyre Fibre | Solid | Schedule III- B3040 | |
| 63. | Carbide Lime Sludge | Solid | Schedule III- OW(A-4) | |
| 64. | ETP Bio solid from soft drink/ Beverage Industry | Solid | Schedule III- OW(B-3060) | Industries like Hindustan Coca Cola Beverages, |
| 65. | Spent carbon from Soft drink/ beverage industry | Solid | Schedule III- OW (B-3060) | Beverage industries. |

| **List of Hazardous wastes Proposed for Co-processing** | | | | |
|---|---|---|---|---|
| **S. No.** | **Name of waste** | **Nature of waste** | **Category** | **Source Details** |
| 66. | WTP sludge from soft drink/ beverage industry | Solid | Schedule III- OW (B-3060) | |
| 67. | FF Slag/ ISF Slag | Solid | Schedule III- OW(B-1200) | Through Suppliers at Andhra Pradesh region. |
| 68. | FMCG waste | Solid | Schedule III- OW OW(B-3060) | Through Suppliers at Andhra Pradesh region. |
| 69. | Red mud | Solid | Schedule III- OW OW(B-2110) | Through Suppliers at Andhra Pradesh region. |
| 70. | Toxic Effluent containing chemical (Toxic effluent/ aqueous waste) | Solid | Schedule III- OW | Respective units generating this category Waste |
| | | | (Class-C4) | |
| 71. | Waste Mix Liquid | Liquid | III-OW-H3 | Through Preprocessing Facilities located at Andhra Pradesh Orrisa & MP. |
| 7 | Waste Mix Solid | Solid | III-OW-H4.1 | |
| **List of Non-Hazardous wastes proposed for Co-processing** | | | | |
| **SN** | **Name of waste** | **Nature of waste** | **Category** | **Source Details** |
| 1 | FRP/ Plastic waste | Solid | Non-hazardous OW (B-3010, B-3026) | Through Preprocessing Facilities located at Andhra Pradesh Orrisa & MP. |
| 2 | Carbon black | Solid | Non-hazardous OW(B-3190) | |
| 3 | Trade Rejects | Solid | Non-hazardous OW(B-3190) | |
| 4 | Plastic Laminates | Solid | Non-hazardous OW (B-3010, B-3026) | |
| 5 | RDF/SCF | Solid | Non hazardous | |
| 6 | Biomass for Cement | Solid | Non hazardous | |
| 7 | Biomass for Power | Solid | Non hazardous | |

***Note:** Depending upon the availability and market the above-mentioned waste will be used for co - processing.*

Approx. 15 % TSR (Thermal Substitution Rate) is proposed in co-processing of Hazardous Waste to reduce the dependency of natural resources i.e., Coal. This TSR may further increase/ decrease depending on the availability of AFR.

AFR will be used based on the availability of waste in nearby area. Proper storage and feeding system will be installed for proper utilization of waste. Company will obtain authorization from Andhra Pradesh Pollution Control Board for Collection, Storage, Transportation, Co-processing in Cement Kiln of Hazardous and Other waste for Co-processing in cement plant as per CPCB guidelines.

***Equipment***

**Ground hopper -** Ground hopper of at ground floor of preheater tower for feeding AFR to Conveying system Mono rail hoist or bucket elevator.

**Mono rail Hoist/ Bucket elevator -** To lift/ transport the waste from preheater ground floor to the floor where AFR/ Waste is actually entered into the kiln inlet/ Calciner.

**Feed Hopper of 2 $m^3$ Capacity -** To keep buffer stock of preheater floor where feeding takes place

**Sacrificial belt conveyor -** The material from feed hopper is fed to variable speed drive to feed AFR into the kiln/ calciner in a controlled way.

**Double flap valve** - from Sacrificial belt conveyor material enters to double flap valve where two pneumatically controlled gates operate in a sequence in such a way that at a time one gate always remains closed to avoid false air intake into kiln.

**Automatic Shut gate -** For safety of other equipment like conveyor etc. pneumatically operated shut gate provided at entry of waste/AFR into calciner/ kiln inlet which automatically closes along with other equipment when kiln stops or is under positive pressure.

**Table - 2.13**

**Major List of Equipment's for Green Fuel installation**

| | |
|---|---|
| **A** | **Equipment Design, Engineering & Supply - Mech** |
| **1** | **Shed Structure & Hoist** |
| b | PEB shed for equipment & material storage |
| c | Electrical overhead crane for shed |
| **2** | **Shredding system (Pre-processing system)** |
| a | Chain belt conveyor for Shredder Feeding |
| b | Imported Shredder - Imported |
| c | Important Screen for the shredding circuit |
| d | Shredding circuit belt conveyors |
| e | Secondary Shredder |
| f | Wind shifter |
| g | Wind shifter bag filter |
| 3 | **Preheater feeding system (Co-processing system)** |
| a | Extractor for feeding |
| b | Transport Belt Conveyors |
| c | Pan conveyor for feeding flab valves |
| d | Double flap valve & gates for feeding |
| **B** | **Material and Service cost - Mechanical** |
| a | Steel |
| b | Fabrication and erection |
| c | Equipment and structure Dismantling |
| d | Equipment Erection |
| e | Crane Hiring |
| f | Design & Consultancy Charges |

| | |
|---|---|
| **A** | **Equipment Design, Engineering & Supply - Mech** |
| g | OEM Engineer / Supervision Charges |
| **C** | **E&I - Material and Service** |
| a | MCC, HT panel, Transformer |
| b | Control & power cable |
| c | PLC Components |
| d | Earthing, cable tray |
| **D** | **Civil - Material and Service** |
| a | Shed meters (Civil Only with Flooring) (Storage) |
| b | Belt Conveyor (Civil Foundation Only) |
| c | Shredder Foundations with Screen |
| d | Extractor |
| e | Existing Strengthening of Conveyor Gallery |
| f | MCC and Hydraulic Room |
| g | Transformer Room |
| h | Design and Engineering cost - Civil |
| **E** | **Miscellaneous** |
| a | Two years operational and commissioning Spares |
| b | Fire Fighting & Safety Provisions |
| c | Retention basin and Geo membrane sheet |
| d | Painting and consumable |
| g | DE odour system |
| h | Construction activities |
| i | Project Preparation / Storage/ Matl Unloading |

***Clinker Cooler -*** This equipment recuperates heat from hot clinker, which reduces the consumption of fossil fuel and other fuels required for cement clinker making. It is a spillage-free and high efficiency third generation clinker cooler with roller crusher, ESP (electrostatic precipitator) including fan and stack, WHRS (waste heat recovery system) for cooling clinker to 65 °Centigrade plus ambient.

Hot clinker discharged from the Kiln drops on the grate cooler and gets cooled.

- ***Clinker Storage -*** Clinker shall be extracted from the bottom of the clinker silo and conveyed to the cement mill feed hopper.
- ***Clinker transport to Clinker GU -*** Part of the clinker will also be transported to Sister Split Grinding Units.

***d) Cement Grinding, Storage, Packing & Dispatch***

- ***Cement Grinding & Storage -*** Clinker and gypsum with fly ash and mineral components (Slag, Iron ore) according to requirement are extracted from their respective hoppers and fed to the Cement Mill. Cement Mill (VRM / roller press with ball mill) grind the feed to a fine powder i.e., cement and it is transported to RCC Cement Silos for dispatch.

- ***Cement Packing & Dispatch*** - Cement extracted from cement silos will be packed in bags by rotary packing machines and dispatched to consumers by road/ rail

***Process Flow Diagram***

Process Flow Diagram of proposed cement manufacturing process is given in Figure - 2.7.

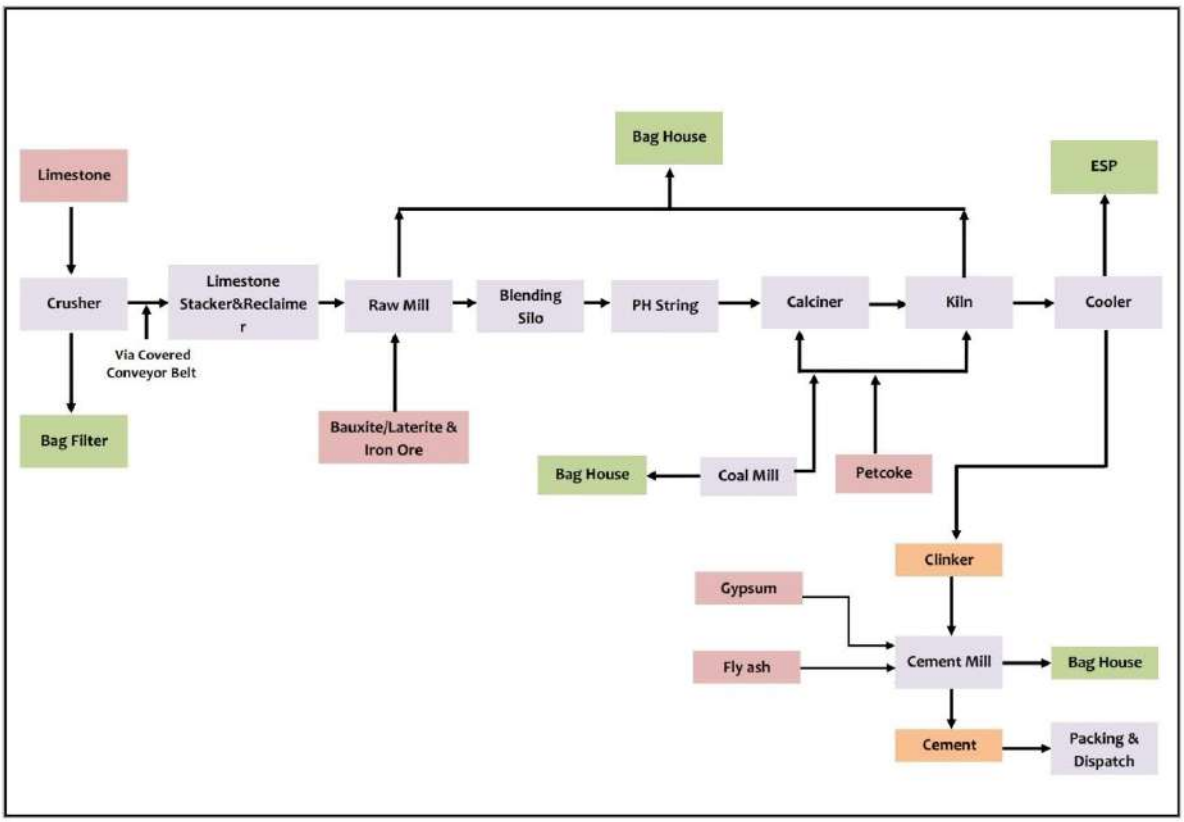



**Figure 2.7: Typical Cement Manufacturing Process Flow Diagram**

### 2.7.2 Captive Power Plant (Coal Based - 100 MW)

The captive power plant will have an installed capacity of 100 MW (Phase-I 50 MW & Phase-II 50 MW). The coal based captive power station is conceived as coal fired station of Phase-I (50 MW) and Phase-II (50 MW) units. To achieve efficiency without sacrificing availability, it is considered to limit the choice of steam parameters within the sub critical range, in line with the established practice of most of the manufactures of Phase-I (50 MW) and Phase-II (50 MW) units.

The fuel considered for the station coal from SCCL by railway wagon. The thermodynamic cycle will consist of the boiler, the steam turbine, the condenser, the condensate extraction and boiler feed systems, the condensate and feed water heaters along with all other necessary equipment for single reheat regenerative feed heating. A reheat steam cycle with regenerative feed heating system is proposed.

The main steam from the boiler, after passing through the turbine, is exhausted into the Air Cooled condenser for condensing. The feed water after being de- aerated in the de-aerator would be pumped to the boiler through the high- pressure heaters. Provision would be kept for dosing

hydrazine solution in the condensate extraction pump discharge and in deaerator feed tank or boiler feed suction line for oxygen scavenging and pH control of the feed condensate steam cycle. The boiler feed pumps would be provided with lube oil system, automatic leak off and minimum flow re-circulation valves. Pumps would be provided with modulating variable speed hydraulic coupling. Condensate drain from the HP heaters would be cascaded to the deaerator feed storage tank and the HP heaters would be cascaded to the deaerator feed storage tank and the condensate drains from the LP heaters would be cascaded to the condenser through the drain cooler. The auxiliary steam for the station would be drawn from a suitable point of the boiler and after pressure reduction and de-superheating would be used for various services. The auxiliary steam supply system of the units would be interconnected and this would supply steam to the deaerators, turbine gland sealing system during light load and start-up conditions. Auxiliary steam will also be supplied to the fuel oil heating, atomization system etc. Provision, for steam supply to auxiliary steam system from cold reheat piping through pressure reducing and de-superheating station, would also be provided.

Each unit will also be provided with HP and LP turbine bypass system for quick start and large load rejections. The turbine generator unit would be so designed that it will be capable of cyclic duty and frequent start-ups and shutdowns during its lifetime.

**Table - 2.14**

**Details of Captive Power Plant**

| Sr. No. | Features | Description |
|---|---|---|
| 1. | Capacity | 100 MW |
| 2. | Configuration | Phase-I: 50 MW; Phase-II: 50 MW |
| 3. | Type of boilers | Circulating Fluidized Bed Combustion (CFBC) Boiler |
| 4. | Power evacuation | Through SEB/PGL transmission line |
| 5. | Fuel | Coal |
| 6. | Source of coal | Singareni Collieries Company Limited (SCCL) / Imported |
| 7. | Coal requirement | Phase-I: 0.485 MTPA; Phase-II: 0.485 MTPA |
| 8. | Sulphur content | 0.5% (max) |
| 9. | Ash content in coal | 40% |
| 10. | Ash generation | 0.628 MTPA (Phase-I & Phase-II), entire ash generated will be used in cement manufacturing |
| 11. | ESP efficiency | 99.9% |
| 12. | Stack height | 84 m |
| 13. | Water requirement | 900 $m^3$/day (Phase-I 450 $m^3$/day & Phase-II 450) |
| 14. | Source of water | Water requirement will be met initially from ground water sources. Once mine will get developed same will be used to fulfill the water requirements. Rainwater harvesting will be done inside the premises. |

***Process Description of Captive Power Plant***

The generating station will be designed to operate with high efficiency and availability at various modes throughout the lifetime of the project considering the nature of cement plant loading. There are various sections of the power plant described as below:

**a) Fuel Requirement and Quality:**

The annual coal requirement for integrated cement plant (Phase-I & II) will be 1.10 MTPA and CPP (Phase-I & II) will be about 0.97 MTPA which will be sourced from Singereni Collieries Company Limited (SCCL) alternatively imported coal will be used. The average GCV coal as <3800 Kcal/kg.

**Steam Turbine and Auxiliaries**

The steam turbines would be single casing, non-reheat, and regenerative, condenser type. The turbine is rated for 50 MW with rated steam inlet condition of 515±3°C and 0.2 at a condenser backpressure with associated feed water heaters in service. The turbine would be complete with all the accessories customarily supplied, by the manufacturers such as governing and protection system, turbine oil system its auxiliaries, turbine gland seal system, turning gear, supervisory and operating instruments with all necessary indicating and control devices to permit the unit to be replaced on turning gear, rolled, accelerated and synchronized from the central control room.

**b) Steam Generator (Boiler)**

The Steam Generator (Boiler) are of Circulating Fluidized Bed Combustion (CFBC), which is well-established mode of burning fuels, which permit the solids to escape from the combustor with the flue gas but then capturing them in external spacing device. The carried-over bed material and un-burnt fuel particles are returned to the bottom of combustor vessel. It has been proposed CFBC boilers for CPP with steam generation capacity of 210 TPH capacity attached to 50 MW capacity Turbo generator set respectively

**c) Coal Handling System**

Required coal will be received at site through railway siding by railway wagons. Crushed coal at the intermediate coal bunker from where a reclaim hopper and other series of proposed conveyors, crusher and screens would feed coal to proposed boiler.

**d) Ash Handling System**

Ash Handling Plant (AHP) design would be based on the worst coal quality and maximum ash content and the bottom ash and fly ash equipment parameters would be guided by the following:

The ash handling system will include the collection of ash in various ash hoppers and transportation of both bottom and fly ash to storage silos by pneumatic pressure conveying. CFBC boiler consists of following hoppers for collection of ash:

i) Bottom ash hoppers with ash coolers;

ii) Economizer hopper for fly ash;

iii) Air heaters hopper for fly ash; and

iv) ESP hoppers for fly ash.

The bottom ash, which will be at a temperature of 200C after bottom ash coolers of the boiler, is conveyed to bottom ash silo with the help of scrapper conveyor or dense phase system.

The fly ash from the ESP and economizer hoppers is conveyed by installing dense phase pneumatic ash handling system to fly ash silo. From the fly ash silo, fly ash is being transferred to the cement plant for PPC production. Total fly ash generated in the captive power plant is being utilized in the cement plant for producing PPC. A separate silo near the cement mill will be constructed for storage of fly ash.

The bottom ash collected will be sent to the bottom ash silo from where it will be suitably utilized for manufacturing of PPC.

**e) Ash Disposal**

The CPP would generate ash about 0.339 MTPA. Entire ash generated at CPP will be 100% utilized by the cement plant. Thus, at any point of time, there will not be any disposal or stacking of the fly ash.

The flow chart showing the process in captive power plant is shown in **Figure - 2.8** and energy balance is given in **Figure - 2.9.**

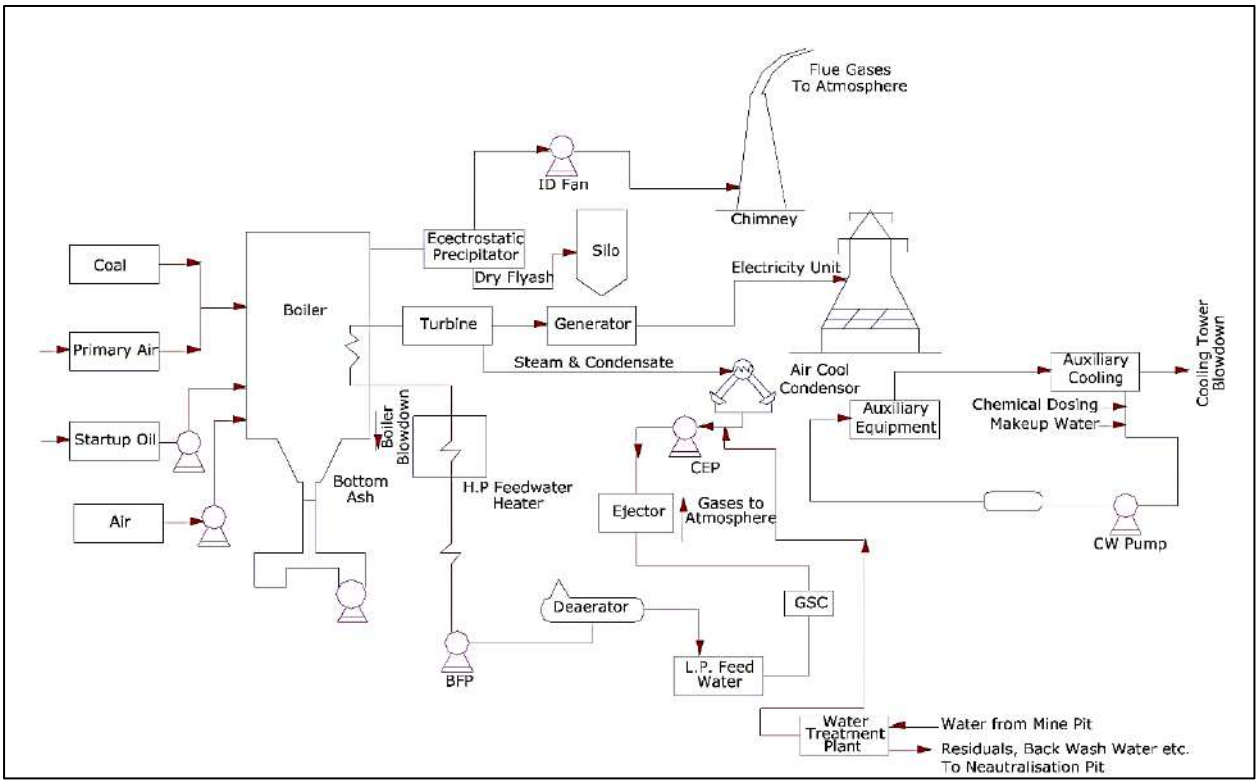



**Figure 2.8: Flow chart showing the process in captive power plant**

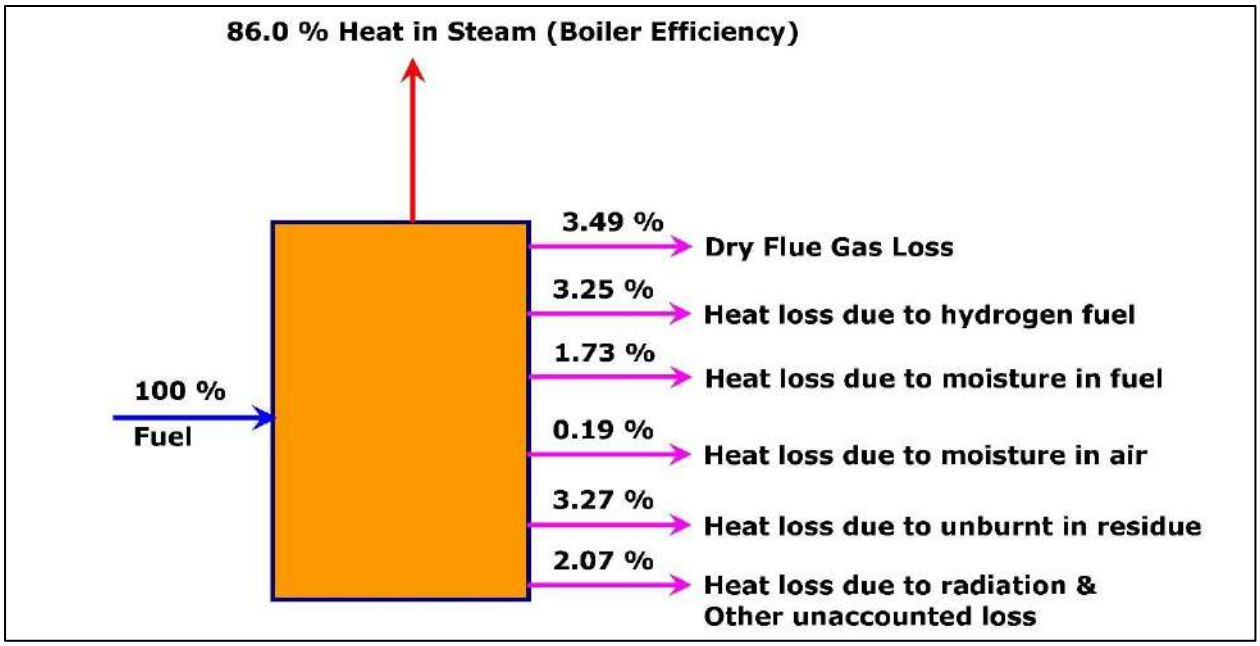



**Figure 2.9: Energy balance**

**f) Fire Protection System**

Hydrant system is proposed for the interior and exterior of the station building, the boiler platforms, the bunker area, the electrostatic precipitator area, coal handling area, ash-handling area, WT plant and CW pump house. An automatic high velocity water spray system is proposed for the various transformers and turbine oil tanks. Automatic sprinkler system and fire detection system is proposed for the Coal conveyor. Portable hand appliances are proposed for extinguishing small fires in the selected areas of the plant.

**g) Air Cooled Condensers**

Air-cooled condenser will be considered for condenser cooling system. The air- cooled condenser will have number of modules with each module having tube bundles. The tubes will be have finned type either of aluminum or carbon steel galvanized material. All necessary indicating and control instruments will be provided for operation of the turbine generators. The control panels will be located in the main plant control room at powerhouse building operating floor. Installation of Air-cooled condenser reduces the precious water requirement to a great extent.

**h) Power Plant Control**

The control system of the proposed power plant will be through Distributed Digital Control Systems (DCS). This control system will utilize the state-of-the-art technology so as to offer higher reliability, flexibility and availability

## 2.8 OTHER PROJECT ASSOCIATED ACTIVITIES

### 2.8.1 Waste Heat Recovery System (WHRS)

M/s. ACC Limited is also proposing to install Waste Heat Recovery System (WHRS) of 25 MW (Phase I: 12.5 MW & Phase II: 12.5 MW) for re-utilization of the exhaust gases from the Pre-heater & Cooler to generate electric power and consequently reduce consumption of grid power. The project will

contribute to the more efficient use of energy and will reduce reliance on exhaustible fossil fuel.

**Technology Description of WHRS**

In the cement plant, WHRS will consist of two waste heat recovery boilers viz.

- Pre-Heater (PH) boiler: PH boiler will be installed after Pre-Heater and recovers heat from Pre-Heater exhaust gases.
- Clinker Cooler (AQC) boiler: Clinker cooler or Air Quenching cooler (AQC) boiler will be installed after Clinker cooler and recovers heat from Clinker cooler exhaust gases.

The PH boiler will be a vertical configuration single drum boiler. AQC boiler will be vertical single drum boiler. Both the boilers are top supported, outdoor unit suitable for the specified Pre-heater and clinker cooler exhaust of cement plant.

The waste heat coming out of Pre-heater and cooler will be used in Waste Heat Recovery System to produce low pressure steam which is fed to turbine to produce power of 25 MW.

Process flow chart is shown in Figure 2.10:

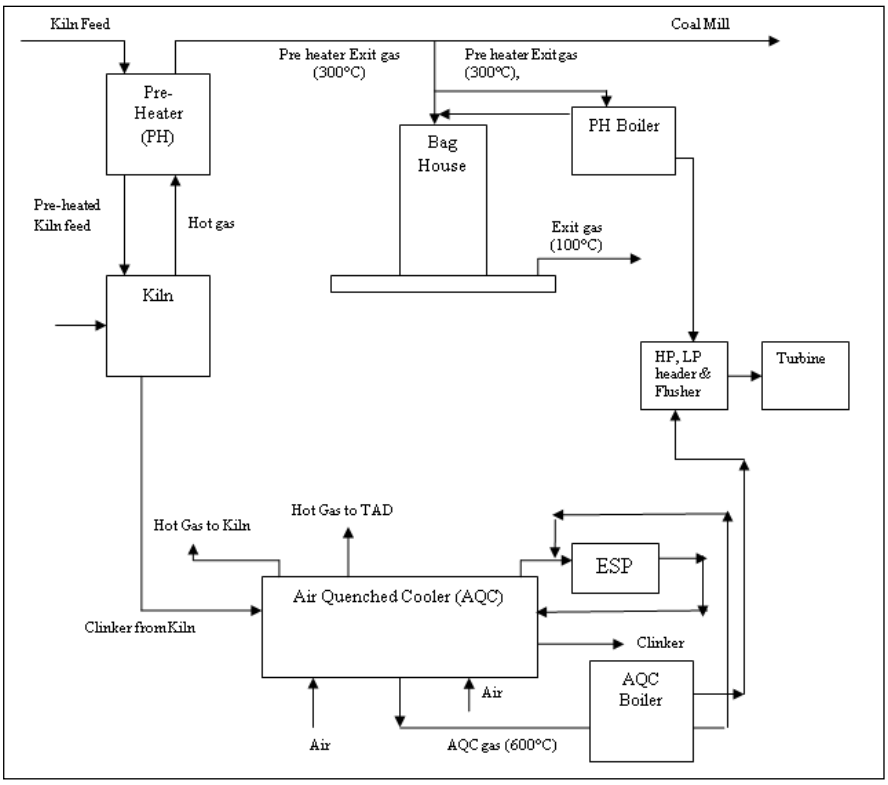



**Figure 2.10: Process Flow Diagram for WHRS**

***Process Description of Waste Heat Recovery System:***

- ***Flue Gas Circuit:***

***For Pre-Heater (PH) Boiler***

The flue gas, at 280°C from the top of the Pre-heater will enter the boiler and after entering boiler the temperature of the flue gas will be 150°C, which will be used for drying of raw material in Raw Mill. When the boiler will be in shut down the flue gas will enter the Bag house / ESP.

***General Description of PH Boiler***

PH boiler is a waste heat recovery boiler which uses waste heat from cement kiln pre-heater at about 280°C. In order to improve the utilization of waste heat boiler, dual pressure system is adopted. It is an outdoor, vertical, U- type arranged boiler. The boiler structure is compact. The flue gas path is as follows:

- High-pressure super heater
- Three stage high-pressure evaporator
- High-pressure economizer
- Two stage low-pressure evaporator
- Low-pressure super heater
- Low-pressure economizer

Each heating surface has a vibration dust removal device and dust evenly discharges out of boiler bottom along with the air.

***Mechanical Rapping System***

Due to high ash content in the flue gas, the boiler is equipped with a mechanical rapping system. Every tube bank is equipped with 4 unit's mechanical rapping system. Each group has one motor to drive all 4 units, which are connected together with connecting rods. The rapping frequency is 3 times per minute. The impact force is approx. 1500 N. For better regulation, the user can also reset the transducer drive controls of the motor, thereby regulating the frequency of rapping.

The mechanical rapping system is a key component of this boiler. Each group of rapping devices can be individually controlled. Shut-down for maintenance of one group of rapping devices does not affect other groups. The rapping devices are equipped with removable doorframes, to facilitate easy repair and maintenance.

- ***For AQC Boiler***

The flue gas, at 395°C, from the mid tap of the AQC will enter the boiler and after boiler the temperature of the flue gas will be 100°C, which will be used / rejected in Atmosphere through ESP Fan. In this load on cooler ESP will be on lower side. The balance in Final will be maintained by control dampers in AQC WHRB and ESP inlet duct. When the boiler will be in shut down the flue gas will enter the ESP and after ESP the same circuit will be followed.

***General Description of AQC Boiler***

The AQC boiler adopts a dual pressures system. This Dual pressure system improves the utilization efficiency of waste heat. It adopts tube box type of construction. From the top to the bottom, the arrangements of tube boxes are as follows:

- High-pressure segment high temperature super-heater tube box
- High-pressure segment low temperature super-heater tube box
- High-pressure segment evaporator tube box I
- High-pressure segment evaporator tube box II

- High-pressure segment economizer
- Low-pressure segment super heater tube box
- Low-pressure segment evaporator tube box
- Common economizer
- Low-pressure segment economizer tube box.

All the tube boxes transfer their own weight to the beam steel structure through their base. The tube box type of construction reduces the air leakage to a minimum, reduces the heat loss of air leakage, improves boiler efficiency, and reduces the workload at site. The AQC boiler heating surface adopts special shaped heat exchanger components in the form of spiral fin tubes, which, due to the nature and characteristics of AQC waste gas, results in better anti-wear and anti-deposition.

***Casing, Flue Gas Duct and Boiler Wall***

The outer casing of the Boiler tube boxes and flue gas ducts are built outside of insulation layer to protect the insulation. All the outer surfaces of the Boiler are installed with colored plates. The color is chosen by customer, ensuring the boiler is aesthetic, to the Customers' taste and harmonic with the surrounding environment.

***Condensate Circuit***

In this system condensate from Condensate Extraction Pump (CEP) will be transferred into the water pre-heater in AQC WHRB then WHRB separate De-aerator. After De-aerator the condensate will enter the Boilers through Boiler Feed Pump.

***Steam Circuit***

The combined generated steam will be used to generate electricity from the steam turbine with Air cooled condenser.

***Auxiliary Cooling Water and DM Water***

Requirement of Auxiliary cooling water and DM water will be fulfilled.

Based on experience and technical studies carried out by the company for similar product configurations, the optimum power which can be generated through heat recovery system from kiln is 25 MW. However, during our detail engineering, possibility for any further increase in generating capacity will be explored.

- **Benefits of Waste Heat Recovery**

Benefits of 'waste heat recovery' can be broadly classified in two categories:

1. **Direct Benefits:**

Recovery of waste heat has a direct effect on the efficiency of the process. This is reflected by reduction in the utility consumption & costs, and process cost.

2. **Indirect Benefits:**

- Reduction in equipment sizes: Waste heat recovery reduces the fuel consumption, which leads

to reduction in the flue gas produced. This results in reduction in equipment sizes of all flue gas handling Equipment such as fans, stacks, ducts, burners, etc.

- Reduction in auxiliary energy consumption: Reduction in equipment sizes gives additional benefits in the form of reduction in auxiliary energy consumption like electricity for fans, pumps etc.

### 2.8.2 Sewage Treatment Plant

The sewage treatment plant (STP) of 300 KLD in Plant will be installed for treatment of Domestic waste - water generated from Plant. The treatment given to the influent in the STP will be both chemical and biological.

**Process description of STP plant:**

**Screen:**

Screen is mechanical filter used to remove large objects from wastewater. The Sewage is first allowed to pass through screen chamber where heavy waste, floating materials are trapped. Due to this blockage or choking of downstream equipment's is avoided.

**Equalization:**

The sewage from the bar screen chamber, grit trap and oil & grease striper comes to the equalization tank. It is first collection tank of the STP, it acts as buffer: to collect the incoming raw sewage that comes at widely fluctuating rates, and pass it on to the rest of the STP at a constant flow rate.

**Biological Treatment:**

The equalized sewage is passed into the MBBR tank. The bulk of the treatment is provided here, employing microbes/bacteria for the process, where BOD and COD treatments are enhanced. Oxygen is supplied by means of diffused aeration system. The components of the aeration tank are mixed completely. For higher surface area for microorganisms, floating media (MBBR) is provided on which their growth takes place. The MBBR process works on the principle of attached growth system and uses rotating bio-media to retain an active biomass to reduce the influent BOD levels.

**Sludge Settling:**

The bio treated waste water passed through the settling tank, where the biomass gets settle at the bottom and the clear water overflows from the top of settling tank for filtration. Settled sludge has been pumped periodically.

**Membrane diffuser:**

**Dual Media Filter (DMF):** The treated sewage is passed to Dual Media Filter (DMF) for removing of turbidity, suspended solids and Odour of treated sewage. Dual media filters provide very efficient particle removal under the conditions of high filtration rate.

**Activated Carbon Filter (ACF):** It receives the water that is already filtered by the Pressure Sand Filter and improves the multiple quality parameters of the water like BOD, COD, turbidity, color and odor.

**Softener:** After filtration water is passed through Softener to reduce total hardness.

**Disinfection:** The treated water is then disinfected using Sodium hypochlorite (NaOCl) to kill and render harmless disease-causing organisms, such as bacteria, viruses, etc. Sodium Hypochlorite is dosed for disinfection of the treated water.

Finally, the treated water will be collected in the treated water tank for further uses in greenbelt development & plantation and gardening activities. The schematic diagram for sewage treatment plant has been shown in Figure - 2.11.

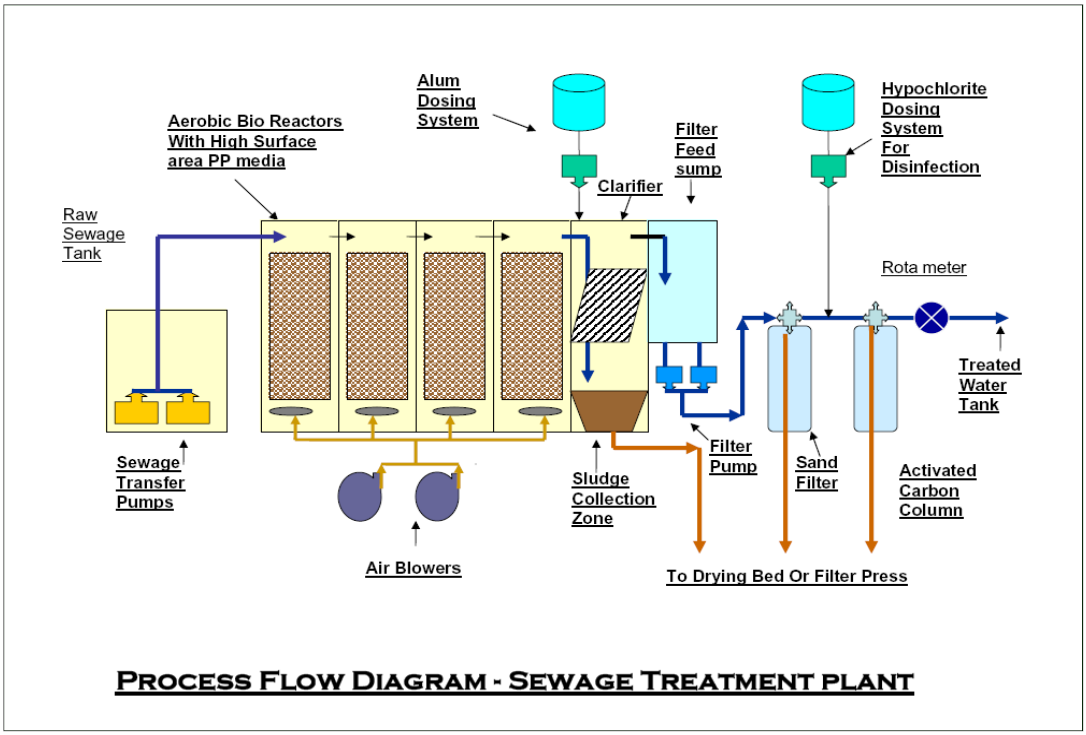



**Figure 2.11: Schematic Diagram for Sewage Treatment Plant**

**Table - 2.15**

***Expected Waste Water Characteristics of STP***

| S. No. | Parameters | Unit | Raw sewage quality | Expected Quality of Treated Sewage |
|---|---|---|---|---|
| 1. | pH | - | 7.5 - 8.5 | 6.5 - 9.0 |
| 2. | BOD | mg/L | 300 - 350 | < 10 |
| 3. | COD | mg/L | 500 - 550 | < 100 |
| 4. | Total Coliform | MPN/100 ml | $10^6$ | $10^3$ |
| 5. | TSS | mg/L | 300 | <80 |
| 6. | Oil & grease | mg/L | 20 - 30 | <5 |
| 7. | Total Coliform | MPN/100 ml | $10^6$ | $<10^3$ |

### 2.8.3 Water Treatment Process Description (Reverse Osmosis)

The reverse osmosis of capacity process consists of three main steps: (1) Pre-treatment, (2) Membrane Assembly System and (3) post-treatment.

***Pre-treatment***

The purpose of the pre-treatment step is to avoid any risk of clogging, fouling or scaling of the

membrane. Pre-treatment is an important aspect of RO system. All RO devices require pre-treatment to remove the suspended solids, scalants, foulants and colloidal matter. In the pre-treatment system, some chemicals are usually used before the filtration step. Chlorine is often injected to disinfect feed water. Sodium Meta bisulphate is used to dechlorinate the feed water. Ferric chloride, alum or polymers are the typical coagulants used at the pre-filter stage. In the filtration stage, a gravity filter with different sand particle sizes is used. Then a fine cartridge filter is used after the sand filtration. For ground water treatment, Hydrochloric acid and sodium hexameta phosphate (SHMP) is often used to prevent carbonate scale. The exact dosage of each chemical depends on the chemical analysis of the feed water.

***Membrane Assembly System***

Several types of RO membranes are commercially available. These are prepared either as flat sheet or as hollow fibers made from cellulose acetate (CA) ester or polyamide (PA). There are different ways of packing RO membranes. Of these, three configurations have been produced commercially: tubular, spiral wound (SW) and hollow fine fibre (HFF). Hollow fine fibre and spiral wound modules have proved to be appropriate for several types of raw water in RO desalination systems. Spiral wound has found many applications in the wastewater reclamation. The success of the spiral-bound device has been related to the capability to package a relatively large amount of membrane surface area into a relatively small element while maintaining a certain degree of "cleavability", which, of course, is particularly important for wastewater processes.

***Post-treatment***

In the post-treatment step, product water passes through a de-carbonation system, a pH adjustment system and water passing through UV light. Generally, Sodium Carbonate (Food Grade) is added to the product water to adjust its alkalinity. The purpose of passing the water through UV is to eliminate the presence of microorganisms during storage and distribution.

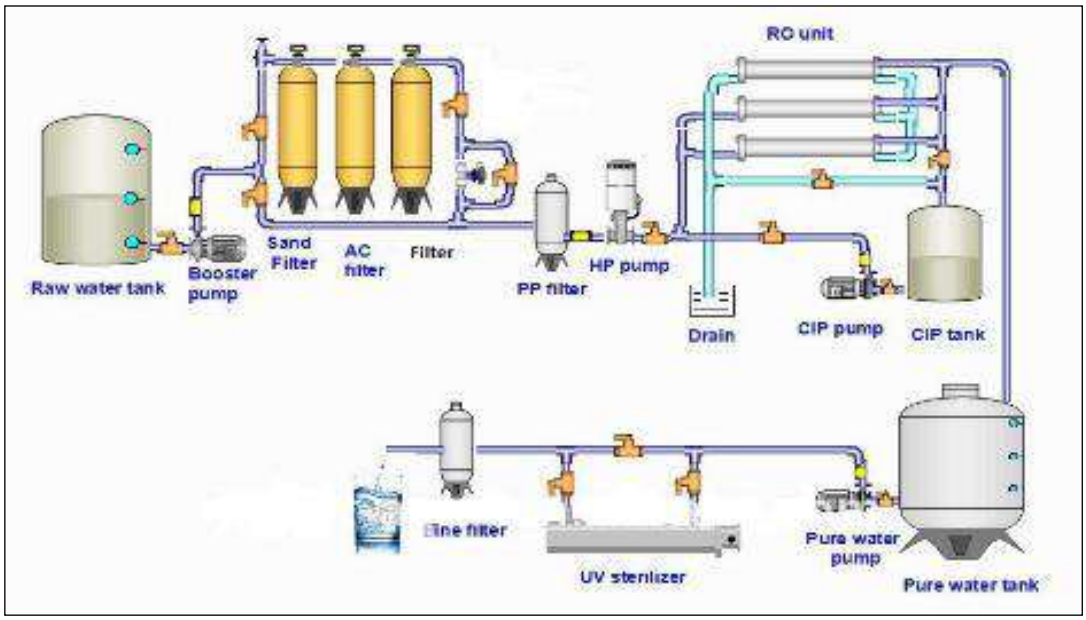



**Figure 2.12: Schematic Diagram for Reverse Osmosis**

## 2.9 DETAILS OF PROPOSED MAJOR EQUIPMENTS & MACHINERIES

### 2.9.1 Equipment Selection

In selecting a particular type of equipment or storage for the project, among others, the following issues have been considered:

- Equipment costs
- Energy consumption
- Raw materials characteristics
- Sizes in which the equipment is available
- Lead times for particular types of equipment
- Operating experience with various types of equipment
- Ease of operation of equipment
- Product to be manufactured
- Site conditions
- Local skills available
- Environmental issues.

### 2.9.2 Plant and Equipment Sizing

Details reg. Proposed Plant and equipment sizing are given in Table - 2.16

**Table - 2.16**

**Proposed Equipment Details of Cement Plant, WHRS, CPP**

| Sr. No. | Department | Capacity (TPH) | | Type |
|---|---|---|---|---|
| | | Phase-I | Phase-II | |
| Cement Plant | | | | |
| 1 | Limestone Crusher | 1500 | 1500 | Impactor |
| 2 | Limestone stacker | (1x 1800) | (1x 1800) | Luffing type |
| 3 | Limestone Reclaimer | (1 x 825) | (1 x 825) | Bridge type |
| 4 | Raw mill | (2 x 340) | (2 x 340) | Vertical Roller Mill / Roller Press |
| 5 | Coal crusher | 1 x 1875 | 1 x 1875 | Common for all materials received through wagons |
| 6 | Coal stacker | (1 x 1875) | (1 x 1875) | Luffing |
| 7 | Coal reclaimer | (1 x 150) | (1 x 150) | Scrapper |
| 9 | Coal mill | (1 x 80) based on coal | (1 x 80) based on coal | Vertical Roller Mill (coal & Petcoke) |
| 10 | Rotary Kiln and Preheater | 8100 TPD | 8100 TPD | Dry process twin string 6 stage |
| 11 | Clinker cooler | 8100 TPD | 8100 TPD | High Efficiency Cooler |
| 12 | Cement grinding | (3 x 220) | (3 x 220) | (VRM / RP + Ball Mill) |
| 13 | Packing Plant | (5 x 240) | (5 x 240) | Rotary packer |

| Sr. No. | Department | Capacity (TPH) | | Type |
|---|---|---|---|---|
| | | Phase-I | Phase-II | |
| 14 | Truck Loaders | 8 x 120 | 8 x 120 | Auto truck loaders |
| 15 | Wagon Loaders | 16 x 120 | | |
| 16 | CPP Turbine | 50 MW | 50 MW | - |
| 17 | Waste Heat Recovery Boilers with pre-heaters and Clinker Cooler | 12.5 MW | 12.5 MW | - |

### 2.9.3 Storage Facilities

Details regarding proposed storage facilities of raw material & product are given below in Table 2.17.

**Table - 2.17**

**Proposed Storage Facilities**

| S. No. | Particulars | Type of Storage | Proposed Capacity (Tonnes) |
|---|---|---|---|
| 1. | Limestone | Covered Stockpile | 2 x 1,50,000 |
| 2. | Clay | | 2 x 10,000 |
| 3. | Bauxite | | 2 x 5,000 |
| 4. | Iron ore | | |
| 5. | Coal and Petcoke | Covered Shed | 2 x 35,000 |
| 6. | Gypsum | | 2 x 10,000 |
| 8. | Raw Meal | Silo | 1 x 50,000 |
| 9. | Clinker | | 2 x 50,000 |
| 10. | Fly Ash | | 4 x 8,000 |
| 11. | Cement | | 6 x 10,000 |

### 2.9.4 Air Pollution Control Equipment's

**Table - 2.18**

**Proposed control equipment (Cement Plant & CPP)**

| S. No. | Plant Equipment | Type of APCEs | Air Pollution Control Equipments | |
|---|---|---|---|---|
| | | | Phase - I (Numbers) | Phase - II (Numbers) |
| 1. | Raw Mill / Kiln | Bag House | 1 | 1 |
| 2. | Clinker Cooler | ESP | 1 | 1 |
| 3. | Coal Mill | Bag House | 1 | 1 |
| 4. | Cement Mill | Bag House | 1 | 1 |
| 5. | CPP Boiler | ESP | 1 | 1 |
| 6. | Transfer Points | Bag Filters | 110 | 58 |

**Bag House Specifications -**

| Description | Raw Mill-1 BH | Raw Mill-2 BH | Coal Mill-1 BH | Coal Mill -2 BH | Cement Mill -1 BH | Cement Mill -2 BH |
|---|---|---|---|---|---|---|
| Type of cleaning | Pulsjet | Pulsjet | Pulsjet | Pulsjet | Pulsjet | Pulsjet |
| Gas volume (m3/h) | 1500000 | 1500000 | 320000 | 320000 | 740000 | 740000 |
| Temperature of gas (°C) | 240 | 240 | 90 | 90 | 120 | 120 |
| Bag filter Inlet pressure (mmWG) | -50/-100 | -50/-100 | -800 | -800 | -650 | -650 |
| Bag filter design pressure (mmWG) | ± 500 | ± 500 | -1500/+2000 | -1500/+2000 | ± 1000 | ± 1000 |
| No. of compartments (Nos) | As per OEM | As per OEM | As per OEM | As per OEM | As per OEM | As per OEM |
| No. of bags per compartment (Nos) | As per OEM | As per OEM | As per OEM | As per OEM | As per OEM | As per OEM |
| Total No. of bags (Nos) | 6220 | 6220 | 2120 | 2120 | 3072 | 3072 |
| Collection area (m2) | 25000 | 25000 | 5350 | 5350 | 12350 | 12350 |
| Air to cloth ratio (m3/min/m2) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Bag dimensions:<br>Diameter, Length, filtration area | 160 mm x 8000 mm, 4.02 m2 | 160 mm x 8000 mm, 4.02 m2 | 160 mm x 5000mm 2.513 m2 | 160 mm x 5000mm 2.513 m2 | 160 mm x 8000 mm, 4.02 m2 | 160 mm x 8000 mm, 4.02 m2 |
| Type of filter cloth | PTFE laminated Glass bag | PTFE laminated Glass bag | PAN bags | PAN bags | Polyester needle felt /PAN | Polyester needle felt /PAN |
| Weight of filter cloth (gm/m2) | 550 | 550 | 550 | 550 | 550 | 550 |
| No. & Size of solenoid valves | As per OEM | As per OEM | As per OEM | As per OEM | As per OEM | As per OEM |
| Inlet dust concentration (gm/m3) | 100 | 100 | 400 | 400 | 400-450 | 400-450 |
| Outlet dust concentration (mg/Nm3) | 30 | 30 | 30 | 30 | 30 | 30 |
| Dust collection efficiency (%) | 99.97 % | 99.97 % | 99.99 % | 99.99 % | 99.99 % | 99.99 % |

**ESP Specifications -**

| S. No. | Particulars | Details | | | |
|---|---|---|---|---|---|
| | | **Clinker Cooler - 1 ESP** | **Clinker Cooler - 2 ESP** | **CPP Boiler -1 ESP** | **CPP Boiler-2 ESP** |
| 1. | Design volume ($m^3$/hr) | 1250000 | 1250000 | 350000 | 350000 |
| 2. | Design temp. ($^oC$) | 350 | 350 | 160 | 160 |
| 3. | Collection area (Sq.m) | 26000 | 26000 | 11500 | 11500 |
| 4. | Number of fields (No. s) | 4 | 4 | 5 | 5 |
| 5. | Residence time (Sec.) | 20 | 20 | 25 | 25 |
| 6. | Inlet dust concentration (gm/$Nm^3$) | 30 | 30 | 150 | 150 |
| 7. | Outlet dust concentration (mg/$Nm^3$) | 30 | 30 | 30 | 30 |
| 8. | Dust collection efficiency (%) | 99.90 | 99.90 | 99.98 | 99.98 |

## 2.10 INFRASTRUCTURE FACILITIES

The proposed infrastructure facilities will be located within / close proximity of the Industrial area (Processing).

### *(i)* ***Construction Phase-*** **Facilities for Construction labors:**

All the workers will be housed in labour colony to be built by respective contractor, which will be located near the project site. The colony which will be temporary in nature will have the following amenities:

- Drinking water facility – Drinking water will be supplied through water tankers/community taps;
- Community kitchen will be provided by contractor for the workers;
- Sanitation facilities will be constructed which will include the adequate number of separate toilets for men and women. The make shift treatment plant will be
- Installed and treated wastewater will be utilized in greenbelt development;
- Bins will be installed to collect municipal waste from the colony;
- Small playground and child care centers will be developed in the colony;
- Fuel (kerosene/LPG) will be supplied to the labours for cooking to prevent tree felling.
- Medical facilities with first aid, pre medical visiting facilities & transportation facilities as required

## 2.11 DESCRIPTION OF MITIGATION MEASURES

The mitigation measures given in this section will be for management of the emissions, effluents, solid and hazardous waste generation from the plant to meet the environmental standards and environmental operating conditions. Detailed Mitigation measures are also given in chapter -4 & 10 of Final EIA/EMP report.

### 2.11.1 Details of Emissions from the Proposed Plant and their mitigation measure:

| Emissions | Source | | Proposed Mitigation measures |
|---|---|---|---|
| | **Plant Unit** | **Section** | |
| PM | Cement Plant | Raw Mill & Kiln | Bag House (2nos.) |
| | | Coal Mill | Bag house |
| | | Clinker Cooler | ESP |
| | | Cement Mill | Bag house |
| | CPP | CPP Boiler | ESP |
| $SO_2$ | Cement Plant | Raw Mill & Kiln | Due to the interaction of raw materials and kiln gases, rotary kiln systems have inherent SO2 removal efficiencies ranging between 40-99% of the Sulphur input to the system. |
| | CPP | CPP Boiler | o Installation of boiler<br>o Lime dozing in boiler.<br>o Stack height (as per CPCB guidelines) will be provided |
| $NO_x$ | Cement Plant | Raw Mill & Kiln | o Low NOx burners / De $NO_x$ will be used<br>o Incline Calciner for low $NO_x$<br>o formation<br>o Installation of analyzer at the inlet of kiln to monitor & control O2 & $NO_x$ |
| | CPP | CPP Boiler | o Boiler improved combustion efficiency<br>o Stack height (as per CPCB guidelines) will be provided |
| Fugitive Emission | Cement Plant & CPP | Raw Material Handling & Storage | o Bag filters (168 nos.) at various material handling & transfer points will be provided.<br>o Clinker, fly ash and Cement will be stored in the silos<br>o Gypsum, Coal and Petcoke will be stored in the covered storage yard<br>o Greenbelt will be developed around/ within the premises of the plant site to control the fugitive emissions.<br>o Unloading of trucks and railway wagons will be carried out with proper care avoiding dropping of the materials from height.<br>o Sprinkling of water will be done along the internal roads in the plant in order to control the dust arising due to the movement of vehicles<br>o Only PUC certified vehicles will be allowed inside the plant premises.<br>o Proper maintenance of vehicles will be done to reduce gaseous emissions<br>o All the movement area will be concreted.<br>o Vacuum sweeping machine (1 large & 2 small) for better housekeeping will be used.<br>o Greenbelt development & plantation will be done in 42.65 % of the total project area in and around the plant boundary and avenue plantation to attenuate air pollution.<br>o Preference to rail transportation. |
| | | Transportation activity | |

### 2.11.2 Stack Emissions & Control Technologies

To keep the PM emissions from stack below 30 mg/Nm$^3$, all major sources of air pollution (i.e., Raw Mill & kiln, Clinker cooler, Coal Mill, Cement mill, CPP Boiler) will be provided with requisite Air Pollution Control Equipment's such as Bag House, Bag filters & ESP.

***A. Material Transfer***

Dust will be generated from all the transfer points of belt conveyors. This will be controlled by providing bag filters at all material transfer points. Details of the proposed bag filters are given in table 2.19 below:

**Table - 2.19 (a)**
**List of Bag Dust Collectors (Pyro-Section)**

| S. No. | Application | | Material | Qty. |
|---|---|---|---|---|
| **A** | **Bag House & ESP** | | | |
| 1 | Clinker Cooler ESP (Electrostatic precipitator) | | Clinker dust | 1 |
| 2 | Raw mill Bag House | | LS Dust | 1 |
| 3 | Coal Mill Bag House | | Coal Dust | 1 |
| **B** | **Bag Filter for Plant** | | | |
| **a** | **Limestone / Kiln Feed** | | | |
| 1 | Primary Crusher | At Primary crusher house | LS Dust | 1 |
| 2 | Secondary crusher | At Secondary crusher house | LS Dust | 1 |
| 3 | Screening system | At vibrating screen | LS Dust | 1 |
| 4 | Reject Hopper | At lime stone reject hopper | LS Dust | 1 |
| 5 | Transfer tower | Limestone Belt Conveyor to Stacker | LS Dust | 4 |
| 6 | Transfer tower | Limestone Reclaimer Belt Conveyor | LS Dust | 1 |
| 7 | Transfer tower | Limestone Belt Conveyor to Raw mill hopper | LS Dust | 1 |
| 8 | Raw mill hopper | At Raw mill hopper top | LS Dust | 1 |
| 9 | Raw mill hopper Extraction | At Raw mill hopper Extraction | LS Dust | 1 |
| 10 | Transfer tower | Raw mill hopper extraction to Raw mill | LS Dust | 1 |
| 11 | Raw Mill - Recirculation | At Raw mill reject building | LS Dust | 1 |
| 12 | | At Reject hopper (40 T) | LS Dust | 1 |
| 13 | Raw mill transport | At Cyclone Building | LS Dust | 1 |
| 14 | | At silo BE boot, AS, Kiln feed bin BE boot and CC from RABH | LS Dust | 1 |
| 15 | Blending silo | At silo Top | LS Dust | 1 |
| 16 | Blending silo | At control bin | LS Dust | 1 |
| 17 | Kiln feed bin | For Kiln Feed Bin | LS Dust | 1 |
| 18 | Preheater | Preheater Building Top | LS Dust | 2 |
| **b** | **Laterite** | | | |
| 19 | Bulk Receiving Unit | Laterite Bulk Receiving Unit | Laterite Dust | 1 |
| 20 | Transfer tower | Before stockpile | Laterite Dust | 1 |
| 21 | Transfer tower | Between stockpile and laterite hopper | Laterite Dust | 1 |
| 22 | Hopper | Bag filter at Laterite Hopper | Laterite Dust | 1 |
| **c** | **Coal** | | | |

| S. No. | Application | | Material | Qty. |
|---|---|---|---|---|
| 23 | Coal Bulk Receiving Unit | Coal dump hopper | Coal Dust | 2 |
| 24 | Transfer tower | At TT after Bulk Receiving Unit | Coal Dust | 1 |
| 25 | Transfer tower | At TT before stockpile | Coal Dust | 1 |
| 26 | Transfer tower | At TT after coal stockpile | Coal Dust | 1 |
| 27 | Transfer tower | At TT after coal stockpile | Coal Dust | 1 |
| 28 | Transfer tower | At TT before Coal mill | Coal Dust | 1 |
| 29 | Coal Mill Hopper Top | Raw coal hopper | Coal Dust | 1 |
| 30 | At Fine coal Storage | Fine coal hopper | Coal Dust | 1 |
| **d** | **Clinker tank extraction & Clinker Loading** | | | |
| 31 | Clinker tank -1 top | At Top of the clinker tank-1 | Clinker Dust | 1 |
| 32 | Clinker tank -2 top | At Top of the clinker tank-2 | Clinker Dust | 1 |
| 33 | Clinker tank -3 top | At Top of the clinker tank-3 | Clinker Dust | 1 |
| 34 | Clinker tank-1 extraction head end | Bag filter for clinker Extraction at head clinker silo-1 | Clinker Dust | 3 |
| 35 | Clinker tank-1 extraction middle end | Bag filter for clinker Extraction at middle clinker silo-1 | Clinker Dust | 3 |
| 36 | Clinker tank-1 extraction tail end | Bag filter for clinker Extraction at Tail clinker silo-1 | Clinker Dust | 3 |
| 37 | Clinker tank-2 extraction head end | Bag filter for clinker Extraction at head clinker silo-2 | Clinker Dust | 3 |
| 38 | Clinker tank-2 extraction middle end | Bag filter for clinker Extraction at middle clinker silo-2 | Clinker Dust | 3 |
| 39 | Clinker tank-2 extraction tail end | Bag filter for clinker Extraction at Tail clinker silo-2 | Clinker Dust | 3 |
| 40 | Clinker tank-3 extraction head end | Bag filter for clinker Extraction at head clinker silo-3 | Clinker Dust | 3 |
| 41 | Clinker tank-3 extraction middle end | Bag filter for clinker Extraction at middle clinker silo-3 | Clinker Dust | 3 |
| 42 | Clinker tank-3 extraction tail end | Bag filter for clinker Extraction at Tail clinker silo-3 | Clinker Dust | 3 |
| 43 | Transfer tower | Before clinker hopper feeding | Clinker Dust | 1 |
| 44 | Transfer tower | Before clinker truck loading hopper | Clinker Dust | 1 |
| 45 | At Clinker TL hopper | At Clinker truck loading hopper | Clinker Dust | 1 |
| 46 | Truck loading | Bag Filter for Clinker Truck Loading | Clinker Dust | 7 |
| **Total Quantity** | | | | **75** |

**Table - 2.19 (b)**
**List of Bag Dust Collectors in Grinding Section**

| S. No. | Application | Material | Quantity each Grinding Section | Total Quantity |
|---|---|---|---|---|
| **A** | **Bag House** | | | |
| 1 | Cement Mill Bag House | Cement Dust | 1 | 2 |

| S. No. | Application | | Material | Quantity each Grinding Section | Total Quantity |
|---|---|---|---|---|---|
| **B** | **Bag Filter for Plant** | | | | |
| **a** | **Clinker Transport & Grinding** | | | | |
| 1 | Clinker hopper | Bag Filter for Clinker Hopper 1 & 2 | Clinker Dust | 1 | 2 |
| 2 | Mill hopper extraction | For Hopper Extraction Weigh Feeders | Clinker Dust | 1 | 2 |
| 3 | | For Hopper Extraction Weigh Feeders | Gypsum/Gitty | 1 | 2 |
| 5 | Mill Recirculation | Mill Recirculation | Clinker Dust | 1 | 2 |
| 6 | Mill Reject circuit | Mill Reject circuit | Clinker Dust | 1 | 2 |
| **b** | **Coal** | | | | |
| 7 | Hot Air Generator (HAG) Coal Bin & Crusher | At 100 T bin top | Coal dust | 1 | 2 |
| 8 | HAG building | At screen and coal recirculation | Coal dust | 1 | 2 |
| 9 | HAG building | At building top | Coal dust | 1 | 2 |
| **c** | **Dry Fly ash Handling** | | | | |
| 10 | Dump hopper | Fly ash Truck unloader | Fly ash | 2 | 4 |
| 11 | Fly ash unloading Bin | Fly ash Pneumatic unloading | Fly ash | 1 | 2 |
| 12 | Transfer tower | Dry Fly ash Elevator at HTU | Fly ash | 1 | 2 |
| 13 | Transfer tower | At Transfer tower from HTU to Fly ash silo | Fly ash | 1 | 2 |
| 14 | Elevator bottom | Dry Fly ash Silo Feeding | Fly ash | 1 | 2 |
| 15 | Fly ash silo top | Dry Fly ash Silo venting | Fly ash | 1 | 2 |
| 16 | Fly ash silo inside | Dry Fly ash Silo venting | Fly ash | 1 | 2 |
| 17 | Fly ash extraction elevator | Dry Fly ash Silo Extraction | Fly ash | 1 | 2 |
| **d** | **Gypsum Handling** | | | | |
| 18 | Dump hopper | Bag filter at Gypsum Dump Hopper | Gypsum Dust | 1 | 2 |
| 19 | Transfer tower | Before gypsum feed hopper | Gypsum Dust | 1 | 2 |
| 20 | Cement mill- Gypsum Hopper | Gypsum/ Pond ash hopper top | Gypsum Dust | 1 | 2 |
| **e** | **Cement transport, storage & Packing** | | | | |
| 21 | Bag House Transport | Bag House Transport Air slide | Cement Dust | 1 | 2 |
| 22 | Elevator boot | Air slide & elevator bottom | Cement Dust | 1 | 2 |
| 23 | Silo-1 | Silo Top | Cement Dust | 1 | 2 |
| 24 | Silo-2 | Silo Top | Cement Dust | 1 | 2 |
| 25 | Silo-3 | Silo Top | Cement Dust | 1 | 2 |
| 26 | Silo-4 | Silo Top | Cement Dust | 1 | 2 |
| 27 | Silo-1 | Silo inside Extraction | Cement Dust | 1 | 2 |
| 28 | Silo-2 | Silo inside Extraction | Cement Dust | 1 | 2 |
| 29 | Silo-3 | Silo inside Extraction | Cement Dust | 1 | 2 |
| 30 | Silo-4 | Silo inside Extraction | Cement Dust | 1 | 2 |
| 31 | Silo 3 & 4 | Silo extraction elevator | Cement Dust | 1 | 2 |

| S. No. | Application | | Material | Quantity each Grinding Section | Total Quantity |
|---|---|---|---|---|---|
| 32 | Packer 1 | Airslide and Elevator Boot | Cement Dust | 1 | 2 |
| 33 | | Roto packer dedusting | Cement Dust | 1 | 2 |
| 34 | | Roto packer aux. dedusting | Cement Dust | 1 | 2 |
| 35 | Packer 2 | Airslide and Elevator Boot | Cement Dust | 1 | 2 |
| 36 | | Roto packer dedusting | Cement Dust | 1 | 2 |
| 37 | | Roto packer aux. dedusting | Cement Dust | 1 | 2 |
| 38 | Bulk Loading | Cement Bulk Loading | Cement Dust | 1 | 2 |
| 39 | Packer 3 | Airslide and Elevator Boot | Cement Dust | 1 | 2 |
| 40 | | Roto packer dedusting | Cement Dust | 1 | 2 |
| 41 | | Roto packer aux. dedusting | Cement Dust | 1 | 2 |
| 42 | Packer 4 | Airslide and Elevator Boot | Cement Dust | 1 | 2 |
| 43 | | Roto packer dedusting | Cement Dust | 1 | 2 |
| 44 | | Roto packer aux. dedusting | Cement Dust | 1 | 2 |
| | **Total Quantity** | | | **44** | **88** |

**Table - 2.19 (c)**
**List of Bag Dust Collectors (CPP)**

| S. No. | Application | Quantity (Nos.) |
|---|---|---|
| 1 | Grizzle hopper | 1 |
| 2 | Coal Crusher House | 1 |
| 3 | Transfer tower | 1 |
| 4 | Coal bunker-1 | 1 |
| 5 | Coal bunker-2 | 1 |
| **Total Quantity** | | **5** |

### 2.11.3 Details of Effluent and their mitigation

| Effluents | Plant Unit | Proposed Mitigation measures |
|---|---|---|
| Process Waste Water | RO Plant<br>CPP & WHRS | • As the cement manufacturing is based on dry process technology hence, no waste water will be generated and "Zero Liquid Discharge" will be maintained.<br>• Blow down and RO / DM reject water (235 KLD) will be used for dust suppression (210 KLD) after treated in Neutralization pit. |
| Sewage | Plant | ○ Sewage Treatment Plant (STP) of capacity 300 KLD will be installed for the treatment of domestic waste water from plant.<br>○ 100% STP treated water (206 KLD) will be used in greenbelt development & plantation. |

### 2.11.4 Details of Solid and Hazardous Waste Generation and their mitigation

| Plant Unit | Section | Type of Waste | Waste | Estimated Quantity | Treatment / Disposal |
|---|---|---|---|---|---|
| Cement Plant | APCE | SW | Dust | 500 TPD | Dust collected from various APCEs will be totally recycled back into the |

| Plant Unit | Section | Type of Waste | Waste | Estimated Quantity | Treatment / Disposal |
|---|---|---|---|---|---|
| | | | | | process. |
| CPP | - | SW | Fly ash | 1029 TPD | Used in manufacturing of PPC. |
| STP | - | SW | STP Sludge | 30 Kg/Month | Used as manure in horticulture and greenbelt development. |
| Maintenance | Different sections | HW | Used or spent Oil (Cat. 5.1) | 120 KL / annum | Will be generated as per Schedule- I of Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016; which will be sold to CPCB/ SPCB authorized recycler. Used Oil/ Spent oil will be filled in Empty barrels and further sold to CPCB/ SPCB authorized recycler/Will be used in Co-processing in Kiln. |
| | | | Contaminated cotton rags or other cleaning materials (Cat. 33.2) | 2.0 Tonnes/ Annum | |
| | | | Empty barrels/containers/liners | 300 Barrels/ Annum | |
| | | | Wastes or residues containing oil (Cat. 5.2) | 2.0 Tonnes/ Annum | |
| | | | Used Lead Acid Batteries | 100 Nos./Annum | Will be stored in the designated storage area and will be disposed-off/ sold to registered vendors as per Battery Waste Management Rules 2020. |
| Plant | - | SW | Bottles, paper, cans, etc. | 100 Tonnes / annum | Municipal solid waste generated from plant canteen & residential colony will be disposed after segregating into bio- degradable and non-biodegradable waste in compliance of solid waste management rules 2016. Bio-degradable waste will be composted and non-biodegradable wastes will be disposed of suitably. Concept of waste minimization 3R's (Recycle, Reduce, Recover) will be adopted. Also, company will install Bio-gas Generation Plant. |
| | | | Kitchen and canteen/ Horticulture waste | | |
| Cement Plant | Different sections | SW | Redundant machinery, Scrap | 850 Tonnes / annum | Will be Sold to recyclers |
| Cement Plant | Packing section | PW | Plastic bag & other packing materials | 20 Tonnes / annum | Authorized vendor/AFR |
| Cement Plant | Plant & office | e-Waste | Discarded electrical equipment, Cables, CFL/ LED Lights | 15 Tonnes / annum | Sold to registered vendors as per e-Waste Management Rules, 2016. |
| Construction of Cement plant | -- | C & D | Construction & fabrication waste | 200 Tonnes / annum | Fabrication waste-to scrap dealers; other construction waste-land levelling/ road construction. |

## 2.12 ASSESSMENT OF NEW & TESTED TECHNOLOGY FOR THE RISK OF TECHNOLOGICAL FAILURE

Latest Tested modern dry process cement manufacturing technology i.e., dry process technology will be used to produce Clinker and Cement manufacturing. The plant will be using high efficiency separator and energy efficient Equipment's to ensure low power consumption. Modern equipment and best practice of water usage such as water sprinkler/fog & mist sprinkler, use of treated water etc. will be used to reduce water consumption. To reduce the natural resource consumption by the proposed plant, alternate fuels & Raw Materials will also be used. CFBC technology will be used for CPP. WHRS will be installed to harness the waste heat from AQC and PH. The modern pollution control equipment will be used to keep the pollution within prescribed limits by MoEFCC and other concern authorities.

The proposed 5.0 MTPA Integrated Cement Clinkerisation Plant, 8.0 MTPA Cement Grinding Unit, 100 MW Captive Power Plant & 25 MW WHRS at Gollapalle, Village of Myalavaram Mandal, Kadapa (YSR) District, Andhra Pradesh will be using latest tested State of the art technology to avoid the risk of technological failure.

## 2.13 SUMMARY & CONCLUSION

M/s. ACC Limited is 5.0 MTPA Integrated Cement Clinkerisation Plant, 8.0 MTPA Cement Grinding Unit, 100 MW Captive Power Plant & 25 MW WHRS *a*t Gollapalle, Village of Myalavaram Mandal, Kadapa (YSR) District, Andhra Pradesh. Total project area is 187.10 ha and approx. 42.65% area of total project area will be developed under greenbelt & plantation. Limestone & Clay will be sourced from Captive Limestone Mine and other raw material will be sourced from nearby market & other industries. WHRS of 25 MW capacity is also proposed as a green energy source. Imported coal/Petcoke will also be used for the project. Also, water &, power and manpower will be required as a basic requirement for the project. Latest modern State-of-Art technology will be used for clinker and cement manufacturing and all the mitigation measures including installation of efficient air pollution control equipment's will be taken as part of Environmental Management Plan to keep pollution level in prescribed limits. On the basis of said parameters considered for the project; Baseline Study parameter has been decided and monitored.

# *CHAPTER - 3*
# *DESCRIPTION OF THE ENVIRONMENT*

## 3.0 INTRODUCTION

To predict and evaluate the impacts of proposed project on the surrounding area, it is vital to assess the baseline status of the environmental quality in the vicinity of the project site. An exhaustive attempt has been made in this chapter to account all the possible baseline status of the environmental quality due to the proposed project, which further serves as the basis for identification, prediction and evaluation of impacts. To assess the baseline environmental quality of the area, field assessment has been conducted in the study area considering following components of the environment, *viz.* land, meteorology, air, noise, water, soil, biological and socio-economic. The baseline study was conducted during the Summer Season (March., 2013 to May., 2013) by earlier consultant Vimta Labs Ltd. as the baseline data was 3 year old & hence expired; therefore, in compliance to the MoEFCC OM dated 8th June, 2022 a fresh baseline study has been conducted during Summer Season (March, 2024 to May, 2024) in the study area covering an area of 10 km radius from the project site in accordance with the guidelines of MoEF&CC and approved ToR granted to the Proposed Integrated Cement Plant for preparation of EIA/EMP report.

## 3.1 Environmental Setting of the Study Area

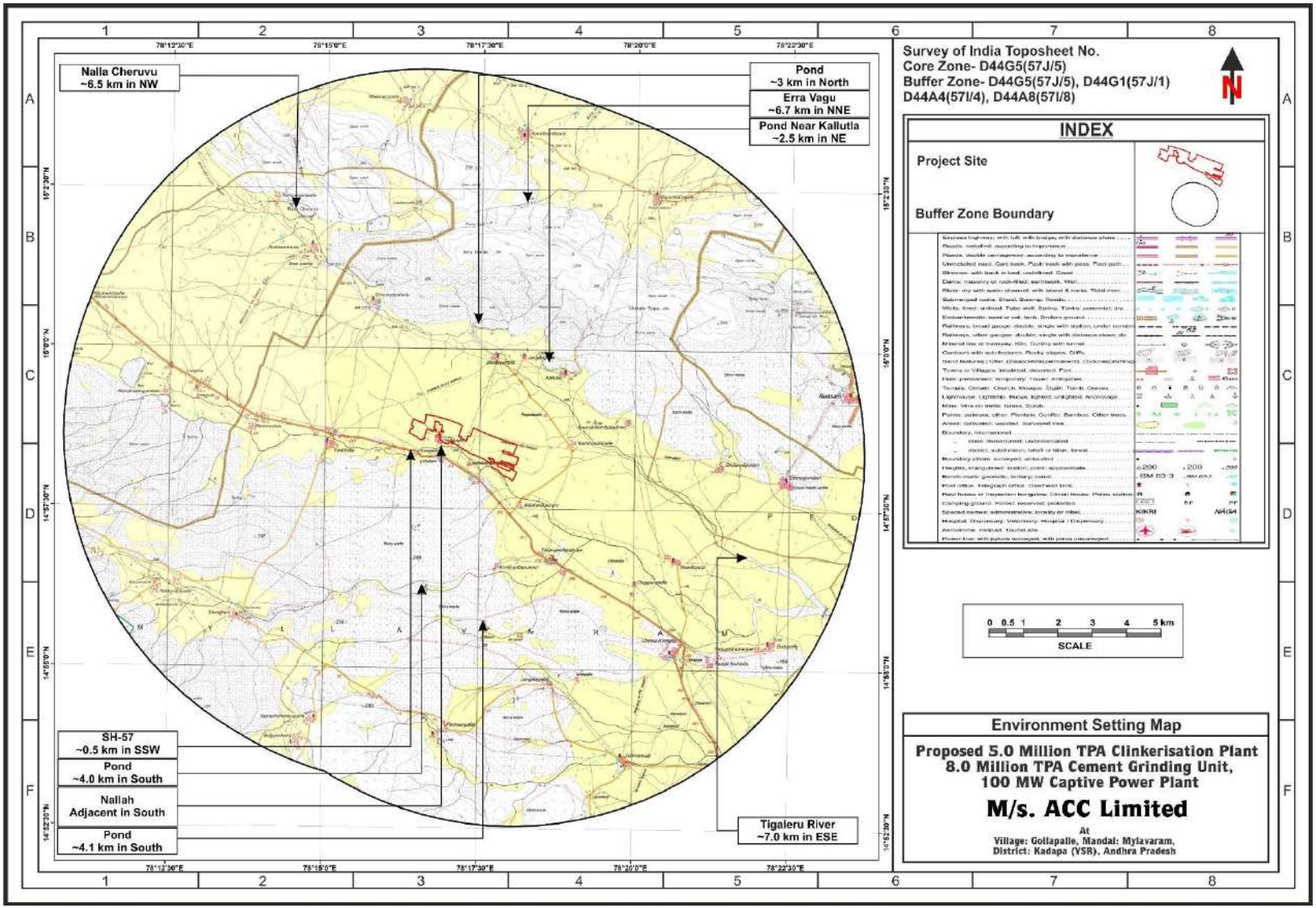
The study area / buffer zone considered is an area of 10 km radius (aerial distance) marked from the boundary of the proposed plant site. The area marked within the project site is considered as core zone. The major environmental settings within the study area are given in Table - 3.1 and shown in Figure - 3.1.

**Table - 3.1**
**Environmental Setting Details**

| S. No. | PARTICULARS | DETAILS *(With approximate aerial distance & direction from the nearest project boundary)* |
|---|---|---|
| 1. | Nearest Village | Gollapalle (0.25 km in SSE direction) |
| 2. | Nearest Town/ City | Kadapa (79 km in SE direction) |
| 3. | National / State Highways within 10 km radius | SH - 57 (0.5 km in SSW direction) |
| 4. | Nearest Railway Station | ○ S. Uppalapadu (11.5 km in SE direction)<br>○ Kondapuram (24 km, SSW direction) |
| 5. | Nearest Airport | ○ Kadapa Airport (70.5 km in SE direction)<br>○ Tirupati Airport (195 km in SE direction) |
| 6. | National Parks, Wildlife Sanctuaries, Biosphere Reserves within 10 km radius | No National Park, Wildlife Sanctuary, Biosphere Reserve falls within 10 km radius of the plant site. |
| 7. | Reserve Forests (RF) / Protected Forests (PF) etc. within 10 km radius | No Reserved Forests (RF) / Protected Forests (PF) etc. within 10 km. radius of the plant site. |

| S. No. | PARTICULARS | DETAILS<br>*(With approximate aerial distance & direction from the nearest project boundary)* |
|---|---|---|
| 8. | Rivers/Water Bodies within 10 km radius | o Nallah (Adjacent in south)<br>o Nallah Cheruvu (6.5 km in NW direction)<br>o Tigaleru River (7.0 km in ESE direction)<br>o Pond (3.0 km in North direction)<br>o Pond Near Kallutla (2.5 km in ENE direction)<br>o Pond (4.0 km in South direction)<br>o Pond (4.1 km in South direction) |
| 9. | Critically Polluted areas (CPA), SPA & OPA | There are no Critically Polluted areas (CPA), SPA & OPA within the 10 Km radius of study area. |
| 10. | Seismic Zone | Zone - II [as per IS 1893 (Part-I): 2002] |

*Source: SOI Toposheet & Google Earth Pro*




*Source: SOI Toposheet*

**Figure 3.1: Map Showing Environmental Settings of 10 km radius from the project site**

**Table - 3.2**
***The major Industries falling nearby the project area***

| *S. No.* | *Name of the Industry* | *Type of Industry* | *Approx. aerial distance and direction from plant site* |
|---|---|---|---|
| 1. | Dalmia Cement Bharat Ltd. | Cement Plant | ~3.5 km in ESE Direction |

*Source: Field Survey*

## 3.2 STUDY PERIOD

The relevant information and data (both primary and secondary) were collected in core as well as buffer zone (10 km distance from the plant boundary) during Summer Season (March, 2013 to May, 2013) by earlier consultant Vimta Labs Ltd. in accordance with the guidelines for preparation of EIA studies in order to assess the impact of the proposed plant & mine site present within the 10 Km study area on existing physical, biological and social environment. As the baseline data was 3-year-old hence expired; therefore, in compliance to the MoEF&CC OM dated 8th June, 2022 a fresh composite baseline study (Plant and Mine) has been conducted during Summer Season (March, 2024 to May, 2024) in accordance with the guidelines for preparation of EIA studies in order to assess the impact of the proposed plant site present within the 10 Km study area on existing physical, biological and social environment.

## 3.3 ENVIRONMENTAL COMPONENTS

Information on the following components / parameters were collected to understand the existing scenario of the core and buffer area:

1. Land Use & Land Cover Study
2. Hydrogeological Study
3. Meteorology
4. Air Environment
5. Noise Environment
6. Water Environment
7. Soil Environment
8. Biological Environment
9. Socio-economic Environment

## 3.4 ESTABLISHMENT OF BASELINE FOR VALUED ENVIRONMENTAL COMPONENTS

Composite Baseline data was collected for the proposed plant site and interlinked limestone mine site for monitoring by using various environmental components / parameters in the core as well as buffer zone during the study period i.e., Summer season (March, 2013 to May, 2013) and due to expiry of earlier conducted baseline study; therefore, in compliance to the MoEF&CC OM dated 08th June, 2022 a fresh baseline has been conducted during Summer Season (March, 2024 to May,2024), The details of which are given in Table - 3.3.

Sampling, preservation, transportation & storage of samples were carried out by J.M. EnviroLab Pvt. Ltd. under supervision of EC/FAE concerned.

**Table - 3.3**
**Baseline Data Collection**

| S. No. | Environmental Component | Primary data | | | | Secondary data |
|---|---|---|---|---|---|---|
| | | Parameters | Frequency | Monitoring / Sampling Locations | Methodology | |
| 1. | Micro-Meteorology | Wind speed (Hourly),<br>Wind direction,<br>Dry bulb Temperature,<br>Wet bulb Temperature,<br>Relative humidity,<br>Rainfall,<br>Solar radiation,<br>Cloud cover,<br>Environmental Lapse Rate | 1 Hourly Continuous | 01 (Project site) | Automatic Weather monitoring station | IS 5182 Part 1-20 Site specific primary<br>Data collected at site.<br>IMD book (Climatological Normals 1981-2010),<br>Past year Rainfall data for Nagaur district. |
| 2. | Air | $PM_{2.5}$, $PM_{10}$ $SO_2$, $NO_x$, CO, HC and other parameters relevant to the project and topography of the area. | (24 hourly), twice a week | 12 Locations during Summer Season (March to May, 2013) & 13 Locations during Summer Season (March to May, 2024) | *Sampling:* CPCB Guidelines/NAAQS/ IS 5182 and Instrument Manual<br>*Analysis:* CPCB Guidelines / IS 5182 | Project baseline data |

| S. No. | Environmental Component | Primary data | | | | Secondary data |
|---|---|---|---|---|---|---|
| | | **Parameters** | **Frequency** | **Monitoring / Sampling Locations** | **Methodology** | |
| 3. | Noise | Hourly equivalent noise levels | Once in a season (day & night time) | 12 Locations during Summer Season (March to May, 2013) & 11 Locations during Summer Season (March to May, 2024) | *Sampling*: IS 9989<br>*Analysis:* CPCB Guidelines/IS 9989 | -- |
| 4a. | Surface Water | Laboratory analyzed Physical parameters, chemical parameters & toxic substances in Ground water samples (Reference-drinking water standard (10500:2012), in surface water biological Parameters, BOD, COD, DO & TSS were also analyzed. Temperature, pH, Conductivity, Total dissolved solids, dissolve oxygen (Surface Water) were analyzed onsite by various types of instruments. | Once in a season | 04 Locations during Summer Season (March to May, 2013) & 07 Locations during Summer Season (March to May, 2024) | *Sampling:* CPCB Guideline & APHA 22nd edition 2012<br>*Analysis:* IS 10500-2012/ IS 3025/APHA 22nd edition 2012 | BIS Standards |
| 4 b. | Ground Water | | Once in a season | 09 Locations during Summer Season (March to May, 2013) & 10 Locations during Summer Season (March to May, 2024) | | -- |

| S. No. | Environmental Component | Primary data | | | | Secondary data |
|---|---|---|---|---|---|---|
| | | **Parameters** | **Frequency** | **Monitoring / Sampling Locations** | **Methodology** | |
| 5. | Traffic Study Type of vehicles Frequency of vehicles for transportation of material Additional traffic due to proposed project Parking Arrangement | Type of vehicle | - | SH - 57 | Manual by observation | IRC guideline 106:1990 |
| 4. | Land Environment | | | | | |
| a. | Soil Particle size Distribution, Texture, pH, Electrical conductivity, Cation exchange capacity, Alkali metals, Sodium Absorption Ratio (SAR), Permeability, Water holding capacity, Porosity | Parameters As per IS 2720/USDA | Once in a season | 12 Locations during Summer Season (March to May, 2013) & 10 Locations during Summer Season (March to May, 2024) | *Sampling as per BIS Specification* | - |
| b. | Land use / Landscape, Location code, Total project area, Topography, Drainage (natural), Cultivated, forest, plantations, water bodies, roads and settlements | - | - | - | - | - |
| 8. | Biological Environment | Flora and fauna | Once in a season | Study area | Quadrate sampling method/ random sampling | Forest working plan and Local Information and forest. Andhra Pradesh.gov.in |

| S. No. | Environmental Component | Primary data | | | | Secondary data |
|---|---|---|---|---|---|---|
| | | **Parameters** | **Frequency** | **Monitoring / Sampling Locations** | **Methodology** | |
| a. | **Aquatic**<br>Primary productivity,<br>Aquatic weeds, Enumeration of Phyto plankton, zoo plankton and benthos, Fisheries, Diversity indices, Trophic levels, Rare and endangered Species, Marine Parks/ Sanctuaries/ closed areas /coastal regulation zone (CRZ) | | | | Samples to collect from upstream and downstream of Discharge point, nearby tributaries at downstream, and Also, from dug wells close to activity site. For forest studies, direction of wind should be considered while selecting forests. | Government offices,<br>NGOs, published literature |
| b. | **Terrestrial**<br>Vegetation-species list, economic importance, forest produce, medicinal value, Importance value index (IVI) of trees, Fauna, Avi fauna, Rare and endangered species, Wildlife Sanctuaries / National Park / Biosphere reserve, Migratory routes | | | | | |
| 9. | Socio- Economic Environment Demographic Structure, Infrastructure resource base, Economic resource base, Health status:<br>Morbidity pattern, Cultural and aesthetic attributes Education | Economic<br>Demography | Once in a season | Study area | ***Economic Parameter***<br>Random Sampling of the villages.<br>Survey Conduction,<br>Through Questionnaire approach.<br>Group Discussions. | • Demographic Data: Census data, 2011.<br>• List of prevailing diseases from Public Health Centre<br>• List of villages where public health Centre are set up<br>• List of schools<br>• Map of tehsil. |

### 3.4.1 Instruments Used for Environmental Baseline Data Collection

The following instruments were used at the site for environmental baseline data collection work.

1. Respirable Dust Sampler with attachment for gaseous Pollutants, Envirotech APM 460
2. Fine Particulate Sampler (FPS), APM 550
3. Sound Level Meter, Model Envirotech SLM - 100
4. Digital D.O. Meter Model, 831 E (CPCB Kit)
5. Weather Monitoring Station, Model Enviro WM 271
6. Global Positioning System (GPS)

The collected samples of air, water, noise and soil as given in above section were collected from the representative sampling points. The primary data covering the details such as type of vegetation/ various agricultural crops, no. of forest, type of habitation, their occupation type, existing infrastructure and communication/ medical facilities were also collected by the site visit team through interaction with a large number of local inhabitants from the study area and also with different government departments for preparation of additional studies such as Land use Land cover study, Biological Environment, Geological & Hydrogeological study. Based on the primary and secondary data obtained from the 10 km radius buffer area and the core area, the Analysis interpretation and conclusion of the baseline conditions within the core zone and buffer zone is given below:

## 3.5 BASELINE STATUS OF THE VARIOUS ENVIRONMENTAL COMPONENTS

### 3.5.1 Land

**Geology of the Area**

Sedimentary rocks found in the northwestern part of Kadapa district belong to the Kurnool Group. The limestone and other rock formations occurring in the area belong to Kurnool Formations of Indian Stratigraphy sequence. These formations are younger than rocks of the Kadapa Basin and are well preserved in the Kadapa Basin. The Kadapa basin extends from Nagari in the south up to Amaravati in the north east over a length of about 440 km. with width ranging from 80 to 145 km. encompassing an area of about 44000 sq. km. Kadapa and associated younger Kurnool occupy a unique position in Indian Stratigraphy because of economic interest and hence have been the subject of studies for more than seven decades. Kurnool Group of rocks is found confined to two small areas within Kadapa basin one in the area between Kadapa and Kurnool and another in the area West of Amaravati. In general, the Kurnool rocks overlie rocks belonging to the Kadapa. The Kadapa are in turn deposited over the Archaean basement. These rocks are believed to be of Proterozoic age equivalent to early Vindhyan rocks. The Kurnool rocks comprise limestone, shale and sandstones. Unlike the rocks of Kadapa group, which are associated with intrusive and are slightly disturbed. King gave a detailed account of the stratigraphic sequence of the formations. Later, the Geological Survey of India (GSI) carried out systematic mapping of the region and confirmed the stratigraphy, which was established earlier with minor changes.

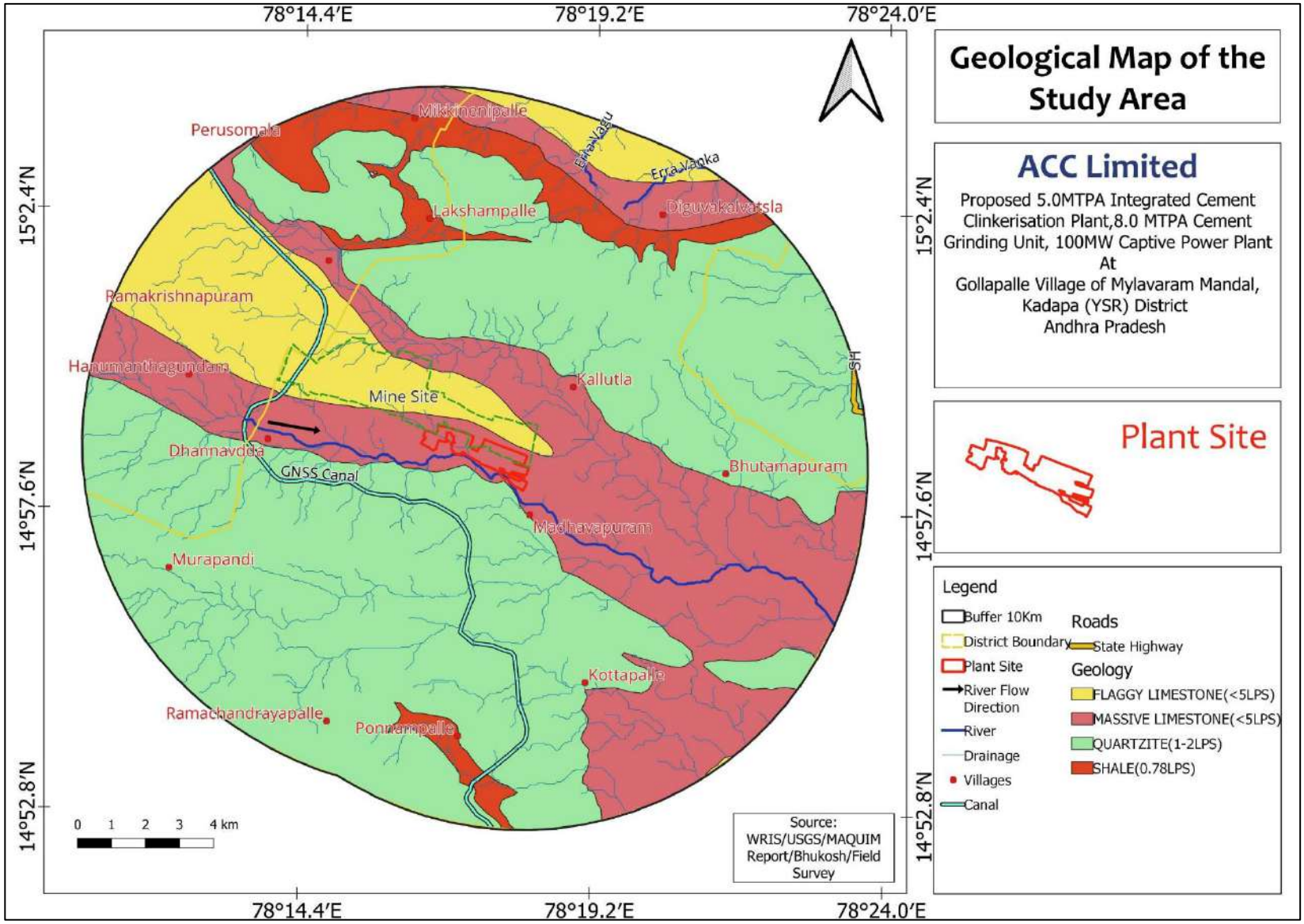



**Figure 3.2: Geological Map of the Study Area**

### 3.5.2 Topography & Drainage Pattern of the Study Area

**Topography**

The study area concerned with this project is gently undulating. The elevation of the study area ranges from 227- 240 amsl a which indicates that it is slightly undulating topography. The digital elevation map is prepared by data taken from USGS SRTM.

**Drainage Pattern**

Kadapa district, located in the southern part of the Indian state of Andhra Pradesh, exhibits diverse geomorphological features owing to its location between the Eastern Ghats and the Deccan Plateau. **Eastern Ghats:** The eastern part of the district is characterized by the presence of the Eastern Ghats Mountain range. This region is marked by rugged terrain, steep slopes, and deep valleys. The Nallamala Hills, a part of the Eastern Ghats, run through the northeastern portion of the district.

**Plateaus:** Much of the district is situated on the Deccan Plateau, which is a relatively flat and elevated region. These plateaus are often dissected by rivers and streams, resulting in undulating topography.

**River Valleys:** The district is traversed by several rivers, including the Pennar, Chitravathi, and Papagni rivers. These rivers have carved out valleys and plains across the landscape, contributing to the agricultural productivity of the region.

**Alluvial Plains:** The river valleys and their tributaries have created extensive alluvial plains in certain areas, particularly along the banks of major rivers. These fertile plains support agriculture and are densely populated.

**Residual Hills:** In addition to the Nallamala Hills, Kadapa district also features smaller residual hills and rocky outcrops scattered throughout its landscape. These hills often provide scenic vistas and serve as habitats for diverse flora and fauna.

Where few streams of first order originate near the northern and southern border of the project area. The catchment areas of these streams originating inside the project area is small and these streams carry limited surface runoff during the rains. GNSS canal (Galeru Nagari Sujala Sravanthi) is passing through the western side of the project area. Northern and southern sides of the project area are bounded by two nalas (Vagu), i.e. Pala Vagu (northern side) and Rallavanka Vagu (southern side). The upstream catchment areas of both Vagu (nala) are disturbed by huge height of dumps of deep excavated GNSS canal.

Although there is a well-defined drainage system having dendritic drainage pattern in the buffer zone, a major part of drainage has been harnessed by constructing irrigation projects, tanks and anicuts. The drainage pattern of the study area is given in Figure: 3.3

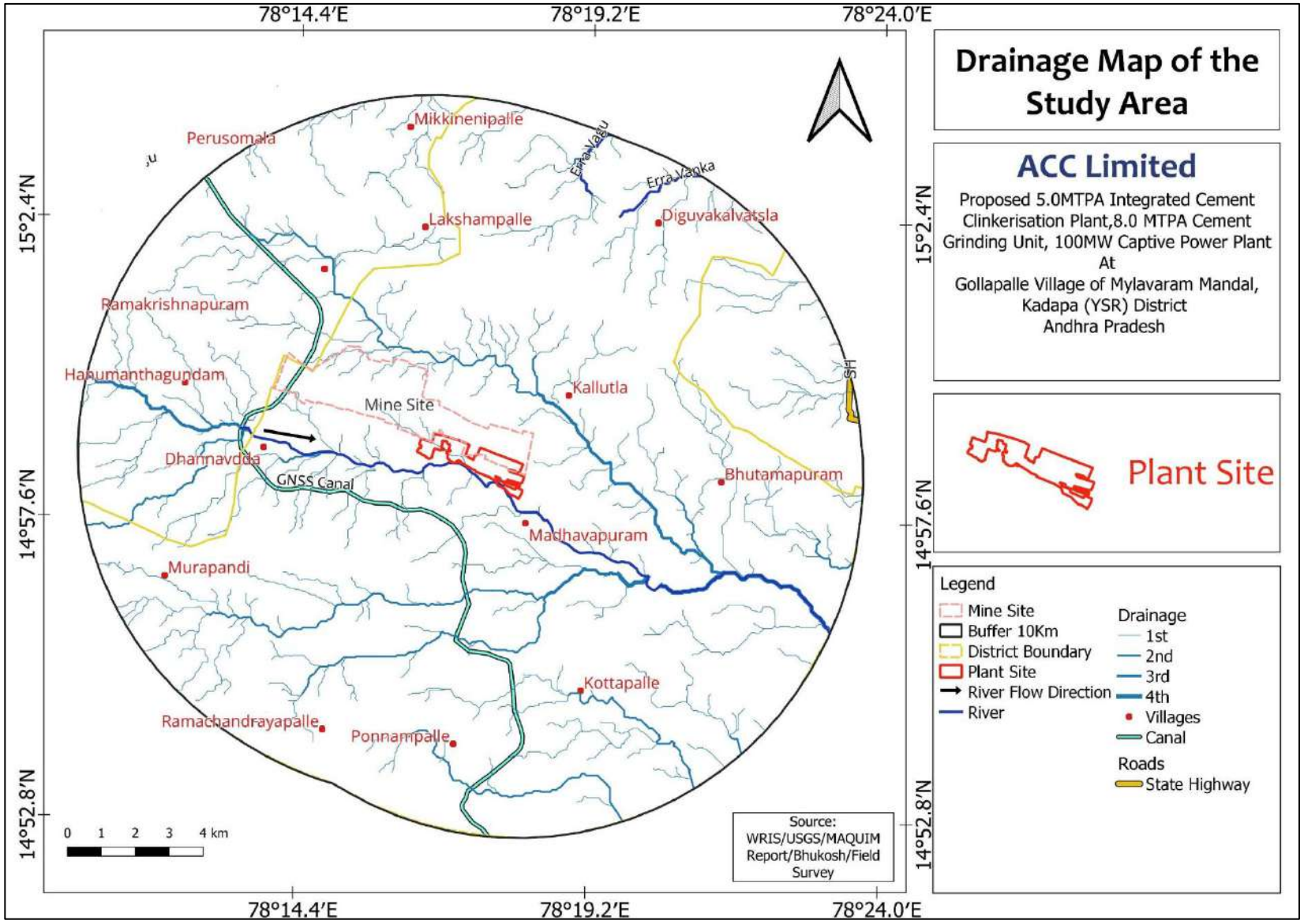



**Figure 3.3: Drainage Map of the Study Area**

### 3.5.3 Land and Land Cover Study

To study the land use pattern of the core as well buffer zone, land use / land cover details have been identified / maps have been prepared in accordance to the *ToR point no. 7 stating:*

*7. "Present land use shall be prepared based on satellite imagery. High-resolution satellite image data having 1m-5m spatial resolution like quick bird, Ikonos, IRS P-6 pan sharpened etc. for the 10 km radius area from proposed site. The same should se be used for land use / land cover mapping of the area."*

#### 3.5.3.1 Objectives:

*The objectives of the LULC study are as follow:*

- To develop the Land use & Land cover map using land coordinates of the plant area (Core Zone) and 10 km radius from the plant site (Buffer area).
- To Identify and mark the important Land use and Land cover features using the primary and secondary data collected.
- To evaluate the impacts on existing land use/cover features of the buffer area by the Proposed Project activities.
- To identify the mitigative measures for the sustainable use of land and to protect the buffer zone from the adverse impacts.

#### 3.5.3.2 Methodology and Methods:

***Data Collection***

- Preliminary / primary data collection of the study area
  - Satellite data procurement from NRSC Hyderabad.
  - Primary Field Survey.
- Secondary data collection from concern Department
  - Survey of India Toposheet (SOI)
  - Plant Layout
  - Cadastral / Khasra map
  - GPS Coordinates of Project Boundary

***Image Processing methods:***

- Processing of satellite data using ERDAS Imagine 9.2 and to prepare the Land use & Land cover maps (e.g., Agriculture Land, Human Settlement, Road, Railway line, Industries, Vegetation/Plantation, Mine Quarry, Waste/Open Scrub/Stony Waste, Water Bodies, Solar Plant, etc.) by Digital Image Processing (DIP) technique.
  - Geo-Referencing of the Survey of India Topo sheet.
  - Geo-Referencing of satellite Imagery with the help of Geo-Referenced Topo sheet.
  - Enhancement of the Satellite Imagery.
  - Base Map layer creation (Roads, Railway, Village Names and others Secondary data etc.).
  - Data analysis and Classification using Digital interpretation techniques.
  - Ground truth studies or field Verification.

- Error fixing / Reclassification.
- Final Map Generation.

***Technical Specification of used Satellite Imagery Data:***

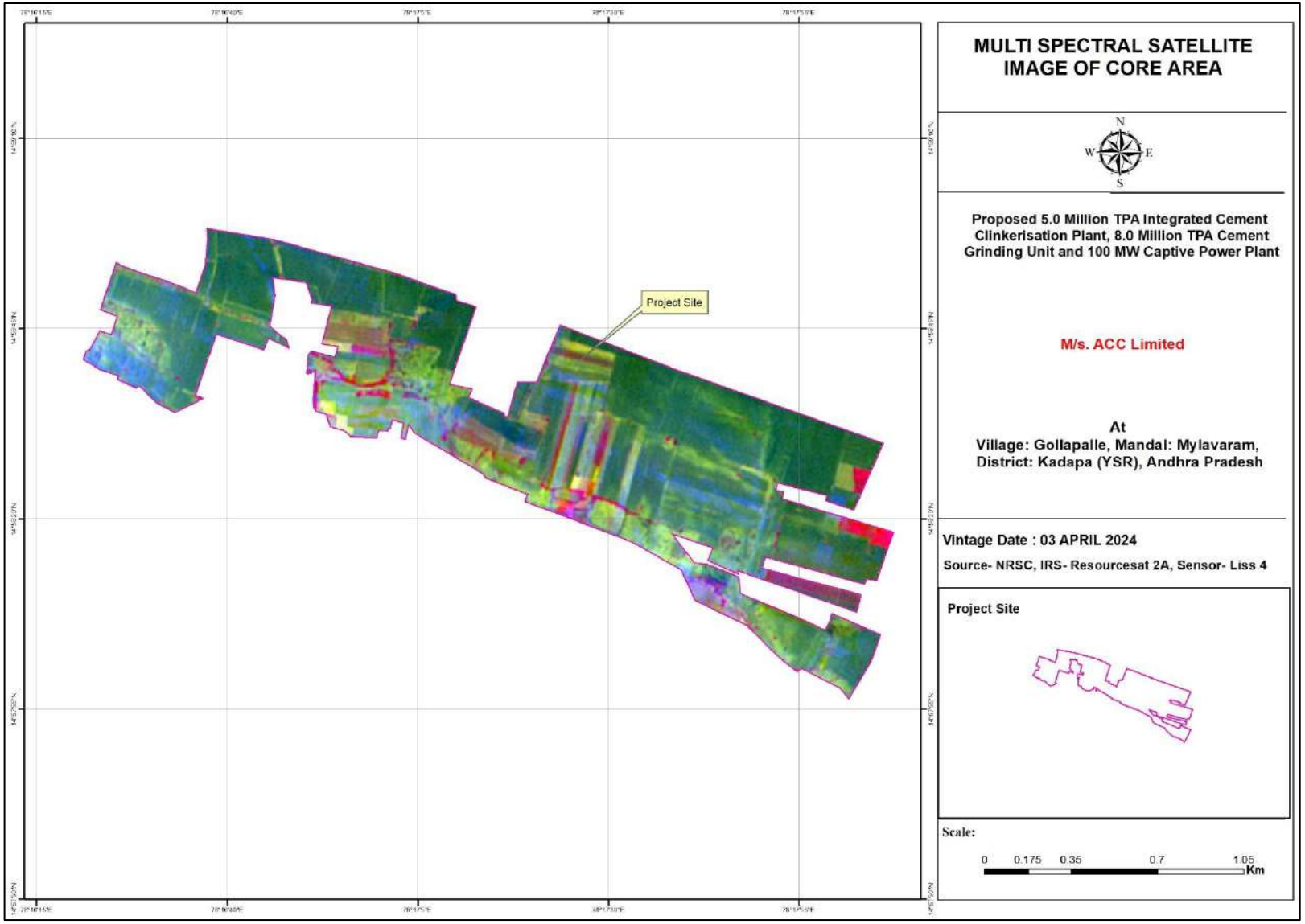
Current vintage data of Indian Remote Sensing Satellite LISS-IV digital FCC (False Color Composite) has been used for preparation of Land use/ Land cover thematic map of study area. Satellite image has been procured from National Remote Sensing Centre, Hyderabad. Survey of India Toposheet as a reference map on 1:50,000 scale has been used for preparation of base layer data like road, rail network; village for geo-referencing of satellite image.

***Technical description:***

| | |
|---|---|
| ꕥ Satellite Image: | Resoucesat 2A, Source: Liss 4 |
| ꕥ Satellite Data Source: | NRSC, Hyderabad |
| ꕥ Satellite Vintage: | 03rd April, 2024 |
| ꕥ SOI Toposheet No.: | Core Zone: D44G5 (57J/5), Bufffer Zone: D44G5 (57J/5), D44G1 (57J/1), D44A4 (57I/4) & D44A8 (57I/8) |
| ꕥ Software Used: | Earth Resources Data Analysis System (ERDAS) Imagine 9.2 and 14 |

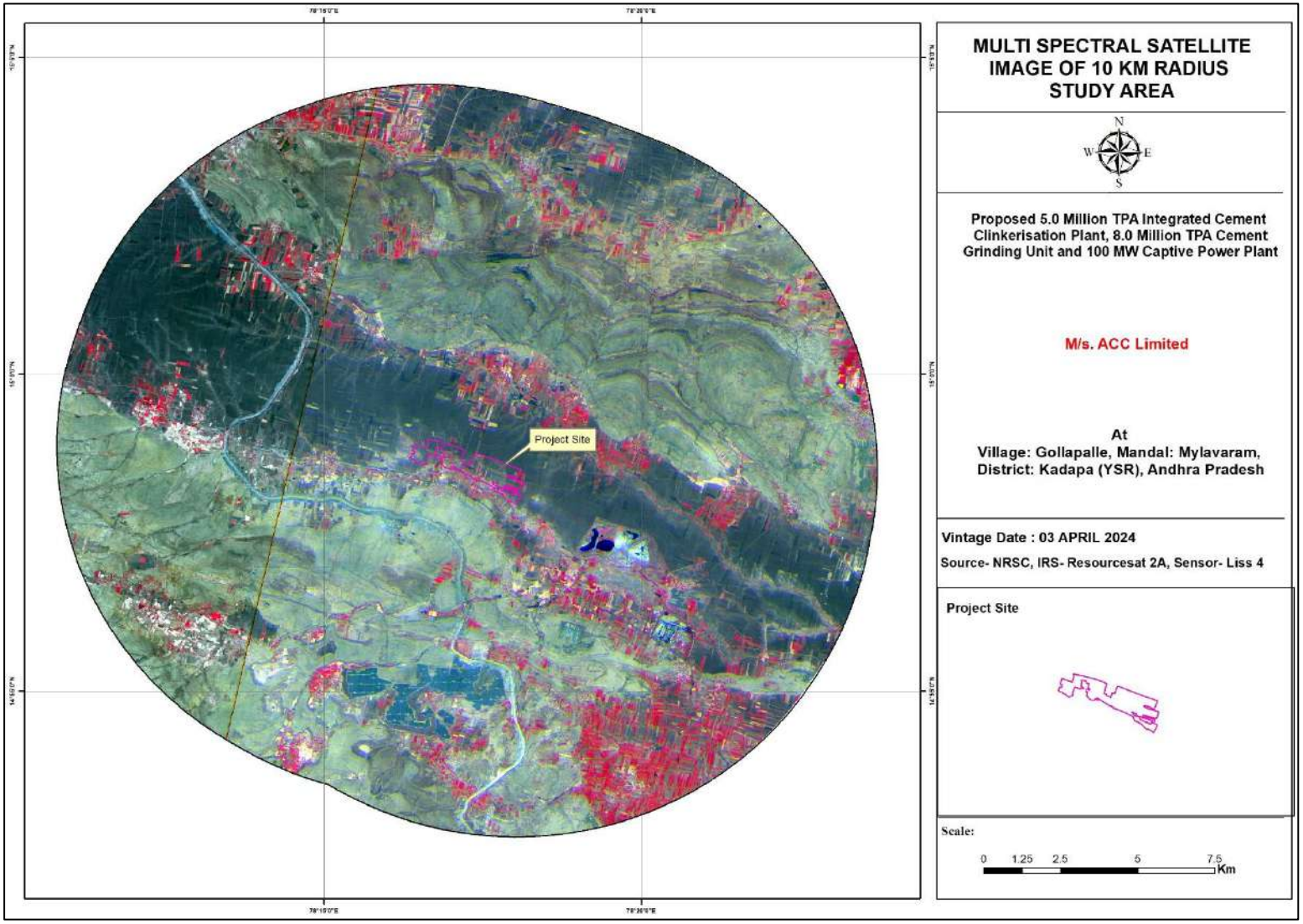
Satellite image (FCC) of the Core & buffer zone is given in 3.4 (a & b)

Land Use & Land Cover (LULC) of the Core & buffer zone is given in 3.5 (a & b)



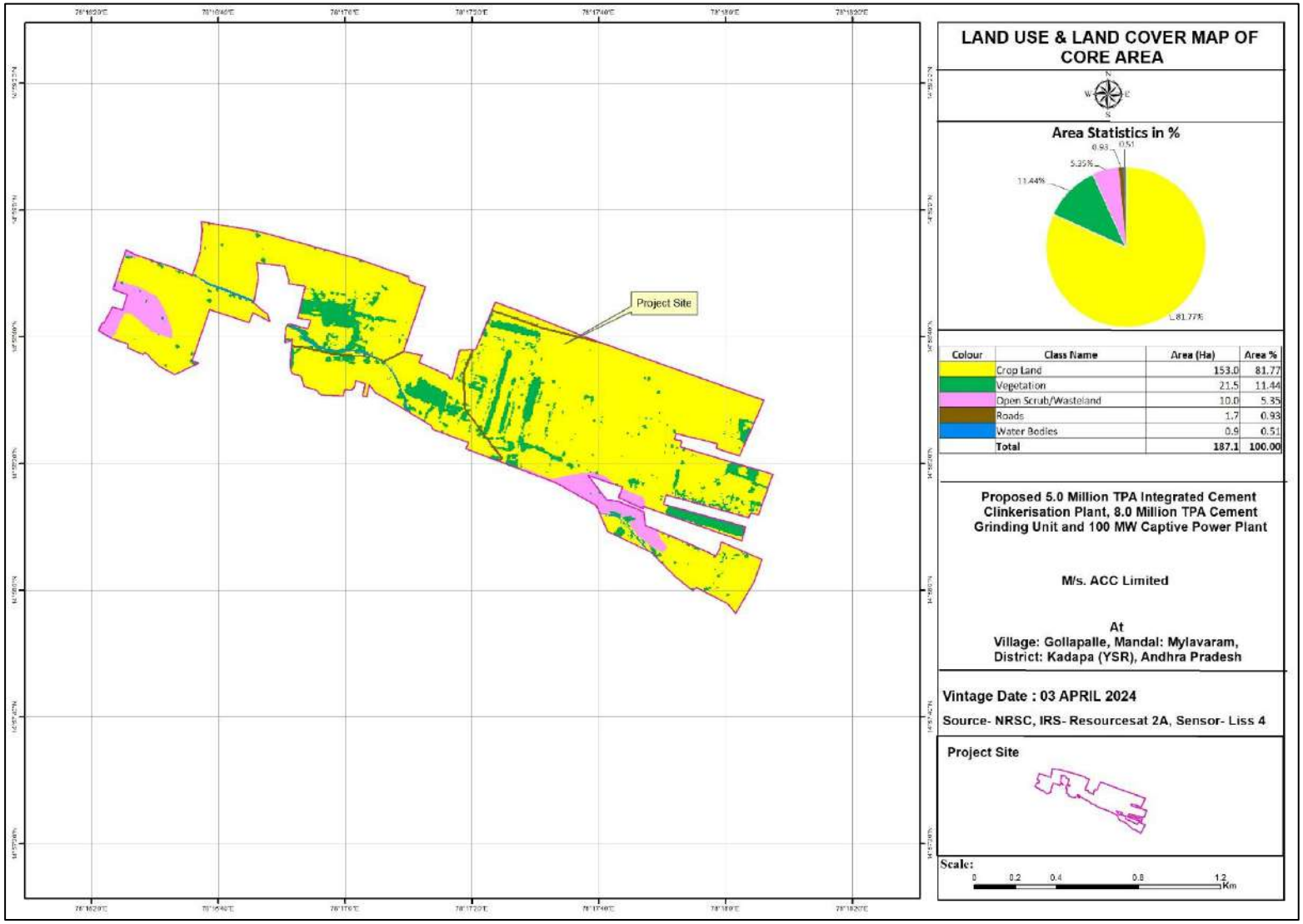

*Source: NRSC, Hyderabad*

**Figure 3.4 (a): False Color Composite (FCC) Satellite Imagery of the Core Zone**



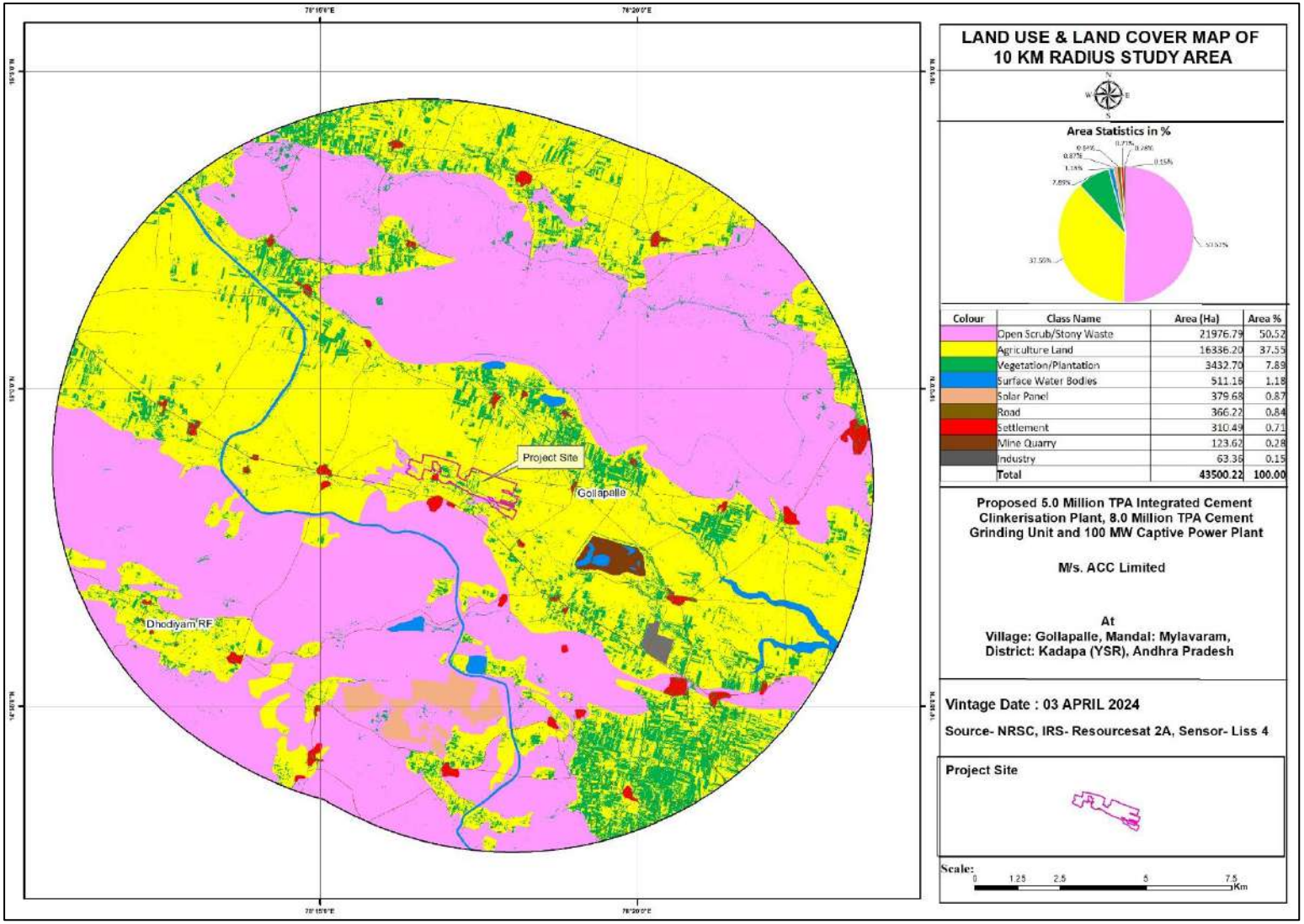

*Source: NRSC, Hyderabad*

**Figure 3.4 (b): False Color Composite (FCC) Satellite Imagery of the Study area**




*Source: Satellite Imagery*

**Figure 3.5 (a): Land Use / Land Cover Map of the Core Zone**




| Colour | Class Name | Area (Ha) | Area % |
|---|---|---|---|
| | Open Scrub/Stony Waste | 21976.79 | 50.52 |
| | Agriculture Land | 16336.20 | 37.55 |
| | Vegetation/Plantation | 3432.70 | 7.89 |
| | Surface Water Bodies | 511.16 | 1.18 |
| | Solar Panel | 379.68 | 0.87 |
| | Road | 366.22 | 0.84 |
| | Settlement | 310.49 | 0.71 |
| | Mine Quarry | 123.62 | 0.28 |
| | Industry | 63.36 | 0.15 |
| | Total | 43500.22 | 100.00 |

*Source: Satellite Imagery*

**Figure 3.5 (b): Land Use / Land Cover Map of the Study area**

***Observations of Land Use / Land Cover Study:***

Details are given in Table - 3.4 and map is shown in Figure - 3.5(b).

**Table - 3.4**

**Land Use / Land Cover Details of Study Area**

| S. No. | LU/LC | Area (Ha) | % Area |
|---|---|---|---|
| 1. | Open Scrub/Stony Waste | 21976.79 | 50.52 |
| 2. | Agriculture Land | 16336.20 | 37.55 |
| 3. | Vegetation/ Plantation | 3432.70 | 7.89 |
| 4. | Surface Water Bodies | 511.16 | 1.18 |
| 5. | Solar Panel | 379.68 | 0.87 |
| 6. | Road | 366.22 | 0.84 |
| 7. | Settlement | 310.49 | 0.71 |
| 8. | Mine Quarry | 123.62 | 0.28 |
| 9. | Industry | 63.36 | 0.15 |
| **Total** | | 43500.22 | 100.00 |

*Source: LU/LC Map of Study area*

***Interpretation:***

- The 10 km radius study area mainly comprises of Open Scrub/ Stony Waste accounting of 50.52 %of the total study area.
  - Water Bodies such as ponds / lakes comprises of 1.18 % of the total buffer area. As per the primary survey and SOI Toposheet, there are seven water bodies present in the 10 km radius of the study area and they are: Pond Near Kallutla (~2.5 km in NE direction), Pond (~3 km in North direction), Pond (~4.0 km in South direction), Pond (~4.1 km in South direction) Tigaleru River (~7.0 km in ESE direction). The agriculture fields of the buffer area are fed by the canal, Ponds/lakes, tube wells & dug wells which are the main source of irrigation. The farmers are using the water conservation technology such as drip irrigation technology for watering the fields.
  - The buffer zone studied has no ecological sensitive area (National Park, Wildlife Sanctuary, Biosphere Reserve/ Protected Forest/ Reserve Forest etc.). Only 7.89 % of the buffer area consists of vegetation/plantation and 50.2 % of the area is occupied by waste/open scrub/ stony waste.
  - 0.41 % of the total study area is occupied by the settlement and rest of the area is also occupied by few major industries which cover 0.15 % of the total buffer area. Mine quarry which covers 0.28 % of the total buffer area.

***Conclusion***

M/s. ACC Limited has proposed 5.0 MTPA Clinkerisation Plant, 8.0 MTPA Cement Grinding Unit, 100 MW Captive Power Plant at Gollapalle, Village of Mylavaram Mandal, Kadapa (YSR) District, Andhra Pradesh.

Total land area proposed for the project is 187.1 ha project area, (earlier 275.028 ha); the complete required area is Pvt. agricultural land and is under the possession of M/s. ACC *Limited.*

Proposed site has an existing land use of mostly predominantly barren land and partly single crop rainfed agricultural land, thus installation of plant at the site will change the land use to industrial land. This change in the land use will have positive impacts which in turn change their livelihood; as various livelihood programmes will be undertaken by the company for the development of the area, boost up of the new infrastructure facilities in the surrounding area along with the generation of employment for the local peoples in various forms due to the project.

### 3.5.3.4 Digital Elevation Model

Digital Elevation Models are data files that contain the elevation of the terrain over a specified area, usually at a fixed grid interval over the "Bare Earth". The intervals between each of the grid points will always be referenced to some geographical coordinate system.

This is usually either latitude-longitude or UTM (Universal Transverse Mercator) coordinate systems. The closer together the grid points are located, the more detailed the information will be in the file. The details of the peaks and valleys in the terrain will be better modeled with small grid spacing than when the grid intervals are very large. Elevations other than at the specific grid point locations are not contained in the file. As a result, peak points and valley points not coincident with the grid will not be recorded in the file. For practical purpose, this "Bare Earth" DEM is generally synonymous with a Digital Terrain Model (DTM).

DEM has been prepared for Cement plant of M/s ACC Kadapa for 10 km radius study area.

### 3.5.3.5 Data Used

- DEM Data : Shuttle Radar Topographic Mission (SRTM) data
- Data Source : http://srtm.csi.cgiar.org
- Software Used : Arc GIS

### 3.5.3.6 Methodology

Shuttle Radar Topographic Mission (SRTM) data has been used for creation of Digital Elevation Model of the study area. The SRTM data has vertical accuracy of 16m and the spatial resolution is of 90m.

**1st Stage:**

The first processing stage involves importing and merging the 1-degree tiles into continuous elevational surfaces in Arc GRID format.

**2nd Stage:**

Re-sampling the data at 23m is done and a contour interval of 10m through the usual process of interpolation is created.

**3rd Stage:**

SRTM data is converted in grid format through Arc GIS 9.2 to obtain elevation information of study area. Contours are then generated at 10 m interval through 3D analyst of Arc GIS and then are interpolating with raster data.

**4th Stage:**

Integration of DEM with contour map showing 3D view for analysis of surface is done.

Digital Elevation Model (DEM) of the Study Area is given in 3.8 respectively.

### 3.5.3.7 Interpretation

It is very clear from the DEM that the elevation varies from 176 m to 430 in the whole study area, having the contour interval of 20m. The areas in the north-western portion have generally higher elevation which is covered by scrub land while the low-lying areas are generally used for agricultural purposes and habitation.

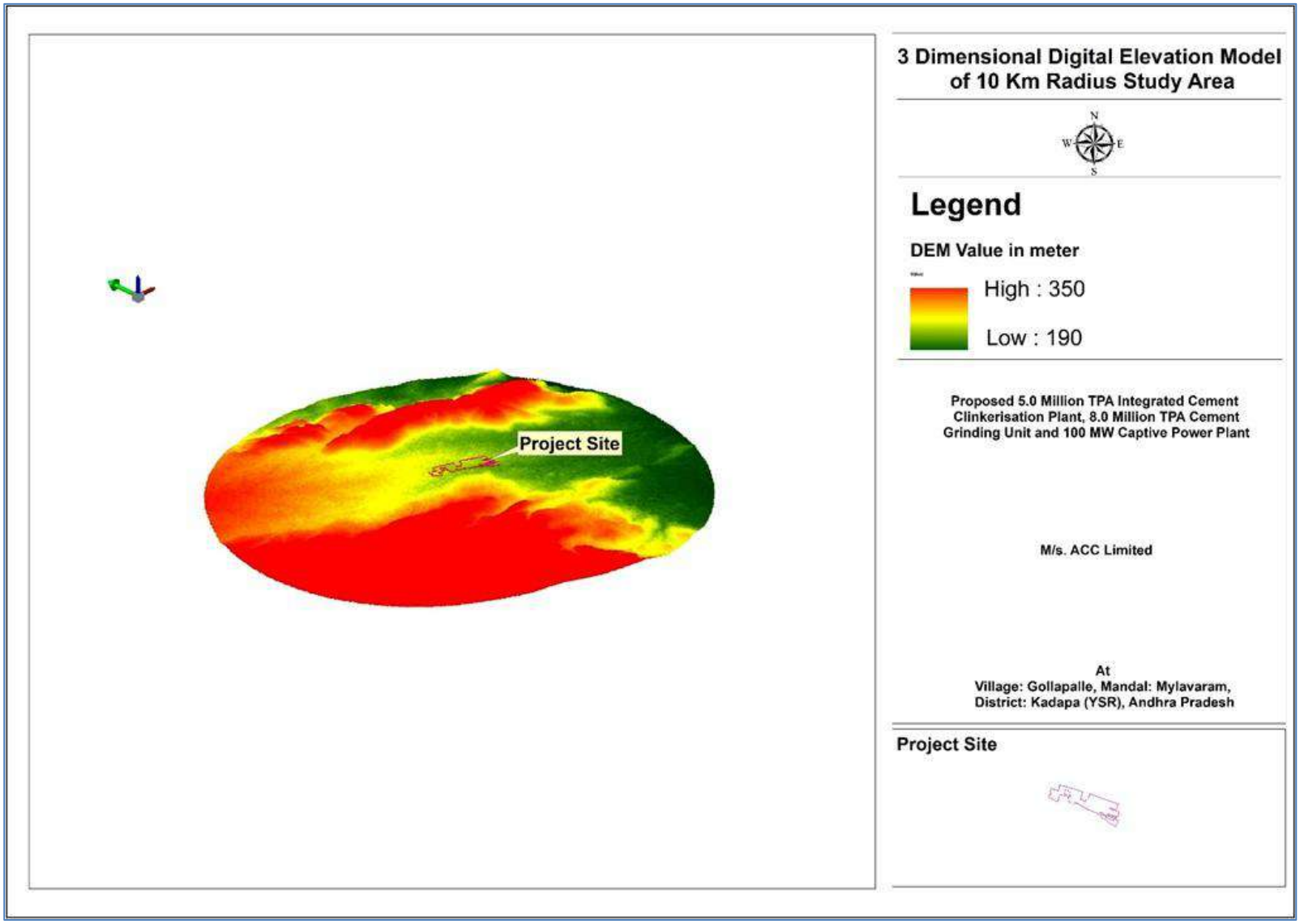



**Figure 3.6 (a): 3-D Digital Elevation Model of 10 km radius from the project site**

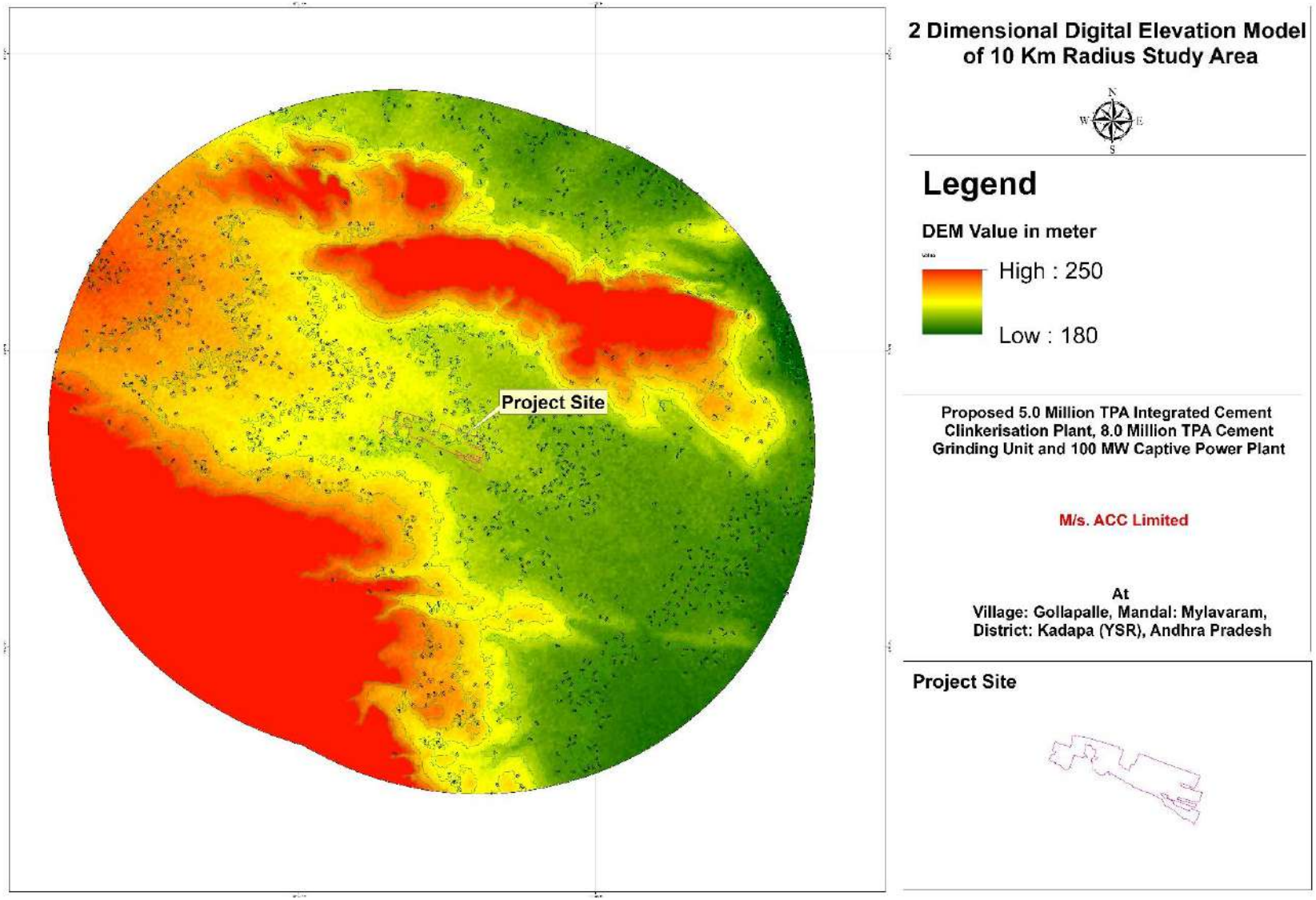



**Figure 3.6 (b): 2-D Digital Elevation Model with contours of 10 km radius from the project site**

### 3.5.4 SEISMICITY AND FLOOD HAZARD ZONATION OF THE AREA

***Seismicity of the Area:***

Bureau of Indian Standards [IS - 1893 (Part-1): 2002], has grouped the country into four seismic zones viz. Zone - II, III, IV and V. Of these, Zone - V is the most seismically active region, while Zone - II is the least. The Modified Mercalli Intensity (MMI) scale, which measures the impact of the earthquakes on the surface of the earth, broadly associated with various zones is as follows:

**Table - 3.5**
**Seismic Zones in India**

| S. No. | Seismic Zone | Risk | Intensity on MMI Scale |
|---|---|---|---|
| 1. | Zone - II | Low Risk Zone | VI & below |
| 2. | Zone - III | Moderate Risk Zone | VII |
| 3. | Zone - IV | High Risk Zone | VIII |
| 4. | Zone - V | Very High-Risk Zone | IX & above |

*Source: IMD & NIDM*

The Andhra Pradesh State falls in a region of low Seismic hazard zone with the exception being moderate hazard in few areas of the state. It mainly lies in Zones II and III. The proposed plant site as well as 10 km study area lies in Zone-II which is low damage Risk Zone as per Seismic Zoning Map of India, updated by "Vulnerability Atlas - 3rd Edition (updated on 2nd March, 2019); Peer Group, Ministry of Health (MoH) and UPA; based on digitized data of SOI, GOI; Seismic Zones of India Map, IS 1893 - 2002, BIS, GOI, Seismic tectonic Atlas of India and its environs, GIS, GOI"

Seismic Zoning Map of Andra Pradesh State & Seismic Zoning Map of India showing the proposed plant site is given in Figure 3.7 (a) & 3.7 (b).

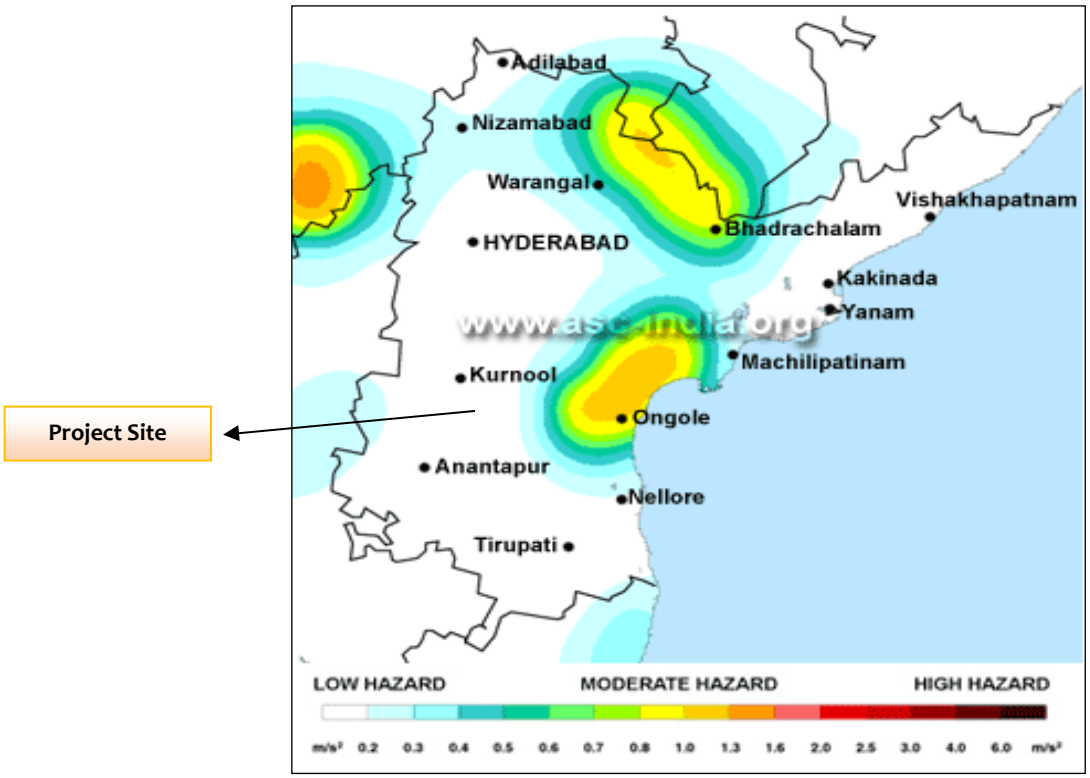



**Figure 3.7 (a): GSHAP Hazard Map of Andhra Pradesh**

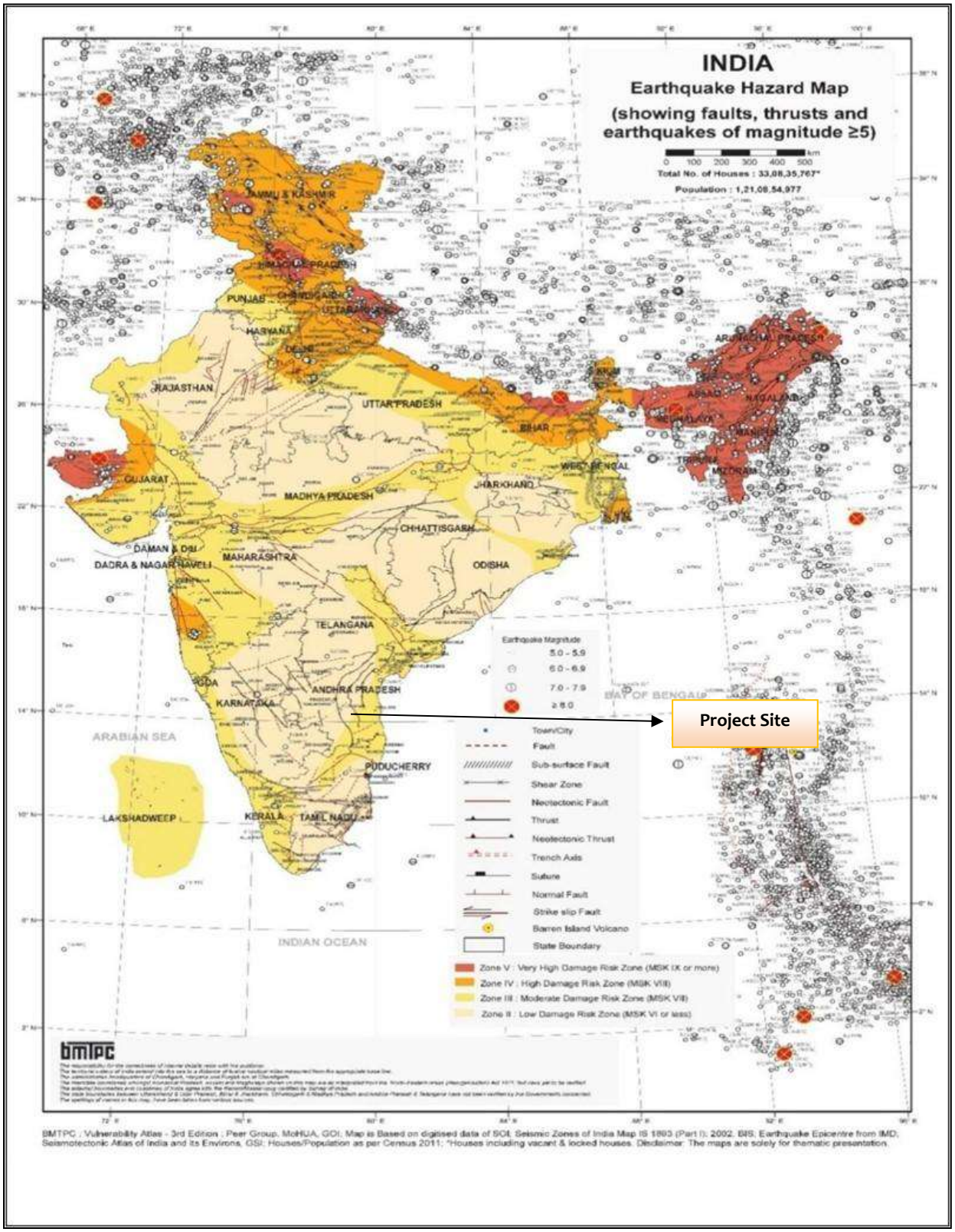



**Figure 3.7 (b): Seismic Zone Map Showing Project Site falls in Zone II**

**Conclusion:** The proposed plant site as well as 10 km study area lies in Zone-II which is low Risk Zone. No major threat is involved.

**Flood Hazard Zonation of the Area**

The proposed plant site does not fall into the study area which is "liable to flood" as per the "BMTPC: Vulnerability Atlas - 3rd Edition (updated on 2ndMarch, 2019); Peer Group, Ministry of Housing (MoH) and UPA (Urban Poverty Alleviation); based on digitized data of SOI, GOI; Census of India 2011; Flood Atlas (1987), Task Force Report (2004), C.W.C., GOI. Flood Hazard Zonation Map of India showing the proposed plant site is given in Figure - 3.8.

**Conclusion** - The proposed plant site as well as 10 km study area not fall into the area which is "liable to flood" as per the "BMTPC. No major threat is involved.

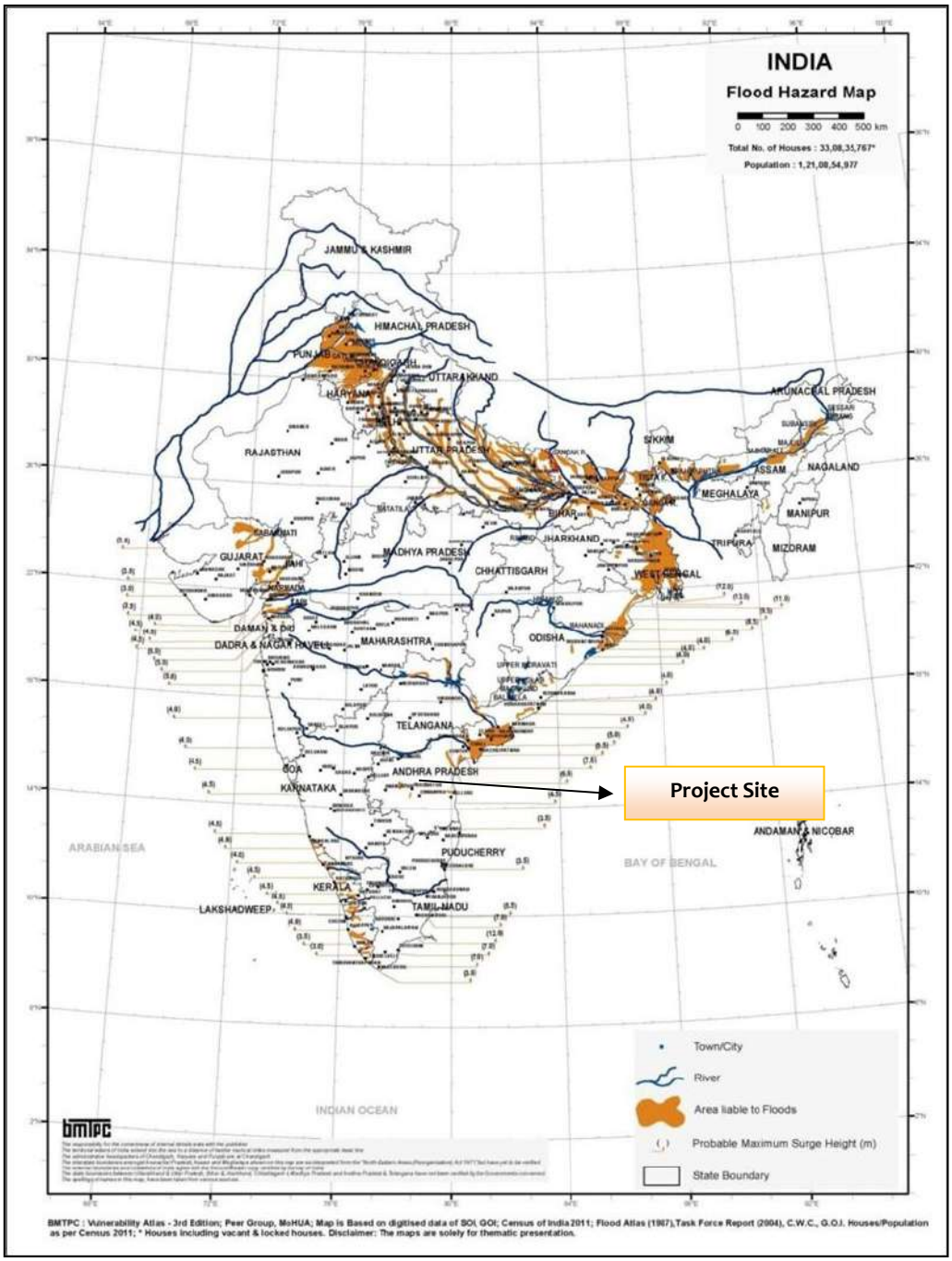



**Figure 3.8: Flood Hazard Zonation Map of the Area**

### 3.5.5 Climatological Details

***Climate and rainfall***

The climate of Andhra Pradesh Varies from tropical Wet and dry to semi-arid. Pre- Monsoon Season in the state extend from March to June, When the moisture level is quite high. The district covered under coastal belt of the state has a slightly higher temperature than other part of the state. The average annual temperature for past 10 years varies from 43.7 to 14.9. The climate of the State is majorly influenced by the South-West Monsoon, whereas one third also experience North- East Monsoon. The annual average rainfall in the area or past 10 years is 842.77 mm where October is the wettest month of the year. Winter is from October to February. Winters are pleasant with low temperatures (13°C) and less humidity.

Rainfall pattern during last 10 years for Kadapa district is presented in Table 3.6.

**Table - 3.6**
**Average Annual Rainfall Data for last 10 years**

| Years | Rainfall (mm) |
|---|---|
| 2014 | 475.78 |
| 2015 | 1174.03 |
| 2016 | 561.82 |
| 2017 | 869.08 |
| 2018 | 412.74 |
| 2019 | 761.2 |
| 2020 | 1276.66 |
| 2021 | 1290.49 |
| 2022 | 933.56 |
| 2023 | 672.3 |

*Source: WRIS*

***Conclusion***

The rainfall record of last 10 years of District Kadapa indicates that rainfall varied between minimum of 475.78 mm in year 2014 to maximum of 1290.49 mm in year 2021 and with an average of 842.77 mm per annum.

### 3.5.6 Meteorology

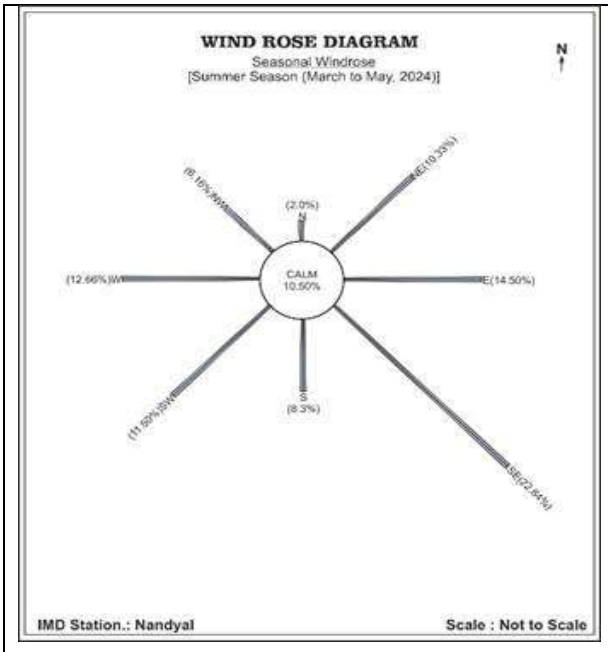
Meteorology plays a vital role in determining the transport and diffusion pattern of air pollutants released into the atmosphere. The principal variables include horizontal convective transport (average wind speed and direction), vertical convective transport (atmospheric stability) and topography of the area.

Meteorological characteristics of an area are very much important in assessing possible environmental impacts and in preparing environmental management plan. Meteorological factors are time dependent and changes with respect to time thus meaningful interpretation can be drawn only from long-term reliable data. For collecting the baseline data, understanding of the

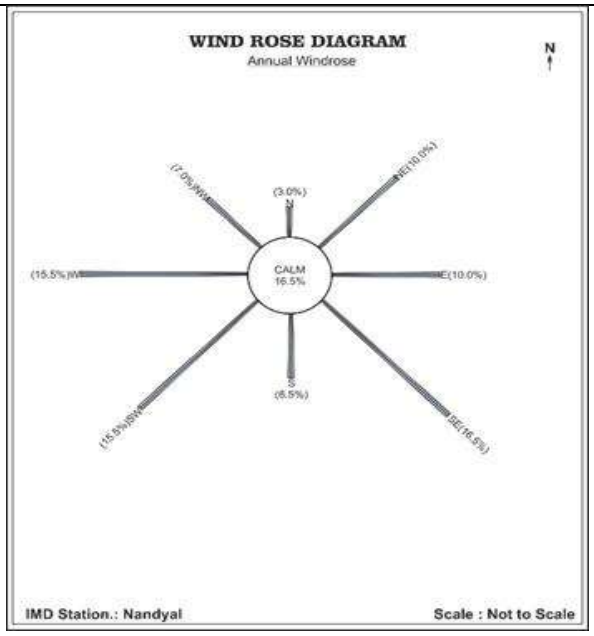
meteorological conditions at the project site is done through study period records data obtained from India Meteorological Department (IMD) (1981-2010). The prime importance of understanding the factor wind speed/wind direction from the IMD data was to determine the baseline monitoring sites for air with respect to the direction of the dominant meteorological factor.

**Conclusion:** The nearest IMD station from the proposed site is Nandyal located at approx. 65 km in distance in NNE direction. Wind Rose Diagram of the season prepared based on the Indian Meteorological Department (IMD) (1991-2020); the Dominant wind direction is from South East and second dominant wind direction is from East, West, South West. Thus, one of the criteria for site selection for assessing the ambient air quality within the 10 km radius from the proposed site is that sampling is done in the upwind and downwind of the dominant wind direction of season & annual wind pattern.

Also, Meteorological data has been collected at Site during the study period and wind Rose Diagram showing the wind pattern during the study period is shown in below figures:




**Summer Season (March to May, 2024)**




**Annual Secondary Windrose (IMD: Nandyal)**

**Figure 3.9 (a): Wind Rose based on secondary Meteorological data for Summer Season & Annual**

### 3.5.6.1 Micro-Meteorology Condition at Site

Meteorological station was set-up at project site to record surface meteorological parameter during Summer Season *(March to May, 2013)* and due to the expiry of earlier conducted baseline study; a fresh baseline has been conducted during Summer Season *(March to May, 2024)*.

Theoretically, meteorological parameters such as Temperature, Humidity, wind speed/ wind direction and Rainfall are the basic parameter which helps in determining the ambient

environment quality of the area. Thus, Primary data for the Wind speed /wind direction, Temperature and Humidity was recorded during the study period. Based on the collected meteorological data, relative percentage frequencies of different wind directions and speed were calculated and plotted as a wind rose diagram as given in Figure 3.9 (b). The percentage calculated for all parameters wind speed, wind direction, rainfall, temperature can influence the Quality, dispersion and movement of the pollutant thereby helps in the determining the Impacts caused by the proposed plant activity.

Wind Rose Diagram showing the wind pattern during the study period is shown in Figure - 3.9 (a). Summary of the micro-meteorology condition near to the site is given in Table - 3.7. Detailed Hourly Meteorological data of has been enclosed as ***Annexure - 6*** with this Final EIA / EMP Report.

**Table - 3.7**
**Micro-Meteorology at Site**
**Study Period: Summer Season (March, 2024 to May, 2024)**

| Month | Temperature (°C) | | Relative Humidity (%) | | Wind Speed (m / sec.) | |
|---|---|---|---|---|---|---|
| | Maximum | Minimum | Maximum | Minimum | Maximum | Minimum |
| **March, 2024** | 40.9 | 27.6 | 57 | 38 | 4.4 | 0.1 |
| **April, 2024** | 41.5 | 30.5 | 58 | 41 | 5.3 | 0.2 |
| **May, 2024** | 42.1 | 36.4 | 60 | 43 | 5.8 | 0.4 |

*Source: Meteorological Station at Site*

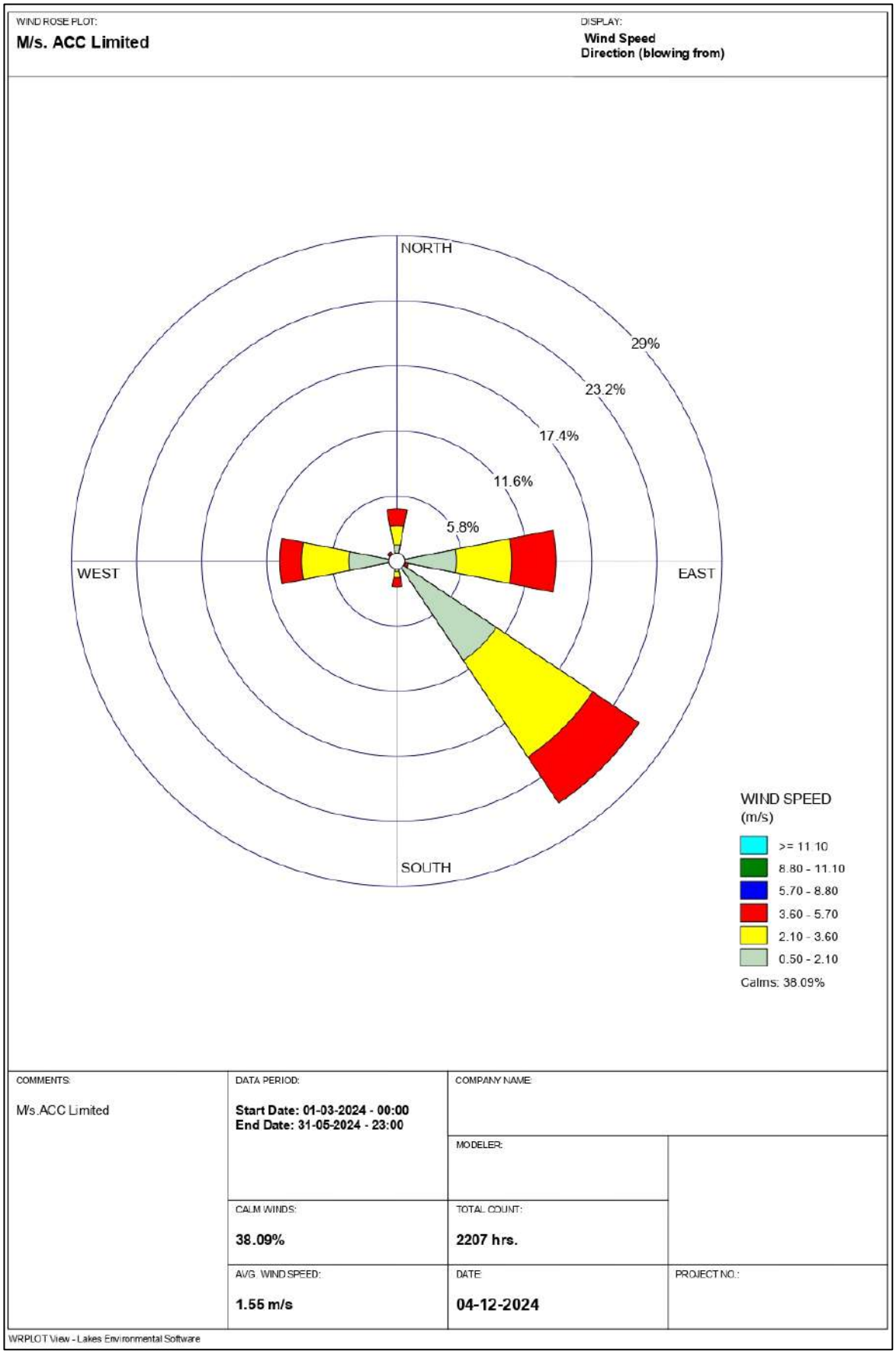



**Figure 3.9(b): Wind rose Diagram (Study Period: Summer Season (March, 2024 to May., 2024)**

### 3.5.6.2 Atmospheric Inversion Level

Inversions are a result of the *vertical temperature profile of air*. Temperature normally decreases as altitude increases in the troposphere (at an average rate of 1°C per 100 meters). However, an increase of temperature as altitude increases can occur and is called an inversion. Thus, the colder air layer is below the warmer air, resulting in a stable temperature profile that restricts vertical mixing. Because of the restricted mixing volumes of air due to the inversion, pollution becomes stagnant and does not dissipate.

**Mixing Height**

Mixing Height (MH) is the vertical extent through which the contaminant plume can be mixed. Forecasting of mixing height is done with the aid of the vertical temperature profile. The MH is a function of stability. In unstable air the MH is higher and in stable air the MH is lower. With a lower MH, there is a smaller volume of air in which the pollutant can be dispersed, resulting in higher concentrations in the ambient environment. There is a seasonal variation of MH. During summer daylight hours, MH can be few thousand feet whereas for winter it can be a few hundred feet. It varies also in the course of a day. It is lowest at night and increases during the day.

Mixing heights based on IMD publication, "Atlas of Hourly Mixing Height and Assimilative Capacity of Atmosphere in India", has been used to determine the mixing height over the study region for the study period i.e., Summer Season and it varies from 110 m - 2000 m respectively.

**Table - 3.8**
**Mixing Height & Inversion Levels**

| Time (Hours) | Mixing Height in m (Summer Season) | Inversion Level* |
|---|---|---|
| 06:00 | 110 | 111 |
| 07:00 | 150 | 151 |
| 08:00 | 350 | 351 |
| 09:00 | 615 | 616 |
| 10:00 | 800 | 801 |
| 11:00 | 1100 | 1101 |
| 12:00 | 1375 | 1376 |
| 13:00 | 1550 | 1551 |
| 14:00 | 1750 | 1751 |
| 15:00 | 1850 | 1851 |
| 16:00 | 2000 | 2001 |
| 17:00 | 1711 | 1712 |
| 18:00 | 1475 | 1476 |
| 19:00 | 1100 | 1101 |
| 20:00 | 975 | 976 |

*Source: IMD publication, "Atlas of Hourly Mixing Height and Assimilative Capacity of Atmosphere in India"*

** As inversion layer foms above the Mixing Height where there foms a condition in which ELR = ALR. Therefore, Inversion level profile has been assumed to be formed above the mixing height.*

Both (Inversion level and Mixing height) are results of vertical temperature profile; and mixing of pollutants will not take place beyond the inversion layer. Thus, it can be presumed that at 6:00 hours, inversion level starts beyond 111 m during Summer Season.

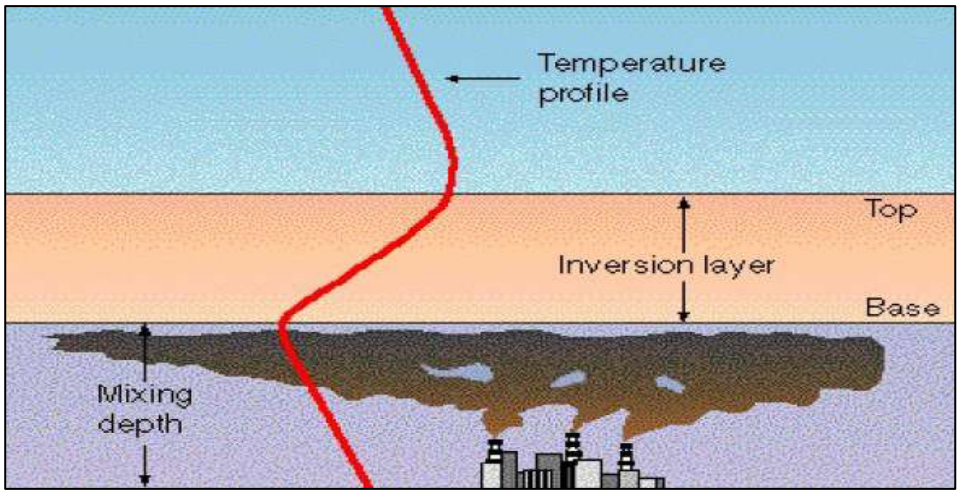



**Figure 3.10: Mixing depth and Inversion layer**

### 3.5.7 Ambient Air Environment

The baseline study was conducted during the Summer Season (March, 2013 to May, 2013) by earlier consultant Vimta Labs Ltd. as the baseline data was 3-year-old & hence expired; therefore, in compliance to the MoEF&CC OM dated 08th June, 2022 a fresh baseline study has been conducted during Summer Season (March, 2024 to May, 2024).

**Summary of Ambient Air Quality Monitoring (Summer Season March, 2013 to May, 2013)**

The observed values for PM2.5 vary between 19.1 µg/m3 near village Bestavemula to 23.6 µg/m3 at Nakkavanipalle and PM10 is found to be 28.3 µg/m3 at Kondsunkesula to 42.5 µg/m3 at Vaddirala. As far as the gaseous pollutants SO2 and NO2 are concerned, the concentrations of SO2 and NO2 were found to be in range of 8.1 to 13.8 µg/m3 and 10.4 to 16.7 µg/m3 respectively. CO concentration was observed to be 204 µg/m3 and 445 µg/m3. Also, Benzene, BaP, As, Ni, Pb, Ozone, Ammonia has monitored in the study area.

**Details of Ambient Air Quality Monitoring (Summer Season - March, 2024 to May, 2024)**

The ambient air quality depends upon the nearby emission sources, micro meteorological conditions and the background concentration of specific pollutants. Samples were collected from the 10 km study area to observe the ambient air quality conditions throughout the region. It helps in providing a data base for evaluation of the anticipated impacts in the 10 km radius study area by the activities of both sites. It will also be useful in ascertaining the quality of air environment in conformity to standards of the ambient air quality during operation phase of both the projects.

***Monitoring Parameters***

The samples were collected for the following air quality determinants:

- Sulphur Dioxide (SOx)

- Nitrogen Dioxide (NO2)
- Particulate Matter (PM10 and PM2.5)
- Carbon Monoxide (CO)

Analytical methods prescribed by CPCB & approved Indian Standard methods were used for carrying out air quality monitoring.

***Methodology***

The methodology adopted for monitoring is given below in Table 3.9

**Table - 3.9**
**Details of Test Procedures**

| S. No. | Parameters | Test Method Specification against which tests are performed | Range of testing | Limit of detection | Equipment used for monitoring | |
|---|---|---|---|---|---|---|
| | | | | | Equipment required for Sampling | Equipment required for Analysis |
| 1. | Sulphur Dioxide ($SO_2$) | IS: 5182, (P-2), 2001 Reaffirmed 2017 | 5 µg/m³ to 1050 µg/m³ | 5 µg/m³ | RDS/Low flow Pump | UV spectrophotometer |
| 2. | Nitrogen Dioxide ($NO_2$) | IS: 5182, (P-6), 2006 Reaffirmed 2017 | 5 µg/m³ to 750 µg/m³ | 5 µg/m³ | RDS/Low flow Pump | UV spectrophotometer |
| 3. | Particulate Matter ($PM_{10}$) | IS: 5182, (P-23), 2006 Reaffirmed 2017 | 10 µg/m³ to 1000 µg/m³ | 10 µg/m³ | RDS | Desiccators, high accuracy weighing balance |
| 4. | Particulate Matter ($PM_{2.5}$) | IS: 5182, (P-24), 2019 | 10 µg/m³ to 500 µg/m³ | 10 µg/m³ | FPS | Desiccators, high accuracy weighing balance |
| 5. | Carbon Monoxide (CO) | IS: 5182, (P-10), 1999 Reaffirmed 2014 | 0.5 mg/m³ to 50 mg/m³ | 0.5 mg/m³ | Sampling in Tedlar Bag with low flow pump | Gas chromatography with detector (FID) |

**Protocol Used:** CPCB Guidelines/IS-5182
**RDS:** Respirable Dust Sampler
**FPS:** Fine Particulate Sampler

***Monitoring Schedule***

Ambient Air quality monitoring has been carried out at 13 locations for 24 hours $PM_{10}$, $PM_{2.5}$, $SO_x$, $NO_x$, and CO with frequency of twice a week for three months (26 observations for one location).

***Sampling Locations***

Sampling locations in the downwind and upwind direction were selected for AAQ Monitoring keeping in view the pre-dominant wind direction prevailing in the area during the study period and as per the IMD data.

It can be observed from the wind rose diagram {Figure - 3.10} of the fresh baseline that the dominant wind direction during Summer Season (March to May, 2024) is from South East.

Villages / locations have been selected in the downwind direction as well as in the upwind direction for AAQ monitoring from proposed site.

Monitoring stations selected for Ambient Air Quality Monitoring during the study period are given in Table - 3.10 and shown in Figure - 3.11.

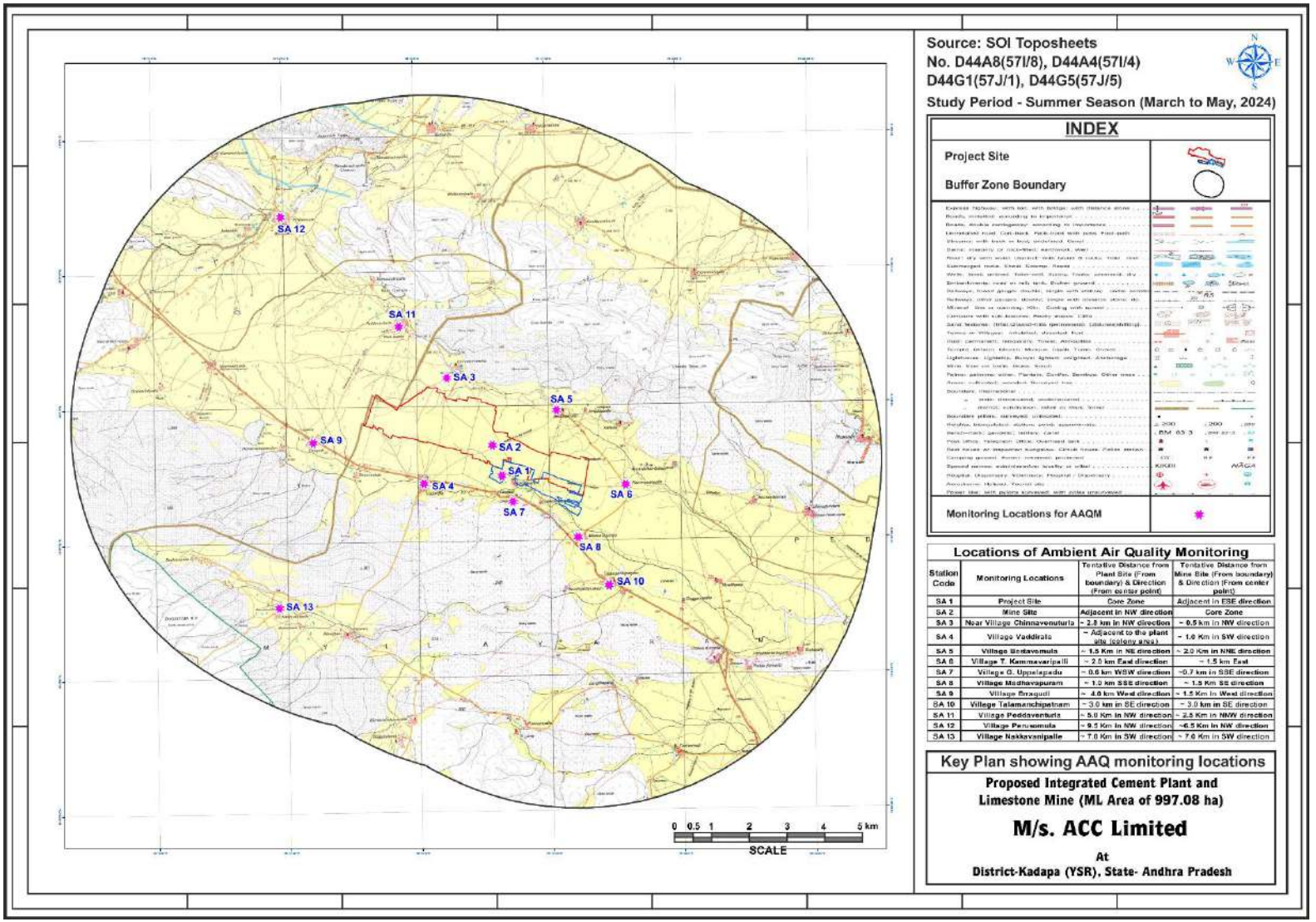
**Table - 3.10**

**Composite Locations of Ambient Air Quality Monitoring Stations for Summer season (March, 2024 to May, 2024)**

| S. No. | Monitoring Stations | Distance and direction from Mine Site | | | Distance and direction from the Plant site | | |
|---|---|---|---|---|---|---|---|
| | | Distance | Direction | Selection Criteria | Distance | Direction | Selection Criteria |
| 1. | Plant Site | Adjacent | ESE | Cement Plant Site | Core Zone | North | Core area |
| 2. | Mine Site | Core Zone | - | Core area | Adjacent | NW | • Mine site |
| 3. | Near Village Chinnavenuturla | ~0.5 km | NW | Downwind of dominant wind direction (Seasonal and annual) | ~ 2.80 km | NW | • Downwind of Dominant Wind Direction (Seasonal and Annual) |
| 4. | Village Vaddirala | ~1. 0 km | SW | • Downwind to the cross wind of the dominant Wind direction<br>• Nearby Habitation<br>• Near SH - 57 | ~ Adjacent to the plant site (colony area) | - | • Downwind to the cross wind of the dominant wind direction<br>• Near SH - 57<br>• Nearest habitation to the colony of proposed plant |
| 5. | Village Bestavemula | ~2.0 km | NNE | • Nearby Habitation to the mine site<br>• Downwind to the cross wind of the dominant Wind direction | ~ 1.5 Km | NE | • Downwind to the 2nd dominant direction<br>• Downwind to the cross wind of the dominant wind direction<br>• Nearby Habitation |
| 6. | Village T. Kammavaripalli | ~1.5 km | East | • Nearby Habitation<br>• Downwind to the 3rd dominant Wind direction (Seasonal and annual) | ~ 2.0 km | East | • Downwind to the 3rd dominant wind direction (Seasonal & Annual) |
| 7. | Village G. Uppalapadu | ~0.7 km | SSE | • Near SH-57 | ~600 m | WSW | • Near SH - 57<br>• Nearby Habitation to the proposed plant site & truck parking area |
| 8. | Village Madhavapuram | 1.5 km | SE | • Upwind to dominant wind direction | ~ 1.0 km | SSE | • Upwind to the dominant wind |

| S. No. | Monitoring Stations | Distance and direction from Mine Site | | | Distance and direction from the Plant site | | |
|---|---|---|---|---|---|---|---|
| | | **Distance** | **Direction** | **Selection Criteria** | **Distance** | **Direction** | **Selection Criteria** |
| | | | | • Nearby Habitation to the proposed plant site | | | • Nearby Habitation to the proposed plant site |
| 9. | Village Erragudi | ~1.5 km | West | • Upwind of the 2nd dominant wind direction<br>• Near SH-57<br>• Habitation in the study area | ~ 4.0 km | West | • Near SH - 57<br>• Habitation in Study Area |
| 10. | Village Talamanchipatnam | ~3.0 km | SE | • Near SH-57<br>• Upwind to dominant wind direction | ~ 3.0 km | SE | • Near SH – 57<br>• Upwind to the dominant wind direction |
| 11. | Village Peddaventurla | ~2.5 km | NNW | • Downwind to dominant wind direction | ~ 5.0 Km | NW | • Downwind to the dominant wind direction |
| 12. | Village Perusomula | ~6.5 km | NW | • Downwind to dominant wind direction<br>• Dense Habitation & Nearby 2-3 Villages in close proximity | ~ 9.5 Km | NW | • Downwind to the dominant wind direction<br>• Dense habitation & nearby 2-3 villages in close proximity. |
| 13. | Village Nakkavanipalle | ~7.0 km | SW | • Near RF<br>• Upwind of 2nd Dominant Wind Direction | ~ 7.0 Km | SW | • Near RF<br>• Upwind of 2nd Dominant Wind direction |

*Source: SOI Toposheet*




*Source: SOI Toposheet*

**Figure 3.11: Key Plan showing Ambient Air Quality Monitoring Locations for Summer season (March, 2024 to May, 2024)**

***Ambient Air Quality Monitoring***

Table - 3.11 shows the maximum & minimum concentration of the air pollutants monitored at different locations (as mentioned in Table - 3.10) during the study period. All 26 observations of pollutants for each location are detailed in Ambient Air Quality Monitoring Tables enclosed as ***Annexure - 7*** along with this report.

**Table - 3.11**

**Ambient Air Quality Monitoring Results for Study Period: Summer Season (March, 2024 to May, 2024)**

| S. No. | Monitoring Location | $PM_{2.5}$ (µg/m³) | | $PM_{10}$ (µg/m³) | | $NO_2$ (µg/m³) | | $SO_2$ (µg/m³) | | CO (mg/m³) | | PAH (ng/m3) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | |
| SA 1 | Project Site | 28.0 | 20.8 | 50.2 | 36.4 | 12.3 | 9.5 | 6.8 | 4.3 | BDL | BDL | BDL |
| SA 2 | Mine Site | 27.8 | 20.1 | 51.9 | 38.0 | 11.0 | 8.9 | 6.6 | 4.2 | BDL | BDL | BDL |
| SA 3 | Near Village Chinnavenuturla | 34.9 | 24.7 | 59.2 | 48.2 | 17.9 | 11.3 | 8.6 | 5.9 | BDL | BDL | BDL |
| SA 4 | Village Vaddirala | 39.2 | 30.8 | 71.3 | 59.0 | 20.3 | 15.7 | 11.7 | 8.0 | BDL | BDL | BDL |
| SA 5 | Village Bestavemula | 33.3 | 24.4 | 58.3 | 46.8 | 17.8 | 10.3 | 7.5 | 5.4 | BDL | BDL | BDL |
| SA 6 | Village T. Kammavaripalli | 32.9 | 24.0 | 56.4 | 42.0 | 16.5 | 9.7 | 7.0 | 4.6 | BDL | BDL | BDL |
| SA 7 | Village G. Uppalapadu | 36.9 | 29.5 | 67.6 | 54.7 | 18.0 | 14.1 | 8.0 | 5.9 | BDL | BDL | BDL |
| SA 8 | Village Madhavapuram | 33.5 | 24.0 | 55.0 | 44.1 | 15.6 | 9.9 | 7.0 | 4.9 | BDL | BDL | BDL |
| SA 9 | Village Erragudi | 35.4 | 27.6 | 62.0 | 49.0 | 16.6 | 11.2 | 9.0 | 6.0 | BDL | BDL | BDL |
| SA 10 | Village Talamanchipatnam | 31.3 | 25.9 | 58.9 | 46.2 | 15.9 | 9.8 | 7.7 | 5.0 | BDL | BDL | BDL |
| SA 11 | Village Peddaventurla | 36.5 | 30.0 | 68.1 | 55.8 | 18.0 | 13.4 | 9.0 | 6.2 | BDL | BDL | BDL |
| SA 12 | Village Perusomula | 41.8 | 34.8 | 76.5 | 62.5 | 22.2 | 17.9 | 11.2 | 8.3 | 0.67 | 0.56 | BDL |
| SA 13 | Village Nakkavanipalle | 33.2 | 25.1 | 60.2 | 47.7 | 14.8 | 8.9 | 7.6 | 4.1 | BDL | BDL | BDL |
| **NAAQS*** | | **60** | | **100** | | **80** | | **80** | | **4 (DL 0.5)** | | |

*Source: Ambient Air Quality Monitoring Results*
**NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 16.11.2009*

**Observations**

- The concentrations of PM10 and PM2.5 for all 13 AAQM stations were found between 36.4 µg/m³ at Project site to 76.5 µg/m³ at Perusomula and 20.1 µg/m³ near Mine site to 41.8 µg/m³ at Perusomula, respectively and were found to be well within the prescribed limits.
- As far as the gaseous pollutants SO2 and NOx are concerned, the prescribed CPCB limit of 80 µg/m³ has never surpassed at any station. The concentrations of SO2 and NO2 were found to be in range of of 4.1 to 11.7 µg/m³ and 8.9 to 22.2 µg/m³ respectively.

- The CO concentration was observed to be BDL at various stations, it was observed maximum at Perusomula (0.67 mg/m$^3$).
- The concentration of PAH was observed Below Detection Limit at all sampling locations.
- The baseline air quality conditions of the region are majorly associated with the type of anthropogenic activities, cement & mine industries located within the area and dependent on the prevailing natural weather conditions of the area. Based on the primary and secondary data collection the ambient air quality monitoring results were analyzed and observed that the anthropogenic source of air pollution within the 10 km study area are mainly due to point sources, line sources and area sources.

**Interpretation & Conclusion**

The baseline air Quality conditions of the region are majorly associated with the type of anthropogenic activities taking place within the area and the same is dependent on the prevailing natural weather conditions of the area. Based on the primary and secondary data collection, the ambient air quality monitoring results were analyzed and it was observed that the anthropogenic source of air pollution within the 10 km study area are mainly due to point sources and line sources. The major cause for the point sources, line sources and area sources within the 10 km radius of study area are follows:

- ***Point source:*** Presence of Large, Medium and Small-Scale Industrial activities such as Cement Plant etc.
- ***Line Source:*** Movement of heavy-duty vehicles used for raw material and finished product transportation for the located Industries. Movement of the private and public vehicles / as well as tractors and trolley movement for agricultural and construction activities.
- ***Area sources:*** Incomplete combustion practice for domestic/cooking/ heating at few villages.

  The concentration of the dust pollutants (i.e., PM2.5 & PM10) and gaseous pollutants (i.e., Sox and NOx) assessed is found maximum at Village Perusomula and at Village Vaddirala. The reason for the higher value near to the above-mentioned location is due to the presence of comparatively dense habitation and its human activities such as construction and heavy-duty vehicular movement. Presence of SH-57, roads of the town are another reason for this increased concentration of pollutants as it increases the dust load due to vehicular movement in the nearby surroundings.

  Based on the present scenario, it can be predicted that the area could be more impacted due to the proposed project. Proper mitigation measures will be adopted by the company to reduce the same.

***Conclusion:***

All the parameters at the sampling locations were found well within the prescribed NAAQ standards. But it is expected, from the proposed project, that the increased transportation during the operation phase as well as construction phase will increase the pollutant concentration in the nearby villages

but proper mitigation measure will be adopted by M/s. ACC Limited to reduce the additional air pollution load. Details of the mitigation measures to control the Air emissions are incorporated in the Chapter- 4 & 10 of EIA/EMP report.

### 3.5.7.1 Mineralogical composition for RSPM

RSPM is "defined as the component of inhaled respirable dust small enough to reach the pulmonary or alveolar region of the lung".

***Classification of RSPM***

| Classification | Type of particles | Size of the particles |
|---|---|---|
| $PM_{10}$ | Inhalable particles | ≤ 10µm |
| $PM_{2.5}$ | Fine particles | ≤ 2.5µm |

The mineralogical composition of RSPM may have Calcite, Dolomite, Vaterite, Aragonite Minerals (Calcite Minerals) or Actinolite or Tremolite (Magnesium minerals) and Free Silica.

**Chemical Characterization of RSPM**

| S. No. | IONS | Units | CONCENTRATION |
|---|---|---|---|
| 1. | Free Silica (SiO2) | % | 1.75 |
| 2. | Calcium (Ca) | µg/m³ | 48.24 |
| 3. | Magnesium (Mg) | µg/m³ | 7.14 |
| 4. | Iron (Fe) | µg/m³ | 35.10 |
| 5. | Aluminium (Al) | µg/m³ | 2.23 |
| 6. | Sodium (Na) | µg/m³ | 7.00 |
| 7. | Potassium (K) | µg/m³ | 3.64 |
| 8. | Manganese (Mn) | µg/m³ | 11.08 |
| 9. | Chromium (Cr) | µg/m³ | 2.30 |
| 10. | Nickel (Ni) | µg/m³ | BDL (DL 1,0) |
| 11. | Zinc (Zn) | µg/m³ | BDL (DL 1.0) |
| 12. | Copper (Cu) | µg/m³ | 1.42 |
| 13. | Cobalt (Co) | µg/m³ | BDL (DL 1.0) |
| 14. | Lead (Pb) | µg/m³ | BDL (DL 1.0) |
| 15. | Mercury (Hg) | µg/m³ | BDL (DL 1.0) |
| 16. | Cadmium (Cd) | µg/m³ | BDL (DL 1.0) |

**Analysis of Poly-Aromatic Hydrocarbons (PAH) in SPM**

Over the past years, PAHs have been found to be ubiquitous constituents of urban airborne particles and have become a major health concern mainly due to their well-known carcinogenic and mutagenic properties. PAHs are formed during incomplete combustion of organic materials such as fossil fuels, coke and woods. Residence time and removal mechanisms of PAHs in the atmosphere depend on their distribution among the particle size fractions.

PAHs are emitted from combustion sources and are thus emitted to atmosphere in gas phase or in

fine particles. After the entrance to atmosphere, they are cold and they unite or get adsorbed into small particles. These processes lead PAHs in higher concentrations to fine particles.

PAHs analysis was also done during the study period for all the air sampling stations but has been found Below Detection Limit.

### 3.5.8 NOISE ENVIRONMENT

The baseline study was conducted during the Summer Season (March., 2013 to May., 2013) by erlier consultant Vimta Labs Ltd. as the baseline data was 3-year-old & hence expired; therefore, in compliance to the MoEF&CC OM dated 08th June, 2022 a fresh baseline study has been conducted during Summer Season (March, 2024 to May, 2024).

***Summary of earlier Noise Quality Monitoring (Summer Season - March, 2013 to May, 2013)***

The maximum noise level of 49.1 dB (A) was observed at Vaddirala and the minimum noise level of 40.4 dB (A) was observed at Kondsunkesul. It is observed that the day time noise levels are in accordance to the prescribed limit of 55 dB (A) for Residential and 65 dB (A) for Commercial areas. The maximum noise level of 44.3 dB (A) was observed at Vaddirala and the minimum noise level of 40.4 dB (A) was observed at Kondsunkesula. It has been found that the night time noise levels are in accordance with prescribed limit of 55 dB (A) for Commercial and the standard limit of 45 dB (A) for Residential.

***Details of Fresh Noise Quality Monitoring (Summer Season - March, 2024 to May, 2024)***

Any unwanted sound that interferes with speech communication, causes annoyance, distracts from work, and disturbs sleep, thus deteriorating quality of human environment can be defined as noise.

***Source of Noise***

There are several sources of noise in the 10 km radius of study area, which contribute to the local noise level of the area. Ambient noise sources in the vicinity of the plant and mine site include the noise from traffic on road, human activities in villages and agricultural fields.

***Ambient Noise Level***

In order to know the baseline noise levels, in and around the proposed plant site and mine site, noise levels were measured at site and villages in the study area.

***Sampling Schedule***

The sampling was done during day time and night time once in the study period.

***Sampling Locations***

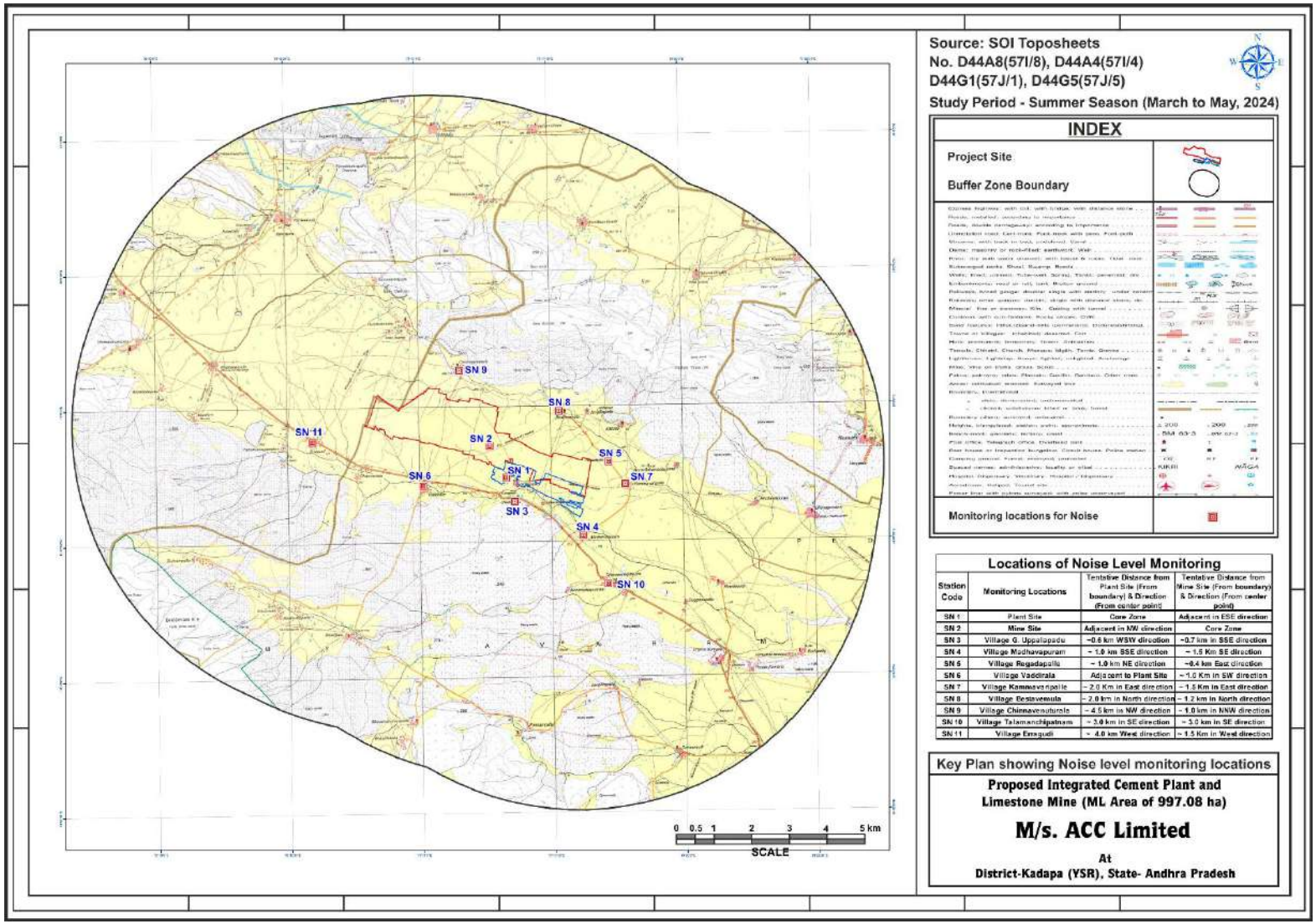
Locations / stations selected for noise level monitoring are given in Table - 3.12 and shown in Figure - 3.12

**Table - 3.12**

**Composite Locations of Ambient Noise Monitoring Stations: Summer Season**

**(March, 2024 to May, 2024)**

| S. No. | Monitoring Stations | Distance and direction from Plant Site | | Distance and direction from the Mine site | |
|---|---|---|---|---|---|
| | | Distance | Direction | Distance | Direction |
| 1. | Plant Site | Core Zone | - | Adjacent | ESE |
| 2. | Mine Site | Adjacent | NW | Core Zone | - |
| 3. | Village G. Uppalapdu | ~ 0.6 km | WSW | ~0.7 km | SSE |
| 4. | Village Madhavapuram | ~1.0 km | SSE | ~1.5km | SE |
| 5. | Village Regdapalle | ~1.0 km | NE | ~0.4 km | East |
| 6. | Village vaddirala | Adjacent | - | ~1.0 km | SW |
| 7. | Village Kammavaripalle | ~2.0 km | East | ~1.5 km | East |
| 8. | Village Bestavemula | ~ 2.0 km | North | ~1.2 km | North |
| 9. | Village Chinnavenuturala | ~4.5 km | NW | ~1.0 km | NNW |
| 10 | Village Talamanchipatnam | ~3.0 km | SE | ~3.0 km | SE |
| 11 | Village Erragudi | ~4.0 km | West | ~1.5 km | West |




*Source: SOI Toposheet*

**Figure 3.12: Key Plan showing Ambient Noise Monitoring Locations for Study Period: Summer Season (March, 2024 to May, 2024)**

***Ambient Noise Level Monitoring***

Ambient noise levels monitoring results monitored at different locations as mentioned in Table - 3.13 during the study period are given in Table - 3.13

**Table - 3.13**

**Ambient Noise Level Monitoring Results**

**Study Period: Summer Season (March, 2024 to May, 2024)**

| S. No. | Monitoring Locations | Noise Level dB Leq (A) | | | |
|---|---|---|---|---|---|
| | | Day Time (6:00 am to 10:00 pm) | | Night Time (10:00 pm to 6:00 am) | |
| | | Result | Prescribed limit | Result | Prescribed limit |
| SN1 | Plant Site | 48.1 | 75.0 | 37.8 | 70.0 |
| SN2 | Mine Site | 47.5 | 75.0 | 37.7 | 70.0 |
| SN3 | Village G. Uppalapdu | 51.4 | 55.0 | 40.5 | 45.0 |
| SN4 | Village Madhavapuram | 50.5 | 55.0 | 40.1 | 45.0 |
| SN5 | Village Regdapalle | 50.7 | 55.0 | 40.6 | 45.0 |
| SN6 | Village vaddirala | 52.6 | 55.0 | 42.5 | 45.0 |
| SN7 | Village Kammavaripalle | 50.3 | 55.0 | 40.2 | 55.0 |
| SN8 | Village Bestavemula | 51.8 | 55.0 | 41.7 | 45.0 |
| SN9 | Village Chinnavenuturala | 53.1 | 55.0 | 42.5 | 45.0 |
| SN10 | Village Talamanchipatnam | 50.1 | 55.0 | 39.8 | 45.0 |
| SN11 | Village Erragudi | 53.9 | 55.0 | 42.6 | 45.0 |

***Observations, Interpretation & Conclusion for Summer Season (March, 2024 to May,2024):***

- Ambient noise levels were measured at 11 locations in and around the project site during the day and night time.
- Noise levels vary from 47.5 Leq dB (A) near Mine site to 53.9 Leq dB (A) at Village Erragudi during day time and from 37.7 Leq dB (A) at Mine Site to 42.6 Leq dB (A) at Erragudi during night time.
- The noise level monitoring for the study period was done considering the maximum residential area, the commercial area and around the small and medium scale industries.
- Within the 10 km radius of study area the noise levels at the sampling locations are under the prescribed limits as defined by the CPCB.
- During the implementation phase of the project, a minor increase in noise levels near to the plant site will be observed which will be temporary. The noise level after commencement of the plant will remain confined within plant boundary. In order to mitigate the anticipated impacts, adequate mitigation measure will be adopted to reduce the noise impacts. Details of the mitigation measures by M/s. ACC Limited are incorporated in the Chapter- 4 & 10 of Final EIA/EMP report.

### 3.5.9 Water Environment

The baseline study was conducted during the Summer Season (March, 2013 to May, 2013) by earlier consultant Vimta Labs Ltd. as the baseline data was 3-year-old & hence expired; therefore, in compliance to the MoEF&CC OM dated 08th June, 2022 a fresh baseline study has been conducted during Summer Season (March, 2024 to May, 2024).

The water resources in the study area were divided into two categories for getting ideal upshot of baseline status of water quality of the study area. The two major water resources are categorized as follows:

- Surface water resources: Streams, Nallah, Ponds, River, Canals.
- Ground water resources: Bore-wells, Tube well, open well, Hand pumps and Tap water.

#### 3.5.9.1 Surface Water

**Surface Water Quality (Summer Season March, 2013 to May, 2013)**

As rivers, streams and lakes in the study area are seasonal; surface water was not available for sampling during study period i.e summer season 2013.

**Surface Water Quality (Summer Season March, 2024 to May, 2024)**

There are 7 major surface water bodies present within 10 km radius of both the plant site and mine site.

***Sampling Schedule***

The surface water sampling was done during once in the study period.

***Sampling Locations***

Monitoring station selected for surface water quality monitoring during the study period is given in Table - 3.14.

**Table - 3.14**

**Composite Location of Surface water Quality Monitoring Locations for Study Period: Summer Season (March, 2024 to May, 2024)**

| S. No. | Monitoring Stations | Distance and direction from Plant Site | | Distance and direction from the Mine site | |
|---|---|---|---|---|---|
| | | Distance | Direction | Distance | Direction |
| 1. | Nallah | Passing thorugh the project site | - | ~ 0.6 km in SSE | |
| 2. | Canal | Adjacent | - | Passing through Mine site | - |
| 3. | Pond 1 | ~ 3.0 km | NNE | ~ 2 km | NE |
| 4. | Pond near Kallutla | ~ 2.5 km | ENE | ~ 1.5 km | ENE |
| 5. | Nalla Cheruvu | ~ 6 km | NNW | ~ 3.5 km | NNW |
| 6. | Pond 2 | ~ 4 km | South | ~ 5 km | South |
| 7. | Pond 3 | ~ 4.4 km | SSE | ~ 5 km | SSE |

Surface water sample was not collected as all the water bodies were found dry during the study period.

### 3.5.9.2 Ground Water

**Summary of Ground water Quality (Summer Season March, 2013 to May, 2013)**

The analysis results of ground water samples showed the pH in range of 7.2-7.8 which are with the specified standard limits of 6.5 to 8.5. Colour and turbidity of the samples ranged from 2-4 Hazens and 3-5 NTU respectively. Electrical conductivity of the samples ranged from 182 - 1923 µS/cm. The maximum value was observed at Mines lease (GW7), and where as the minimum value was observed at Padla Village (GW4). The total hardness of the samples ranged from 51-480 mg/l. The maximum value was observed in Nawabpeta (GW7) and whereas the minimum value observed at Plant Site (GW4). Whereas the total hardness values are as per the prescribed limits of 300 mg/l. Calcium and Magnesium concentrations ranged from 14.4-119.4 mg/l and 3.7-45.5 mg/l respectively. The Total Dissolved solids of the samples ranged from 120-1290 mg/l. The maximum TDS was observed at Nawabpeta (GW7), and where as the minimum value observed at Plant site (GW4) location. The TDS values are within desirable limits 600 mg/l, except in two samples where the values were higher but also within the stipulated 2000 mg/l in case of absence of alternate source. Chlorides and Sulphates concentrations at all the locations ranged in between 22.1-340 mg/l and 12.1-237.7 mg/l respectively. Fluoride concentrations are ranging in between 0.6 – 0.9 mg/l and are found to be within the permissible limits. Similarly, Nitrates are also found to be ranging in between 5.8 - 25.4 mg/l which shows all the samples were within the standard limits only, as 45 mg/l. Iron concentrations in ground waters varied from 0.03-0.11 mg/l. Zinc levels varied from 0.03-0.12 mg/l respectively. Aluminium concentration in ground water ranged from <0.01-0.02 mg/l which are within the limits stipulated. Bacteriological studies revealed the absence of E. coli in ground water samples. The Total Coliform counts is nil in all the samples against the standard limit of 10 MPN/100 ml.

**Details of Ground Water Quality (Summer Season March, 2024 to May, 2024)**

The sources of potable water in the area are storage tanks, bore-wells and tube-wells. The quality of ground water was studied by collecting 9 water samples from the available water resources in and around the proposed plant site and mine site.

***Sampling Schedule***

The ground water sampling was done during once in the study period. Analytical methods prescribed by APHA & approved Indian Standard methods were used for carrying out ground water quality monitoring.

***Sampling Locations***

Details of ground water sampling locations their distance and directions are given in Table - 3.15 & shown in Figure - 3.13. The ground water monitoring results are given in Table 3.16.

**Table - 3.15**

**Composite Locations of Ground Water station**

**Study Period: Summer Season (March, 2024 to May, 2024)**

| S. No. | Monitoring Stations | Distance and direction from Plant Site | | Distance and direction from the Mine Site | |
|---|---|---|---|---|---|
| | | Distance | Direction | Distance | Direction |
| 1. | Plant Site | Core area | - | Adjacent | - |
| 2. | Village Ped Daventurla | ~ 5.9 km | NW | ~ 2.7 km | NNW |
| 3. | Village Jangalapalle | ~ 2.5 km | NE | ~ 1.70 km | NE |
| 4. | Village Talamanchipatnam | ~ 3.0 km | SE | ~ 3.0 km | SE |
| 5. | Village Vaddirala | Adjacent | - | ~ 1.0 km | SW |
| 6. | Nosam | ~ 9.5 km | East | ~ 9.4 km | East |
| 7. | Village Dobbundapalle | ~ 4.7 km | SE | ~ 5.1 km | SE |
| 8. | Village Bestavemula | ~ 2.0 km | North | ~1.2 km | North |
| 9. | Village Malamidkambaladinne | ~ 10.9 km | SSW | ~ 11.6 km | South |

***Source:*** *SOI Toposheet*

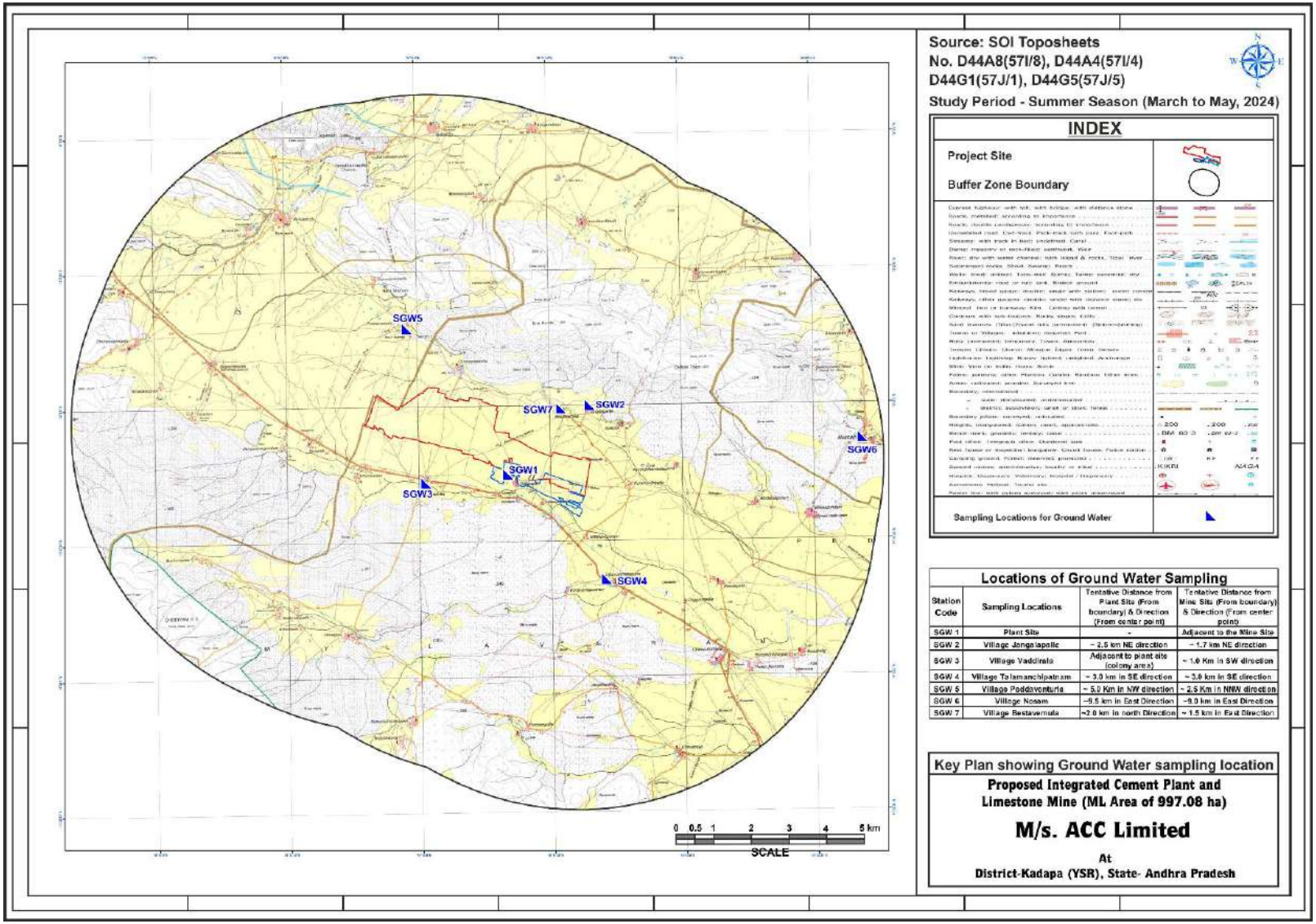



**Figure 3.13: Key Plan showing Ground Water sampling Locations for Study Period: Summer Season (March, 2024 to May, 2024)**

**Table - 3.16**
**Ground Water Analysis**
**Study Period: Summer Season (March, 2024 to May, 2024)**

| S. No. | Parameters | Unit | Near Plant Site | Village Ped Daventurla | Village Jangalapalle | Village Talamanchipatnam | Village Vaddirala | Nosam | Dobbundapalle | Bestavemula | Malamidkambaladinne | Requirement (Acceptable Limit) | Permissible limit (Max.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. | pH (at 25°C) | - | 7.47 | 7.38 | 7.60 | 7.56 | 7.78 | 7.50 | 7.44 | 7.64 | 7.55 | 6.5-8.5 | No Relaxation |
| 2. | Colour | Hazen Unit | BDL (DL 1.0) | BDL (DL 1.0) | BDL (DL 1.0) | BDL (DL 1.0) | BDL (DL 1.0) | BDL (DL 1.0) | BDL (DL 1.0) | BDL (DL 1.0) | BDL (DL 1.0) | 5 | 15 |
| 3. | Turbidity | NTU | BDL (DL 1.0) | BDL (DL 1.0) | BDL (DL 1.0) | BDL (DL 1.0) | BDL (DL 1.0) | BDL (DL 1.0) | BDL (DL 1.0) | BDL (DL 1.0) | BDL (DL 1.0) | 1 | 5 |
| 4. | Odour | - | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable |
| 5. | Taste | - | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable |
| 6. | Total Hardness as $CaCO_3$ | mg/l | 478.7 | 398.2 | 693.2 | 357.6 | 736.4 | 278.3 | 283.1 | 535.0 | 239.17 | 200 | 600 |
| 7. | Calcium as Ca | mg/l | 112.6 | 85.66 | 196.84 | 97.55 | 202.3 | 60.61 | 51.63 | 139.2 | 41.74 | 75 | 200 |
| 8. | Alkalinity as $CaCO_3$ | mg/l | 321.1 | 310.7 | 310.8 | 236.0 | 585.9 | 195.7 | 196 | 270.7 | 185.6 | 200 | 600 |
| 9. | Chloride as Cl | mg/l | 247.6 | 137.29 | 386.3 | 167.0 | 434.5 | 119.63 | 165.16 | 287.8 | 104.81 | 250 | 1000 |
| 10. | Cyanide as CN | mg/l | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | 0.05 | No Relaxation |
| 11. | Magnesium as Mg | mg/l | 47.9 | 44.72 | 48.85 | 27.63 | 56.04 | 30.8 | 37.42 | 45.43 | 32.76 | 30 | 100 |
| 12. | Total Dissolved Solids | mg/l | 986 | 678.0 | 1162.0 | 645.0 | 1582 | 524.0 | 567.0 | 883 | 475.0 | 500 | 2000 |
| 13. | Sulphate as $SO_4$ | mg/l | 130.3 | 76.59 | 108.3 | 55.2 | 149.4 | 67.56 | 40.38 | 91.2 | 48.23 | 200 | 400 |
| 14. | Fluoride as F | mg/l | 0.63 | 0.28 | 0.73 | 0.63 | 0.76 | 0.16 | 0.43 | 0.52 | 0.36 | 1.0 | 1.5 |
| 15. | Nitrate as $NO_3$-N | mg/l | 22.86 | 9.95 | 19.68 | 12.05 | 27.6 | 6.24 | 6.47 | 10.37 | 8.19 | 45 | No Relaxation |
| 16. | Iron as Fe | mg/l | BDL(DL 0.02) | BDL(DL 0.02) | 0.06 | 0.07 | 0.11 | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | 1.0 | No Relaxation |
| 17. | Aluminium as Al | mg/l | BDL (DL 0.03) | BDL (DL 0.03) | BDL (DL 0.03) | BDL (DL 0.03) | BDL (DL 0.03) | BDL (DL 0.03) | BDL (DL 0.03) | BDL (DL 0.03) | BDL (DL 0.03) | 0.03 | 0.2 |
| 18. | Boron | mg/l | BDL (DL 0.20) | BDL (DL 0.20) | BDL (DL 0.20) | BDL (DL 0.20) | BDL (DL 0.20) | BDL (DL 0.20) | BDL (DL 0.20) | BDL (DL 0.03) | BDL (DL 0.20) | 0.50 | 2.4 |
| 19. | Phenolic Compounds | mg/l | BDL (DL 0.001) | BDL (DL 0.001) | BDL (DL 0.001) | BDL (DL 0.001) | BDL (DL 0.001) | BDL (DL 0.001) | BDL (DL 0.001) | BDL (DL 0.001) | BDL (DL 0.001) | 0.001 | 0.002 |

| S. No. | Parameters | Unit | Near Plant Site | Village Ped Daventurla | Village Jangalapalle | Village Talamanchipatnam | Village Vaddirala | Nosam | Dobbundapalle | Bestavemula | Malamidkambaladinne | Requirement (Acceptable Limit) | Permissible limit (Max.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20. | Anionic Detergents as MBAS | mg/l | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | 0.2 | 1 |
| 21. | Hexa Chromium as $Cr^{+6}$ | mg/l | BDL (DL 0.03) | BDL (DL 0.03) | BDL (DL 0.03) | BDL (DL 0.03) | BDL (DL 0.03) | BDL (DL 0.03) | BDL (DL 0.03) | BDL (DL 0.03) | BDL (DL 0.03) | -- | -- |
| 22. | Chromium as Cr | mg/l | BDL (DL 0.002) | BDL (DL 0.002) | BDL (DL 0.002) | BDL (DL 0.002) | BDL (DL 0.002) | BDL (DL 0.002) | BDL (DL 0.002) | BDL (DL 0.002) | BDL (DL 0.002) | 0.05 | No Relaxation |
| 23. | Zinc as Zn | mg/l | 0.06 | 0.09 | 0.03 | 0.07 | 0.10 | 0.08 | 0.04 | 0.08 | 0.11 | 5 | 15 |
| 24. | Copper as Cu | mg/l | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | 0.05 | 1.5 |
| 25. | Manganese as Mn | mg/l | BDL (DL 0.01) | 0.12 | 0.16 | BDL(DL 0.01) | 0.30 | BDL(DL 0.01) | 0.33 | 0.23 | BDL(DL 0.01) | 0.1 | 0.3 |
| 26. | Cadmium as Cd | mg/l | BDL (DL 0.002) | BDL (DL 0.002) | BDL (DL 0.002) | BDL (DL 0.002) | BDL (DL 0.002) | BDL (DL 0.002) | BDL (DL 0.002) | BDL (DL 0.002) | BDL (DL 0.002) | 0.003 | No Relaxation |
| 27. | Lead as Pb | mg/l | BDL (DL 0.008) | BDL (DL 0.008) | BDL (DL 0.008) | BDL (DL 0.008) | BDL (DL 0.008) | BDL (DL 0.008) | BDL (DL 0.008) | BDL (DL 0.008) | BDL (DL 0.008) | 0.01 | No Relaxation |
| 28. | Arsenic as As | mg/l | BDL (DL 0.002) | BDL (DL 0.002) | BDL (DL 0.002) | BDL (DL 0.002) | BDL (DL 0.002) | BDL (DL 0.002) | BDL (DL 0.002) | BDL (DL 0.002 | BDL (DL 0.002) | 0.01 | No Relaxation |
| 29. | Mercury as Hg | mg/l | BDL (DL 0.001) | BDL (DL 0.001) | BDL (DL 0.001) | BDL (DL 0.001) | BDL (DL 0.001) | BDL (DL 0.001) | BDL (DL 0.001) | BDL (DL 0.001) | BDL (DL 0.001) | 0.001 | No Relaxation |
| 30. | Sodium as Na | mg/l | 155.0 | 85.0 | 140.0 | 80.0 | 280.0 | 70.0 | 87.0 | 108.0 | 70.0 | -- | -- |
| 31. | Potassium as K | mg/l | 9.0 | 6.0 | 8.0 | 20.0 | 11.0 | 5.0 | 4.0 | 9.0 | 3.0 | -- | -- |
| 32. | Phosphate as $PO_4$ | mg/l | BDL(DL 0.02) | BDL(DL 0.02) | BDL(DL 0.02) | BDL(DL 0.02) | BDL(DL 0.02) | BDL(DL 0.02) | BDL(DL 0.02) | BDL (DL 0.02) | BDL(DL 0.02) | -- | -- |
| 33. | Nickel | mg/l | BDL(DL 0.005) | BDL(DL 0.005) | BDL(DL 0.005) | BDL(DL 0.005) | BDL(DL 0.005) | BDL(DL 0.005) | BDL(DL 0.005) | BDL(DL 0.005) | BDL(DL 0.005) | 0.02 | No Relaxation |
| 34. | Conductivity | µS/cm | 1490.0 | 1014.0 | 1720.0 | 970.0 | 2407.0 | 793.0 | 870.0 | 1318.0 | 714.0 | -- | -- |
| 35. | Total Suspended Solid | mg/l | BDL(DL 1.0) | BDL (DL 1.0) | BDL(DL 1.0) | BDL (DL 1.0) | BDL (DL 1.0) | BDL(DL 1.0) | BDL (DL 1.0) | BDL (DL 1.0) | BDL (DL 1.0) | -- | -- |

***Nearest Village sources was sampled***

*BDL - Below Detectable Limit; DL - Detection Level*

*Note: Ground water quality was also analyzed for Aluminum, Boron, Cyanide, Phenolic Compounds, Anionic Detergents as MBAS, Chromium as Cr, Hexa Chromium as Cr+6, Zinc, Copper, Manganese, Cadmium, Lead, Selenium, Arsenic, Mercury, Nickel, Total Coliforms& E-coli etc. and were found below detection limit.*

***Observations, Interpretation & Conclusion for Summer Season (May, 2024 to March, 2024):***

***Observations:***

- The physico - chemical quality of groundwater was compared with drinking water standard (IS: 10500- 2012).
- The pH of the ground water at the sampled locations were observed to be vary from minimum (7.38) at Village Ped Daventurla to maximum (7.78) at Village Vaddirala indicating the water samples have a pH quality slightly alkaline in nature. The pH at the project site was observed to be 7.47 respectively.
- The color and turbidity were found to be BDL (DL 5.0) and BDL (DL 1.0) respectively at all the sampled locations. The odour and taste were found agreeable at all sampling locations.
- The observed value of the ground water quality indicators varies from: Total hardness as $CaCO_3$ (239.17 mg/l at Malamidkambaladinne to 736.4 mg/l at Village Vaddirala); Alkalinity as $CaCO_3$ (185.6 mg/l at Malamidkambaladinne to 585.9 mg/l at Village Vaddirala); Total Dissolved Solids (475 mg/l at Malamidkambaladinne to 1582 mg/l at Village Vaddirala).
- The concentration of chloride varies from 104.81 mg/l at Malamidkambaladinne to 434.5 mg/l at Village Vaddirala and Sulphate from 40.38 mg/l at Dobbudapalle to 149.4 mg/l at Village Vaddirala, Magnesium varies from 27.63 mg/l at Village Talamanchipatnam to 56.04 mg/l at Village Vaddirala; Calcium as Ca varies from 41.74 mg/l at Malamidkambaladinne to 202.3 mg/l at Village Vaddirala; Iron varies from 0.06 mg/l at Village Jangalapalle to 0.11 mg/l at Village Vaddirala; Fluoride varies from 0.16 mg/l at Nosam to 0.76 mg/l at Village Vaddirala.
- Ground water quality was also analyzed for Cyanide as (CN), Aluminium as (Al), Phenolic Compounds, Anionic Detergents as (MBAS), Hexa Chromium as ($Cr^{+6}$), Chromium as (Cr), Zinc as (Zn), Copper as (Cu), Manganese as (Mn), Cadmium as (Cd), Lead as (Pb), Arsenic as (As) are reported to be their Below detection limit at all the sampled locations.

***Interpretation:***

Groundwater pollution is usually traced back to four main origins: Industrial, domestic and agriculture. The type of contaminant is carried out by the aquifers and results in the ground water pollution. Ground water is generally a good source of drinking water thus the physico-chemical quality of groundwater was compared with drinking water standard (IS: 10500- 2015). The location considered for the water analysis includes the area near to the residential area, agricultural area, industrial area and commercial area. As observed during the analysis, the values of few indicators (Alkalinity, TDS, etc.) were above the acceptable limits but were found below the permissible limits and total hardness is slightly more than the permissible limits. As observed during the primary survey, other mining area and industries are located within the 10 km study area which resulted in deterioration of ground water quality values. The study area mainly comprises of agriculture land which uses fertilizers, herbicides pesticides, and canal water for irrigation. Nearby area of the project site consists of open land which is mainly agricultural land. Thus, it can be concluded, that small scale/ medium industrial activities and domestic and agriculture activities are contributing for the ground water Quality values above the acceptable limits. The chemical relationship shows that

water samples have TSS below detection limit (DL 1.0) therefore the colour and turbidity were found to be BDL (DL 1.0) and BDL (DL 1.0) respectively at all the locations.

***Conclusion:***

From the above study and discussions, it can be concluded that ground water quality in the study area is within the permissible limits as per the drinking water standards (IS: 10500-2012). Therefore, the ground water available within the study area is fit for consumption. The proposed project will be utilizing ground water for various plant activities & for drinking & domestic purpose in plant & colony. However, the manufacturing process will be based on the dry process thus no discharge of waste water is envisaged from the proposed project. Also, various adequate mitigative measures along will be adopted by the M/s. ACC Limited to maintain the quality of ground water. The company has proposed rain water harvesting & ground water recharge structures to increase ground water recharge and the details are incorporated in the Chapter - 4 & 10 of Final EIA/EMP report.

### 3.5.9.3 Ground Water Quality

In the Present study, Ground water quality data is presented through statistical distribution diagram such as Piper and Durov Plots. The piper diagram conveniently reveals simalirities and differnces among surface and groundwater samples because those with similar qualities will tend to plot together as groups. The Durov plot shows variation of total cation vs. total anion concentrations; along with TDS (mg/L) and pH data to allow further comparisons.

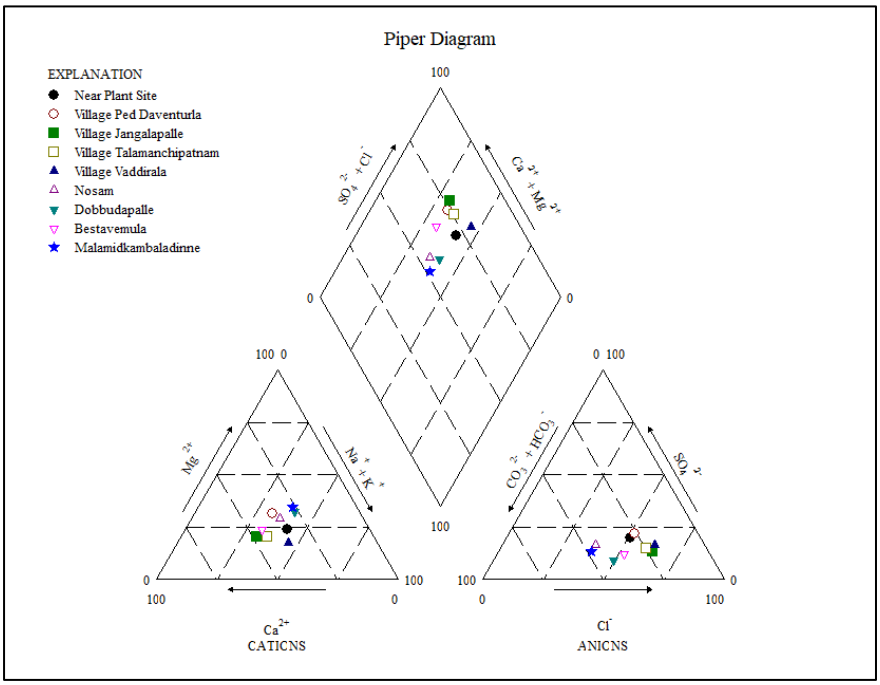



**Figure 3.14(a): Piper Diagram showing Ground water quality**

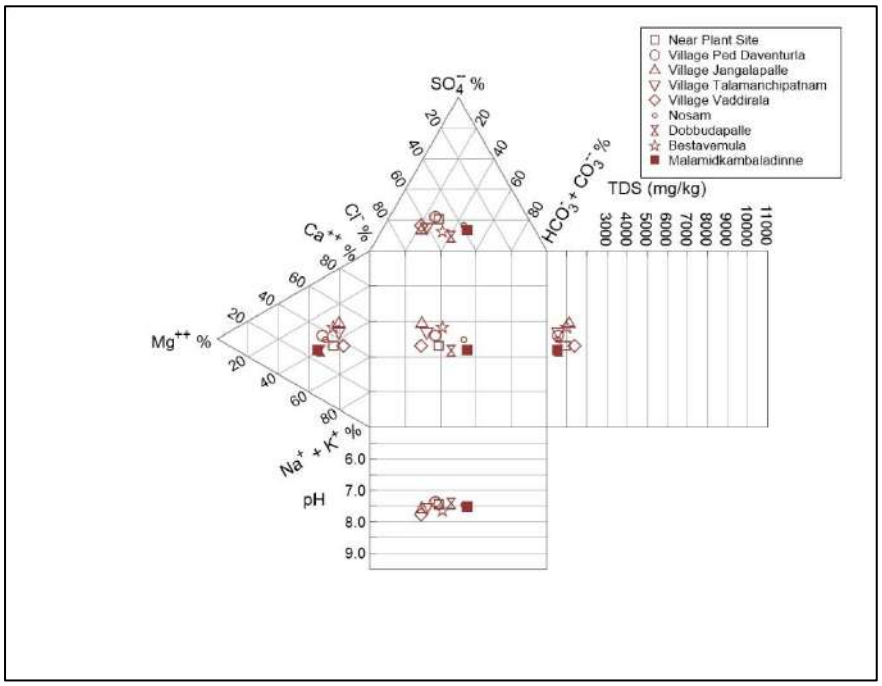



**Figure 3.14(b): Durov Diagram showing Ground water Quality**

### 3.5.10 SOIL ENVIRONMENT

The baseline study was conducted during the Summer Season (March., 2013 to May., 2013) by earlier consultant Vimta Labs Ltd. as the baseline data was 3-year-old & hence expired; therefore, in compliance to the MoEF&CC OM dated 08th June, 2022 a fresh baseline study has been conducted during Summer Season (March., 2024 to May., 2024).

**Soil Quality Analysis (Summer Season March 2013, to May, 2013)**

It has been observed that the texture of soil is Sandy clay in the study area. The pH of the soil indicates that the soil is moderately alkaline in nature. The Electrical conductivity was recorded as 130-273 µS /cm and the Organic Carbon content in the study area was observed as 0.11 to 1.14 %, which shows that the soil has less to more than sufficient OC. Available potassium was observed as 126 kg/ha to 226 kg/ha in the study region indicating that the soil falls under less to medium category. Available Nitrogen was observed as 44 Kg/ha to 58 kg/ha. Based on the above values the soil falls under less to less category. Available phosphorous was observed as 46 kg/ha to 62 kg/ha in the study region. It shows the soil falls under medium to on an average sufficient category.

***Soil Quality and Characteristics:***

The information on soil quality has been gathered by collecting data from various secondary sources and supplemented by collection and analysis of soil samples from representative locations.

In order to assess the base line characteristics of the soil profile of the nearby areas from the proposed project, the samples were analyzed for key and chemical parameters.

The sampling locations were finalized with the following considerations:

- To enable information on baseline characteristics and,

- To determine the anticipated impact of proposed Plant operation activities on soil characteristics.

***Sampling Schedule***

Representative soil samples were collected from 10 different specified locations within the study area from the plant site and mine site. Standard procedures were followed for the sampling and analysis of physico-chemical parameters.

***Sampling Locations***

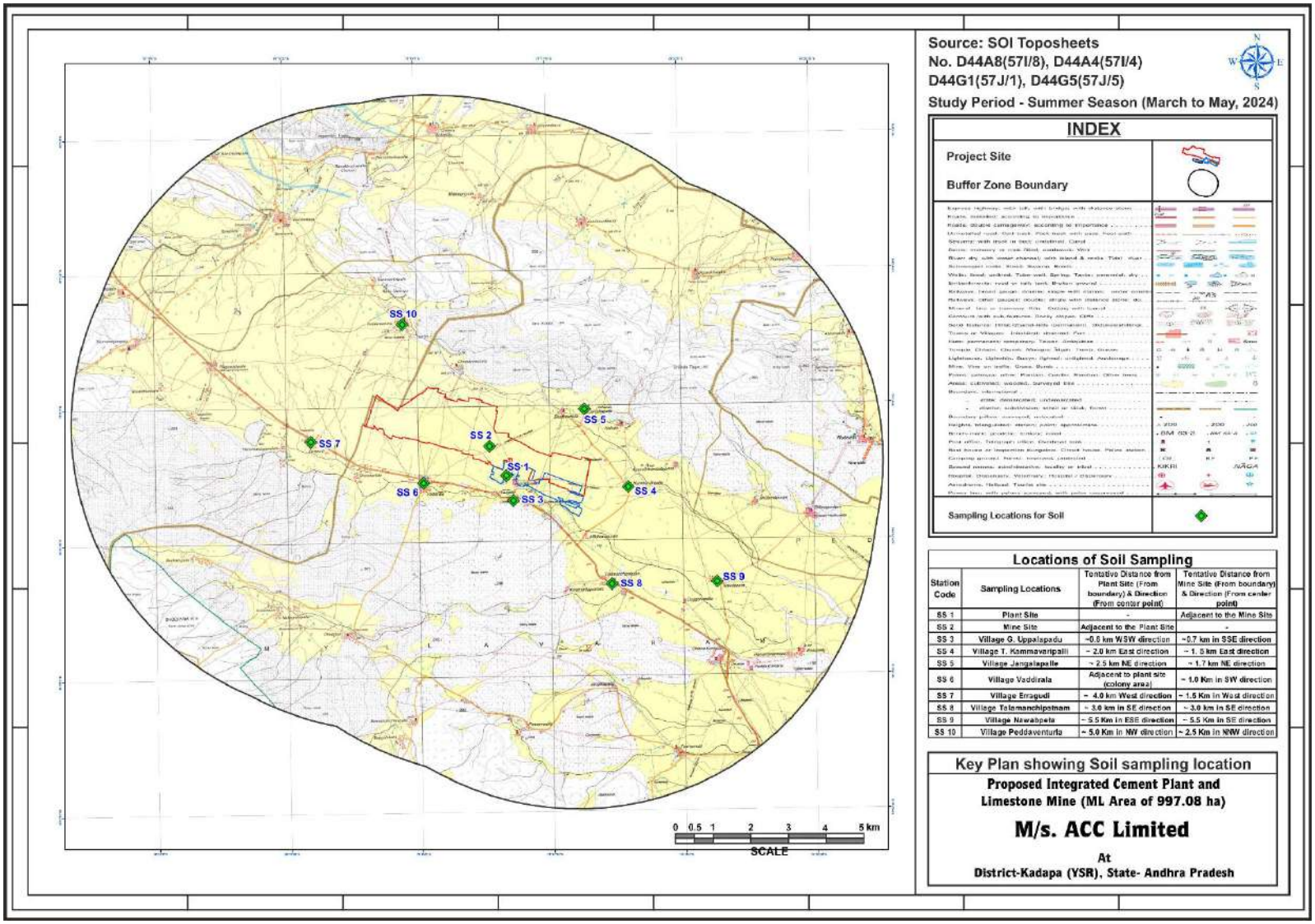
Details of Location of soil sampling stations along with the direction are given in Table - 3.17 and Figure: 3.15 and soil analysis results are given in Table - 3.18.

**Table - 3.17**

**Locations of Soil Sampling**

**Study Period Summer Season (March, 2024 to May, 2024)**

| Station Code | Sampling Location | Distance & direction from Plant Site | Distance & direction from Mine Site |
|---|---|---|---|
| S1 | Plant Site | - | Adjacent to the Mine site |
| S2 | Mine site | Adjacent to the Plant | - |
| S3 | Village G. Uppalapadu | 600 m in WSW direction | ~ 0.7 km in SSE direction |
| S4 | Village T. Kammavaripalli | ~ 2.0 km in East direction | ~ 1.5 km in East direction |
| S5 | Village Jangalapalle | ~ 2.5 km in NE direction | ~ 1.7 km in NE direction |
| S6 | Village Vaddirala | Adjacent to plant site | ~ 1.0 km in SW direction |
| S7 | Village Erragudi | ~ 4.0 km in West direction | ~ 1.5 km in West direction |
| S8 | Village Talamanchipatnam | 3.0 km in SE direction | ~ 3.0 km in SE direction |
| S9 | Village Nawabpeta | ~ 5.5 km in ESE direction | ~ 5.5 km in SE direction |
| S10 | Village -Peddaventurla | ~ 5.0 km in NW direction | ~ 2.5 km in NNW direction |




*Source: SOI Toposheet*

**Figure 3.15: Key Plan showing Soil Sampling Locations**

**Table - 3.18**
**Soil Analysis Results**
**Study Period: *Summer Season (March, 2024 to May, 2024)***

| S. No. | Parameters | Unit | Sampling Locations | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Plant Site | Mine Site | Village- G. Uppalapadu | Village-T. Kammavaripalli | Village - Jangalapalle | Village- Erragudi | Village- Talamanchipatnam | Village- Nawabpeta | Village- Peddaventurla | Village - Vaddirala |
| 1. | pH (at 25°C) (1:2.5 soil water sus.) | - | 8.22 | 8.19 | 8.09 | 8.16 | 8.17 | 8.00 | 8.63 | 8.25 | 8.58 | 8.36 |
| 2. | Conductivity (1:2 soil water sus) | mS/cm | 0.40 | 0.56 | 0.36 | 0.31 | 0.63 | 0.45 | 0.34 | 0.41 | 0.37 | 0.49 |
| 3. | Soil Texture | - | Sandy Clay | Sandy Loam | Sandy Loam | Sandy Loam | Loam | Sandy Loam | Silty Loam | Silty Clay | Silty Clay | Silty Clay |
| 4. | Sand | % | 51.0 | 58.0 | 60.0 | 57.0 | 42.0 | 62.0 | 20.0 | 6.0 | 9.0 | 7.0 |
| 5. | Silt | % | 10.0 | 29.0 | 26.0 | 30.0 | 46.0 | 28.0 | 74.0 | 52.0 | 51.0 | 52.0 |
| 6. | Clay | % | 39.0 | 13.0 | 14.0 | 13.0 | 12.0 | 10.0 | 6.0 | 42.0 | 40.0 | 41.0 |
| 7. | Colour | - | Dull Yellowish Brown | Dull Yellowish Brown | Dull Yellowish Brown | Dull Yellowish Brown | Dull Yellowish Brown | Dull Yellowish Brown | Dull Yellowish Brown | Grayish Brown | Light Gray | Dull Yellowish Gray |
| 8. | Water Holding Capacity | % | 31.37 | 28.60 | 27.85 | 27.72 | 32.63 | 30.15 | 34.48 | 33.03 | 33.49 | 36.43 |
| 9. | Porosity | % | 38.58 | 36.90 | 36.51 | 37.0 | 37.79 | 38.10 | 38.98 | 41.27 | 42.13 | 42.91 |
| 10. | Bulk Density | gm/cc | 1.56 | 1.59 | 1.60 | 1.60 | 1.58 | 1.56 | 1.55 | 1.48 | 1.47 | 1.45 |
| 11. | Chloride | mg/kg | 703.04 | 766.32 | 685.0 | 518.85 | 685.16 | 528.24 | 483.63 | 473.88 | 455.28 | 606.83 |
| 12. | Calcium | mg/kg | 4583.69 | 4346.28 | 4920.45 | 5267.12 | 4098.00 | 4704.08 | 4403.79 | 3653.65 | 4153.06 | 4969.93 |
| 13. | Sodium | mg/kg | 263.37 | 243.56 | 249.34 | 204.20 | 190.46 | 233.40 | 207.16 | 158.69 | 211.41 | 242.09 |
| 14. | Potassium | kg/hec | 591.96 | 300.63 | 312.44 | 511.33 | 410.95 | 467.67 | 512.59 | 544.36 | 578.86 | 489.56 |
| 15. | Organic Matter | % | 0.78 | 0.82 | 0.84 | 0.55 | 0.62 | 0.88 | 0.65 | 0.62 | 0.58 | 0.77 |
| 16. | Magnesium as Mg | mg/kg | 881.17 | 561.64 | 691.56 | 780.06 | 917.93 | 634.30 | 657.59 | 650.14 | 873.91 | 659.46 |
| 17. | Available Nitrogen as N | kg/hec | 208.57 | 193.97 | 227.54 | 174.02 | 186.53 | 281.30 | 218.15 | 224.23 | 199.61 | 318.18 |

| S. No. | Parameters | Unit | | Sampling Locations | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Plant Site | Mine Site | Village- G. Uppalapadu | Village-T. Kammavaripalli | Village - Jangalapalle | Village- Erragudi | Village- Talamanchipatnam | Village- Nawabpeta | Village- Peddaventurla | Village - Vaddirala |
| 18. | Available Phosphorus | kg/hec | 19.46 | 16.03 | 11.55 | 13.26 | 8.93 | 27.36 | 13.58 | 17.25 | 23.88 | 37.76 |
| 19. | Zinc as Zn | mg/kg | 27.17 | 30.40 | 25.39 | 24.53 | 34.12 | 42.07 | 25.16 | 22.63 | 29.63 | 24.35 |
| 20. | Manganese as Mn | mg/kg | 388.34 | 388.30 | 298.83 | 256.78 | 313.90 | 390.13 | 285.52 | 245.75 | 280.72 | 377.95 |
| 21. | Chromium as Cr | mg/kg | 15.49 | 19.61 | 13.67 | 11.63 | 8.77 | 17.73 | 20.33 | 16.5 | 20.61 | 24.09 |
| 22. | Lead as Pb | mg/kg | 20.99 | 21.57 | 16.60 | 6.78 | 16.57 | 28.69 | 22.26 | 21.37 | 31.41 | 34.81 |
| 23. | Cadmium as Cd | mg/kg | BDL(DL-5.0) | BDL (DL 5.0) | BDL (DL 5.0) | BDL (DL 5.0) | BDL(DL-5.0) | BDL(DL-5.0) | BDL (DL 5.0) | BDL (DL 5.0) | BDL (DL 5.0) | BDL(DL-5.0) |
| 24. | Copper as Cu | mg/kg | 23.24 | 13.73 | 21.48 | 24.88 | 17.29 | 21.55 | 18.07 | 16.80 | 15.70 | 13.64 |
| 25. | Organic Carbon | % | 0.45 | 0.48 | 0.49 | 0.32 | 0.36 | 0.51 | 0.38 | 0.36 | 0.34 | 0.45 |
| 26. | SAR Value | - | 0.93 | 0.92 | 0.88 | 0.69 | 0.70 | 0.85 | 0.77 | 0.64 | 0.78 | 0.86 |

*Source: Soil Quality Analysis Report*

The physico-chemical soil Quality was compared and analyzed using the standard soil classification given by IARI.

**Table - 3.19**

**Standard Soil Classification**

| S. No. | Parameters | Classification |
|---|---|---|
| 1. | pH | <4.5 extremely acidic<br>4.51 – 5.0 very strong acidic<br>5.01 – 5.5 strongly acidic<br>5.51-6.0 moderately acidic<br>6.1 - 6.5 slightly acidic<br>6.51 - 7.3 Neutral<br>7.31-7.8 slightly alkaline<br>7.81-8.5 moderately alkaline<br>8.51 – 9.0 strongly alkaline<br>>9.0 Very strongly alkaline |
| 2. | Salinity Electrical Conductivity (mho/cm)<br>1 mho/cm = 640 ppm | Up to 1.0 average<br>1-2 harmful to germination<br>2-3 harmful to crops |
| 3. | Nitrogen (kg/ha) | Up to 50 very less<br>51-100 less<br>110-150 good<br>151-300 better<br>>300 sufficient |
| 4. | Phosphorus (kg/ha) | Up to 15 very less<br>15 – 30 less<br>31-50 medium<br>51-65 on average sufficient<br>66-80 sufficient<br>>80 more than sufficient |
| 5. | Potassium (kg/ha) | 0-120 very less<br>120-180 less<br>180-240 medium<br>241-300 average<br>301-360 better<br>>360 more than sufficient |

*Source: Indian Agricultural Research Institute Handbook.*

***Observation, Interpretation & Conclusion for Summer Season (March 2024 to May, 2024):***

- The pH of the soil samples varies from 8.0 at Village Erragudi to 8.63 at village Talamanchipatnam which indicates the soil samples are moderately alkaline in nature.
- The texture of the soil samples majorly consists of Sandy Loam to Silty.
- The soil samples majorly exhibit Dull Yellowish Brown, Grayish Brown and Light Gray color at all the sampled villages.

- The indicator such as organic matter varies from 0.55% at village T. Kammavaripalli to 0.88% at Village Erragudi and Organic carbon varies from 0.32% at village Village T. Kammavaripalli to 0.51% at Village Erragudi. The Water holding capacity varies from 27.72% at Village T. Kammavaripalli to 36.43% at Village Vaddirala.
- Examined six essential nutrients required for an ideal plant growth are Nitrogen, Phosphorus, Potassium, Magnesium, Sulfur and calcium. Nitrogen ranged between 174.02 kg/ha at VillageT. Kammavaripalli to 318.18 kg/ha Village – Jangalapalle, Phosphorous ranged between 8.93 kg/ha at Village Jangalapalle to 37.76 kg/ha Village – Jangalapalle, Potassium (300.63 kg/ha at Mine Site to 591.96 kg/ha at Plant site), Magnesium (561.64 mg/kg at Mine Site to 917.93 mg/kg at Village Jangalapalle, Calcium (3653.65 mg/kg at Village Nawabpeta n to 5267.12 mg/kg at Village T. Kammavaripalli and Sodium (158.69 mg/kg at Village Nawabpeta to 263.37 mg/kg at Plant site).
- The SAR value was observed under the limits at all the sampling locations with minimum value of 0.64 at village Nawabpeta to maximum value of 0.93 at plant site.

***Interpretation***

Soil pollution is mainly generated by the anthropogenic activities. Within the 10 km study area, majority of the sampled location have a good quality and fertile soil. As per the *Indian Agricultural Research Institute Handbook* the pH property of all the soil samples is found to be slightly to moderately alkaline in nature which is an optimal range for the various commercial crops. The texture of the soil samples majorly consists of Sandy loam, which favors air circulation, drainage and fertility of the soil. The samples have more than sufficient percentage of organic carbon & the samples have an optimum content of organic matter which is suitable for the plant growth. Chloride is generally mentioned as a hydrological & chemically inert substance. Chloride concentration in soil generally shows the salinity of soil. As observed, the essential nutrients within the soil of the sampled villages, Nitrogen content was observed to be present in the better quantity, where the values for phosphorus and potassium were found to be of the medium range.

***Conclusion***

From the above study and discussions, it can be concluded that soil quality in the study area is fertile and is suitable for the agricultural activities. The proposed project will not be discharging any effluent by the plant operation activities which can result in the contamination of the nearby soil. Only the contamination of soil by fugitive emission through the transportation activities is majorly envisaged but various adequate mitigative measures will be adopted by M/s. ACC Limited and the details are incorporated in the Chapter- 4 & 10 of Final EIA/EMP report.

### 3.5.11 Design of Raw mix

Stipulations regarding the various modules required for Quality and Process Control (QPC) will be maintained. In the sintering process, almost all the coal ash is absorbed in the clinker. Therefore, the lower the specific fuel consumption, lower will be the ash absorption. For dry process kilns with

6 stage pre-heaters and pre-calciners, the specific fuel consumption would be around 710 Kcal/Kg. The calorific value of coal from the SECL, from where coal will be brought, can be taken as 3800 Kcal/Kg and ash content about 40 %. On this basis, ash absorbed in clinker would be about 100% in clinker. The raw mix composition would be adjusted to allow for this absorption of ash. A typical chemical analysis of the raw mix is given in the Table-3.20 & Table-3.21. Depending upon the freight economics, imported coal may also be considered for the project.

**Table 3.20**

**Chemical & Trace Element analysis of Raw Mix**

| % **Oxides** | **Limestone** | |
|---|---|---|
| | **Dark Grey** | **Flaggy** |
| $SiO_2$ | 9.4 | 12.8 |
| $Al_2O_3$ | 1.2 | 1.9 |
| $Fe_2O_3$ | 0.6 | 1.0 |
| CaO | 48.5 | 45.6 |
| MgO | 0.6 | 0.6 |
| LOI | 38.8 | 37.2 |
| $Na_2O$ | 0.12 | 0.08 |
| $K_2O$ | 0.23 | 0.34 |
| $SO_3$ | 0.18 | 0.12 |
| Cl | 0.005 | 0.005 |
| $P_2O_5$ | 0.05 | 0.05 |
| $TiO_2$ | 0.06 | 0.08 |
| $Mn_2O_3$ | 0.04 | 0.08 |
| Free $SiO_2$ | 6.3 | 9.3 |
| Sulphur as Pyrite | 0.38 | 0.32 |
| Total Organic Carbon | 0.1 | 0.08 |
| Total $SO_3$ | 1.12 | 0.91 |
| Total Cr (ppm) | 4.0 | 5.0 |
| $Cr^{+6}$ (ppm) | 0.2 | 0.1 |
| Ba (ppm) | 402 | 250 |
| Sr (ppm) | 165 | 160 |
| As (ppm) | <1.0 | <1.0 |
| Co (ppm) | 2.0 | 2.0 |
| Ni (ppm) | 8.0 | 6.0 |
| Se (ppm) | <1.0 | <1.0 |
| Te (ppm) | <1.0 | <1.0 |
| Cd (ppm) | <1.0 | <1.0 |
| Hg (ppm) | 0.06 | 0.04 |
| Tl (ppm) | <1.0 | <1.0 |

**Table 3.21**

**Trace metal analysis**

| Sr. No. | Constituent | Units | Gypsum |
|---|---|---|---|
| 1 | Silica as $SiO_2$ | % | 1.38 |
| 2 | Aluminium as $Al_2O_3$ | % | 0.13 |
| 3 | Iron as $Fe_2O_3$ | % | 0.11 |
| 4 | Calcium as CaO | % | 25.79 |
| 5 | Potassium as $K_2O$ | % | 0.01 |
| 6 | Magnesium as MgO | % | 0.02 |
| 7 | Manganese as MnO | % | 1.38 |
| 8 | Phosphorus as $P_2O_5$ | % | 0.01 |
| 9 | Sulphur as $SO_3$ | % | 26.91 |
| 10 | Titanium as $TiO_2$ | % | 0.01 |
| 11 | Loss on Ignition | % | 5.55 |
| 12 | Sodium as $Na_2O$ | % | 0.20 |
| 13 | Chlorides as Cl | % | <0.01 |
| 14 | Moisture | % | 8.48 |
| 15 | Lead as Pb | % | 25.79 |

### 3.5.12 Petrography & Grain Size analysis

Limestone samples were observed under transmitted light microscope, the observations are as follows:

- **Dark Grey Limestone:**

**Morphology:**

Compact hard fresh fine-grained rock, Dark gray coloured, equigranular, containing microcrystalline grains of calcite, quartz and opaque. Opaque and quartz were randomly distributed and also along the cleavages/ fractures. There are some fine veins of ferruginous materials cutting through the calcitic mass. Some places calcitic mass is partially re-crystallised. The general microstructure is equigranular fine grained. There are some pyritic veins cutting through fine microcrystalline calcitic mass. Veins are containing some recrystallised quartz grains also.

Minerals present: Calcite (Major), Quartz and Opaque Size of Calcite crystals (in Microns): microcrystalline < 45 microns Size of Quartz crystals (in Microns): microcrystalline < 30 microns.

Figure - 3.16: General view of fine-grained limestone with pyrite grains in microcrystalline calcareous matrix, X 32 Crossed Polars,

Figure - 3.17: General view of fine-grained limestone with opaque vein in microcrystalline calcareous matrix, X 80 Crossed Polars.

- **Flaggy Limestone**

**Morphology:**

Compact hard fresh fine - grained rock, Dark gray coloured, equigranular, containing microcrystalline grains of calcite, quartz and opaque. Opaque and quartz were randomly

distributed and also along the cleavages/ fractures. There are some fine veins of ferruginous materials cutting through the calcitic mass. Some places calcitic mass is partially recrystallised. The general microstructure is equigranular fine grained. There are some opaque veins cutting through fine microcrystalline calcitic mass. Veins are containing some recrystallised quartz grains also.

Minerals present- Calcite (Major), Quartz and Opaque.

Size of Calcite crystals (in Microns): microcrystalline < 45 microns

Size of Quartz crystals (in Microns): microcrystalline < 30 microns

Figure - 3.18: General view of fine-grained limestone with microcrystalline calcareous matrix, X 80 Crossed Polars.

Figure - 3.19: General view of fine-grained limestone with opaque veins in microcrystalline calcareous matrix, X80 Crossed Polars.

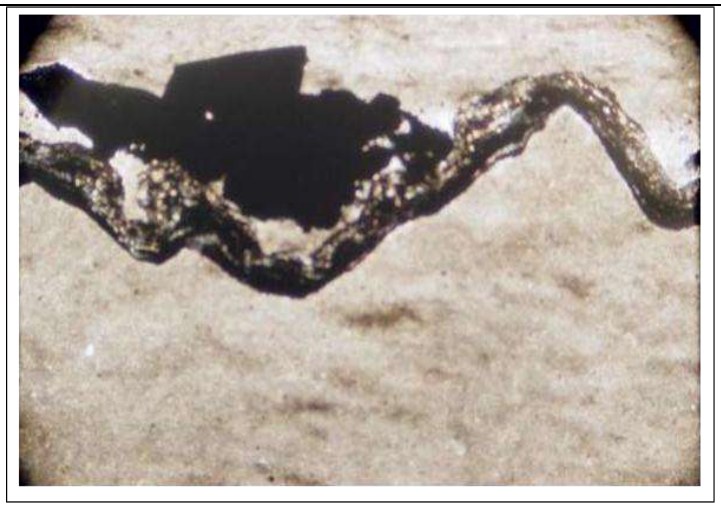


**Figure 3.16 - General view of fine-grained limestone with pyrite grains in microcrystalline calcareous matrix, x 32 crossed polars.**

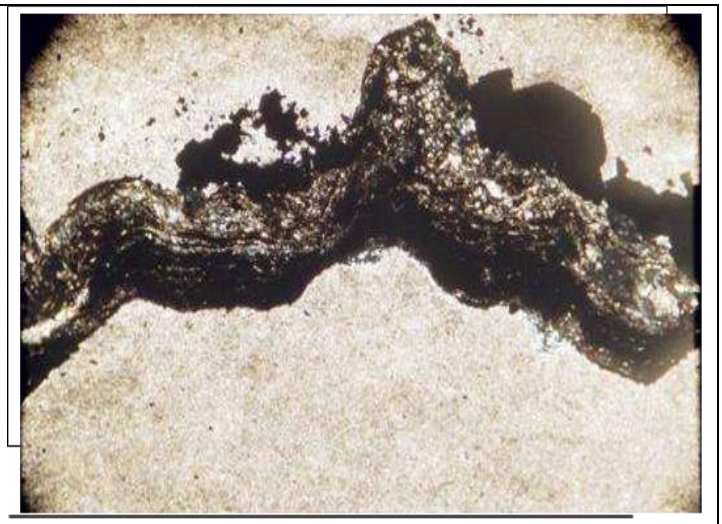


**Figure 3.17 - General view of fine-grained limestone with opaque vein in microcrystalline calcareous matrix, x80 crossed polars.**

**Figure 3.18 - General view of fine- grained limestone with microcrystalline calcareous matrix.**

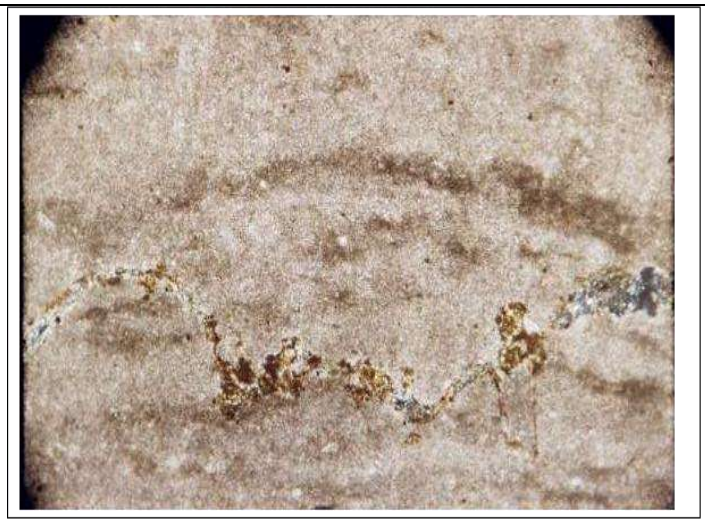


**Figure 3.19 - General view of fine-grained limestone with opaque veins in microcrystalline calcareous matrix**

A suitable raw mix design can be obtained by blending limestone, clay and laterite approximately in the following proportions:

- Limestone - 95%
- Clay, Iron Ore, Bauxite etc - 5 %

### 3.5.13 BIOLOGICAL ENVIRONMENT

#### 3.5.13.1 Introduction

Biological environment includes the Habitat (Place where the organism lives) and natural surroundings of all species (living organism species) of the particular area.

The biological study was undertaken as a part of the EIA study report to understand the present status of ecosystem prevailing in the study area and to study the floristic and faunal diversity of the terrestrial and aquatic environment of the study area within the 10 km radius of the proposed plant site. Studies on various aspects of ecosystem play an important role in identifying sensitive issues for under taking appropriate action to mitigate the impact, if required.

Some of the information was gathered from the local habitants. All the collected data were classified to interpret the impact of pollution on the flora and fauna of that region. Survey of the wild plants as well as cultivated crop plants was made and all the available information was recorded. Night survey was also conducted with the help of spotlight to record nocturnal animals, birds and reptiles.

Secondary data on flora and fauna, cropping patterns etc. were also collected from available literatures, internet, forest department and revenue department.

The List of flora and Fauna in the 10 km radius from the proposed plant and mine site as well including the core zone is mentioned in the list below:

**Table No. - 3.22**

**Inventory of floral diversity in Buffer zone and Core Zone of Plant Site**

**Based on Actual Sighting, based on inputs from locals and Perused from Secondary Data**

| S.NO | FAMILY | COMMON NAME | SCIENTIFIC NAME | TYPE |
|---|---|---|---|---|
| 1 | Combretaceae | Arjun | Terminalia arjuna | Tree |
| 2 | Myrtaceae | Black plum | Syzycium cumini | Tree |
| 3 | Rutaceae | Wood tree apple | Limonia acidissima | Tree |
| 4 | Fabaceae | Rose wood | Dalbergia latilofia | Tree |
| 5 | Mimosoideae | Robber thorn | Vachellia horrida | Tree |
| 6 | Fabaceae | Black locust | Robinia pseudoacacia | Tree |
| 7 | Maivceae | Potia | Thespesia populnea | Tree |
| 8 | Leguminosae | Anjan | Hardwicka binnata | Tree |
| 9 | Euphorbiaceae | White catamaran | Givotia moluccana | Tree |
| 10 | Malvceae | Dhaman | Grewia tilifolia | Tree |
| 11 | Fabaceae | Acacia sandra | Pterocarpus Santalinus | Tree |
| 12 | Myrtaceae | Cambi gum | | Tree |
| 13 | Fabaceae | Bidi leaf | Bauhinia racemosa | Tree |

| S.NO | FAMILY | COMMON NAME | SCIENTIFIC NAME | TYPE |
|---|---|---|---|---|
| 14 | Fabaceae | Golden shower | Cassia fistula | Tree |
| 15 | Rubiaceae | Bur flower tree | Neolamarckia kadamba | Tree |
| 16 | Malvceae | Cotton tree | Bombax ceiba | Tree |
| 17 | Fabaceae | Acacia sandra | Senegalia catechu | Tree |
| 18 | Rutaceae | East Indian satin wood | Chloroxylon swietenia | Tree |
| 19 | Celastraceae | Thorny staff | Meytenus senegalensis | Tree |
| 20 | Lamiaceae | Goda | Vitex peducularis | Tree |
| 21 | Rubiaceae | kommi | Chomelia asiatica | Tree |
| 22 | Rharnnaceae | Indian jujube | Ziziphus mauritiana | Shrub |
| 23 | Verbenaceae | Common lantana | Lantana camara | Shrub |
| 24 | Acanthaceae | Porcupine flower | Barleria prionitis | Shrub |
| 25 | Rharnnaceae | Jackal jujube | Zizyphus oenoplea | Shrub |
| 26 | Sapindaceae | Common hop bush | Dodonaea viscosa | Shrub |
| 27 | Dacrymycetaceae | Gumdrop | Ziziphus obutusifolia | Shrub |
| 28 | Rubiaceae | Gummy gardenia | Gardenia gumnnifera | Shrub |
| 29 | Apocynaceae | Christ's thorn (kalivi) | Carrissa carandus | Shrub |
| 30 | Rharnnaceae | Jhar beri | Zizyphus nummularia _ | Shrub |
| 31 | Rharnnaceae | Kath ber | Ziziphus xylopyrus | Shrub |
| 32 | Amaranthaceae | Thorny amaranth | Amaranthus spinoses | Herb |
| 33 | Amaranthaceae | Mountainknot grass | Aerva lanata | Herb |
| 34 | Nyctaginaceae | Spreading hogweed | Boerhavia diffusa | Herb |
| 35 | Asteraceae | Tridax daisy | Tridax procumbens | Herb |
| 36 | Acalyphimae | Indian acalpha | Acalypha indica | Herb |
| 37 | Euphorbiaceae | Jungle tulsi | Ocimum gratissimum | Herb |
| 38 | Convolvulaceae | Hedge bindweeds | Calystegia sepium | Herb |
| 39 | Asteraceae | False golden asters | Heterotheca villosa | Herb |
| 40 | Dogbanes | Indian sarsaparilla | Hemisdescus indicus | Herb |

*Source: Forest Working Plan, Field Survey, District Forest Survey Reports*
*Abbreviations: LC: Least Concern, NA: Not assessed, DD: Data Deficient, VU: Vulnerable, NT: Near Threatened, EN: Endangered*
(+) Shows: Presence of the species and (-) Shows: Absence of the species

**Analysis of Flora**

Within the Core and buffer zone of proposed project site, a total of 21 species of trees, 10 species of Shrubs, 9 species of Herbs were recorded and observed within the studied area based on primary observation as well as based on information collected from the secondary data.

**Table No. - 3.23**
**Inventory of faunal diversity in Buffer & Core Zone of Plant Site**
**Based on Actual Sighting, based on inputs from locals and Perused from Secondary Data**

**CLASS: MAMMALIA**

| S. No | Family | Common Name | IUCN Status | Wildlife Protection Act 2022 |
|---|---|---|---|---|
| 1 | Sciuridae | Three striped palm squirrels | LC | Schedule II |
| 2 | Bovidae | Four horned Antelope | VU | Schedule I |

| S. No | Family | Common Name | IUCN Status | Wildlife Protection Act 2022 |
|---|---|---|---|---|
| 3 | Canidae | Asiatic Wild Dog | EN | Schedule I |
| 4 | Cercopithecida | Bonnet Macaque | VU | Schedule I |
| 5 | Cervidae | Spotted Deer | LC | Schedule II |
| 6 | Cervidae | Sambar | VU | Schedule I |
| 7 | Eupleridae | Indian grey Mongoose | LC | Schedule I |
| 8 | Leporids | Black Naped Hare | LC | Schedule II |
| 9 | Ursidae | Sloth Bear | LC | Schedule I |
| 10 | Suidae | Indian Wild Boar | LC | Schedule II |
| 1 l | Viverridae | Small Indian Civet | LC | Schedule I |
| 12 | Viverridae | Masked Palm Civet | LC | Schedule I |
| 13 | Canidae | Golden Jackel | LC | Schedule II |
| 14 | Funambulus palmarum | Indian Palm Squirrel | LC | Not listed |
| 15 | Mus musculus | House Mouse | LC | Not listed |
| 16 | Golunda ellioti | Indian Bush Rat | LC | Not listed |
| 17 | Rattus rattus | House Rat or Black Rat | LC | Not listed |
| 18 | Pipistrellus coromandra | Indian Pipistrelle | LC | Not listed |
| 19 | Pipistrellus tenuis | Indian Pygmy Bat | LC | Not listed |
| 20 | Pipistrellus eeylonicus | Kelaart's Pipistrelle | LC | Not listed |
| **CLASS: REPTILIA** | | | | |
| 1 | Colubridae | Daudin's Bronze back | LC | Schedule II |
| 2 | Colubridac | Bengal Monitor Lizard | NT | Schedule I |
| 3 | Agarnidae | Changeable Garden Lizard | LC | Not listed |
| 4 | Testudinidae | Indian Star Tortoise | VU | Schedule I |
| 5 | Scincidae | Common Dotted Garden skink | LC | Not listed |
| 6 | Colubridae | Indian rat snake | LC | Schedule I |
| 7 | Colubridae | Checkered Keeback | LC | Schedule I |
| 8 | Colubridac | Buff-striped keel | LC | Schedule II |
| CLASS-AMPHIBIANS | | | | |
| 1 | Bufonidae | Common Indian Toad | LC | Not listed |
| 2 | Dicrogloss idae | Indian pond frog | LC | Schedule II |
| 3 | Dicrogloss idae | Indian Bull frog | LC | Schedule II |
| 4 | Dicrogloss idae | Indian skittering Frog | LC | Schedule II |
| 5 | Bufonidae | Ferguson's toad | LC | Not listed |
| 6 | Bufonidae | Marbeled toad | LC | Not listed |
| 7 | Mycrolt did ae | Ornate-narrow mouthed frog. | LC | Not listed |

**Avi Fauna**

| S. No. | Family | Common name | IUCN status | Wildlife Protection Act |
|---|---|---|---|---|
| 1 | Ardeidae | Indian Pond Heron | LC | Schedule II |
| 2 | Ardeidae | Cattle Egret | LC | Schedule II |

| S. No. | Family | Common name | IUCN status | Wildlife Protection Act |
|---|---|---|---|---|
| 3 | Ciconiidae | Painted Stork Mycteria | NT | Schedule II |
| 4 | Accipitridae | Shikra | LC | Schedule I |
| 5 | Accipitridae | Black-winged Kite | LC | Schedule II |
| 6 | Accipitridae | Black Kite | LC | Schedule II |
| 7 | Phasianidae | Grey Francolin | LC | schedule II |
| 8 | Phasianidae | Grey Junglefowl | LC | schedule I |
| 9 | Phasianidae | Indian Peafowl | LC | Schedule I |
| 10 | Phasianidae | Red Spurfowl | LC | Schedule II |
| 11 | Turnicidae | Yellow-legged Buttonquail | LC | Schedule II |
| 12 | Rallidae | White-breasted waterhen | LC | Schedule II |
| 13 | Burhinidae | Indian thick knee | LC | Schedule II |
| 14 | Charadriidae | Red-wattled Lapwing | LC | Schedule II |
| 15 | Columbidae | Eurasian Collared Dove | LC | Schedule II |
| 16 | Columbidae | Laughing Dove | LC | Schedule II |
| 17 | Columbidae | Spotted Dove | LC | Schedule II |
| 18 | Psittaculidae | Rose-ringed Parakeet | LC | Schedule II |
| 19 | Cuculidae | Greater Coucal | LC | Schedule II |
| 20 | Cuculidae | Asian Koel | LC | Schedule II |
| 21 | Cuculidae | Common Hawk-Cuckoo | LC | Schedule II |
| 22 | Cuculidae | Blue-faced Malkoha | LC | Schedule II |
| 23 | Dicruridae | Greater-Racket Tailed Drongo | LC | Schedule II |
| 24 | Strigidae | Spotted Owlet | LC | Schedule II |
| 25 | Caprirnulgidae | Common Indian Nightjar | LC | Schedule II |
| 26 | Apodidae | Asian Palm Swift | LC | Schedule II |
| 27 | Alcedinidae | White-throated Kingfisher | LC | Schedule II |
| 28 | Meropidae | Green Bee-eater | LC | Schedule II |
| 29 | Coraciidae | Indian Roller | LC | Schedule II |
| 30 | Upupidae | Common Hoopoe | LC | Schedule II |
| 31 | Flucerotidae | Indian Grey Hornbill | LC | Schedule II |
| 32 | Picidae | Lesser Goldnback Woodpecker | LC | Schedule II |
| 33 | Hirundinidae | Barn Swallow | LC | Schedule II |
| 34 | Motacillidae | Paddy-field pipit | LC | Schedule II |
| 35 | Motacillidae | White-browed wagtail | LC | Schedule II |
| 36 | Vangidae | Common Woodshrikc | LC | Schedule II |
| 37 | Monarchidae | Indian Paradise- flycatcher | LC | Schedule II |
| 38 | Rhipiduridac | White-browed Fantail | LC | Schedule II |
| 39 | Pycnonotidae | Red-vented Bulbul | LC | Schedule II |
| 40 | Pycnonotidac | Red-whiskered Bulbul | LC | Schedule II |
| 41 | Pycnonotidae | White-browed Bulbul | LC | Schedule II |
| 42 | Aegithinidae | Common bra | LC | Schedule II |
| 43 | Laniidae | Bay-backed Shrike | LC | Schedule II |

| S. No. | Family | Common name | IUCN status | Wildlife Protection Act |
|---|---|---|---|---|
| 44 | Laniidae | Long-tailed Shrike | LC | Schedule Il |
| 45 | Muscicapidae | Oriental Magpie-Robin | LC | Schedule II |
| 46 | Muscicapidae | Pied Bushchat | LC | Schedule II |
| 47 | Muscicapidae | Indian Robin | I,C: | Schedule II |
| 48 | Muscicapidae | Asian Brown Flycatcher | LC | Schedule II |
| 49 | Leiothrichidae | Jungle Babbler | LC | Schedule II |
| 50 | Leiothrichidae | Large Grey Babbler | LC | Schedule II |
| 51 | Leiothrichidae | Yellow-billed Babbler | LC | Schedule II |
| 52 | Cisticolidae | Ashy Prinia | LC | Schedule II |
| 53 | Cisticolidae | Jungle Prinia | LC | Schedule II |
| 54 | Cisticolidae | Common Tailorbird | LC | Schedule II |
| 55 | Nectariniidae | Purple Sunbird | LC | Schedule II |
| 56 | Nectariniidae | Purple-rumped Sunbird | LC | Schedule II |
| 57 | Dicaeidae | Pale-billed Flowerpecker | LC | Schedule II |
| 58 | Oriolidae | Indian Golden Oriole | LC | Schedule II |
| 59 | Dicruridae | Black Drongo | LC | Schedule II |
| 60 | Dicruridae | Ashy Drongo | LC | Schedule II |
| 61 | Dicniridae | White-bellied Drongo | LC | Schedule II |
| 62 | Corvidae | Jungle Crow | LC | Schedule II |
| 63 | Corvidae | House Crow | LC | Schedule II |
| 64 | Corvidae | Rufous | LC | Schedule II |
| 65 | Sturnidae | Treepie Common Myna | LC | Schedule II |
| 66 | Ploceidae | [lava Weaver | LC | Schedule II |

**CLASS: BUTTERFLIES**

| S. No | Family | Scientific Name | Common Name | IUC N Status | Wildlife Protection Act 2022 |
|---|---|---|---|---|---|
| 1 | Papilionidae | Graphiurn agamemnon | Tailed Jay | LC | |
| 2 | Papilionidae | Graphium Boson | Common Jay | LC | |
| 3 | Papilionidae | Pachliopta aristolochioe | Common Rose | LC | |
| 4 | Papilionidae | Pochliopto hector | Crimson Rose | LC | Schedule II |
| 5 | Papilionidae | Popilio polymnestor | Blue Mormon | LC | |
| 6 | Papilionidae | Papllio palytes | Common Mormon | LC | |
| 7 | Papilionidae | Papilio crino | Common banded Peacock | LC | Schedule II |
| 8 | Papilionidae | Princeps demoleus | Lime Butterfly | - | |
| 9 | Papilionidae | Graphium sarpedon | Common bluebottle | LC | Schedule II |
| 10 | Papilionidae | Chilasor clytia | Common mime | - | |
| 11 | Pieridae | Cotopsilia crocale | Common Emigrant | - | |
| 12 | Pieridae | Catopsilia pyranthe | Mottled emigrant | NE | |
| 13 | Pieridae | Colotis eucharis | Plain orange tip | EN | |

| S. No | Family | Scientific Name | Common Name | IUC N Status | Wildlife Protection Act 2022 |
|---|---|---|---|---|---|
| 14 | Pieridae | Cepora 17 erissa | Common gull | EN | - |
| 15 | Pieridae | Delius eucharis | Common Jezbel | - | |
| 16 | Pieridae | Eurema hecabe | Common grass yellow | - | |
| 17 | Pieridae | Valeria valeria artais | Common Wanderer | - | |
| 18 | Pieridae | Eurerna brigitta | Small grass yellow | LC | |
| 19 | Pieridae | lxias pyrene | Yellow orange tip | - | |
| 20 | Pieridae | Eurema blanda | Three spot grass yellow | - | |
| 21 | Pieridae | Ccit-opsilla Pomona | Lemon emigrant | - | |
| 22 | Nyrnphalidae | Danaus chrysippus | Plain tiger | LC | |
| 23 | Nymphalidae | Dunaus genutia | Striped Tiger (Common Tiger) | - | |
| 24 | Nymphalida | Euploea core | Common crow | LC | |
| 25 | Nymphalidae | Melantis leda | Common evening brown | - | |
| 26 | Nymphalidae | Ariadne merione | Common castor | - | |
| 27 | Nyrnphalidae | Neptishylas | Common sailer | - | |
| 28 | Nymphalidae | Bybila ilithyla | Joker | - | |
| 29 | Nymphalidae | Hypolirnnas bolina | Great egg fly | - | |
| 30 | Nymphalidae | Hypolomnas misippus | Danaid egg fly | LC | Schedule II |
| 31 | Nyrnphalidae | Junonia lemonias | Lemon pansy | - | |
| 32 | Nymphalidae | Junanio orithyla | Blue pansy | LC | |
| 33 | Nymphalidae | Junonion iphito | Chocolate pansy | NE | |
| 34 | Nymphalidae. | Junania almanac | Peacock pansy | LC | |
| 35 | Nymphalidae | Acraea terpsicore | Tawny coster | - | |
| 36 | Nymphalidae | Melantis phedima | Dark evening brown | - | |

**Analysis of Flora and Fauna**

Flora: Within the Core and buffer zone of proposed project site, a total of 21 species of trees, 10 species of Shrubs, 9 species of Herbs were recorded and observed within the studied area based on primary observation as well as based on information collected from the secondary data.

Fauna: Among faunal diversity, within the 10 km radius of buffer zone, 20 species of mammals, 8 species of reptiles & 7 species of amphibians, 66 species of Avi fauna and 36 species of Butterfly were reported in 10 km radius of project sites.

List of flora & fauna has been submitted for authentication to Chief Wildlife Warden, Guntur, Andhra Pradesh, on 20$^{th}$ Sept., 2024. Copy of the submission receipt is enclosed as Annexure - 3 along with this EIA/EMP report

16 schedule – I species viz. Four horned Antelope, Asiatic Wild Dog, Bonnet Macaque, Sambar, Sloth Bear, Indian Grey Mongoose, Small Indian Civet, Masked Palm Civet, Golden Jackel, Bengal Monitor Lizard, Indian Star Tortoise, Indian rat snake, Checkered Keeback, Grey Junglefowl, Shikra, Indian

Peafowl Indian Species were found in the study area of the proposed project site as per the Primary & Secondary Survey done by Greentech Solutions.

Company has prepared Wildlife Conservation for the proposed integrated cement plant and allocated Rs. 5.07 Crores for conservation of schedule - I species. Wildlife Conservation Plan has been submitted to Chief Wildlife Warden, Guntur, Andhra Pradesh, on 20th Sept., 2024 for further approval. Copy for conservation plan along with the submission receipt is enclosed as ***Annexure - 10*** along with this EIA/EMP report.

### 3.5.14 Socio-Economic Study

An essential part of environmental study is socio-economic environment incorporating various facts related to socio-economic conditions in the area, which deals with the total environment. The Socio-economic study includes demographic structure of the area, provision of basic amenities viz., housing, education, health and medical services, occupation, water supply, sanitation, communication, transportation, prevailing diseases pattern as well as feature of aesthetic significance such as temples, historical monuments etc. at the baseline level. This baseline assessment helps in visualizing and predicting the possible impact depending upon the nature and magnitude of the project.

Socio-economic study of an area provides a good opportunity to assess the socio-economic conditions of an area. This study may possibly facilitate a change in living and social standards of the area around the project. It can undoubtedly be said that this plant will provide some direct and indirect employment and facilitate in improving the infrastructural facilities and standards of living of the area.

The fabrics of socio-economic changes are so complicated that this study would seem to be extremely limited, almost superficial and at times subjective in nature. More thorough and quantified socio-economic study will undoubtedly require vastly longer time and resources, and is, therefore, beyond the scope of the present EIA study. This EIA will give a reasonably clear picture of the socio-economic conditions prevailing in the study area.

***Objectives of the Study***

The objective of this socio-economic study is as follows:

- To identify the current socio-economic condition within the 10 km study area by understanding the determinants such as education, health, sanitation, water, employment transportation and communication, electrification and livelihood.
- To identify the basic needs of the nearby villages within the 10 km of study area.
- To contribute in the development and growth based on the identified needs of the nearby areas using practical strategic interventions under the CSR activities.
- To provide the employment and improved living standards.

***Scope of Work***

To study the socio-economic environment of the 10 km study area.

- Data collection through primary field survey and collate it with the secondary sources.

- Identification and prediction of possible impacts from the proposed project.
- Providing solutions and Mitigation measures.
- Developing Action plan for implementation based on the mitigation measures.

***Methodology***

- ***Collection of Data***

Data for this project was collected from primary sources like Household survey, Personal Interview, Group Discussion in community meetings etc. and secondary sources like Government department, Census 2011, District Census Handbook, Maps, Literature research etc. JMEPL conducted the socio-economic baseline survey using a survey team of Field Assistants and a Supervisor apprising them about the project area and relevant documents.

The Survey was conducted using Simple Random Sampling method with a well-structured questionnaire prepared enabling subjects to reply appropriately. The questionnaires were designed to suit the subjects considering their rural background enabling them to furnish correct information and data to the extent possible. Primary data has been collected at village level, household level by questionnaires and focused group discussions.

The study area for the field survey has been divided into three major segments namely Primary Zone (0 - 3 km), Secondary Zone (3 - 7 km) and Outer Zone (7 - 10 km).

- ***Presentation of Data & Analysis***

The data collected were presented in a suitable, concise form i.e., tabular or diagrammatic or graphic form for further analysis. These tabulated data were interpreted and analyzed with the help of various qualitative techniques and ideographic approaches.

***Background Information of the Area***

Andra Pradesh is a state in on the Southern coastal region of India with a population of 5.27 crores. Andhra Pradesh's eastern boundary is a 600-mile (970-km) coastline along the Bay of Benga. After Gujarat, it features India's second-longest coastline. The capital is Amaravati near the south-eastern border. Agriculture engages majority of the population in the State.

The capital is Amaravati near the south-eastern border. Agriculture engages majority of the population in the State.YSR District (formerly known as Kadapa District), lies in the south-central part of Andhra Pradesh. it has three revenue divisions and 36 mandals. Socio-Economic Profile of the Study area is given in Table - 3.25.

***Demographic Profile***

Study area is the region within 10 km radius of the proposed project. The habitations are spread across 36 Villages. The population as per 2011 Census records is 70,693 (for 10 km radius) and there are 7,06,204 households residing. The village - wise demographic features of the study area as per area classification are given in Table - 3.24.

**Table - 3.24**

**Demographic Profile**

| Particular | India | YSR District | Study Area |
|---|---|---|---|
| Area (in sq. km.) | 3,287,263 | 15,359 | 321.29 |
| No. of Households | 249454252 | 7,06,204 | 17,586 |
| Population | 1210569573 | 28.82,469 | 70,693 |
| Male | 623121843 | 14,51777 | 35,353 |
| Female | 587447730 | 14,30,692 | 35,340 |
| Scheduled Tribes | 104281034 | 75,886 | 11,437 |
| Scheduled Castes | 201378086 | 4,65,794 | 1409 |
| Literacy Rate | 72.99% | 67.88% | 60.4% |
| Sex Ratio (Females per 1000 Males) | 943 | 984 | 1000 |

***Source:*** *Census of India, 2011*

***Baseline Data and Analysis***

The socio-economic study has been conducted on the basis of questionnaires prepared including demographic, educational, medical & health, occupational, agriculture & cropping pattern, basic amenities and religious rituals details. The primary study was conducted within 10 km radius study area from the project site. The study area was categorized on the basis of the distance of the village from the project site. First zone was identified from 0-3 km radius area, Second zone in 3-7 km and outer zone 7-10 km radius area from the project site. Information was collected from Sarpanch, Gram sevak, Doctors, ANM, Aanganwadikaryakarta, school teachers and other recognized persons of the area. To ensure the accuracy of the primary data collected, information collected from all villages was cross checked from census 2011 of YSR district (Andra Pradesh).

Base line data are collected and prepared by conducting a survey by Team Members. 25 villages have been included in buffer zone for this project and keeping that in view, the socio-economic condition of the project area has been analyzed. Secondary data has been used from census 2011 and collected data from NGOs. On the basis of questionnaires prepared including demography, education, medical & health, occupation, agriculture & cropping pattern, basic amenities and religious rituals details, the primary study was conducted within 10 km radius study area from the proposed Plant and Mine site. The study area (buffer zone) was categorized on the basis of the distance of the villages from the project site of M/s. ACC Limited

The village - wise demographic features of the study area as per area classification are given in Table 3.28 below:

To understand the socio-demographic profile of the 10 km study area, village wise distribution has been done based on the below given determinants:

1. Number of Household
2. Number and type of Population
3. Sex Ration
4. Literacy rate
5. Number and type of workers and non-workers.

**Table. 3.25**

**Village Wise Demographic Profile of the Study Area**

| S. No. | Name | No. Of House Hold | Total Population | T. Male | T. Female | Sex ratio | SC population | ST Population | Total Pop (-06) | M_Pop (-06) | F_Pop (-06) | Lit. Rate | Male LR | Female LR | Working Population | Main worker | Marginal Worker | Non Working |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **0 - 3 km** | | | | | | | | | | | | | | | | | | |
| 1 | Gollapalle | 162 | 604 | 299 | 305 | 1020 | 174 | 0 | 541 | 259 | 282 | 65.1 | 77.2 | 53.9 | 337 | 329 | 8 | 267 |
| 2 | Vaddirala | 325 | 1356 | 672 | 684 | 1018 | 149 | 4 | 1178 | 577 | 601 | 58.5 | 67.8 | 49.6 | 789 | 735 | 54 | 567 |
| 3 | Madhavapuram | 100 | 370 | 181 | 189 | 1044 | 9 | 0 | 333 | 166 | 167 | 66.7 | 80.1 | 53.3 | 216 | 209 | 7 | 154 |
| 4 | Talamanchipatnam | 233 | 854 | 434 | 420 | 968 | 290 | 44 | 762 | 380 | 382 | 62.6 | 74.5 | 50.8 | 502 | 418 | 84 | 352 |
| 5 | Kamavaripalle | 373 | 1473 | 728 | 745 | 1023 | 230 | 0 | 1284 | 631 | 653 | 60.4 | 71.6 | 49.5 | 803 | 747 | 56 | 670 |
| 6 | Ayyavari Kambala Dinne | 97 | 370 | 182 | 188 | 1033 | 4 | 0 | 330 | 161 | 169 | 49.7 | 60.9 | 39.1 | 231 | 220 | 11 | 139 |
| 7 | Kallutla | 204 | 843 | 421 | 422 | 1002 | 68 | 0 | 742 | 371 | 371 | 58.2 | 74.1 | 42.3 | 598 | 421 | 177 | 245 |
| 8 | Janganapalle | 654 | 2558 | 1299 | 1259 | 969 | 346 | 0 | 2273 | 1148 | 1125 | 59.6 | 71.6 | 47.4 | 1473 | 1268 | 205 | 1085 |
| 9 | Golla Uppalapadu | 44 | 166 | 89 | 77 | 865 | 0 | 0 | 149 | 78 | 71 | 72.5 | 85.9 | 57.7 | 97 | 78 | 19 | 69 |
| 10 | Bestavemulla | 309 | 1250 | 611 | 639 | 1046 | 252 | 0 | 1110 | 543 | 567 | 62.6 | 75.0 | 50.8 | 743 | 614 | 129 | 507 |
| 11 | Kona Annathapuram | 74 | 261 | 132 | 129 | 977 | 0 | 251 | 221 | 111 | 110 | 65.2 | 77.5 | 52.7 | 153 | 149 | 4 | 108 |
| **Sub-Total** | | 2575 | 10105 | 5048 | 5057 | 1002 | 1522 | 299 | 8923 | 4425 | 4498 | 61.9 | 74.2 | 49.7 | 5942 | 5188 | 754 | 4163 |
| **3-7 km** | | | | | | | | | | | | | | | | | | |
| 12 | Dugga Palle | 41 | 145 | 71 | 74 | 1042 | 0 | 0 | 128 | 63 | 65 | 60.9 | 74.6 | 47.7 | 82 | 82 | 0 | 63 |
| 13 | Nawabpet | 323 | 1267 | 604 | 663 | 1098 | 2 | 6 | 1132 | 541 | 591 | 51.0 | 64.9 | 38.2 | 748 | 742 | 6 | 519 |
| 14 | Bhutamapuram | 141 | 531 | 260 | 271 | 1042 | 0 | 0 | 475 | 233 | 242 | 61.5 | 76.4 | 47.1 | 299 | 296 | 3 | 232 |
| 15 | Chinna Komerla | 1025 | 3791 | 1903 | 1888 | 992 | 287 | 0 | 3317 | 1662 | 1655 | 59.5 | 73.2 | 45.7 | 2012 | 1788 | 224 | 1779 |
| 16 | Murapandi | 291 | 1203 | 623 | 580 | 931 | 488 | 169 | 1029 | 527 | 502 | 48.4 | 62.8 | 33.3 | 814 | 689 | 125 | 389 |
| 17 | Kothapalle | 2456 | 9857 | 4916 | 4941 | 1005 | 1156 | 442 | 8782 | 4361 | 4421 | 68.4 | 78.9 | 58.0 | 4168 | 3751 | 417 | 5689 |
| 18 | Janganapalle | 654 | 2558 | 1299 | 1259 | 969 | 346 | 0 | 2273 | 1148 | 1125 | 59.6 | 71.6 | 47.4 | 1473 | 1268 | 205 | 1085 |
| 19 | Chinnaventhurla | 154 | 666 | 352 | 314 | 892 | 132 | 6 | 588 | 304 | 284 | 62.6 | 73.4 | 51.1 | 405 | 367 | 38 | 261 |
| 20 | Erragudi | 300 | 1191 | 600 | 591 | 985 | 157 | 27 | 1094 | 556 | 538 | 59.5 | 71.8 | 46.8 | 635 | 631 | 4 | 556 |
| 21 | Peddaventhurla | 464 | 1918 | 952 | 966 | 1015 | 233 | 0 | 1747 | 861 | 886 | 63.0 | 78.2 | 48.3 | 1084 | 1073 | 11 | 834 |
| 22 | Dhannavada | 232 | 851 | 421 | 430 | 1021 | 55 | 21 | 744 | 368 | 376 | 62.5 | 74.2 | 51.1 | 477 | 380 | 97 | 374 |
| **Sub-Total** | | 6081 | 23978 | 12001 | 11977 | 998 | 2856 | 671 | 21309 | 10624 | 10685 | 59.7 | 72.7 | 46.8 | 12197 | 11067 | 1130 | 11781 |
| **7 - 10 km** | | | | | | | | | | | | | | | | | | |

| S. No. | Name | No. Of House Hold | Total Population | T. Male | T. Female | Sex ratio | SC population | ST Population | Total Pop (-06) | M_Pop (-06) | F_Pop (-06) | Lit. Rate | Male LR | Female LR | Working Population | Main worker | Marginal Worker | Non Working |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 23 | Nossam | 1373 | 5750 | 2888 | 2862 | 991 | 1294 | 70 | 5107 | 2553 | 2554 | 66.8 | 79.4 | 54.3 | 3198 | 3020 | 178 | 2552 |
| 24 | Bheemagundam | 279 | 1078 | 528 | 550 | 1042 | 81 | 0 | 985 | 478 | 507 | 61.6 | 70.5 | 53.3 | 620 | 613 | 7 | 458 |
| 25 | Ramchandryapple | 260 | 951 | 491 | 460 | 937 | 140 | 52 | 840 | 437 | 403 | 49.9 | 62.0 | 36.7 | 542 | 407 | 135 | 409 |
| 26 | Dhodium | 354 | 1426 | 734 | 692 | 943 | 82 | 2 | 1274 | 645 | 629 | 48.6 | 62.3 | 34.5 | 972 | 855 | 117 | 454 |
| 27 | Nakkavanipalle | 55 | 204 | 103 | 101 | 981 | 0 | 0 | 186 | 93 | 93 | 72.0 | 82.8 | 61.3 | 121 | 104 | 17 | 83 |
| 28 | Hanumanthagundam | 198 | 862 | 425 | 437 | 1028 | 4 | 6 | 761 | 373 | 388 | 52.2 | 64.3 | 40.5 | 492 | 491 | 1 | 370 |
| 29 | Mikkinenipalle | 167 | 664 | 325 | 339 | 1043 | 0 | 0 | 589 | 289 | 300 | 53.8 | 68.5 | 39.7 | 457 | 455 | 2 | 207 |
| 30 | Mitamanipalle | 1079 | 4253 | 2138 | 2115 | 989 | 1537 | 4 | 3693 | 1847 | 1846 | 59.6 | 73.6 | 45.6 | 2284 | 1688 | 596 | 1969 |
| 31 | Kamavaripalle | 373 | 1473 | 728 | 745 | 1023 | 230 | 0 | 1284 | 631 | 653 | 60.4 | 71.6 | 49.5 | 803 | 747 | 56 | 670 |
| 32 | Ponnampalle | 348 | 1372 | 705 | 667 | 946 | 197 | 5 | 1184 | 602 | 582 | 56.7 | 68.8 | 44.2 | 816 | 215 | 603 | 554 |
| 33 | Kondasunkesula | 506 | 2099 | 1024 | 1075 | 1050 | 241 | 0 | 1908 | 925 | 983 | 59.6 | 72.6 | 47.4 | 1313 | 960 | 353 | 786 |
| 34 | Diguva Kalvatala | 415 | 1521 | 765 | 756 | 988 | 385 | 0 | 1343 | 676 | 667 | 55.5 | 70.6 | 40.2 | 1169 | 747 | 422 | 352 |
| 35 | Thorrivemula | 667 | 2639 | 1329 | 1310 | 986 | 253 | 100 | 2311 | 1151 | 1160 | 58.8 | 71.8 | 46.0 | 1621 | 1256 | 365 | 1018 |
| 36 | Nagireddipalle | 2856 | 12318 | 6121 | 6197 | 1012 | 2615 | 200 | 10843 | 5378 | 5465 | 79.3 | 88.5 | 70.2 | 4055 | 3409 | 646 | 8263 |
| **Sub-Total** | | 8930 | 36610 | 18304 | 18306 | 1000 | 7059 | 439 | 32308 | 16078 | 16230 | 59.6 | 72.0 | 47.4 | 18463 | 14967 | 3498 | 18145 |
| **Grand-Total** | | 17586 | 70693 | 35353 | 35340 | 1000 | 11437 | 1409 | 62540 | 31127 | 31413 | 60.4 | 73.0 | 48.0 | 36602 | 31222 | 5382 | 34089 |

*Source: Census of India, 2011*

- **Population Distribution and Composition of the Study area**

The population as per 2011 Census records is 70693 (for 10 km radius buffer zone). Total no. of household is 2575, 6081 and 8930 respectively, in primary, secondary and outer zone. Sex ratio is 1002, 998 and 1000 (females per 1000 males) observed in primary, secondary and outer zone respectively. SC population distribution is 1522, 2856 and 7059 respectively in primary, secondary and outer zone. ST population distribution is 299, 671 and 439 respectively in primary, secondary and outer zone respectively. Demographic profile of study area is given in the Table 3.26 below:

**TABLE - 3.26**

**Zone Wise Demographical Profile of Study Area**

| Zone | No. of Villages | Total Household | Total Population | Total Male Population | Total Female Population | Sex Ratio |
|---|---|---|---|---|---|---|
| Primary Zone (0 - 3 Km) | 11 | 2575 | 10105 | 5048 | 5057 | 1002 |
| Secondary Zone (3 - 7 Km) | 11 | 6081 | 23978 | 12001 | 11977 | 998 |
| Outer Zone (7 - 10 Km) | 14 | 8930 | 36610 | 18304 | 18306 | 1000 |
| Study Area (0-10 km) | 36 | 17586 | 70693 | 35353 | 35340 | 1000 |

***Source:*** *Census of India, 2011*

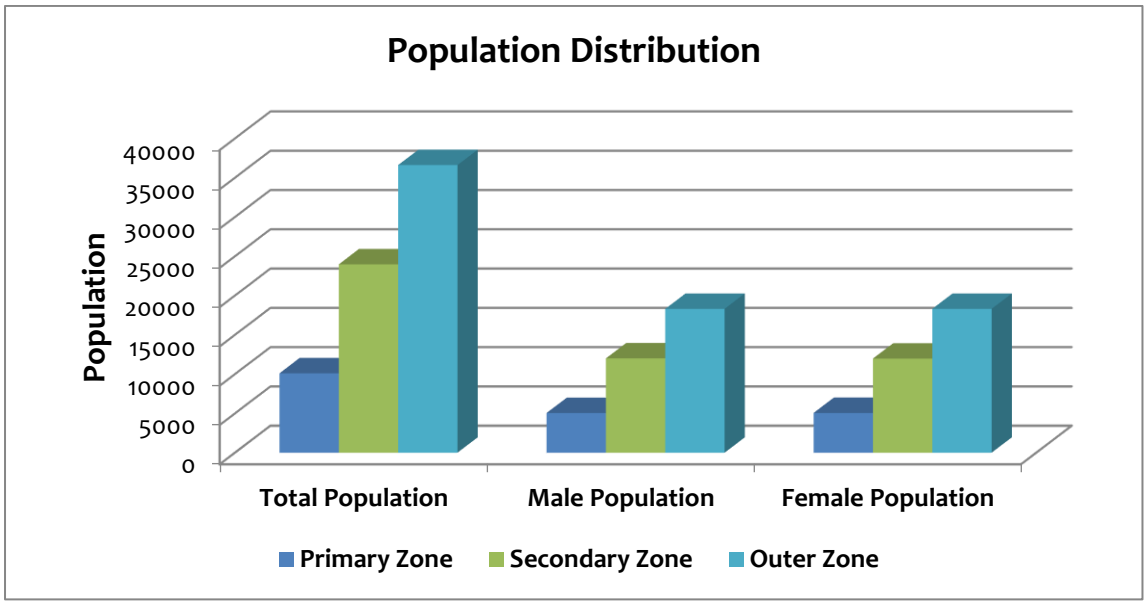



**Figure 3.20: Population Distribution**

As per analysis of the primary data & secondary data the distribution of population varies from place to place. Highest population recorded is in Nagireddipalle whereas population varies on another village. As per census data the Sex Ratio is good in all villages in the study area. In various villages, ratio of females is higher than male population. This indicates that in these villages people have positive view about female.

- **Vulnerable Groups**

While developing an Action Plan, it is very important to identify the population which falls under the marginalized and vulnerable groups and special attention has to be given towards these groups while making action plans. Special provisions should be made for them. In the overview of villages, schedule caste (S.C.) population is 46.25 %, Schedule Tribe (ST) population is 6.96% (See Table 3.27).

**Table - 3.27**
**Summary of Vulnerable Group in the Study area**

| Zone | No. of Villages | Total Household | Total Population | SC Population | ST Population | Others Population |
|---|---|---|---|---|---|---|
| Primary Zone (0 - 3 Km) | 11 | 2575 | 10105 | 1522 | 299 | 8,882 |
| Secondary Zone (3 - 7 Km) | 11 | 6081 | 23978 | 2856 | 671 | 20,451 |
| Outer Zone (7 - 10 Km) | 14 | 8930 | 36610 | 7059 | 439 | 29112 |
| Study Area (0-10 Km) | **36** | **17586** | **70693** | **11437** | **1409** | **58,445** |

***Source:*** *Census of India, 2011*

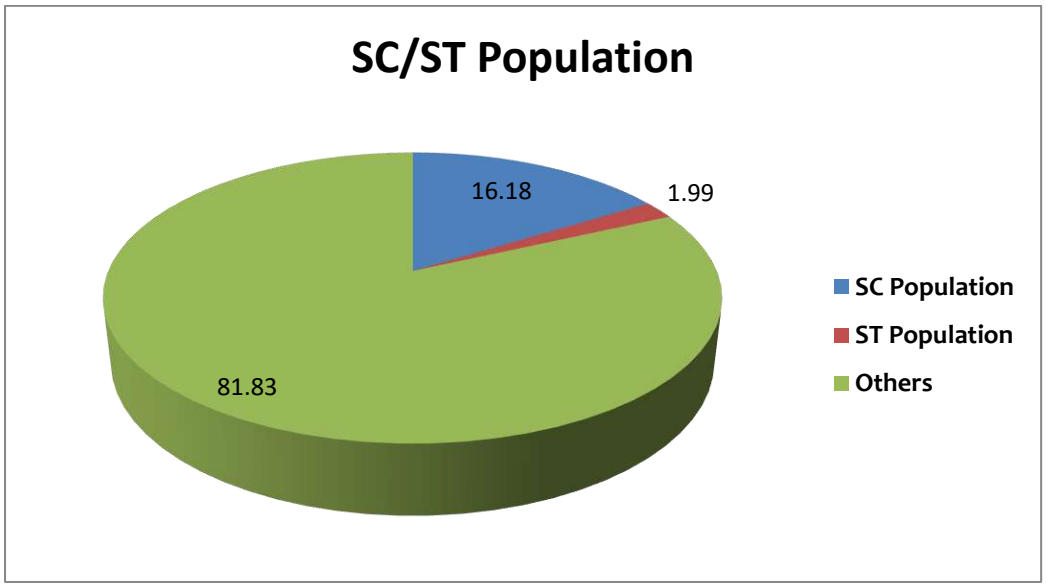



**Figure 3.21: Vulnerable groups**

- **Literacy Rate Distribution**

Literacy is the ability to read and write one's own name and further for knowledge and interest, write coherently, and think critically about the written word. The analysis of the literacy levels is done in the study area. The 10 km radius study area demonstrates a literacy rate of 60.4 % as per census 2011. The male literacy rate works out to be 73.0% whereas the female literacy rate, which is an important indicator for social change, is observed to be 48.0% in the study area. This indicates that the education facilities in the villages are good but there isneed to be aware as the female literacy as it is very important for our society and from the survey it is clear that the literacy rate of female is average comparison to male.

**Table - 3.28**
**Literacy Rate of Surveyed Villages**

| Zone | No. of Villages | Total Literate Population | No. of Male Literate | No. of Female Literate | Total Literacy Rate (%) | Male Literacy Rate (%) | Female Literacy Rate (%) |
|---|---|---|---|---|---|---|---|
| **Primary Zone (0 - 3 Km)** | 11 | 5413 | 3214 | 2199 | 61.9 | 74.2 | 49.7 |
| **Secondary Zone (3 - 7 Km)** | 11 | 13363 | 7955 | 5408 | 59.7 | 72.7 | 46.8 |
| **Outer Zone (7 - 10 Km)** | 14 | 21392 | 12513 | 8879 | 59.6 | 72.0 | 47.4 |
| **Study Area (0-10 Km)** | **36** | **40168** | **23682** | **16486** | **60.4** | **73.0** | **48.0** |

***Source:*** *Census of India, 2011*

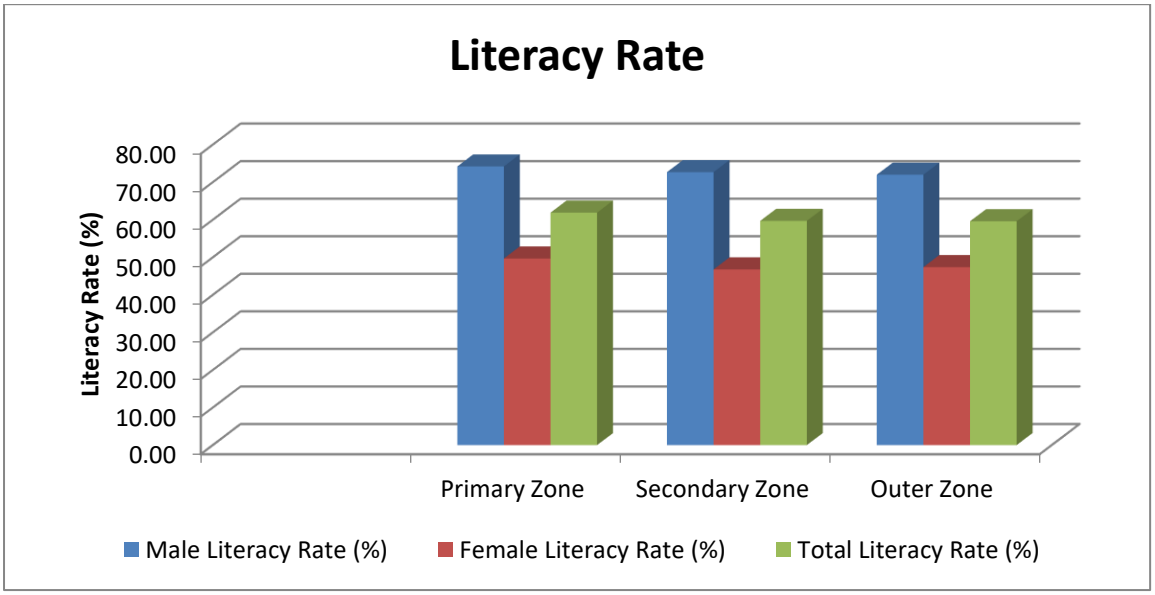



**Figure 3.22: Gender Wise Literacy Rate in the Study Area**

- **Economic Activities**

The economy is defined by the occupational pattern and income level of the people in the area. The occupational structure of residents is studied with reference to work category. The population is divided occupation wise into three categories, viz., main workers, marginal workers and non-workers. The workers include cultivators, agricultural laborers, those engaged in household industry and other services.

The marginal workers are those workers who are engaged in some work for a period of less than 180 days during the reference year. The non-workers include those engaged in unpaid household duties, students, retired persons, dependents, beggars, vagrants etc. besides institutional inmates or all other non-workers who do not fall under the above categories.

**Table - 3.29**
**Working Population of the Study Area**

| Zone | No. of Villages | Total Workers | Main Workers | Marginal Worker | Non-Worker |
|---|---|---|---|---|---|
| **Primary Zone (0 - 3 Km)** | 11 | 5942 | 5188 | 754 | 4163 |
| **Secondary Zone (3 - 7 Km)** | 11 | 12197 | 11067 | 1130 | 11781 |
| **Outer Zone (7- 10 Km)** | 14 | 18463 | 14967 | 3498 | 18145 |
| **Study Area (0-10 Km)** | **36** | **36602** | **31222** | **5382** | **34089** |

***Source:*** *Census of India, 2011*

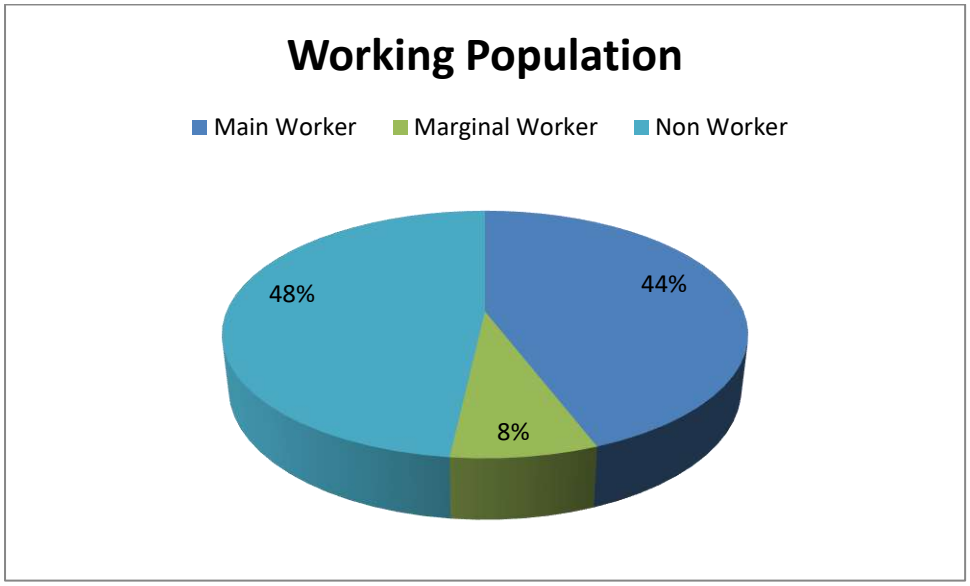



**Figure 3.23: Working Force in the Study Area**

- ***Occupation Structure***
  - Occupational structure of study area households suggests that most of people are engaged in unorganized sector.
  - They either work as cultivators or agricultural labors or work at small scale manufacturing units such as cement industries, household industry, while few perform self-employed business.
  - Most of the family members in a household are also involved as cultivators and agricultural labors.
  - Proposed cement project would aim to give most of these people employment opportunity to earn decent living.
  - Presence of various industry and portable local businesses in the region, most of them also do not prefer to migrate to other parts of state or country. They work at various household industry or work as agricultural labors and cultivators.

***Basic Amenities***

In all villages, basic facilities as road, school, drinking water, electricity, public transport etc. are available except some villages. Major Facilties like education, health centres, maternity clinic, TB clinic, veterinary hospitals, medical shops, etc. are available at village Tengli.No Mobile Health Centres, Medical facilities, banks, Power repair shop and motor cycle repair shop, Pharmacy and Medical shops are available in most of the villages. Communication facilities are less than average. Radio and newspaper are available in the area. Village is connected by the electricity but the supply is not proper. Developing programs i.e. (Self Help Group, Development of women and children in rural area, Integrated Rural Development Program) are being carried out. There are Aganbari center in all villages. Taking everything into account, the basic amenities in the study area is not satisfactory and it needs to be improved. Facilities suggested by the villagers during the survey are Employment, Transport, Education facilities, Agriculture awareness programme, Bank facility, Electricity etc.

**A. Education facilities**

Education and learning are one of the most important processes in today's society. Education is not just restricted to teaching a person the basic academics, say computers, mathematics, geography or history, education is a much larger term. It is really a means to discover new things which we don't know about and increase our knowledge. Government has provided educational facilities in each village instead some villages do not have school facility. According to surveyed village Primary Schools are available in every village and Middle, Secondary and Senior Secondary School (depend on population size) are available in few of the villages. We observed from the survey that people have to go far away from the villages for colleges and schooling. For higher education people have to migrate to the bigger cities. Educational and literacy details were collected during study period from concerned Schools and Gram Panchayat offices and we observed lack of Education. After analysing the literacy rate from census data, we found that literacy rate is not good. Details of the literacy rate in the study area are given the Table 3.30. The available educational structure for the population in the case study area is mentioned in the table eblow.

**Table - 3.30**

**Educational Facilities in the Study Area**

| Particular | No. of Villages | Primary School | Middle School | Secondary School | Degree Colleges (Arts & Science) |
|---|---|---|---|---|---|
| Primary Zone (0 - 3 km) | 11 | 8 | 1 | 0 | 0 |
| Secondary Zone (3 - 7 km) | 11 | 17 | 4 | 2 | 0 |
| Outer Zone (7 - 10 km) | 14 | 21 | 5 | 2 | 0 |
| **Sub - Total** | **36** | 46 | 10 | 4 | 0 |

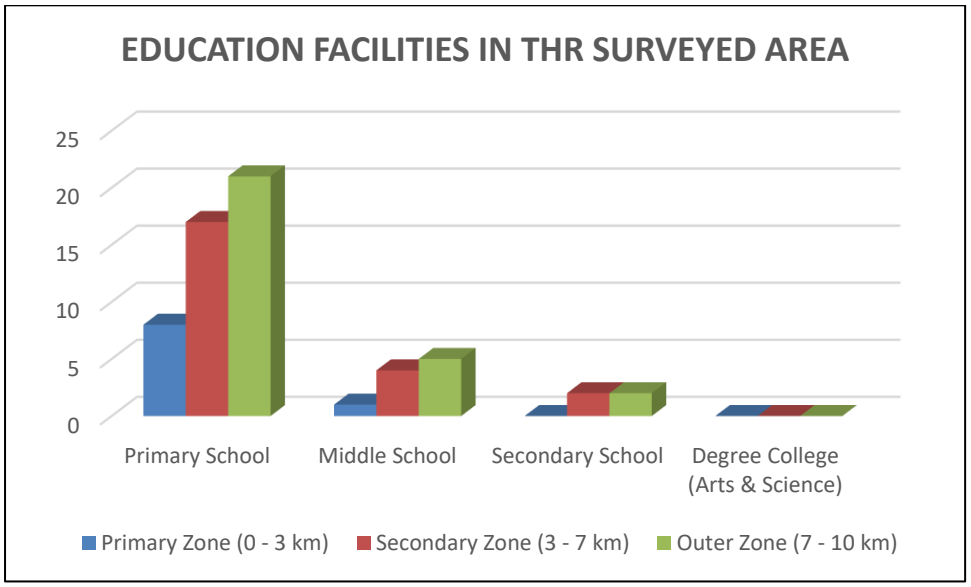



**Figure 3.24: Education facilities in the study area**

**B. HEALTH FACILITIES**

Health is a premier asset of human capital which is an important factor for growth of any economy. It is a source of human welfare. Health and nutrition play a major role for developing a healthy society as it impacts the productivity of a person.

The healthcare facilities in the study area consisted of Primary Health Centre, Primary Health Sub-Centre's; Maternity and Child Welfare Centre; Dispensaries and a Hospital of Alternative Medicine. Sub-Centres and Primary Health Centres are available only in very few villages. The findings from the case study of the 10 km radius study area indicates that medical facilities are needed to be improved by the Government as satisfactory facilities are not available for any medical emergencies. Patients have to move to Cities for any serious illness.

**Table - 3.31**

**Health Facilities in the Study Area**

| Particular | No. of Villages | Primary Health Centre | Primary Health Sub Centre | Veterinary |
|---|---|---|---|---|
| Primary Zone (0 - 3 km) | 11 | 1 | 1 | 1 |
| Secondary Zone (3 - 7 km) | 11 | 0 | 1 | 0 |
| Outer Zone (7 - 10 km) | 14 | 2 | 5 | 2 |
| **Sub - Total** | **36** | **03** | **07** | **03** |

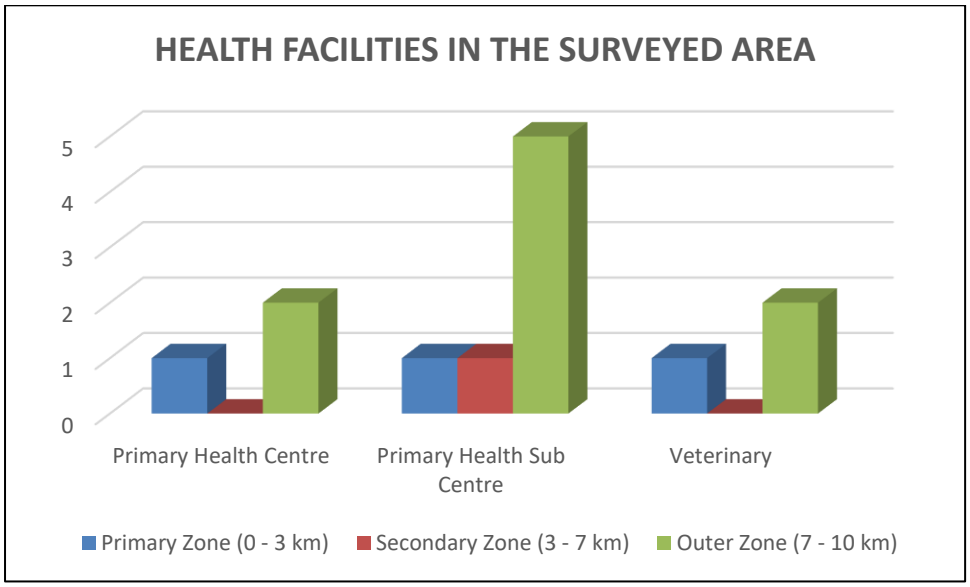



**Figure 3.25: Healthcare facility distribution**

**C. Other Infrastructure Facilities**

**Electrification in the Area**

The source of electricity is fulfilled by the Government. Most of the villages are electrified. The Electricity supply is on average 12-20 hours and even 24 hours in few villages.

**Drinking Water Facilities**

During the primary survey it has been noticed that the requirement of drinking water is being fulfilled by Public borewells and tankers. More than 80% of the villagers are availing drinking water facilities generally from ground water wells, Tube well/Bore wells or Hand pumps. The drinking water sources are domestic taps, bore well and hand pump. Mostly in the month of March, April, May, June and July the villagers face the drinking water problems.

**Needs Identification**

- Need to develop conveyance and transport facilities.
- Required Internet and computer technology for better communication system.
- Need of awareness for professional courses and career management plan.
- Need of improvement in public infrastructure facilities.
- Camp for providing knowledge of Government schemes and loan or subsidies for agriculture.
- Training Programmes for Agriculture related new technologies.
- Awareness program should be conducted to make the population aware to get education and better treatment for livelihood.
- Health care center and ambulance facility can be provided to make the population get easy medical facilities.

**Conclusion and Discussion**

The socio-economic study of the study area on the basis of surveyed villages gives clear picture of its population, average household size, literacy rate, sex ratio etc. Based on the data collected for socio-economic status of the study area, following inferences could be drawn:

- As far as the literacy rate is concerned the study area does not have satisfactory level (60.4%), which is lower than the district literacy rate (67.88%). As per the 2011 Census of India, the male literacy rate, i.e., the percentage of literate males in the study area works out to be 73.0% whereas the female literacy rate which is an important indicator for the social change is observed to be 48.0%. The difference observed indicates that there is a need for social development in the region.
- The Percentage of total working population and non-working population is 51.75 % and 48.22 % respectively in the study area. The analysis revealed that the percentage of working population is higher than non - working population. A major portion of working age people are not ideal workers because of limited sectors in which they are engaged with less training and non-awareness of latest sectors in which maybe they can better off than traditional work.
- The agriculture is main source of income within the region but productivity majorly depends upon the rainfall.
- The villages are well supplied with the drinking water facilities with presence of hand pumps, tap water and bore wells. The people face scarcity of water during summer.
- As observed by the survey, the area has an average medical facility, thus region still requires improvement in the medical conditions such as improvement in the immediate medical mobility services and health equipments etc.
- The study area has a moderate road network, which includes state highway, major district roads and other roads.
- The socio-economic analysis of the study area shows that in terms of education and health facilities, the area is average developed. The overall socio-economic status of the target population is below average in terms of female literacy, work participation rate etc. More attention and care should be taken so that the needs and demand of the population of the influence area be minimized and can get more exposure to modern facilities of education, health, skill development and development for a bright future.

**Recommendations and Suggestion**

- Education Awareness program to be conducted to make the population aware and better treatment for livelihood.
- Vocational training session to be organized to provide self-employment to the women and unemployment youth.
- Routinely various medical health camps to be organized.
- Natural Resource Management and Environmental Conservation.
- On the basis of qualification and skills local youths to be employed.
- Long term and short-term employments to be generated.

Basic amenities and facilities will be made available to the people and there will be proper maintenance of the facilities already provided by the government. In the study area, various CSR activities will be conducted by M/s. ACC Limited.

## 3.6 CONCLUSION

To predict and evaluate the impacts of the proposed project on the surrounding area, it is vital to assess the baseline status of the environmental quality in the vicinity of the site. The environment baseline study was conducted by both collecting Primary and Secondary data collections during the Summer Season (March, 2024 to May, 2024). Due to the expiry of earlier conducted baseline study; a fresh baseline was conducted during Summer Season (March, 2024 to May, 2024).

The baseline study was conducted considering the abiotic factors such as air, water, soil, land. It was found that the parameters monitored for air, noise, water, soil were well within the limits as per the prescribed standards by CPCB. Apart from monitoring, LU-LC study was also conducted using primary and secondary sources which revealed that majority of the study area is occupied by the agricultural land. Socio-Economic Survey was also conducted during the study period which revealed that area further require improvement in the Economy and Infrastructure Development of the area.

# *CHAPTER - 4*
# *ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES*

## 4.1 ENVIRONMENTAL IMPACT STUDY

The anticipated environmental impacts of the proposed project would be mainly due to the construction and operational activities. The environmental parameters likely to be affected are related to many factors, viz. physical, social, and economic, agriculture and aesthetic.

The industrial operations can disturb the environment in various ways, such as change in air, noise level; water and soil quality of that particular area. While for the purpose of development and economic up-liftment of people, there is need for establishment of industries, but these have to be environment friendly and sustainable. Therefore, it is essential to assess the impacts of proposed project on different environmental and socio-economic parameters; so that, abatement measures could be planned in advance to prevent, minimise/reduce, mitigate, offset or compensate for adverse impacts; and to maximise positive impacts where practicable.

The likely impacts on different environmental parameters due to the proposed project are discussed below.

## 4.2 METHODOLOGY OF IMPACT ASSESSMENT

The impact assessment has been undertaken following a systematic process that identifies, predicts and evaluates the impact a project could have on aspects of the physical, biological, social/ socio-economic and cultural environment, and identifies measures that the project will take to avoid, minimise/reduce, mitigate, offset or compensate for adverse impacts; and to enhance positive impacts where practicable. The stages of the impact assessment process comprise of the following:

- *Impact identification:* to identify the potential impact of the project on the various environmental parameters.
- *Impact prediction:* to determine what could potentially happen to resources/receptors as a consequence of the project and its associated activities.
- *Impact evaluation:* to evaluate the significance of the predicted impacts by considering their magnitude and likelihood of occurrence, and the sensitivity, value and/or importance of the affected resources/ receptors.
- *Impact mitigation:* to identify appropriate and justified measures to mitigate negative impacts and enhance positive impacts.

## 4.3 BASIS OF IMPACT ASSESSMENT

The impact of the proposed project would be assessed on the basis of their characteristics i.e., nature, type, extent, duration, intensity & frequency and its significance.

***Characteristics of Impacts***

The impact is described in terms of its characteristics such as nature, type etc. Impact characteristics are given in Table - 4.1.

**Table - 4.1**
**Impact Characteristics**

| Characteristic | Classification | Description |
|---|---|---|
| Nature | Positive | When impact is considered to represent improvement to baseline or introduce a new positive factor/change. |
| | Negative | When impact is considered to represent adverse change from the baseline or introduce a new undesirable factor/change. |
| | Neutral | When there is no impact to represent any change from the baseline and not introducing any new factor/change. |
| Type | Direct | Resulting from a direct interaction between a project activity and the receiving environment / receptors. |
| | Indirect | Resulting from other activities that happened as a consequence of the project. |
| | Cumulative | Impacts that work together with other impacts (including those from concurrent or planned future third-party operations) to influence the same resources and/or receptors as the Project. |
| Extent | Project Area | When impact due to the project related activities is restricted within the premises of project area i.e. core zone. |
| | Local | When impact due to the project related activities is restricted within the immediate surroundings i.e. upto 3 km radius. |
| | Zonal | When impact due to the project related activities is restricted within the study area i.e. up to 10 km radius. |
| | Regional | When an impact due to the project activity extends within as well as beyond 10 km radius. |
| Duration | Short - term | When the impact is usually temporary or last for a short time or will have an effect soon rather than in the distant future. |
| | Long- term | When impact would occur during the development of the project and either takes a long time or lasts a long time or cause a permanent change in the affected receptor/resource. |
| Intensity | Low | When resulting in slight changes of prevailing baseline conditions and quality of existing physical environment is good. Ecological environments as well as human receptors are not likely to be affected due to the proposed project activity. |
| | Medium | When resulting in changes of prevailing baseline conditions which are within the benchmark norms and quality of existing physical environment shows some signs of stress. Ecological environment as well as human receptors could be sensitive to change in quality of prevailing baseline condition, but human receptors retain an ability to adapt to change. |
| | High | When resulting in changes of prevailing baseline conditions which are exceeding the benchmark norms and quality of existing physical environment is already under stress. Ecological environment as well as human receptors would be impacted to the larger extent and the ability of human receptors to adapt to changes would be undermined. |

| Characteristic | Classification | Description |
|---|---|---|
| Frequency | Remote (R) | When resulting in remote or one off chance of an event due to an activity on a receptor/ resource. |
| | Occasional (O) | When an impact due to an activity is occurring intermittently from time to time on a receptor/resource. |
| | Periodic (P) | When an impact due to an activity is resulting on periodic basis for a week or a month on a resource/receptor. |
| | Continuous (C) | When an impact due to an activity is continuously resulting on a resource/receptor. |

***Significance of Impacts***

Impacts are described in terms of 'significance'. Significance is a function of the magnitude & sensitivity / importance of the impact.

Classification of impact significance is given in Table - 4.2.

**Table - 4.2**

**Significance of Impact**

| Significance | Description |
|---|---|
| Insignificant | Negligible impact or where a resource or receptor (including people) will not be affected in any way by a particular activity, or the predicted effect is known to be 'negligible' or 'imperceptible' or is indistinguishable from natural background context. |
| Minor | Where an effect will be experienced, but the impact is well within accepted standards/guidelines with or without mitigation. |
| Moderate | Where an effect will be experienced and the impact is within accepted standards/guidelines with mitigation. |
| Major | Impact where an accepted limit or standard may be exceeded or the impact occurs to the highly valued/sensitive resource/receptors. |

***Irreversible and Irretrievable commitments of environmental components***

Determining the irreversible and irretrievable commitment of the resources is one of the major stages of impact evaluation, which gives an understanding about the potential impacts that are likely to affect future generations of the area and facilitates for adoption of proper mitigation measure regarding the same.

**Table - 4.3**

**Irreversible and Irretrievable commitments of environmental components**

| Commitment of resources | Description |
|---|---|
| Irreversible | Irreversible commitment of resources refers to the impact or loss of the resources that cannot be recovered or reversed. Irreversible is a term that defines the loss of future options. It applies primarily to the impacts of use of nonrenewable resources or to those factors that are renewable only over long periods of time. |
| Irretrievable | Irretrievable is a term that applies to the loss of production, harvest, or use of natural resources. Irretrievable commitment of resources may be considered as the loss of resources as a result of change (both reversible & irreversible) due to any project activity that cannot be regained or recovered. |

## 4.4 INTERACTION MATRIX

The interaction matrix enables a methodical identification of the potential interactions each project activity may have on the range of resources/receptors within the Area of Influence for the Project. The interaction matrix for the project activities and likely impacted resources/receptors is presented in Table - 4.4 which covers potential interactions, regardless of probability of occurrence. The matrix consists of a list of resources/ receptors that could be affected against a list of project activities.

Entries in the matrix cells are tick marked to indicate whether:

- An interaction is not reasonably expected (blank);
- The interaction is reasonably possible and may lead to potential impact (tick marked).

**Table - 4.4**
**Interaction Matrix**

| S. No. | Project Activity / Likely Impacted Resources / Receptors | *Pre-construction Phase* | | | **Construction Phase** | | | | | | *Operation Phase* | | | | | | | | *Miscellaneous* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Land Acquisition | Site Clearing | Site preparation / Change in Topography | Civil works such as earth moving and building structures including temporary structures | Heavy Equipment operations | Disposal of construction waste | Generation of Sewerage | Influx of construction workers | Transportation of construction material | Raw Material transportation, storage and handling | Crushing of coal, storage, and handling/stock pilling | Kiln operation | Grinding process | Operation of power source | Abstraction of water | Co-processing of Hazardous Waste / AFR | Waste management | Development activities carried out by company | Greenbelt Development |
| ***A.*** | ***Physical*** | | | | | | | | | | | | | | | | | | | |
| 1. | Air | | √ | √ | √ | √ | √ | | | √ | √ | √ | √ | √ | √ | | √ | | √ | √ |
| 2. | Noise & / Vibration | | √ | | √ | √ | | | | √ | √ | √ | √ | √ | √ | | | | | √ |
| 3. | Land Use | | | | √ | | | | | | | | | | | | | | | |
| 4. | Topography | | | √ | | | | | | | | | | | | | | | | |
| 5. | Geology | | | | | | | | | | | | | | | | | | | |
| 6. | Drainage Pattern | | | √ | √ | | | | | | | | | | | | | | | |
| 7. | Surface Water | | | | √ | | | | √ | | | | | | | √ | | | | |
| 8. | Ground Water | | | | √ | | | | √ | | | | | | | √ | | | | |
| 9. | Soil | | √ | √ | √ | √ | √ | | | | | | | | | | | | | √ |
| ***B.*** | ***Biological*** | | | | | | | | | | | | | | | | | | | |
| 1. | Flora | | √ | √ | √ | | | | | | √ | √ | √ | √ | √ | √ | | | | √ |
| 2. | Fauna | | √ | √ | √ | √ | | | | | √ | √ | √ | √ | √ | √ | | | | √ |
| 3. | NP/WLS/BR/reserves/Forests etc. | | | | | | | | | | | | | | | | | | | |
| ***C.*** | ***Social / Socio-Economic*** | | | | | | | | | | | | | | | | | | | |
| 1. | Demography | | | | | | | | √ | | | | | | | | | | | |
| 2. | Physical Displacement | | | | | | | | | | | | | | | | | | | |

| S. No. | Project Activity / Likely Impacted Resources / Receptors | ***Pre-construction Phase*** | | | **Construction Phase** | | | | | | ***Operation Phase*** | | | | | | | | ***Miscellaneous*** | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Land Acquisition | Site Clearing | Site preparation / Change in Topography | Civil works such as earth moving and building structures including temporary structures | Heavy Equipment operations | Disposal of construction waste | Generation of Sewerage | Influx of construction workers | Transportation of construction material | Raw Material transportation, storage and handling | Crushing of coal, storage, and handling/stock pilling | Kiln operation | Grinding process | Operation of power source | Abstraction of water | Co-processing of Hazardous Waste / AFR | Waste management | Development activities carried out by company | Greenbelt Development |
| 3. | Land Use (w.r.t. Population influx) | | | | | | | | √ | | | | | | | | | | | |
| 4. | Habitation | | | | | | | | √ | | | | | | | | | | | |
| 5. | Economy & Livelihood | √ | | | | | | | √ | √ | √ | | | | | | | | √ | |
| 6. | Social & Cultural Structure | | | | | | | | √ | | | | | | | | | | √ | |
| 7. | Infrastructure & Public Services | | | | √ | | | | | | | | | | | | | √ | √ | |
| 8. | Public Health | | | | | | | √ | √ | | | | | | | | √ | √ | √ | √ |
| 9. | Education | | | | | | | | √ | | | | | | | | | | √ | |
| 10. | Agriculture | √ | | | | | | | | | √ | | | √ | √ | √ | | | √ | |
| 11. | Transport Infrastructure | | | | √ | √ | | | √ | √ | √ | | | | | | | | | |
| ***D.*** | ***Occupational Health*** | | | | | | | | | | | | | | | | | | | |
| *1.* | Injury | | √ | √ | √ | √ | √ | | | √ | √ | √ | √ | √ | √ | | | | | |
| *2.* | Health | | | | | | √ | √ | | √ | √ | √ | √ | √ | √ | | √ | | | |
| 3. | Non - routine risk | | | | | √ | | | | | √ | √ | √ | √ | √ | | √ | √ | | |
| | Legends | | Show no interactions is reasonably | | | | | | | | √ | | | | | Show interactions reasonably possible with one of the outcomes may lead to potential impact | | | | |

According to the interactions identified between project activities and resource/receptors as described in the above table, it is evident that the following aspects are likely to have impact due to the proposed project (Table: 4.5) and therefore, to be considered for Impact Assessment:

**Table - 4.5**
**Likely Impacted Resources / Receptors**

| S. No. | Likely Impacted Resources / Receptors | |
|---|---|---|
| A. | Physical | Air Quality |
| | | Noise Level |
| | | Surface Water |
| | | Ground Water |
| | | Soil Environment |
| | | Topography |
| | | Drainage Pattern |
| B. | Biological environment | Flora |
| | | Fauna |
| C. | Socio economic environment | Demography |
| | | Land use (w.r.t. population influx) |
| | | Economy & Livelihood |
| | | Social & Cultural Structure |
| | | Infrastructure & Public Services |
| | | Public Health |
| | | Education |
| | | Agriculture |
| | | Transport Infrastructure |
| D. | Occupation Health & Safety | Injury |
| | | Health |
| | | Non-Routine Risk |

*Source: Interaction Matrix*

The impact of proposed project related activities on various environmental parameters were assessed and are given:

## 4.5 ANTICIPATED IMPACT ON TOPOGRAPHY & LAND USE PATTERN AND MITIGATION MEASURES

### ☙ *Anticipated Impacts*

The impacts due to change in the topography and land use pattern of the area due to the proposed project are given below:

- The lowest contour in the area is 228 mRL while highest contour is at 245 mRL. As such, there is total elevation difference of 17 meters. The eastern part represents undulating terrain with sparsely distributed knolls (a small hill or mound) and tors (a hill or rocky terrain). Hence, for the project establishment, good amount of levelling will be required to maintain the general slope of the area.

- Predominantly major area of the project site comprises of barren land and partly single crop rainfed agriculture land. As majorly it contains barren land; hence, changing the land use from barred land to industrial land will not have considerable amount of impact.
- Changing the land use of an area from partly agricultural to industrial land involves the indirect impact on the livelihood of the nearby villagers. Various other employment opportunities based on the eligibility criteria will also be generated.
- Increase in dust pollution due to the movement of earth moving equipment.

ꕥ ***Impact Evaluation***

Impact Evaluation is given in table below:

***Impact Evaluation for Change in Land Use Pattern***

| | | | | |
|---|---|---|---|---|
| Impact Evaluation Element | Land use of the area will be changed from existing private agriculture land to industrial land. | | | |
| Potential Effect/ Concern | Land use of the proposed project area is private agriculture land which will be used for industrial purpose after its conversion into Industrial land use. | | | |
| ***Characteristics of Impacts*** | | | | |
| Nature | Positive | | Negative | *Neutral* |
| | | | √ | |
| Type | ***Direct*** | Indirect | Cumulative | |
| | √ | | | |
| Extent | ***Project Area*** | Local | Zonal | Regional |
| | √ | | | |
| Duration | Short - term | | ***Long - term*** | |
| | | | √ | |
| Intensity | Low | | ***Medium*** | High |
| | | | √ | |
| Frequency | Remote (R) | Occasional (O) | Periodic (P) | ***Continuous (C)*** |
| | | | | √ |
| ***Significance of Impact*** | | | | |
| Significance | *Insignificant* | Minor | **Moderate** | Major |
| | | | √ | |

ꕥ ***Mitigation Measures:***

- At the stage of site clearing and site preparation, the overall slope of the area will be maintained by some level of cutting and filling.
- The soil generated will be used for levelling work.
- Changing the land use of an area from agriculture to industrial involves direct impact on the livelihood of the land owners. To compensate the impacts, the owners of the land has been / will be provided with appropriate compensation. Apart from that, preference in employment based on the eligibility will also be provided to the land owners extended to local people.

- Existing road will be strengthened to ensure the proper connectivity for Villages Gollapalli.
- The existing water course / seasonal nalla will not be disturbed in any case.
- The water body/ infrastructure present within the project site will not be disturbed in any case. Proper mitigation measures will be taken to conserve the water body.
- Water sprinkling will be done to attenuate the dust arising from levelling work.

**Mitigation measures for Seasonal Nallah passing from the project site -**

There is a Seasonal Nalla passing through the project site entering from NW direction to NE direction. The Company has proposed minor re-alignment for part of nalla traversing through the proposed plant area to protect the seasonal nalla and maintain the natural course without disturbing the flow. Company has no proposal for construction of Manufacturing section of plant in that area where the Nalla is crossing the site. A request letter for obtaining No Objection Certificate (NOC) has been submitted to Executive Engineer, Quality Control Division, Water Resource Department, Nagarajupeta, Kadapa, Andhra Pradesh on 14$^{th}$ Oct., 2024. The copy of the submission receipt is enclosed as ***Annexure - 13*** along with this EIA / EMP Report.

Also, company will adopt all the mitigation measures which are as follows -

- Silt fences and sediments traps will be installed.
- Erosion control measures will be taken.
- Limiting construction activities near the nalla.
- The cement manufacturing process is based on dry process technology; and no waste water is being/will be discharged outside the plant premises as the cement plant is based on Zero Liquid Discharge (ZLD). Therefore, there will be no impact on the Nallah passing near to the project.
- Domestic wastewater (252 KLD) generated from Project will be treated in the STP (300 KLD) and the treated water (206 KLD) is being/will be utilized for greenbelt development/ plantation and cooling.
- Boiler blow down generated from CPP and cooling tower (67 KLD) will be treated in Neutralization tank and will be re-used for dust suppression inside the plant premises.
- RO reject water will be reused for dust suppression.
- The rainfall runoff within the plant site will be diverted through the drains to the recharge pits which prevents the runoff of the project from mixing into the nearby water bodies.
- Storm water drains will be made immediately after starting construction activity. The drains will be properly aligned in conformity with the site drainage pattern so that the alteration is kept to the minimum and flooding or soil erosion does not occur.
- All stacking /Storage and loading areas will be provided with proper garland drains equipped with baffles to prevent wash offs from reaching the downstream of nearby surface water bodies.

## 4.6 ANTICIPATED IMPACT ON AIR QUALITY AND MITIGATION MEASURES

***Construction Phase***

- ***Anticipated Impacts***
  - Type of Major Air Pollutant: PM, $SO_2$, $NO_2$, CO
  - The main sources of dust emission will be Batching plant, Gitty crusher, RMC Plant etc. due to movement of equipment at site, leveling, grading, earthwork and foundation works.
  - Exhaust emissions from the machineries, vehicles and equipment deployed during the construction phase is also likely to result in marginal increase in the levels of $SO_2$, $NO_2$, PM, CO and un-burnt hydrocarbons.
  - Loading and unloading of construction waste will also contribute in deterioration of the ambient air quality.

  The impact will be for short duration. This will be confined within the plant boundary and is expected to be negligible outside the plant boundary. The impact will, however, be reversible, marginal and temporary in nature.

- ***Mitigation Measures***
  - To minimize air pollution, various pollution control Equipment such as dust collectors, Bag filters will be installed with Batching plant, Gitty crusher and RMC Plant etc. during construction.
  - Sprinkling of water at the construction site and on the nearby unpaved roads.
  - Construction equipment having PUC certificate will be deployed during the activity to keep control over the exhaust emissions.
  - Proper upkeep and maintenance of vehicles will be done throughout the construction phase.
  - In addition to above, dust will also be generated from stockpiles of construction material (aggregates and sand). To prevent this, stockpiles will be aligned properly with slopes stabilized and maximum height will be maintained. Stockpile will also be covered.
  - To reduce the impact on air quality due to loading and unloading of construction waste, proper handling/ height for unloading material on the land will be maintained.

***Operation Phase***

- ***Anticipated Impacts***

  Increase in concentration of Fugitive emissions and Stack emissions (PM, $SO_2$, $NO_x$ and CO).

- The operational phase of the proposed project comprises of various activities and each of them will impact the air quality due to:
  - Fugitive emissions
  - Stack emissions

**(A) Fugitive Emissions**

A fugitive emission in cement plant is due to various process and non-process related activities which are given below:

- *Process related activities*
  - ✓ Material Handling and Transfer
    - Loading and unloading operations of raw material and finished product
    - Transfer operations (Transfer Points)
    - Silos Vent
  - ✓ Milling Operations
    - Primary and Secondary crushing of limestone, coal and Petcoke
    - Grinding of Raw Meals.
    - Grinding of clinker
    - Packing plant

- *Non-process related activities*
  - ✓ Vehicular Traffic
    - Movement of raw material and finished product by trucks / trailer from main gate to designated place inside the plant and vice-versa
    - Movement of personnel vehicles
  - ✓ Material Storage
    - Material (e.g., limestone, Gypsum, etc.) stored in open yard

**B) Stack Emissions**

From Cement Plant and CPP, the major emission from the stack is Particulate Matter (PM) emissions. In addition, gaseous pollutants ($SO_2$, $NO_x$ and CO) are also anticipated from stack. In case of co-processing of hazardous waste, Dioxins & Furans will also add to the ambient air.

***Air Quality Predictions through Mathematical Modeling***

The details of Air Quality Impact Prediction, mathematical modelling, Isopleths and its outcome prediction done by earlier consultant M/s. Vimta Labs, Hyderabad has been attached as ***Annexure - 14*** along with this EIA/EMP Report.

However, M/s. J.M. EnviroNet Pvt. Ltd. Predicted the impact as per the Additional Detail point conveyed during appraisal in 16$^{th}$ EAC (Industry - I) held on 06$^{th}$ March, 2017.

For obtaining quantitative value of impacts, modelling for air environment is carried out. Mathematical modelling is an established and accepted technique to predict the impacts. In this section, impact on air environment due to emissions to be generated from the proposed plant have been assessed.

Prediction of impacts on air environment has been carried out employing mathematical model based on a steady state Gaussian plume dispersion model designed for multiple point sources for short term. In the present case, AERMOD version 10.2.1 dispersion model based on steady state Gaussian plume dispersion, designed for multiple sources and developed by United States Environmental Protection Agency [USEPA] has been used for simulations from Industrial

sources. The concentrations have been predicted in all directions covering all types of weather conditions. Spatial distributions of all the pollutants are also presented in the form of Isopleths.

**(i) Pollutants/Model Options Considered for Computations**

The model simulations deal with major pollutant Particulate Matter (PM), $SO_2$, $NO_x$ and CO emitted from the proposed plant activity -

The model options used for computation are:

- Cartesian co-ordinate system has been used for computations; and
- The model computations have been done for total 10 km with 250-m interval.
- It is assumed that the pollutants do not undergo any physio-chemical transformation and that there is no pollutant removal by dry deposition;
- Washout by rain is not considered.

**(ii) Model Options Used for Computations**

Model Uses following Regulatory DEFAULT Options:

- Stack-tip Downwash.
- Model Accounts for Flat Terrain Effects.
- Use Calms Processing Routine.
- Use Missing Data Processing Routine.
- No Exponential Decay.

**(iii) Model Input Data**

**a) Meteorological Data**

Meteorological inputs required are Temperature, Relative Humidity, Wind Speed, Wind Direction, Cloud Cover, Celling Hight and etc. which was recorded at site during Summer Season (March to May, 2013) by earlier consultant and due to expiry of earlier baseline, fresh baseline has been conducted in Summer Season (March to May, 2024). Hourly meteorological data has been enclosed as ***Annexure - 6*** with this EIA/EMP Report.

**b) Stack Emissions**

Stack emission details are given in Table - 4.6.

**Table - 4.6**

**Proposed Stack Emission Details for Proposed Integrated Cement**

| Stack attached to | Height from ground level (m) | Internal Diameter (Top) (m) | PM10 | PM2.5 | $SO_2$ | $NO_x$ | CO | Temp. of Exhaust Gases ($^oC$) | Exit Velocity (m/sec) | Volumetric Flow ($m^3/hr$) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Emission Rate (g/s) | | | | | | | |
| Raw Mill & Kiln Bag House - 1 | 152 | 5.2 | 4.04 | 2.696 | 8.47 | 10.83 | 135.03 | 240 | 18 | 1415000 |
| Coal Mill Bag House - 1 | 60 | 1.6 | 0.70 | 0.472 | NA | NA | - | 120 | 30 | 190000 |
| Clinker Cooler-ESP - 1 | 60 | 4.3 | 3.432 | 2.288 | NA | NA | - | 275 | 28 | 1282000 |
| Cement Mill (VRM) Bag House - Unit -I | 50 | 4.0 | 3.39 | 2.264 | NA | NA | - | 120 | 27 | 910000 |

| Stack attached to | Height from ground level (m) | Internal Diameter (Top) (m) | PM10 | PM2.5 | $SO_2$ | $NO_x$ | CO | Temp. of Exhaust Gases ($^oC$) | Exit Velocity (m/sec) | Volumetric Flow ($m^3/hr$) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Emission Rate (g/s) | | | | | | | |
| ESP of Boiler - I (50 MW) | 40 | 2.3 | 0.80 | 0.536 | 2.28 | 2.91 | 21.651 | 140 | 22 | 226880 |
| Raw Mill & Kiln Bag House - 2 | 152 | 5.2 | 4.04 | 2.696 | 8.47 | 10.83 | 135.03 | 240 | 18 | 1415000 |
| Coal Mill Bag House - 2 | 60 | 1.6 | 0.70 | 0.472 | NA | NA | - | 120 | 30 | 190000 |
| Clinker Cooler ESP - 2 | 60 | 4.3 | 3.432 | 2.288 | NA | NA | - | 275 | 28 | 1282000 |
| Cement Mill - (VRM) Bag House - Unit- II | 50 | 4.0 | 3.39 | 2.264 | NA | NA | - | 120 | 27 | 910000 |
| ESP of Boiler - II (50 MW) | 40 | 2.3 | 0.80 | 0.536 | 2.28 | 2.91 | 21.651 | 140 | 22 | 226880 |

- ✓ Width of Roads (SH - 57)
- ✓ Additional number of trucks: 702 trucks per hour
- ✓ Truck details (such as width - 2.5 m, height - 3.1 m, length - 6.8 m, capacity - 30 Tonnes) etc.

❖ Existing value has been covered in the Background Baseline Ambient Air Quality Monitoring

Emission rate for the pollutants has been calculated based on following equation:

E = A x EF x Deterioration factor * (no. of vehicles / day)

Where,

E = Emission rate of each pollutant (expressed as gm /day or TPD)

A = Speed of vehicle in km/hr. (40 km/hr. for the project)

EF = Emission factor for the vehicles

**(iv) Modeling Procedure**

Prediction of ground level concentrations (GLC's) due to proposed project has been made by AERMOD version 10.2.1 as per CPCB guidelines. It is US-EPA approved model to predict the air quality. The model uses rural dispersion and regulatory defaults options as per guidelines on air quality models (PROBES/70/1997-1998). For this study, uniform polar receptors on flat terrain have been assumed.

Meteorological inputs required are hourly wind speed and direction, ambient temperature, stability class, and mixing height, Relative Humidity, Cloud Cover, Celling Hight & etc.

**(v) Presentation of Results**

In the present case, model simulations have been carried using the hourly Triple Joint Frequency data. Short-term simulations were carried to estimate concentrations at the receptors to obtain an optimum description of variations in concentrations over the site in 10 km radius covering 16 directions. The incremental concentrations are estimated for the monitoring period.

For each time scale, i.e., for 24 hr the model computes the highest concentrations observed during the period over all the measurement points. Existing value has been covered in the Background Ambient Air Quality Monitoring.

***Cumulative Max. GLC due to Proposed Integrated Cement Project and Proposed Captive Kadapa Limestone Mine and Transportation -***

Ground Level Concentration has also been predicted composite for Proposed Integrated Cement Plant and Proposed Captive Kadapa Limestone Mine and Vehicular transportation. Details are given in table below:

**Table - 4.7 (a)**
**Cumulative Ground Level Concentrations (Incremental & Resultant) due to Integrated Cement Plant**

| Particular | Concentration (µg/m³) | | | Approx. Distance in km | CPCB NAAQS Standards (µg/m³) |
|---|---|---|---|---|---|
| | Baseline | Incremental | Resultant | | |
| $PM_{2.5}$ | 28.0 | 1.95 | 29.95 | Within Mining Lease boundary | 60 |
| $PM_{10}$ | 50.2 | 2.93 | 53.13 | Within Mining Lease boundary | 100 |
| $SO_2$ | 6.8 | 3.37 | 10.17 | Within the Plant Boundary | 80 |
| $NO_x$ | 12.3 | 3.99 | 15.69 | Within the Plant Boundary | 80 |
| CO | 0 | 33.5 | 33.5 | Within the Plant Boundary | 4 mg/m³ |

- Maximum GLC due to Integrated Cement Plant for PM10 is found to be 2.93 µg/m³ {Figure 4.1 (a)}.
- Maximum GLC due to Integrated Cement Plant for PM2.5 is found to be 1.95 µg/m3 {Figure 4.1 (b)}.
- Maximum GLC due to Integrated Cement Plant for SO2 is found to be 3.37 µg/m3. {Figure 4.1 (c)}.
- Maximum GLC due to Integrated Cement Plant for NOx is found to be 3.99 µg/m3 {Figure 4.1 (d)}.
- Maximum GLC due to Integrated Cement Plant for CO is found to be 33.5 µg/m3 {Figure 4.1 (e)}.

The maximum GLC's after implementation of the Proposed Integrated Cement Plant are very much likely to be within the prescribed NAAQ standards.

**Table - 4.7 (b)**
**Cumulative GLC due to for Integrated Cement Plant, captive mines and vehicular transportation**

| Particular | Concentration (µg/m³) | | | Approx. Distance in km | CPCB NAAQS Standards (µg/m³) |
|---|---|---|---|---|---|
| | Baseline | Incremental | Resultant | | |
| $PM_{2.5}$ | 28.0 | 1.95 | 29.95 | Within Mining Lease boundary | 60 |
| $PM_{10}$ | 50.2 | 2.93 | 53.13 | Within Mining Lease boundary | 100 |
| $SO_2$ | 6.8 | 3.37 | 10.17 | Within the Plant Boundary | 80 |
| $NO_x$ | 12.3 | 3.99 | 15.69 | Within the Plant Boundary | 80 |

- Cumulative maximum GLC due to Integrated Cement Plant, captive mines and vehicular transportation for PM10 for is found to be 2.93 µg/m3. {Figure 4.2(a)}.
- Cumulative maximum GLC due to Integrated Cement Plant, captive mines and vehicular transportation for PM2.5 is found to be 1.95 µg/m3 {Figure 4.2(b)}.
- Cumulative maximum GLC due to Integrated Cement Plant, captive mines and vehicular transportation for SO2 is found to be 3.37 µg/m3 {Figure 4.2(c)}.

- Cumulative maximum GLC due to Integrated Cement Plant, captive mines and vehicular transportation for $NO_x$ is found to be 3.99 µg/m$^3$ {Figure 4.2(d)}.

**Peak Incremental GLC due to Proposed Project (including transportation)**
**Under worst condition**

| S. No. | Particular | Concentration (µg/m$^3$) |
|---|---|---|
| | | **PM under Worst case** |
| 1. | Monitored Maximum concentrations in µg/m$^3$ | 50.2 |
| 2. | Predicted incremental Maximum concentrations under normal Conditions in µg/m$^3$ | 3325 |
| 3. | Resultant Maximum concentrations in µg/m$^3$ | 3375.2 |
| 4. | NAAQS (dated 2009) | 80 |
| 5. | Distance & Direction | Within Plant Boundary |

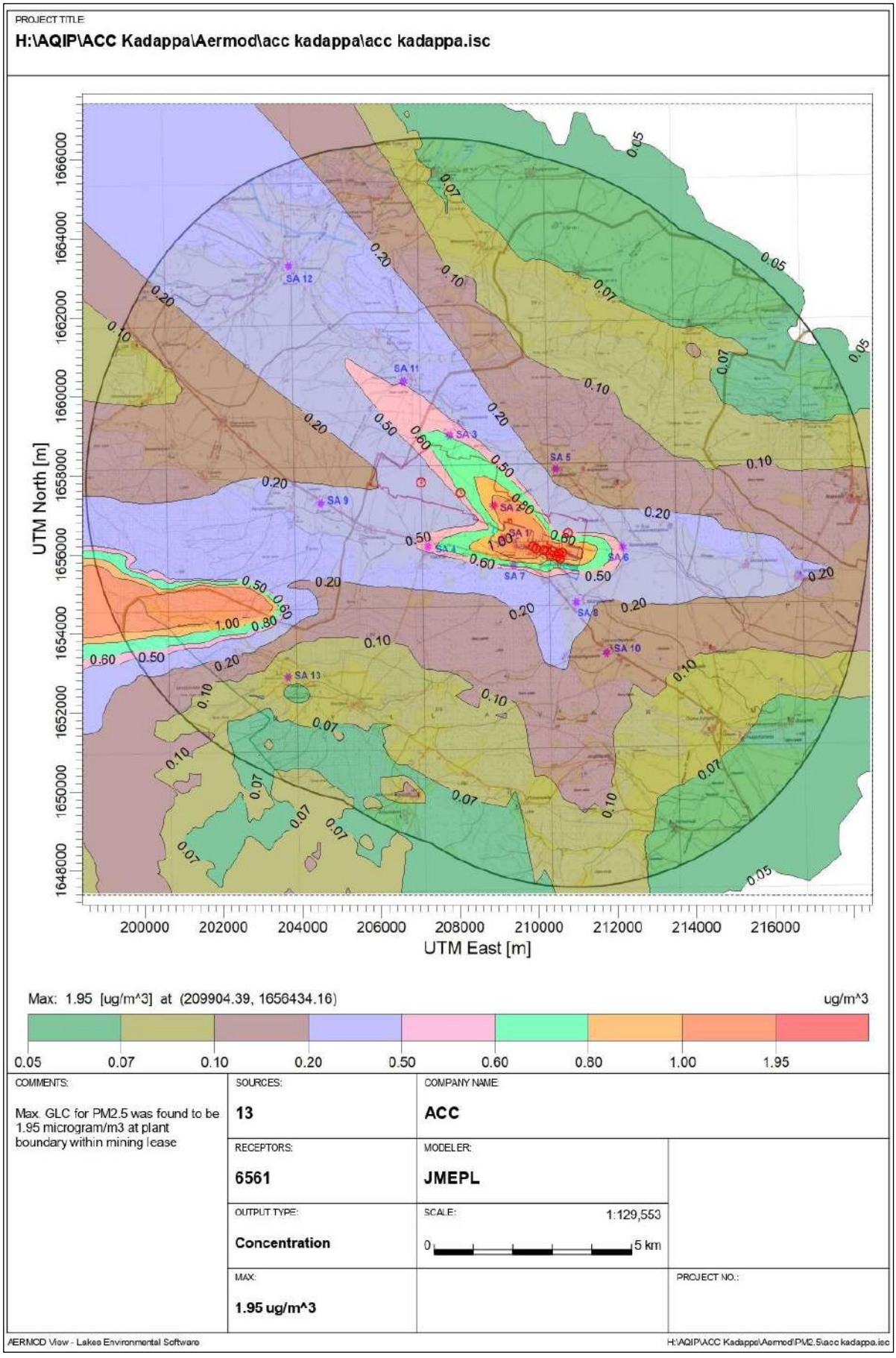



**Figure 4.1 (a) Isopleth showing the incremental GLCs of $PM_{2.5}$ due to Integrated Cement Plant**

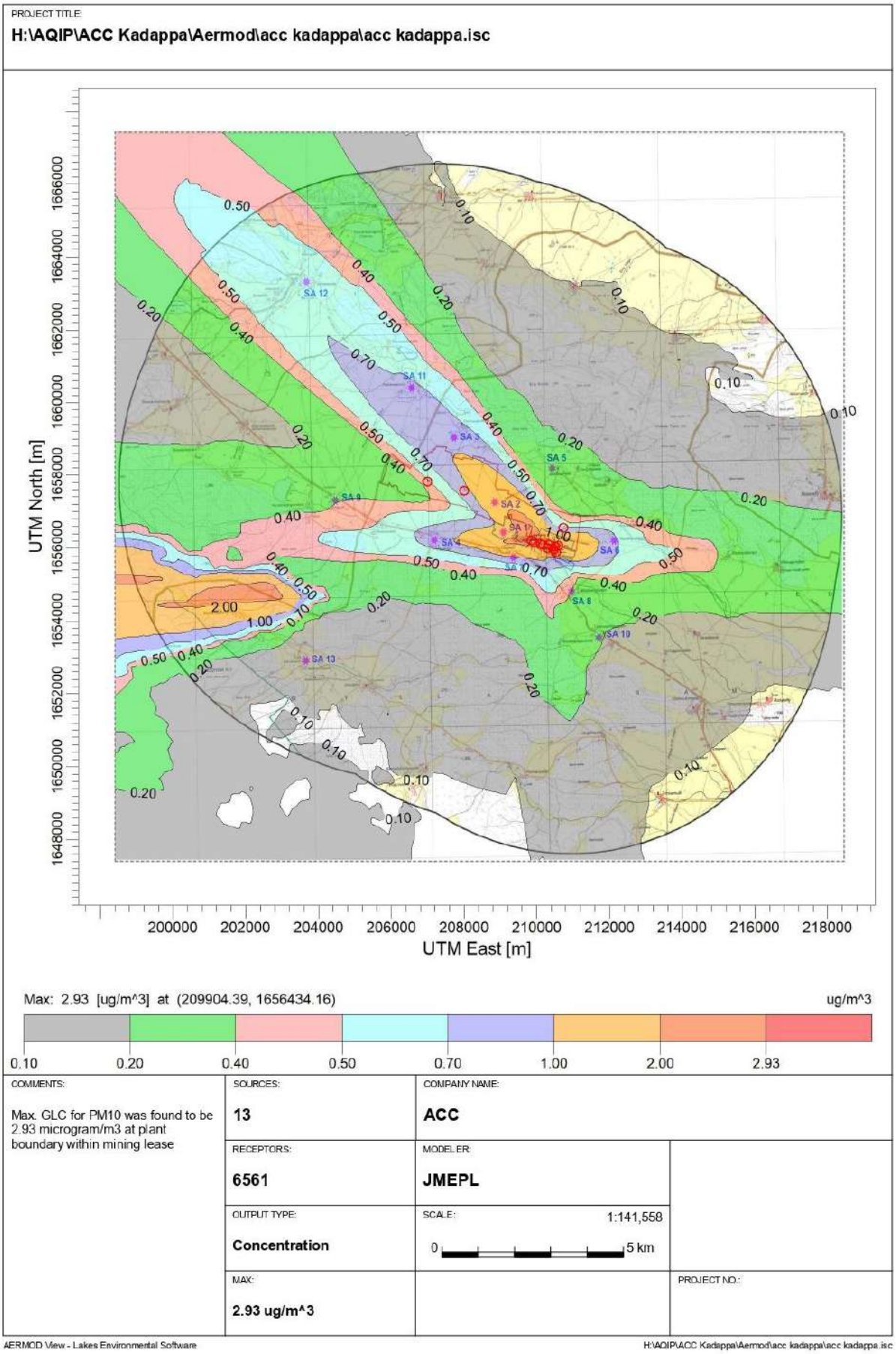



**Figure 4.1 (b) Isopleth showing the incremental GLCs of $PM_{10}$ due to Integrated Cement Plant**

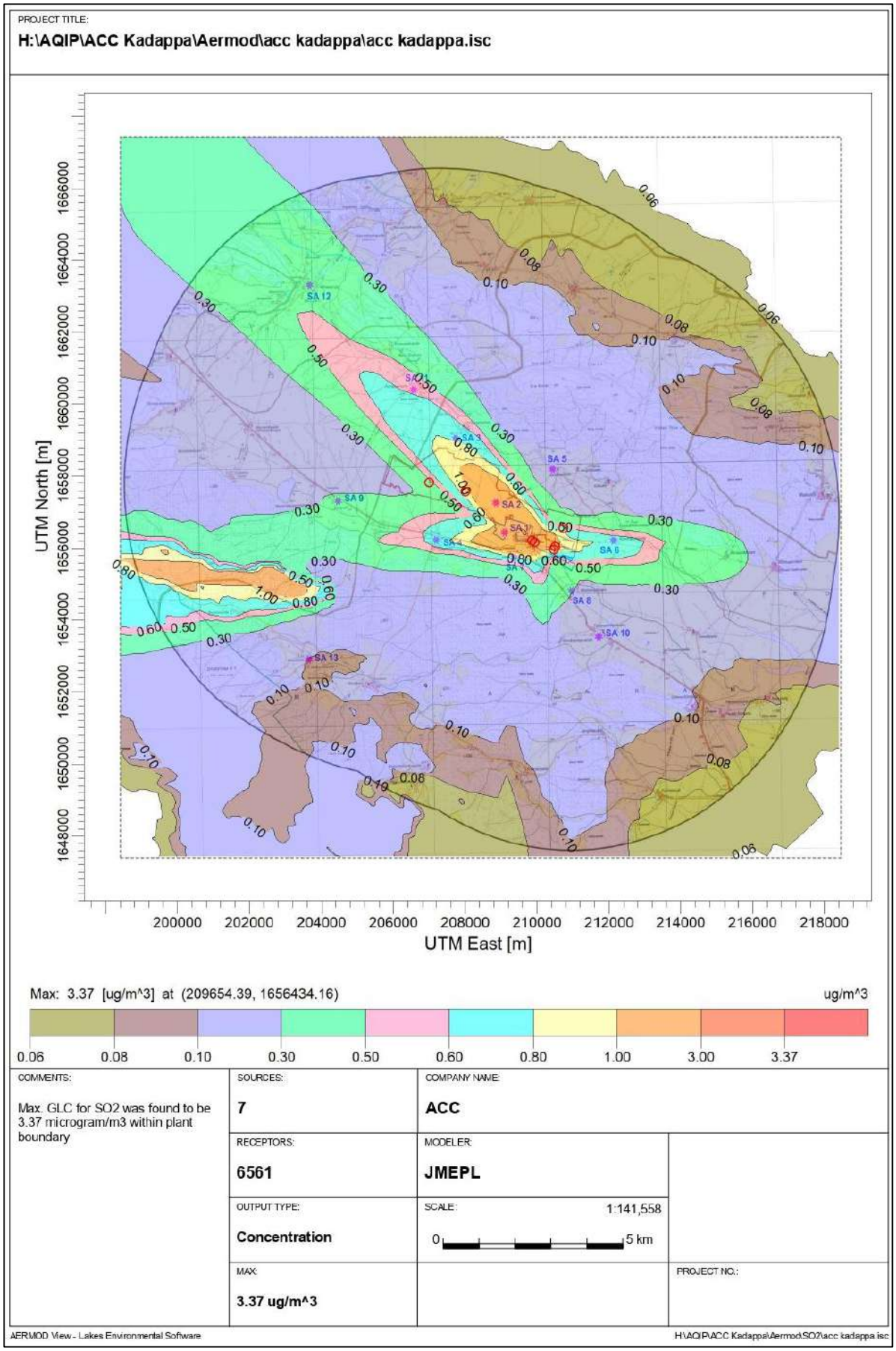



**Figure 4.1 (c) Isopleth showing the incremental GLCs of $SO_2$ due to Integrated Cement Plant**

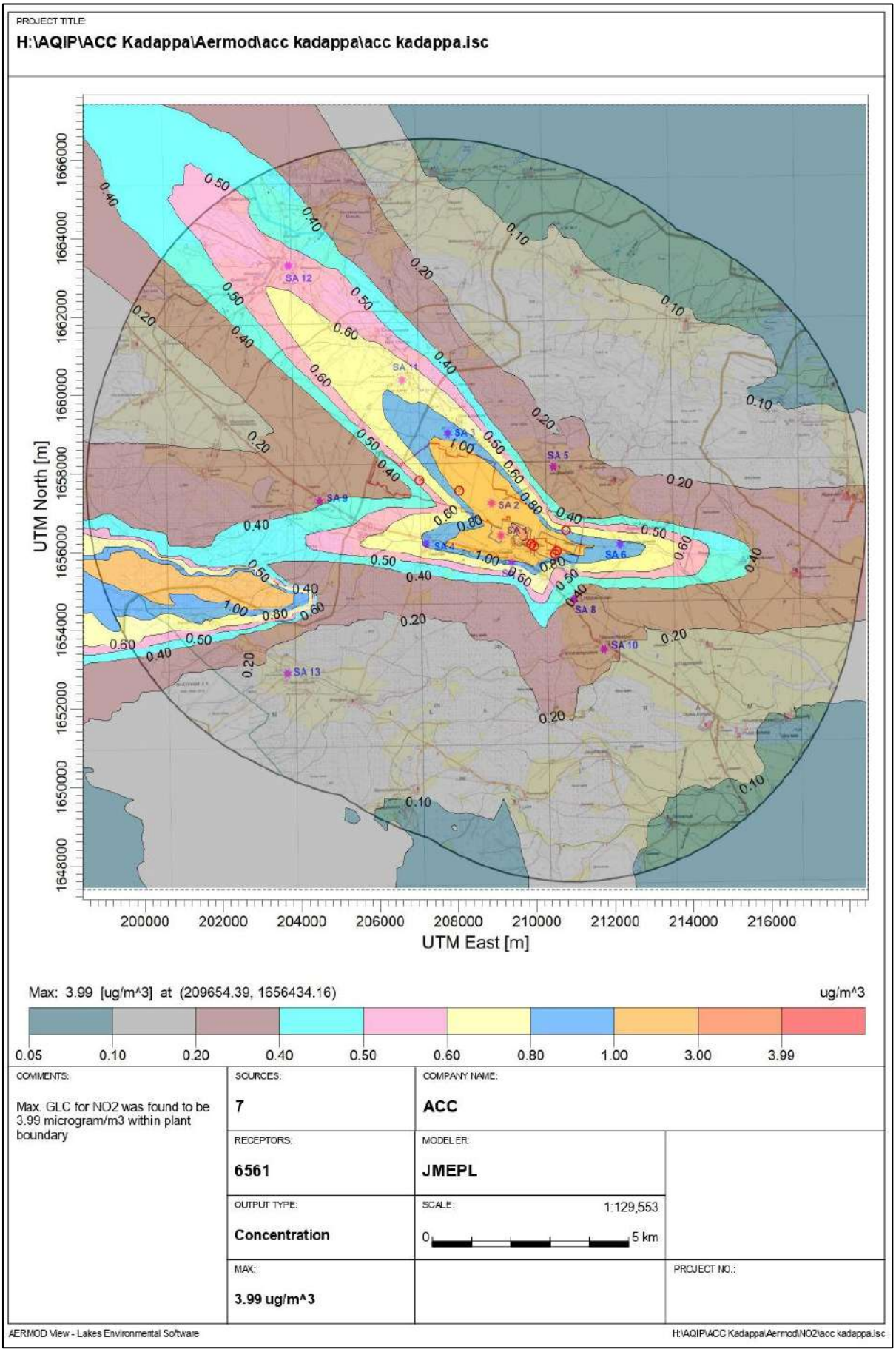



**Figure 4.1 (d) Isopleth showing the incremental GLCs of $NO_2$ due to Integrated Cement Plant**

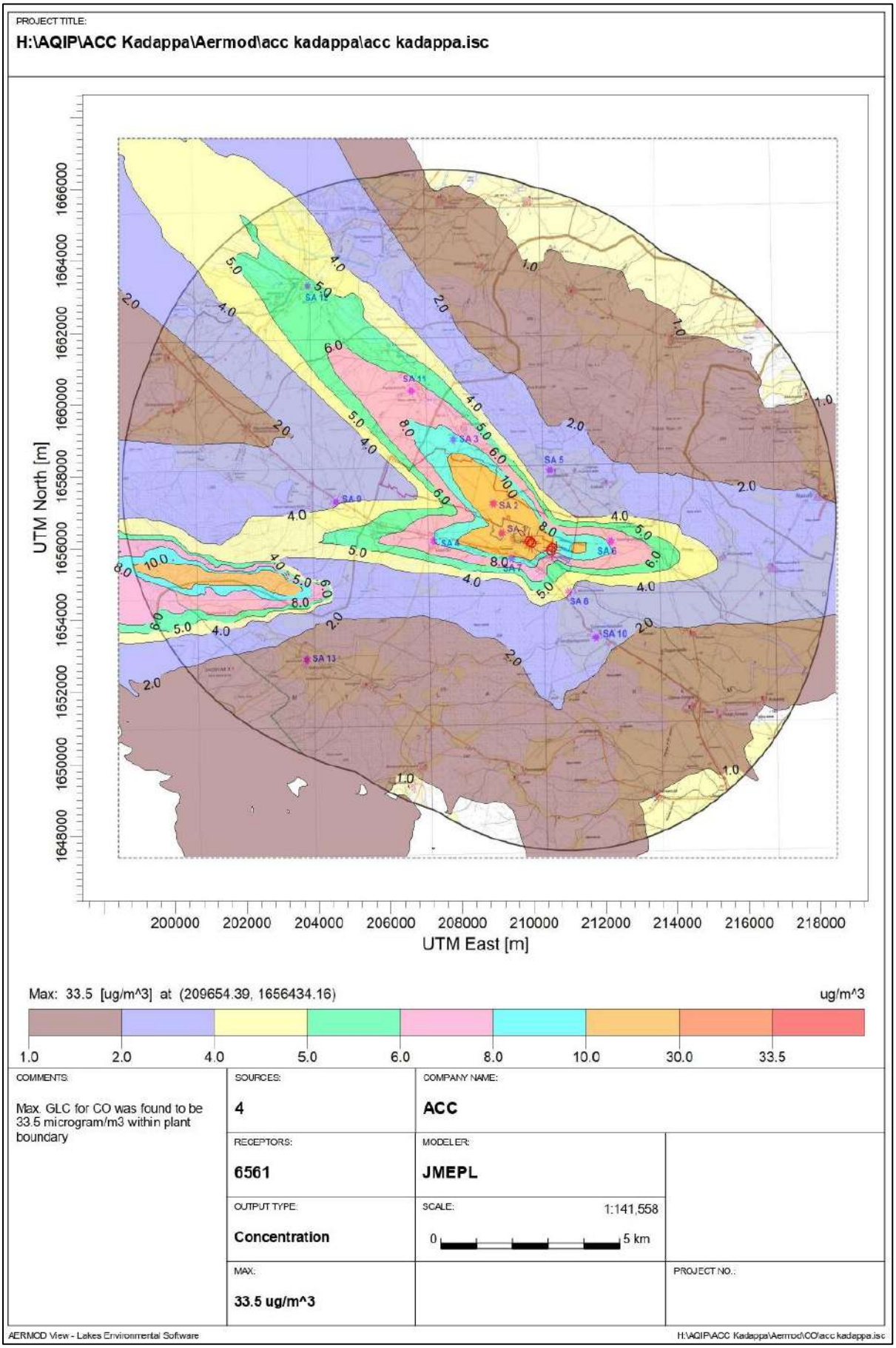



**Figure 4.1 (e) Isopleth showing the incremental GLCs of CO due to Integrated Cement Plant**

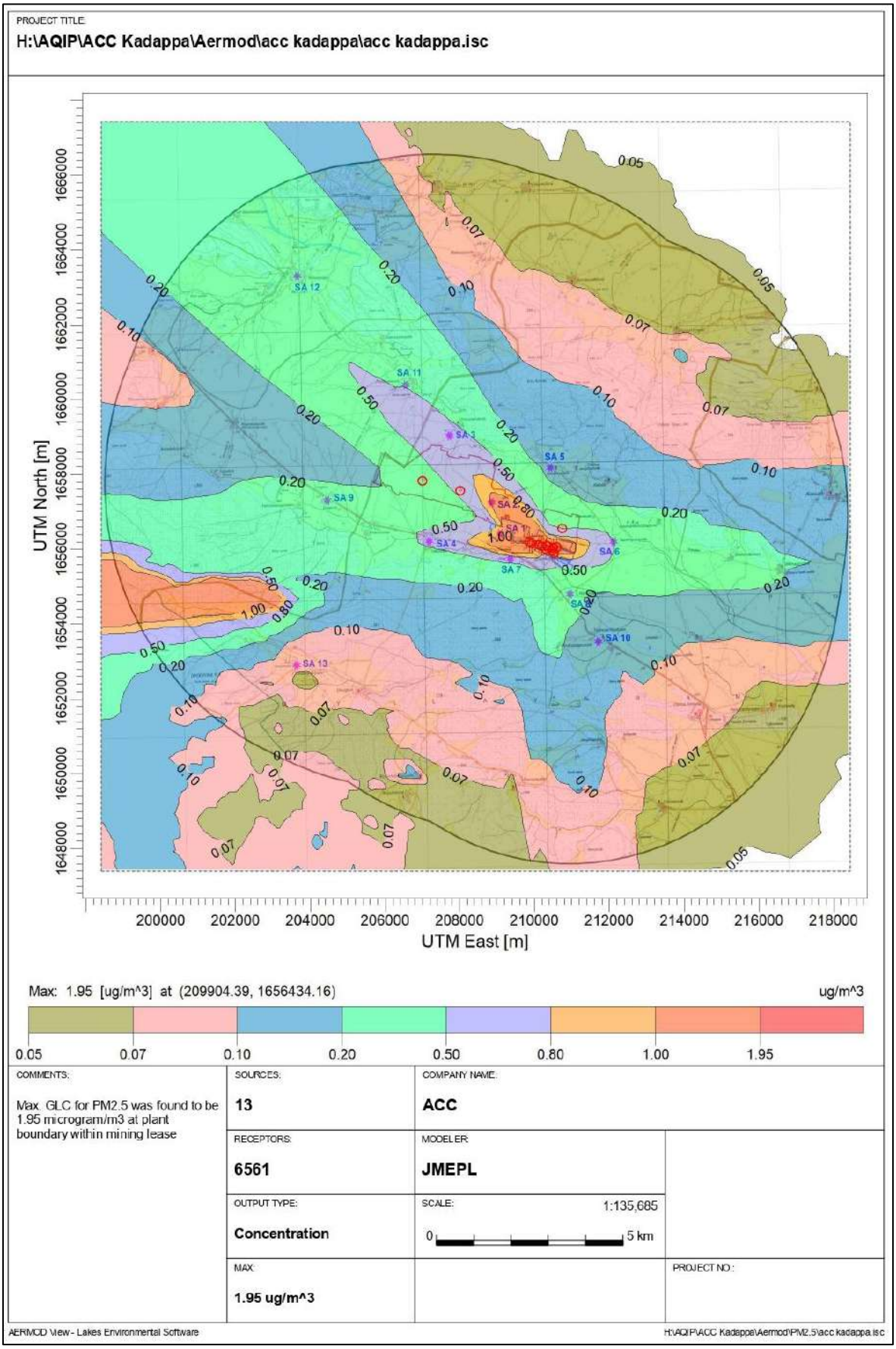



**Figure 4.2 (a): Isopleth showing the incremental GLCs of $PM_{2.5}$ due to Integrated Cement Plant, Captive Limestone Mine and Vehicular Transportation**

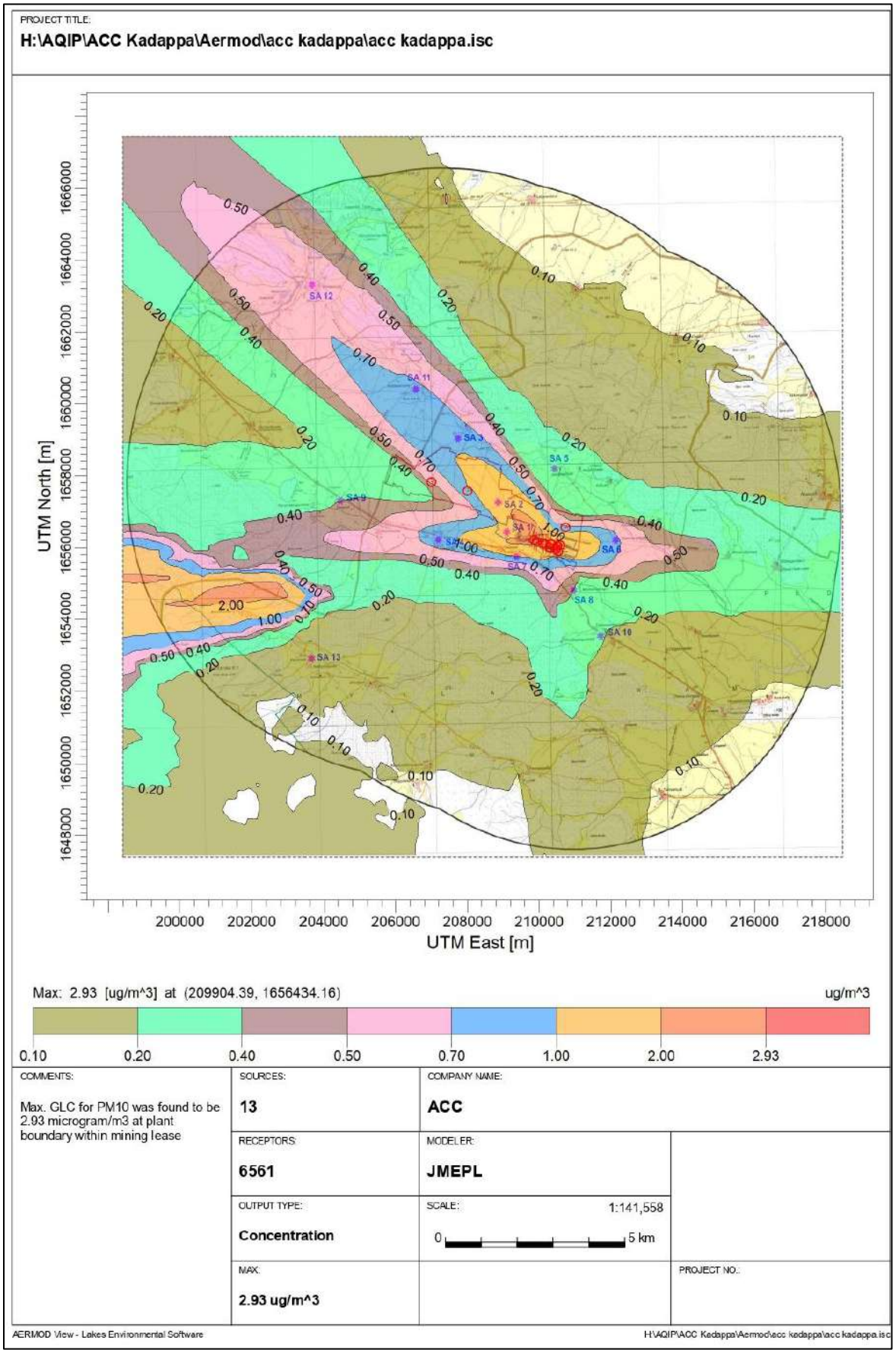



**Figure 4.2 (b): Isopleth showing the incremental GLCs of $PM_{10}$ due to Integrated Cement Plant, Captive Limestone Mine and Vehicular Transportation**

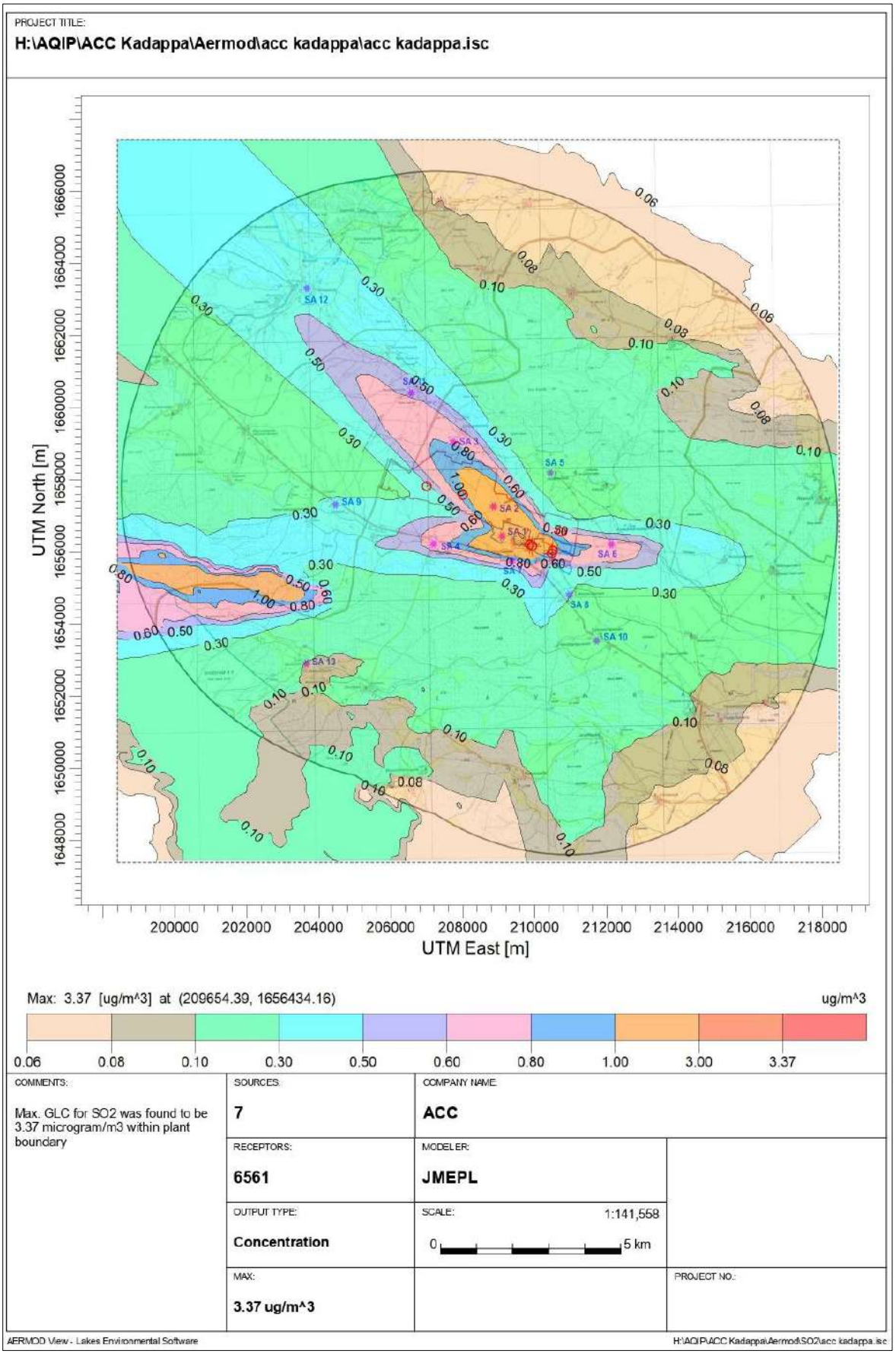



**Figure 4.2 (c): Isopleth showing the incremental GLCs of $SO_2$ due to Integrated Cement Plant, Captive Limestone Mine and Vehicular Transportation**

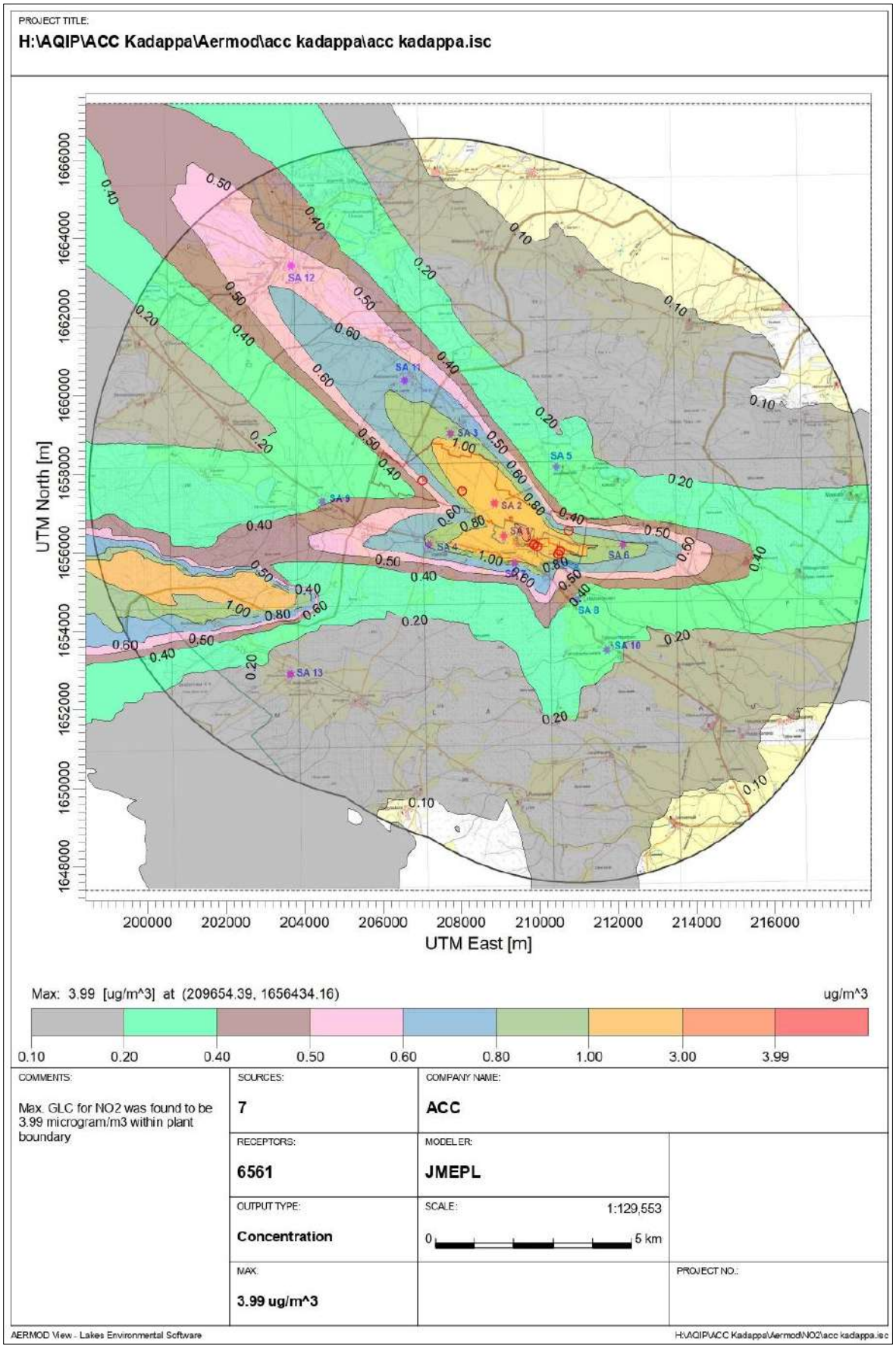



**Figure 4.2 (d): Isopleth showing the incremental GLCs of $NO_x$ due to Integrated Cement Plant, Captive Limestone Mine and Vehicular Transportation**

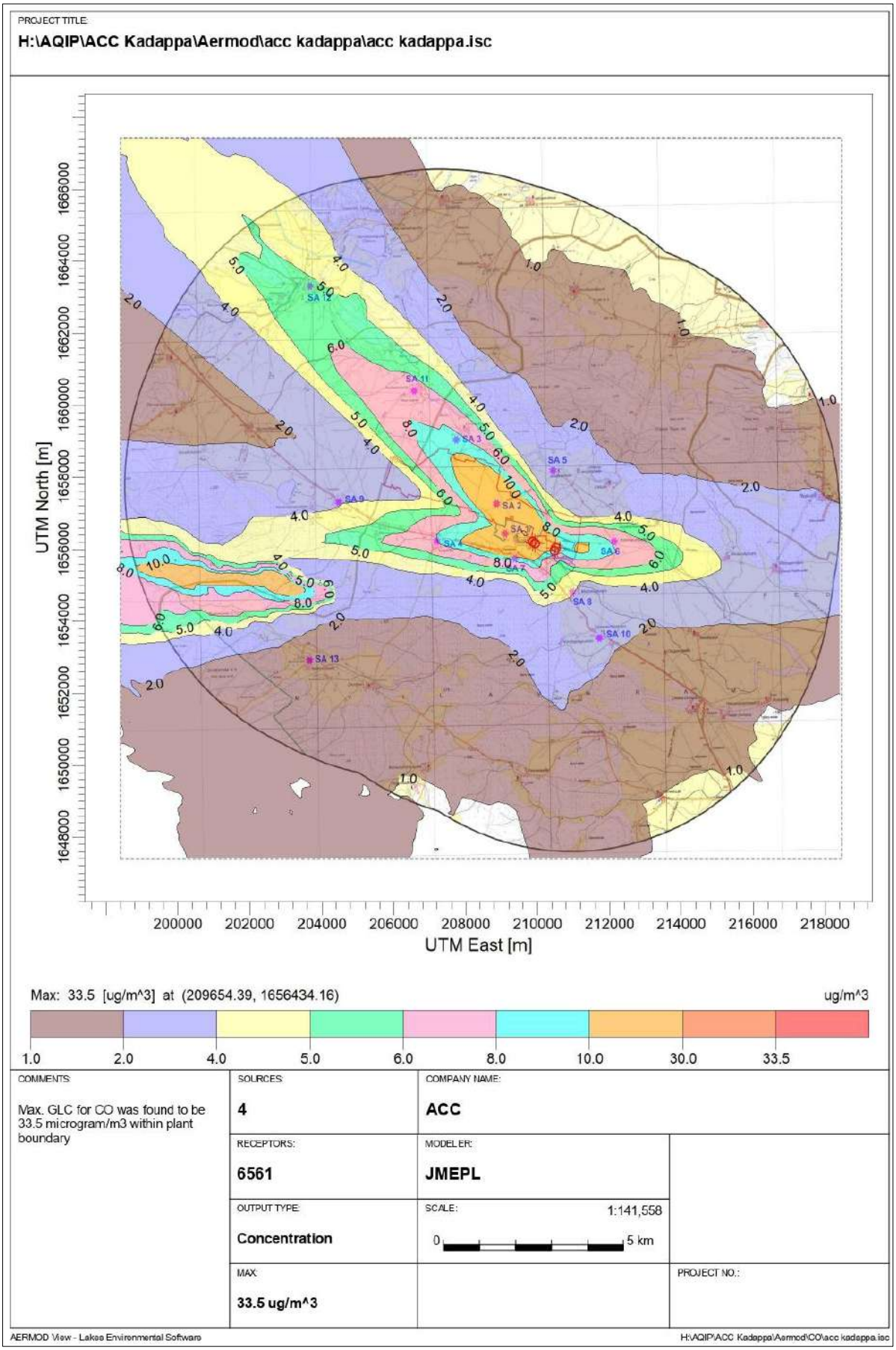



**Figure 4.3: Isopleth showing the incremental GLCs of PM in worst case**

- ***Impact Evaluation***

***From the above table, it can be concluded that after the operation of the projects the concentration will be well within the prescribes limit of 100 µg/m³.***

Ambient Air Quality monitoring results are given in Chapter - 3 of this EIA/EMP Report. From the results, it is evident that AAQ levels are well within the prescribed norms. Impact evaluation is given in table below -

***Impact Evaluation for Ambient Air Quality***

| | | | | |
|---|---|---|---|---|
| Impact Evaluation Element | Change in Air Quality during operational phase of proposed project | | | |
| Potential Effect/ Concern | Impact on health of humans and nearby biological/ecological receptors due to point sources of air emissions and fugitive emissions due to proposed project. | | | |
| ***Characteristics of Impacts*** | | | | |
| Nature | Positive | | ***Negative*** | Neutral |
| | | | √ | |
| Type | ***Direct*** | Indirect | Cumulative | |
| | √ | | | |
| Extent | Plant Area | ***Local*** | Zonal | Regional |
| | | √ | | |
| Duration | Short - term | | ***Long- term*** | |
| | | | √ | |
| Intensity | Low | | ***Medium*** | High |
| | | | √ | |
| Frequency | Remote (R) | Occasional (O) | Periodic (P) | ***Continuous (C)*** |
| | | | | √ |
| ***Significance of Impact*** | | | | |
| Significance | Insignificant | Minor | **Moderate** | Major |
| | | | √ | |

- ***Mitigation Measures***
  - ***Fugitive Emissions***

Adequate pollution control measures will be taken to keep the fugitive emissions from all sources within the statutory norms, brief of which are given below:

- A set of water spray nozzles will be provided over the conveyor belt in the stacker feed point.
- Bag filters (168 Nos.) will be installed at all material handling and transfer points.
- Regular sprinkling of water on roads will be done.
- Regular cleaning and sweeping of roads and near-by area of storage facilities will be done by vacuum sweeping machine.
- Greenbelt & plantation will be done in 42.65% (~79.8 ha) of the total project area and 15 m wide greenbelt & plantation will be done along the plant boundary and 20 meter width towards the habitation to attenuate the air pollution.
- Railway Siding has been proposed and as far as possible, materials will be transported by Rail.

Details on fugitive emission control measures are given in Chapter - 10 of this EIA / EMP Report.

- ***Stack Emissions***
  - Efficient Air Pollution Control Equipment (APCE) like Bag House (2 Nos.) on Raw mill & Kiln on Coal Mill, (2 Nos. Bag House) on Cement Mill and Bag filters (168 Nos.) on various material handling and transfer points; ESP (2 Nos.) at Clinker Cooler and (2 Nos.) on CPP boiler will be installed at all above mentioned stacks to keep the emissions within the permissible limits.
  - Pyro-process itself acts as a long $SO_2$ scrubber. Kiln with Pre-heater / Calciner will remove 40-99 % $SO_2$ emissions. Installation of a good burner system will provide improved combustion efficiency of the fuel and also avoid flame impingement on the raw materials.
  - $NO_x$ generation takes place at high temperature and excess air. Low $NO_x$ burner & De-NOx system will be installed for fuel burning along with Calciner for low $NO_x$ formation.
  - Vehicles and machineries will be regularly maintained. Proper upkeep and maintenance of vehicles will be done.
  - Machineries will be regularly maintained. Proper upkeep and maintenance of machines will be done.
  - Proper maintenance of Air Pollution Control Equipment will be done periodically.
- ***Accidental Release***
  - All the stack will be equipped with Continuous Online Monitoring Systems and connected with Central Control Room in the plant for monitoring the emissions.
  - All the arrangements will be done to avoid tripping in the ESP along with interlocking system.

Hence, the overall quality of the ambient air will be maintained within the limit prescribed by CPCB after the commencement of the operation of proposed project.

## 4.7 ANTICIPATED IMPACT ON NOISE ENVIRONMENT AND MITIGATION MEASURES

***Construction Phase***

- ***Anticipated Impacts***

Increase in noise level due to construction equipment.

- During construction phase, noise will be generated due to the following activities / processes:
  - Movement /operation of transport and construction vehicles / equipment.
  - Transportation of equipment, materials and people.
  - Piling work during laying down of foundation for infrastructure
  - Other important activities involved in construction stage such as excavation, earthmoving, compaction, concrete mixing, crane operation, steel erection, mechanical /electrical installation.

The noise generation during construction phase will be temporary and will be limited to the plant site.

- ***Mitigation Measures***
  - PPE will be provided to the workers on the construction site e.g., ear plugs, earmuffs.

- Construction work will be done in day time only.
- Boundary of plant site will also help in keeping noise within plant premises.
- Machineries will be installed in suitable acoustic enclosures to suppress noise and vibration.
- Equipment will be kept in good condition to keep the noise level within 90 dB (A).
- Workers will be provided necessary protective equipment e.g., ear plugs, earmuffs.

***Operation Phase***

- ***Anticipated Impacts***
  - Movement /operation of transport vehicles / equipment
  - Increase in noise levels within the plant area which will be generated from the machineries and equipment such as raw mill & Clinker grinding mill, turbines, fans, compressors, motors, and D.G. Sets itself; and from transportation activities.
  - Hence, the noise generated will cause a significant impact on workers and surrounding residents and if exceeds the permissible levels for a continuous period of time, this will reduce the labour productivity and would also lead to loss of attention/concentration resulting in accidents.

- ***Impact Evaluation***

Ambient Noise Level monitoring results are given in Chapter - 3 of this EIA/EMP report. From this, it is evident that results are well within the prescribed norms. Impact evaluation is given in table below.

***Impact Evaluation for Ambient Noise Level***

| Impact Evaluation Element | Change in Noise Level due to operation of Cement Plant and CPP | | | |
|---|---|---|---|---|
| Potential Effect/ Concern | Impact on health of humans and biological factors/receptors due to noise generated due to the proposed project during day and night time and also on occupational health of the workers exposed to noise. | | | |
| ***Characteristics of Impacts*** | | | | |
| Nature | Positive | | ***Negative*** | Neutral |
| | | | √ | |
| Type | ***Direct*** | Indirect | Cumulative | |
| | √ | | | |
| Extent | ***Plant Area*** | *Local* | Zonal | Regional |
| | √ | | | |
| Duration | ***Short - term*** | | Long- term | |
| | √ | | | |
| Intensity | Low | | ***Medium*** | High |
| | | | √ | |
| Frequency | Remote (R) | Occasional (O) | Periodic (P) | **Continuous (C)** |
| | | | | √ |
| ***Significance of Impact*** | | | | |
| Significance | Insignificant | Minor | **Moderate** | Major |
| | | | √ | |

- ***Mitigation Measures***
  - Following noise abatement measures will be taken:

- Equipment/ machinery will be selected with low noise and will be housed in insulated ceiling.
- Machine operators and Persons working just close to machine will be provided with personal protective equipment viz. Ear plugs / Ear muffs etc.
- Proper maintenance, oiling and greasing of machines at regular intervals will be done to reduce generation of noise.
- Compressors and turbine will be installed in closed building.
- Greenbelt of appropriate width at the project boundary will be developed.
- Regular monitoring of noise level will be carried out and corrective measures in concerned machinery will be adopted accordingly.

## 4.8 ANTICIPATED IMPACT ON WATER QUALITY AND MITIGATION MEASURES

***Construction Phase***

- ***Anticipated Impacts***
  - During construction Phase of Proposed Project, 100 KLD water will be required for construction activities at site. This requirement of water will be met From Authorized supplier (Tanker)/ groundwater and used in civil construction, canteen, besides domestic use by construction workers. About 10 KLD of domestic wastewater will be generated from the construction site. The extraction of groundwater may result in decrease in ground water table and & waste water generated may deteriorate the quality of groundwater.
  - Increase in suspended solids due to soil run-off during heavy precipitation and due to loose soil at construction site.

- ***Mitigation Measures***
  - The waste water will be diverted to soak pit and septic tank. No waste water will be discharged out of the Plant boundary.
  - Rainwater harvesting will be practiced which helps in recharge of ground water table.
  - Storm water drains will be made immediately after starting construction activity. The drains will be properly aligned in conformity with the site drainage pattern so that the alteration is kept to the minimum and flooding or soil erosion does not occur.
  - Sedimentation pits will be provided at appropriate location to trap the silt laden runoff water and prevent excessive silt from going outside. The storm water drains will be diverted to a water reservoir to collect the runoff. This stored water will be utilized for civil construction purpose.

***Operation Phase***

- ***Anticipated Impacts***
  - Waste water generated from the project will have an impact on the ground water and surface water quality of the nearby area if not managed properly.

- 206 KLD waste water will be generated from the drinking & domestic utilities from the plant & Truck Parking will be used in greenbelt

ꕥ ***Impact Evaluation***

Impact evaluation is given in table below.

***Impact Evaluation for Water Environment***

| | | | | |
|---|---|---|---|---|
| Impact Evaluation Element | Change in water Level due to abstraction of ground water and surface water for the proposed project. | | | |
| Potential Effect/ Concern | Impact on ground water level due to ground water abstraction;<br>No change in quality of water as no water will be discharged outside the proposed cement plant. | | | |
| ***Characteristics of Impacts*** | | | | |
| Nature | Positive | | ***Negative*** | Neutral |
| | | | √ | |
| Type | ***Direct*** | Indirect | Cumulative | |
| | √ | | | |
| Extent | Plant Area | ***Local*** | Zonal | Regional |
| | | √ | | |
| Duration | Short - term | | **Long- term** | |
| | | | √ | |
| Intensity | Low | | ***Medium*** | High |
| | | | √ | |
| Frequency | Remote (R) | Occasional (O) | Periodic (P) | **Continuous (C)** |
| | | | | √ |
| ***Significance of Impact*** | | | | |
| Significance | Insignificant | Minor | **Moderate** | Major |
| | | | √ | |

ꕥ ***Mitigation Measures***

- Waste water will not be discharged outside the plant premises. RO reject from CPP, WHRS, Domestic will be will be used for dust suppression and partly for mill spray.
- Domestic wastewater (252 KLD) will be generated from plant which will be treated in STP of 300 KLD capacity the 206 KLD treated water will be utilized for greenbelt development/ plantation.
- Rain water harvesting will be practiced inside the plant and colony premises
- Regular monitoring of water quality and water level will be carried out.
- Training and awareness programmes on water conservation measures will also be organized for the locals.
- No waste water will be discharged outside the plant premises and zero liquid discharge concept will be followed. Therefore, operation of proposed project will not pose any adverse impact on the ground water quality of the area.

## 4.9 ANTICIPATED IMPACT ON SOIL QUALITY AND MITIGATION MEASURES

***Construction Phase***

ꕥ ***Anticipated Impacts***

Impact on soil during construction would be mainly due to the left out of construction material used which are as below:

- *Soil Compaction* - Compaction is a common problem during the construction activity due to the movement of large number of heavy machineries over the soil.
- *Soil Contamination* - Due to the accumulation of cement, used for construction purpose, on the top soil results in the lack of oxygen and hence, reducing the soil porosity.
- *Soil Degradation* -Soil stockpiling during the construction phase will increase the risk of mixing of top soil with the sub-soil components & other construction material, thereby reducing its quality.

ꕥ ***Mitigation Measures***

- Careful design, planning and good site management would minimize wastage of materials such as concrete, mortars and cement grouts.
- Construction wastes will be segregated as much as possible at plant site itself to increase the feasibility of recycling concrete and masonry as filling material and steel pieces as saleable scrap.
- Litter disposal and collection points will be established around the work sites.
- Empty packaging materials, drums, glass, tin, paper, plastic, pet bottles, wood, thermocol and other packaging materials, etc. will be disposed through recyclers (locally called kabadis) from time to time.
- The construction spoils will be temporarily stored at designated dumpsite located inside the plant premises.
- To minimize the extent of soil stockpiling, soil will be mounded no higher than 1.3 m high to prevent soil erosion.
- To reduce the soil compaction, working on the wet soil will be avoided.

***Operation Phase***

ꕥ ***Anticipated Impacts***

- The soil of the area may get affected due to operational activities, if proper care is not taken. Degradation of soil quality will take place due to settling of air borne dust.
  i) Changes in soil texture due to settling of air borne dust or due to wash off of solid particulates by surface or ground water. This will lead to change in porosity, permeability and other physical characteristics of soil of the area.
  ii) Changes in soil chemistry due to addition of foreign material from polluted air and water due to unit activities in the area.

ꕥ ***Impact Evaluation***

Impact evaluation is given in table below.

***Impact Evaluation for Soil Environment***

| | |
|---|---|
| Impact Evaluation Element | Change in soil texture & soil chemistry |
| Potential Effect/ Concern | Impact on soil quality of nearby areas due to generation & settling of air borne dust due to proposed project. |
| *Characteristics of Impacts* | |

| | | | | |
|---|---|---|---|---|
| Nature | Positive | | ***Negative*** | Neutral |
| | | | √ | |
| Type | ***Direct*** | Indirect | Cumulative | |
| | √ | | | |
| Extent | Project Area | ***Local*** | Zonal | Regional |
| | | √ | | |
| Duration | Short - term | | ***Long- term*** | |
| | | | √ | |
| Intensity | Low | | ***Medium*** | High |
| | | | √ | |
| Frequency | Remote (R) | Occasional (O) | Periodic (P) | **Continuous (C)** |
| | | | | √ |
| *Significance of Impact* | | | | |
| Significance | Insignificant | Minor | **Moderate** | Major |
| | | | √ | |

- ***Mitigation Measures***
  - Efficient Air Pollution Control Equipment (APCE) like Bag House / Bag Filter / ESP will be installed at all major stacks of Cement Plant & CPP to keep the emissions within Permissible Standard.
  - Bag Filters (168 Nos.) will be provided at all material transfer points to control fugitive dust emission.
  - Waste water will not be discharged outside the plant premises.
  - A horticulturist will be engaged who will ensure soil quality improvement in the plant area, by adequate manuring and fertilizing. Therefore, no adverse impact on the soil quality of the area is anticipated.
  - Approx. 42.65 % of the total plot area i.e., ~79.8 ha to be developed under greenbelt & plantation and 15 m wide greenbelt & plantation will be done along the plant boundary and 20 meter width towards the habitation to attenuate the air pollution.

  Besides, soil samples will be collected and tested at regular intervals from the nearby areas. This will help in mitigation of any harmful impact on soil due to the proposed project activity, if any.

## 4.10 ANTICIPATED IMPACT ON BIOLOGICAL ENVIRONMENT AND MITIGATION MEASURES

There is no National Park, Wildlife Sanctuary, Biosphere Reserve, Tiger/ Elephant Reserve, Migratory Corridor of wild animals exists within 10 km radius study area.

List of flora & fauna has been submitted for authentication to Chief Wildlife Warden, Guntur, Andhra Pradesh, on 20th Sept., 2024. Copy of the submission receipt is enclosed as ***Annexure - 3*** along with this EIA/EMP report.

16 schedule - I species viz. Four horned Antelope, Asiatic Wild Dog, Bonnet Macaque, Sambar, Sloth Bear, Indian Grey Mongoose, Small Indian Civet, Masked Palm Civet, Golden Jackel, Bengal Monitor Lizard, Indian Star Tortoise, Indian rat snake, Checkered Keeback, Grey Junglefowl, Shikra, Indian Peafowl Indian Species were found in the study area of the proposed project site as per the Primary & Secondary Survey done by Greentech Solutions.

Company has prepared Wildlife Conservation for the proposed integrated cement plant and allocated Rs. 5.07 Crores for conservation of schedule - I species. Wildlife Conservation Plan has been submitted to Chief Wildlife Warden, Guntur, Andhra Pradesh, on 20th Sept., 2024 for further approval. There may be an impact on the biological environment of the area due to operation of cement plant, if proper care will not be taken.

- ***Anticipated Impacts***

  There may be an impact on the biological environment of the area due to operation of cement plant, if proper care will not be taken.

  - Particulate matter emissions from stack and fugitive emissions due to transportation activity & material handling may degrade the soil quality of surrounding environment that may affect the biodiversity of surrounding environment.
  - Particulate matter emission may cause migration of wild animals and birds.
  - Fugitive emissions (dust) may impact the terrestrial flora. The settlement of dust on the laminar surface of plants can impede the efficiency of photo-transduction and thereby, affect the productivity of plants. In some of the plant, it may also smother the leaf surface blocking stomata, resulting in reduced transpiration.
  - Increased noise level due to running of machinery may scare the fauna and force them to migrate to other areas.

- ***Impact Evaluation***

  Impact evaluation is given in table below.

***Impact Evaluation for Biological Resources***

| | | | | |
|---|---|---|---|---|
| Impact Evaluation Element | Change in the biological resources of the area due to proposed project operation and generation of emissions | | | |
| Potential Effect/ Concern | Loss of habitat, Impact on health of biological receptors due to area and line sources of air emissions including fugitive dust emissions during operation activities. | | | |
| *Characteristics of Impacts* | | | | |
| Nature | Positive | | ***Negative*** | Neutral |
| | | | √ | |
| Type | ***Direct*** | Indirect | Cumulative | |
| | √ | | | |
| Extent | Project Area | ***Local*** | Zonal | Regional |
| | | √ | | |
| Duration | Short - term | | ***Long- term*** | |
| | | | √ | |
| Intensity | ***Low*** | | Medium | High |
| | √ | | | |
| Frequency | Remote (R) | Occasional (O) | Periodic (P) | **Continuous (C)** |
| | | | | √ |
| *Significance of Impact* | | | | |

| Significance | Insignificant | ***Minor*** | Moderate | Major |
|---|---|---|---|---|
| | | √ | | |

- ***Mitigation Measures***
  - Scaling up the greenbelt development and plantation in and around the Plant site to control the spread of particulate emission and noise.
  - Efficient Air Pollution Control Equipment (APCE) will be installed to keep the emissions within the permissible limits.
  - Use of water sprinkler on the roads to control fugitive emissions in the surrounding environment.
  - Using paved roads for transportation to minimize fugitive emissions.
  - Material transport in close truck and storing it under tarpaulin cover.
  - Transport vehicles and machinery will be properly maintained and periodically checked for pollution level to reduce noise and gaseous emission in the surrounding environment.

## 4.11 ANTICIPATED IMPACT ON SOCIO-ECONOMIC ENVIRONMENT AND MITIGATION MEASURES

***Construction Phase***

- ***Anticipated Impacts***
  - Impact of the proposed project involves site clearing and land use change of agriculture land to industrial land thus will create an indirect impact on the livelihood of the land owners involved.
  - Around 2400 nos. of people will get employment during the construction stage. Local people will be given preference for employment on the basis of their skill and experience.
  - Further due to proposed project, influx of working community will generate an indirect employment (approx. 2000 people) through development of nearby market/ shops, trade centers, activities, transportation etc.
  - Population influx during the construction phase might introduce various water and vector borne diseases or would lead to other unhygienic conditions in the area through disturbing existing sanitation infrastructure.
  - Rapid diverse population influx at the plant site might create unusual behavioral activity such as worker-community conflicts, increase violence such as theft/ stabbing, and increased consumption of alcohol within the area.
  - Impacts on the health of nearby villagers can be envisaged due to the short-term exposure to fugitive dust generated during transportation activities resulting in increased eye irritation, nausea, headache etc.

- ***Mitigation Measures***
  - Changing the land use of an area from barren land & partly agricultural/fallow land to industrial land involves the direct impact on the livelihood of the land owners. Apart from providing appropriate compensation for the land and generation of various employment

opportunities, various skill development plan for local community to provide self-employment to the women and unemployed youth and increase their employment eligibility will be undertaken suitably which includes Dairy, Poultry, Farming, Mechanic, Health workers, Tailoring and other trades to improve income generation and also for women empowerment.

- Deploying of mobile toilets or the construction of temporary toilets will be done near to the construction site with the adequate water supply.
- Awareness programme will be conducted before the monsoon season regarding the spread of water borne/ vector diseases.
- Mosquito repellents will be provided in the nearby villages and at construction site to avoid the spread of diseases.
- To overcome behavioral impact, proper site in charge with timely supervision will be done. In advance, facilities with equipped medical and safety services will be provided to take a control over the incident/violence if any caused.
- To overcome behavioral impact, supervision will be done by site in charge. In advance, emergency cell will be formed with fully equipped communication system, medical and safety services to take control over the incident/violence caused.
- To control the dust emissions during the construction phase, the site boundary will be covered by the curtains.
- Further, to improve the living standards and livelihood conditions, ACC will take an initiative as a part of Socio - economic development plan / CSR activities by conducting various programmes and capacity building training.

***Operation Phase***

Project Potential impacts on socio-economic environment are summarized below and categorized either as positive / beneficial or negative / adverse impacts.

- ***Anticipated Impacts***
  - Long term exposure to the pollutants such as PM, $SO_2$, $NO_2$, Cement dust have a potential to create health impacts such as risk of cardiovascular and respiratory disease, eye irritation, bronchitis, lung damage, increased heart ailments, etc.
  - Other impacts, associated with the proposed project will create a positive impact as it will result in the overall development of the area in respect to the infrastructure development, educational growth, health facilities etc. as a part of the CSR activity.
  - Additionally, approx. 500 persons (contractual workers) will be provided employment during operational phase of the proposed project., thereby generating employment and improving living standards.
  - A minor shift in livelihood will be observed due to the proposed project, as the project will attract the more able-bodied persons from the community which in turn will lead to low labor availability in other sectors of the economy including agricultural, shop keepers etc.

This impact will not be significant due to low level of education and skills in the area which will result in sourcing skilled workforce from outside the immediate area. But the magnitude of this impact will be high due to high number of household dependency.

- ***Impact Evaluation***

Impact evaluation is given in table below.

***Impact Evaluation for Socio-economic Environment***

| Impact Evaluation Element | Impact on socio economics due to the proposed project. | | | |
|---|---|---|---|---|
| Potential Effect/ Concern | Proposed project will provide direct & indirect employment opportunities to the local residents, which will help to increase their earning, and better living standard as well as further up-liftment of socio-economic status of the area. | | | |
| ***Characteristics of Impacts*** | | | | |
| Nature | **Positive** | | Negative | Neutral |
| | √ | | √ | |
| Type | ***Direct*** | Indirect | Cumulative | |
| | √ | | | |
| Extent | Project Area | Local | ***Zonal*** | Regional |
| | | √ | | |
| Duration | Short - term | | ***Long- term*** | |
| | | | √ | |
| Intensity | Low | | ***Medium*** | High |
| | | | √ | |
| Frequency | Remote (R) | Occasional (O) | Periodic (P) | ***Continuous (C)*** |
| | | | | √ |
| *Significance of Impact* | | | | |
| Significance | Insignificant | Minor | **Moderate** | Major |
| | | | √ | |

- ***Mitigation Measures***

- In order to mitigate the health impacts, efficient Air Pollution Control Equipment (APCE) like Bag House / Bag Filter / ESP will be installed at all major stacks to keep the emissions within the permissible limits. To reduce the gaseous emission, Pyro-process itself acts as a long $SO_2$ scrubber and Low NOx burner will be installed for fuel burning along with Calciner for low NOx formation. To reduce fugitive emission, vehicles and machineries will be regularly maintained. For emergency, ACC will have a first aid center for its employees and also provide assistance, in conjunction with government and NGOs, to the routinely medical service for the villages.
- CEMS will be installed at all major stacks for pollution under check continuously.
- For emergency, ACC has proposed to develop an occupational health center (first aid center) for its employees and nearby villagers.
- As per MoEFCC OM dated 30th Sept., 2020 & OM dated 20th Oct., 2020; Socio-Economic Developmental activities has been formulated on the basis of the issues raised during Public

Hearing which is addressed in EMP & will be implemented in a time bound manner with the start of the project implementation. Company has allocated Rs. 106.95 Crores for Socio-economic development activities based on the Public Hearing issues / suggestions and needs of locals.

- There will be generation of direct and indirect employment opportunities in the region. Preference will be given to the local people as per their eligibility. Business opportunities for local community will be available like transport of cement to market, fly ash transport from power plant, maintenance & house-keeping contract work etc.

ꕥ ***Mitigation Measures for nearby Villages and Nearby Schools mitigate the impacts:***

- Company has prepared the layout for the proposed project in such a way that the impact on nearby habitation will be minimum and for that purpose; location of Stacks is decided away from the nearby sensitive receptors.
- To mitigate both Dust and Noise generated due to the plant activities, ACC will be developed 20-meter 3 tier Greenbelt at the plant boundary towards the school as well as plantation inside the school boundary to create an effective barrier to arrest the dust and noise pollution.
- The total plant area is 187.1 ha, out of which 42.65% of the total plot area i.e., ~ 79.8 ha has been earmarked to be developed as greenbelt development & plantation.
- Company has proposed to install high efficiency and latest technology ESP and bag house for control of emissions from stack and the emission level will be maintained within the standards and real time data will be transmitted to CPCB and SPCB server.
- Various fugitive dust control measures will be adopted i.e., regular sweeping machine, water sprinkling, covered belt conveyors, covered storage, installation of Bag filters (168 Nos) will be installed at various material handling and transfer points, etc.
- Speed limit of the vehicles will be maintained at 10 kmph and speed monitoring will be carried out.
- Sign boards is set up near the school to make the drivers aware about it.
- Company will carry out mass plantation at common land, govt. buildings, schools and village road etc. as physical barriers so that it can be used to arrest noise and fugitive dust.
- Water sprinkling will be done in every 2 - 3 days (wherever required) with the help of mist type sprinkler to attenuate the Suspended Particulate Matter.
- Major raw material i.e., limestone will be transported through covered conveyor belt.
- Trucks will be covered with tarpaulin during transportation by road.
- Transportation will also be done by Railway to avoid road transportation & there will be 40% reduction in the number of trucks after installation of railway siding which will turns out to be beneficial to the environment in terms of global $CO_2$ emission reduction, reduction in GHG emission.
- Various control measure will be adopted i.e., regular sweeping machine, water sprinkling,

covered conveyer belts, covered storage, installation of Bag filters at various material transfer points to control the fugitive emission.

- The plant will be based on the dry process technology, ZLD will be maintained and hence no waste water will be discharged outside the plant premises.

- ***Mitigation measures that will be adopted in order to conserve these water body.***
  - During the construction & operation of the project the ponds will not be disturbed in any case.
  - The rainfall runoff within the plant site will be prevented from entering into the pond. The entire run-off will be collected through storm drains and shall be adequately treated through a series of settling tanks.
  - The entire process in the proposed project is based on ZLD therefore no discharge from the project site will be done into the nearby water bodies. Hence, their natural water quality will be maintained.
  - Transportation activities will not be done near to the pond.
  - Also, thick greenbelt & plantation will be developed all along the periphery of the banks of Pond and existing will be maintained.

## 4.12 ANTICIPATED IMPACT ON OCCUPATIONAL HEALTH AND MITIGATION MEASURES

Hazards associated with cement industry are as follows:

- Exposure to dust,
- Exposure to high temperatures,
- Noise exposure,
- Physical hazards,
- Chemical hazards and other industrial hygiene issues, and
- Others

These mainly impact on those working within the industry, although health hazards can also impact on local communities.

***Exposure to Dust***

Exposure to fine particulates is associated with work in most of the dust-generating stages of Cement Plant, but most notably from, raw material handling, and clinker grinding. Workers with long term exposure to fine particulate dust are at risk of pneumoconiosis, emphysema, bronchitis, and fibrosis.

***Exposure Levels as per Norms will be maintained***

| Description | Personal Exposure, time weighted average 8 hr. RSPM in µg/m³ |
|---|---|
| | Norms |
| Coal and Petcoke Dust | 2000 |
| Limestone Dust | 5000 |
| Cement Dust | 5000 |

*Source: CPCB guidelines*

Methods to prevent and control exposure to dust include the following:

- Control of dust through implementation of good housekeeping and maintenance;
- Use of air–conditioned, closed cabins;
- Use of dust extraction and recycling systems to remove dust from work areas, especially in grinding mills;
- Use of PPE's, as appropriate (e.g., masks and respirators) to address residual exposures following adoption of the above-referenced process and engineering controls.

***Exposure to High Temperatures***

The principal exposures to heat in this sector occur during Handling of hot raw meal (Powdered limestone, additives etc. is heated in a pre-heater cyclone), hot clinker and operation & maintenance of kilns or other hot equipment. Recommended prevention and control techniques include the following:

- Shielding surfaces where workers proximity and close contact with hot equipment is expected, using Personal Protective Equipment (PPE), as needed (e.g. insulated gloves and shoes)
- Minimizing the work time required in high temperature environments by implementing shorter shifts at these locations.

***Noise and Vibration Exposure***

Exhaust fans and grinding mills, kiln, compressors, and motors are the main sources of noise and vibrations in Cement Plant.

Following risks are involved:

- Hearing Impairment, Hypertension, Increase Pulse rate
- Annoyance, Tinnitus, Sleep Disturbances

*Exposure Levels as per Norms*

| S. No. | Area | Factory Act Norms, dB(A) | Exposure Level, dB(A) |
|---|---|---|---|
| 1. | Kiln Area | 85* | <75 |
| 2. | Cement Mill | | <75 |
| 3. | Packing Area | | <75 |
| 4. | Power Plant | | <75 |

** By taking 8 hr. total time of exposure (continuous short-term exposures)*

*Source:* DGFASLI (*https://dgfasli.gov.in/en/model-rules-part-ii/operations-involving-high-noise-and-vibration-levels* )

*Mitigation Measures*

- Use of silencers for ID fans, room enclosures for mill operators, noise barriers
- Personal hearing protection (ear plugs/muffs) at high noise level area
- Proper maintenance of machineries, DG sets
- Installation of compressors in closed buildings
- Regular monitoring of noise level
- Display of noise level with permission level

- Display instruction to use of PPEs at high noise level area
- Periodic health checkup for Audiometry for the person working in high noise

***Physical hazards***

Injuries during Project operation are typically related to slips, trips, and falls; contact with falling / moving objects; and lifting / over-exertion.

Other injuries may occur due to contact with, or capture in, moving machinery (e.g., dump trucks, front loaders, forklifts). Activities related to maintenance of equipment, including crushers, mills, mill separators, fans, coolers, and belt conveyors, represent a significant source of exposure to physical hazards. Such hazards may include the following:

- Falling / impact with objects;
- Hot surface burns; and
- Transportation
- Contact with allergic substances.

Following management measures will be ensured to prevent the physical hazards in the plant:

- Any person working on equipment with moving parts personally ensures the equipment is de-energized, isolated and locked/tagged out.
- Any person working from a position with the potential risk for a fall from height uses fall protection.
- Prescribed PPE will be provided to all workers exposed to open processes or systems.

In case of any accident immediate & proper medical care will be provided at the plant site

| High Risk Categories: | Prevention: |
|---|---|
| Contractors | Contractor Safety Management |
| Young/Temporary Employees | Special Safety Induction |
| **Direct Causes** | |
| Traffic and Mobile Plant | Driver Training |
| Falls from Heights, Objects falling from Heights | Safety Procedures for Work at Heights, Overhead Protection |
| Caught in Starting/Moving Equipment | Plant Isolation Procedures |

## 4.13 ANTICIPATED IMPACT DUE TO TRANSPORTATION OF RAW MATERIAL AND FINISHED PRODUCT AND MITIGATION MEASURES

- ***Anticipated Impacts***
  - Increase in the Road traffic density which will result in deteriorating the ambient air quality.
  - Rapid Movement of heavy-duty vehicles will cause in increase noise level.
  - No direct impact is envisaged on the flora and fauna of the vicinity area due to noise/ or the vibrations, slight impact could be observed on the nearby biodiversity.
  - Increased traffic volume may increase the probability of accidental incidences in the area.
  - Increased transportation can also lead to impacts on public health.

***Mode of Transportation of Raw Material, Fuel & Finished Product***

Transportation of raw material, fuel and finished product will be done 100% by road during initial years of plant operation until the installation of railway siding; except for limestone, which will be transported by covered conveyor belt from captive limestone mine.

- After installation of railway siding, mode of transportation will be given as below:
  - ✓ Limestone - via Covered Belt Conveyor from Captive Limestone Mine
  - ✓ Fly ash - 100% by Road
  - ✓ Gypsum (Mineral, Chemical & Imported) - 50 % by road & 50 % by rail
  - ✓ Iron ore - 50 % by road & 50 % by rail
  - ✓ Clay - 100 % by road
  - ✓ Bauxite - 50 % by road & 50 % by rail
  - ✓ Indian & imported Coal and Petcoke as feed stock – 50 % by road & 50 % by rail
  - ✓ Petcoke - 50 % by road & 50 % by rail
  - ✓ Cement - 50 % by road & 50 % by rail

***Railway Siding Approval Details***

The siding is proposed from Nossam (NOSM) Station to Yerraguntla (YA) Nandyal (NDL). In plant yard is mainly comprised of 6 no. full length loading / unloading lines, facilitated with suitable loading / unloading equipment/installations. It works out that there will be movement of about 3 rakes per day, considering both inward & outward traffic. The incoming traffic for the ACC siding will be raw material while the outgoing material from the siding will be cement & clinker. Major part of traffic is proposed to be transported through rail route. In principle Approval has been taken from Divisional Operations Manager, Guntakal *vide* Letter No. G/T. 143/ACC/NOSM/2024 on 15$^{th}$ Nov., 2024. Copy for the same has been enclosed as ***Annexure - 15*** with this EIA/EMP Report.

***Existing Transportation Details***

Proposed plant of ACC Limited is well connected with SH- 57 (0.8 km in South direction). The nearest railway station is Kondapuram at a distance of about 24 km in SW direction. Nearest Airport is Kadapa Airport which is approx. 70.5 km in SE direction form the project site and Tirupati Airport which is approx. 195 km in SE direction from the project site.

Above mentioned road facilities will be used for inflow of raw material & finished product.

***Existing Traffic Survey***

Traffic survey was conducted for 24 hours at following locations, which have been called as survey points for this study, to project the future traffic growth and the load on the NH-218 and the nearby connecting roads due to the proposed Integrated Cement Plant:

Measurements of Traffic density was made continuously for 24 hours by visual observation and counting of vehicles for the seven categories, viz., Motor cycle/ scooter, Passenger car/ van/ Auto rickshaw, Tractors, Trucks, Bus and Cycle. Total numbers of vehicles per hour under the seven categories were determined. The details of the traffic volume count for each survey point have been given in Table - 4.8.

**Table - 4.8**

**Traffic Volume Count Survey (SH - 57)**

| S. No. | Time | Type of vehicle | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Motor Cycle / Scooter | Passenger Car / Van / Auto-rickshaw | Tractors | Bus | Truck | Trailer | Cycle | Total Vehicles |
| 1 | 6:01 to 7:00 am | 37 | 20 | 2 | 11 | 10 | 12 | 2 | 94 |
| 2 | 7:01 to 8:00 am | 28 | 25 | 5 | 5 | 9 | 18 | 2 | 92 |
| 3 | 8:01 to 9:00 am | 11 | 34 | 10 | 7 | 7 | 10 | 1 | 80 |
| 4 | 9:01 to 10:00 am | 21 | 32 | 11 | 14 | 11 | 12 | 2 | 103 |
| 5 | 10:01 to 11:00 am | 52 | 50 | 7 | 10 | 10 | 10 | 3 | 142 |
| 6 | 11:00 to 12 noon | 17 | 52 | 5 | 11 | 9 | 6 | 1 | 101 |
| 7 | 12:01 to 1:00 pm | 31 | 45 | 4 | 10 | 15 | 10 | 34 | 149 |
| 8 | 1:01 to 2:00 pm | 14 | 41 | 5 | 6 | 13 | 6 | 30 | 115 |
| 9 | 2:01 to 3:00 pm | 15 | 55 | 2 | 6 | 14 | 10 | 3 | 105 |
| 10 | 3:01 to 4:00 pm | 30 | 56 | 4 | 10 | 10 | 9 | 2 | 121 |
| 11 | 4:01 to 5:00 pm | 42 | 26 | 5 | 9 | 17 | 7 | 2 | 108 |
| 12 | 5:01 to 6:00 pm | 34 | 52 | 3 | 15 | 12 | 10 | 1 | 127 |
| 13 | 6:01 to 7:00 pm | 43 | 45 | 2 | 12 | 12 | 7 | 3 | 124 |
| 14 | 7:01 to 8:00 pm | 19 | 41 | 1 | 15 | 15 | 9 | 1 | 101 |
| 15 | 8:01 to 9:00 pm | 28 | 11 | 1 | 13 | 8 | 10 | 1 | 72 |
| 16 | 9:01 to 10:00 pm | 13 | 15 | 10 | 10 | 13 | 12 | 0 | 73 |
| 17 | 10:01 to 11:00 pm | 18 | 21 | 6 | 15 | 18 | 6 | 0 | 84 |
| 18 | 11:01 to 12:00 pm | 7 | 16 | 8 | 18 | 12 | 16 | 0 | 77 |
| 19 | 12:01 to 1:00 am | 13 | 27 | 8 | 12 | 15 | 8 | 0 | 83 |
| 20 | 1:01 to 2:00 am | 14 | 14 | 12 | 9 | 9 | 10 | 0 | 68 |
| 21 | 2:01 to 3:00 am | 7 | 24 | 6 | 21 | 15 | 11 | 0 | 84 |
| 22 | 3:01 to 4:00 am | 12 | 23 | 11 | 14 | 13 | 12 | 2 | 87 |
| 23 | 4:01 to 5:00 am | 15 | 12 | 9 | 12 | 12 | 16 | 1 | 77 |
| 24 | 5:01 to 6:00 am | 19 | 23 | 15 | 14 | 13 | 15 | 2 | 101 |
| total | | **540** | **760** | **152** | **279** | **292** | **252** | **93** | **2368** |

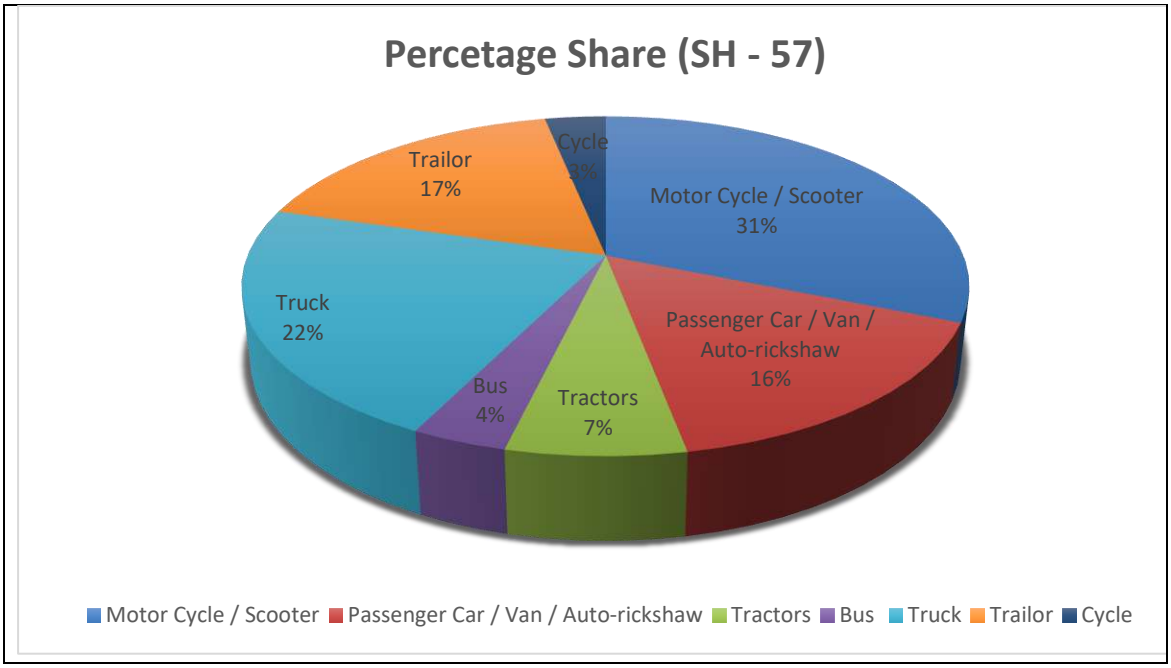



**Table - 4.9**

**Traffic Volume Count**

| S. No. | Types of Vehicles | Observed No. of vehicles / day (SH - 57) |
|---|---|---|
| 1. | Motor Cycle / Scooter | 540 |
| 2. | Passenger Car / Van / Auto-rickshaw | 760 |
| 3. | Tractors | 152 |
| 4. | Bus | 279 |
| 5. | Truck | 292 |
| 6. | Trailor | 252 |
| 7. | Cycle | 93 |
| **Total** | | **2368** |

***No. of Vehicles on SH - 57 with respect to PCU Capacity (as per IRC: 64-1990)***

| S. No. | Types of Vehicles | Number of Vehicles / days | Passenger Car Unit (PCU) Factor | Total Number of Vehicle (PCU) / day |
|---|---|---|---|---|
| 1 | Motor Cycle / Scooter | 540 | 0.5 | 270 |
| 2 | Passenger Car / Van / Auto-rickshaw | 760 | 1 | 760 |
| 3 | Tractors | 152 | 1.5 | 228 |
| 4 | Bus | 279 | 3 | 837 |
| 5 | Truck | 292 | 3 | 876 |
| 6 | Trailer | 252 | 4.5 | 1134 |
| 7 | Cycle | 93 | 0.5 | 46.5 |
| Total | | **2368** | | **4151.5** |
| **PCU / hr. = (PCU / day) / 24** | | | | **172.98** |

***Existing Traffic Scenario and LOS (Level of Service) (as per IRC: 64 - 1990)***

| Road | V (Volume in PCU/hr.) | C (Capacity in PCU/hr.) | Existing V/C Ratio | LOS |
|---|---|---|---|---|
| SH - 57 | 172.98 | 625 | 0.28 | **B** |

***Capacity as per IRC: 64-1990***

| *V/C* | *LOS (Level of Service)* | *Performance* |
|---|---|---|
| *0.0 - 0.2* | *A* | *Excellent* |
| *0.2 - 0.4* | *B* | *Very Good* |
| *0.4 - 0.6* | *C* | *Good / Average / Fair* |
| *0.6 - 0.8* | *D* | *Poor* |
| *0.8 - 1.0* | *E* | *Very Poor* |
| *>1.0* | *F* | *Highly Unstable* |

- ***Traffic Scenario after operation of Cement Plant***

Transportation of raw materials and finished products (Cement) will be done by both road and rail after installation of railway siding. details of which are given in table below:

**Table - 4.10 (a)**

**Inward Traffic due to Raw Material & Fuel Transportation - Considering 100 % by Road**

| S. No. | Material | Total Required Quantity | | Source / Destination | Type of Vehicle | Expected Percent of transportation by Road | Capacity of Vehicle (Tonnes) | Number of Trucks / Day (approx.) |
|---|---|---|---|---|---|---|---|---|
| | | MTPA | TPD | | | | | |
| 1. | Clay | 0.28 | 848 | Open Market | Truck | 100 % | 30 | 29 |
| 2. | Bauxite | 0.05 | 151 | Andru Minerals & AP/Belgaum Minerals-Karnataka and Bellary | Truck | 100% | 30 | 6 |
| 3. | Iron Ore | 0.04 | 121 | Sai Sindhu industries-AP/KEJ Minerals Pvt. Ltd. & Janaki Corporation Ltd Karnataka | Truck | 100% | 30 | 5 |
| 4. | Gypsum / Phospho gypsum | 0.48 | 1454 | CFL, Spic, Sterlite, Fact | Truck | 100% | 30 | 49 |
| 5. | Fly ash | 2.8 | 8484 | CPP, KPCL Raichur Thermal Power Plant, Kothagudem Thermal Power Station VII stage | Trailer/ Bulker | 100% | 45 | 189 |
| 6. | 100% Imported Coal | 1.10 | 3333 | Singareni Coalfields (SCCL) in Andhra Pradesh | Truck | 100% | 30 | 112 |

| S. No. | Material | Total Required Quantity | | Source / Destination | Type of Vehicle | Expected Percent of transportation by Road | Capacity of Vehicle (Tonnes) | Number of Trucks / Day (approx.) |
|---|---|---|---|---|---|---|---|---|
| | | MTPA | TPD | | | | | |
| 7. | Petcoke | 0.27 | 818 | US/ Saudi/ RIL / Essar/ IOCL *via* Krishnapatnam Port | Truck | 100% | 30 | 28 |
| 8. | AFR | 0.20 | 606 | Nearby area of Telangana and Andhra Pradesh | Truck | 100% | 30 | 21 |
| **Total** | | | | | | | | **439** |

*****Considering Pollution Load with 330 working days*

**Table - 4.10 (b)**

**Outward Traffic due to Finished Product Transportation - Considering 100 % by Road***

| S. No. | Material | Total Required Quantity | | Source | Type of Vehicle & Capacity | Expected Percent of transportation by Road | Number of Trucks / Day (approx.) |
|---|---|---|---|---|---|---|---|
| | | MTPA | TPD | | | | |
| 1. | Cement | 8.0 | 22222 | Cement Plant | Truck/ 30 tonnes | 100% | 740 |
| | **Total** | | | | | | |

*****Considering Pollution Load with 360 working days*

Total No. of increased trucks per day (inward) = 439 (250 Trucks and 189 Fly Ash Bulker)

Total No. of increased trucks per day (outward) = 740

Total No. of increased trucks per day (inward + outwards) = 1179

Increase in PCU/Day (Trucks) = 990 x 3 = 2970 (*as per IRC: 64-1990*)

Increase in PCU/Day (Bulker) = 189 x 4.5 = 850.5 (*as per IRC: 64-1990*)

Total increase in PCU/Day on SH - 57 = 3820.5

Increase in PCU/hr on SH - 57 = 159.18 (*as per IRC: 64-1990*)

**Modified Traffic Scenario and LOS (Level of Service) *(as per IRC: 64-1990)***

| S. No. | Road | Increased PCU / hr. | V (Volume in PCU/hr.) | C (Capacity in PCU/hr.) | Existing V/C Ratio | LOS |
|---|---|---|---|---|---|---|
| 1. | SH - 57 | 159.18 | 172.98 + 159.18 =332.16 | 625 | 0.53 | **C** |

***Traffic Projection & Impact due to Transportation***

Due to the proposed project, there will be addition of Heavy and Light motor vehicles in the existing traffic. However, **the Level of Service of the road is Good i.e., SH - 57 will be "C".** Thus, it can be concluded that the present road network is good enough to bear the increased traffic load.

ꕥ ***Scenario 2 Considering 50 % by Road & 50 % by Rail***

**Table - 4.10 (c)**

**Inward Traffic due to Raw Material & Fuel Transportation**

| S. No. | Material | Total Required Quantity | | Source / Destination | Type of Vehicle | Expected Percent of transportation by Road | Capacity of Vehicle (Tonnes) | Number of Trucks / Day (approx.) |
|---|---|---|---|---|---|---|---|---|
| | | MTPA | TPD | | | | | |
| 1. | Bauxite | 0.025 | 75 | Andru Minerals & AP/Belgaum Minerals-Karnataka and Bellary | Truck | 50 % | 30 | 3 |
| 2. | Iron Ore | 0.02 | 60 | Sai Sindhu industries-AP/KEJ Minerals Pvt. Ltd. & Janaki Corporation Ltd Karnataka | Truck | 50 % | 30 | 3 |
| 3. | Gypsum / Phospho gypsum | 0.24 | 727 | CFL, Spic, Sterlite, Fact | Truck | 50 % | 30 | 25 |
| 4. | Fly ash | 1.4 | 4242 | CPP, KPCL Raichur Thermal Power Plant, Kothagudem Thermal Power Station VII stage | Trailer/Bulker | 50 % | 45 | 95 |
| 5. | 100% Imported Coal | 0.55 | 1666 | Singareni Coalfields (SCCL) in Andhra Pradesh | Truck | 50 % | 30 | 56 |
| 6. | Petcoke | 0.135 | 409 | US/ Saudi/ RIL / Essar/ IOCL *via* Krishnapatnam Port | Truck | 50 % | 30 | 14 |
| Total | | | | | | | | 196 |

**Table - 4.10 (d)**

**Inward Traffic due to Raw Material & Fuel Transportation**

| S. No. | Material | Additional Quantity | | Type of Vehicle & Capacity | Number of Trucks / Day (approx.) |
|---|---|---|---|---|---|
| | | Million TPA | TPD | | |
| 1. | Cement | 4.0 | 11111 | Trucks/ 30 Tonnes | 371 |

***Considering Pollution Load with 360 working days*

Total No. of increased trucks per day (inward) = 196 (101 Truck and 95 Bulker)

Total No. of increased trucks per day (outward) = 371

Total No. of increased trucks per day (inward + outwards) = 567

Increase in PCU/Day (Trucks) = 472 x 3 = 1416 (*as per IRC: 64-1990*)

Increase in PCU/Day (Bulker) = 95 x 4.5 = 427.5 (*as per IRC: 64-1990*)

Total increase in PCU/Day on SH - 57 = 1843.5

Increase in PCU/hr on SH - 57 = 76.81 (*as per IRC: 64-1990*)

| S. No. | Road | Increased PCU / hr. | V (Volume in PCU/hr.) | C (Capacity in PCU/hr.) | Existing V/C Ratio | LOS |
|---|---|---|---|---|---|---|
| 1 | SH-57 | 76.81 | 172.98 + 76.81 = 249.70 | 625 | 0.39 | B |

***Traffic Projection & Impact due to Transportation***

Due to the proposed project, there will be addition of Heavy and Light motor vehicles in the existing traffic. However, **the Level of Service of the road is Very Good i.e., SH - 57 will be "B" after Railway Siding.** Thus, it can be concluded that the present road network is good enough to bear the increased traffic load.

Impact evaluation is given in table below.

***Impact Evaluation due to Transportation of Raw Material and Products***

| Impact Evaluation Element | Change in traffic density due to transportation of raw material and products by road. | | | |
|---|---|---|---|---|
| Potential Effect/ Concern | Increased load on existing transportation infrastructure and air emissions due to transportation of material. | | | |
| ***Characteristics of Impacts*** | | | | |
| Nature | Positive | | ***Negative*** | Neutral |
| | | | √ | |
| Type | ***Direct*** | Indirect | Cumulative | |
| | √ | | | |
| Extent | Plant Area | *Local* | Zonal | ***Regional*** |
| | | | | √ |
| Duration | *Short - term* | | **Long- term** | |
| | | | √ | |
| Intensity | **Low** | | *Medium* | High |
| | √ | | | |
| Frequency | Remote (R) | Occasional (O) | Periodic (P) | ***Continuous (C)*** |
| | | | | √ |
| ***Significance of Impact*** | | | | |
| Significance | Insignificant | Minor | *Moderate* | **Major** |
| | | | | √ |

- ***Mitigation Measures during Transportation***
  - Company has revised the plant layout in such a way that the transportation activities (Inward & outward movement of the vehicles) will be away from the nearest habitation. This will ultimately reduce the impact of transportation on the nearby ESA's.
  - Limestone will be transported though covered conveyor belt.
  - Transportation of Clinker to the Clinker Silo will be done through covered conveyor belt in a very controlled manner; while that of the fly ash to fly ash silo will be done pneumatically from bulkers. This helps in reducing the fugitive emissions.
  - Speed limit of the vehicles will be maintained at 10 kmph and speed monitoring will be carried out.
  - The raw material will be transported by rail also; which will reduce the carbon emissions and ultimately will lead to sustainable development goal of the railway sector.

- Un- necessary blowing of horn will be avoided.
- Movement of heavy trucks/ vehicles on the non-metallic road generates substantial quantity of dust emission. This is due to the presence of dust over the road, which is carried away by wind. To control the generation of dust, all the roads inside the plant premises will be concreted.
- Regular sweeping of all the roads and floors will be done by vacuum sweeping machine.
- The total plant area is 187.1 ha, out of which 42.65 % of the total plot area i.e., ~79.8 ha has been earmarked to be developed as greenbelt development & plantation and 15 m wide greenbelt & plantation will be done along the plant boundary and 20 meter width towards the habitation to attenuate the air pollution.
- Avenue plantation will also be done by the company on the approach roads leading to the plant site.

## 4.14 IMPACT DUE TO SOLID AND HAZARDOUS WASTE GENERATION

***Construction Phase***

- ***Anticipated Impacts***
  - Site clearing waste during preparation and leveling phase will be generated such as waste vegetation, surface soil, shrubs, stumps and rubbish from site due to leveling which this may result in soil and water contamination.
  - Left over construction material such as soil, construction debris, iron rods/ cutting might create an impact in deteriorate soil, air and land quality.
  - Municipal Solid wastes will be generated by the construction workers during the construction period.

- ***Mitigative Measures***
  - The waste generated due to site clearing prior to the construction phase construction debris generated from construction will be utilized in the leveling & road construction activities.
  - Left over other construction material having a high recycling value and reuse value thus will be sold to the respective recyclers.
  - Dry & wet solid waste generated by the construction workers will be managed by placing proper segregated litter bins and will be transferred to the identified nearby secondary stations. Recyclable contents will be sold to authorized recyclers and organic waste will be composted.

***Operation Phase***

- ***Anticipated Impacts***
  - Refractory bricks used for lining in the kiln having high recycling values will be generated.
  - Dust will be generated from the manufacturing process.
  - Fly ash generation from CPP will contaminate the soil by increasing the bulk density and water capacity, thereby affecting the microorganism in the soils.
  - Used Oil/spent oil, Cotton rags or cleaning material wastes will be generated from plant process.
  - Sludge will be generated from the STP process.

- Domestic Solid Waste will be generated from the plant canteen.

ꕥ ***Mitigative Measures***

- Refractory bricks will be disposed off to external vendors for their use in other industries.
- Dust collected from various Air Pollution Control Equipment's like ESP; Bag House & Bag Filters will be recycled back into the process.
- Fly ash generated from CPP will be 100% utilized in cement manufacturing process.
- STP sludge will be used as manure in greenbelt development & plantation.
- Used Oil/spent oil generated as hazardous waste will be sold to APPCB/CPCB authorized recycler and co-processed in Cement Kiln along with Cotton rags or cleaning material wastes.
- Dry & wet solid waste generated from plant will be collected in the segregated manner. The biodegradable waste will be compost and then will be used as manure for greenbelt & plantation, whereas the non - biodegradable waste will be disposed scientifically.

## 4.15 ASPECT IMPACT ANALYSIS WITH MITIGATION MEASURES

Aspect Impact analysis and mitigation measures are given in Table - 4.11.

**Table - 4.11**
**Aspect Impact Analysis and Mitigation Measures**

| S. No. | Project Activity | Aspect | Impact | Mitigation Measures |
|---|---|---|---|---|
| 1. | Transportation of Limestone by Covered Conveyor Belt | Fugitive Dust Emission | ▪ There will be no major impact<br>▪ Only, there will be increase in the concentration of fugitive dust in very lesser quantity | • Water spray nozzles over the conveyor belt in the stacker feed point<br>• Installation of Bag Filters at all material transfer points<br>• Greenbelt & Plantation development along the sides of covered conveyor belt and periphery of plant |
| 2. | Transportation of other raw materials by road | Fugitive Dust Emission | ▪ Increase in the fugitive dust concentration in the ambient air which will affect the biotic environment | • Use of PUC Certified vehicles<br>• Vehicles will be covered with tarpaulin and not over loaded<br>• Speed limit will be maintained<br>• Paved road inside the plant premises |
| 3. | Raw Material & Finished Product - storage and handling | | ▪ Increase in the fugitive dust concentration in the ambient air<br>▪ Workers affected by respiratory diseases due to working in the high dust-zone area | • Covered yard for storage of Iron Ore, Bauxite, Pond Ash, Gypsum, Coal & Petcoke.<br>• Personal Protective Equipment to the workers |
| 4. | Raw Mix Preparation | Particulate Matter Emission | Increase in the concentration of particulate matter in the ambient air | • Transportation of material to the raw mill by covered conveyor belt |

| S. No. | Project Activity | Aspect | Impact | Mitigation Measures |
|---|---|---|---|---|
| | | | | • Installation of Bag Filters (168 Nos) at all material transfer points in Clinkerization & Pyro section. |
| 5. | Clinkerization (Calcination) | Particulate Matter Emission, Gaseous Emission & Fugitive Dust Emission | Increase in Particulate Matter, $SO_2$ & $NO_2$ and fugitive dust concentration in air environment | • Installation of adequate APCEs such as Bag House & ESP.<br>• Installation of Bag Filters at transfer points.<br>• Low $NO_x$ burners<br>• Installation of De-NOx system.<br>• Development of greenbelt / plantation<br>• Personal Protective Equipment (Goggles, Mask, Helmet, Boots, Gloves & Earmuffs/ Earplugs etc.) to workers |
| 6. | Clinker Grinding / Cement Mill (including Fly ash handling) | Particulate Matter Emission & Fugitive Dust Emission | Increase in Particulate Matter and fugitive dust concentration in air environment | • Installation of Bag House (6 Nos.)<br>• Installation of Bag Filters (168 Nos) at all material transfer points in Clinkerization & Pyro section<br>• Fly ash received through closed bulkers & fed into Silo through pneumatic system.<br>• Development of greenbelt & plantation. |
| | | Noise generation due to Exhaust fans and Cement grinding | ▪ Increase in noise levels near source generation<br>▪ Hearing impairments<br>▪ Other health effects | • Earmuffs/ Earplugs to persons working in high noise zone.<br>• Proper lubrication & maintenance of machinery<br>• Development of greenbelt & plantation within the plant premises<br>• Periodic Occupational Health Surveillance of worker |
| 7. | Cement Packing & Dispatch | Fugitive Dust Emission | ▪ Area source - Increase in fugitive dust concentration in air environment<br>▪ Respiratory Diseases | • Dust extraction arrangement<br>• Spilled cement collected and recycled<br>• Installation of Bag Filters (168 Nos) in both Cement Mills) at all material transfer points<br>• Development of greenbelt & Plantation (42.65 ha)<br>• Personal Protective Equipment (Goggles, Mask, Helmet, Boots, Gloves & Earmuffs/ Earplugs etc.) to worker.<br>• Periodic Occupational Health Surveillance |
| 8. | Coal handling & Grinding | Fugitive Dust Emission | Increase in fugitive dust concentration in air environment | • Dust extraction arrangement by Installation of Bag Filters (168 Nos) at material transfer points, Coal mill hopper & storage<br>• Development of greenbelt & Plantation. |
| 9. | CPP Boiler | Particulate Matter Emission, | Increase in Particulate Matter, $SO_2$ & $NO_2$ and fugitive dust | • 2 Nos ESPs for both CFBC boiler for PM & gaseous emissions. |

| S. No. | Project Activity | Aspect | Impact | Mitigation Measures |
|---|---|---|---|---|
| | | Gaseous Emission & Fugitive Dust Emission | concentration in air environment | • Installation of Bag Filters at all material transfer points<br>• Lime dozing in CFBC boilers for control of $SO_2$ emissions<br>• Low NOx burners for NOx Control<br>• Development of greenbelt & plantation. |

## 4.16 SUMMARY AND CONCLUSION

The environmental impact evaluation of possible effects as a result of plant site activities and operation on various environmental parameters is primarily based on careful study of Cement Plant, Unit operations, surrounding environment etc. Effective 'Control Technology' has been suggested with a view to mitigate the adverse impact of unit operation on environmental parameters. Considering, all of the above impacts and mitigative measures, it has been observed that the activities under construction and operation phase of the proposed project which will produce very less dust emission and have minor contribution in the baseline environment and have no effluent discharge resulting in the Eco-friendly Integrated Cement plant by M/s. ACC Limited.

Hence it can be concluded that the present baseline environment status of the study area will not be affected by the proposed Integrated Cement Project of M/s. ACC Limited as the company will adopt efficient & adequate control measures to protect the surrounding environment and will contribute in development of the study areas. Specific mitigation measures will also be taken by the company for the protection of nearby ESA's.

# *CHAPTER - 5*
# *ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)*

## 5.1 INTRODUCTION

As per EIA Notification dated 14th Sept., 2006, and as amended thereof; the Chapter on "Analysis of Alternatives (Technology & Site)" is applicable only, if the same is recommended at the Scoping stage.

## 5.2 ANALYSIS OF ALTERNATIVES w.r.t. TECHNOLOGY

As per the (Terms of Reference) ToR points issued by MoEFCC, New Delhi *vide Letter* no. J-11011/265/2012-IA II(I) dated 20th February, 2013; validity extended *vide Letter* dated 18th Feb., 2016 for the proposed project, the Analysis of Alternatives w.r.t Technology is not required.

M/s. ACC Limited will adopt state of art and proven technologies for manufacturing of Clinker & Cement i.e., 6 Stage Preheater for Clinkerization and VRM for Cement Mill keeping in view the lower specific energy consumption, ease of operation, low maintenance and compact layout along with installation of WHRS for energy conservation to utilize the waste heat.

Latest modern technology will be used; brief of which is given below:

- ✓ Vertical Raw Mill will be used for raw meal grinding and to produce Clinker efficient rotary kiln will be installed.
- ✓ Cement Mill (VRM) / ball mill with Roller Press will be used for the cement manufacturing.
- ✓ WHRS will be installed to harness the waste heat from preheater and clinker cooler section.
- ✓ AFR system will be installed to reduce the dependency on coal which is a natural source.
- ✓ The plant will use high efficiency separator and energy efficient equipment to ensure low power consumption.
- ✓ To reduce the natural resource consumption by the proposed plant, alternate fuels will also be used.

However, during the implementation phase, any advancement in technology in the interest of energy conservation, efficiency and reduced emission loads etc., will be considered.

## 5.3 ANALYSIS OF ALTERNATIVES w.r.t. SITE

Keeping in view of proximity to the Captive Limestone Mine, accessibility to SH - 57, Rail network and other Raw material sources, the proposed site has been selected for setting up of Integrated Cement Plant at Village - Gollapalle, of Mandal - Mylavaram, District - Kadapa (YSR), Andhra Pradesh.

Following criteria were considered for selection of site in order to ensure minimum environmental impact on account of proposed project activity:

- Location of Site w.r.t close proximity from the captive limestone mine to fulfilling the limestone requirement of the Cement Plant.
- Adequate land availability (187.1 ha).
- Better connectivity to road network through State Highway (SH - 57) and Rail Network and this will help in minimizing the lead distance, time and the impact on transportation.
- Non - existence of National Park, Sanctuaries, Biosphere Reserve, Tiger / Elephant Reserve and migratory corridors of wildlife, Notified Forest and Deemed Forest within 10 km radius of the Integrated Cement Plant project area.
- The area is devoid of any Environmental sensitive features.
- Non-involvement of any forest area etc.
- Proximity to power source and its availability.

# *CHAPTER - 6*
# *ENVIRONMENTAL MONITORING PROGRAMME*

## 6.1 INTRODUCTION

Post-Project Monitoring is an essential part to check the impact of project related activities. Hence, monitoring of various environmental parameters will be carried out on a regular basis to ascertain the following:

- To evaluate the performance of mitigation measures proposed in the EMP
- To evaluate the adequacy of Environmental Impact Assessment.
- To suggest improvements in management plan, if required
- To enhance environmental quality.
- To implement and manage the mitigative measures defined in EMP.
- To undertake compliance monitoring of the project operation and evaluation of mitigative measures.

Various environmental components and pollution sources, which will be monitored under environmental monitoring programme are stack emission, fugitive emission, ambient air quality, water quality and noise levels.

Details of the Post - Project Environmental Monitoring programme, which will be undertaken for various environmental components, are detailed below.

## 6.2 MEASUREMENT METHODOLOGIES

### 6.2.1 Proposed Monitoring Programme

The post-project monitoring will include details of any major/ minor impact in the core zone and area within buffer zone for the following parameters: -

- Micro-meteorological data
- Ambient air quality monitoring
- Fugitive emission monitoring
- Stack emission monitoring
- Noise level monitoring
- Ground Water quality and level monitoring
- Waste Water Quality Monitoring (Inlet & Outlet)
- Soil Quality Analysis
- Medical Check-up of the employees.
- Performance evaluation of APCE's / Adequacy Study

### 6.2.2 Instruments to be used

The following instruments will be used to monitor above parameter:

- Weather Monitoring Station (WMS)
- Respirable Dust Sampler (RDS) - $PM_{10}$
- Fine Particulate Sampler (FPS) - $PM_{2.5}$
- Stack Monitoring Kit / Continuous Ambient Air Quality Monitoring Systems (CAAQMS)
- Online Continuous Emission Monitoring Systems (OCEMS)
- Sound Level Meter
- Water Level Indicator
- Global Positioning System (GPS)

The above-mentioned instruments will be procured during the implementation of the project.

### 6.2.3 Proposed Monitoring Schedule

Details of the parameters to be monitored in the post project monitoring programme are as follows:

**Table - 6.1**
**Parameters for Post-Project Monitoring**

| S. No. | Attributes / Aspects | Monitoring Parameter | Location | Frequency | Responsibility |
|---|---|---|---|---|---|
| ***Construction Phase*** | | | | | |
| 1. | Ambient Air quality Monitoring | $PM_{10}$, $PM_{2.5}$, $SO_2$, NOx as per NAAQS, 2009 | Near to the entrance Gate of Plant Site and towards the Villages in upwind & downwind direction from the plant site, as per the max. GLC obtained and as per EC / CTO conditions. | Twice a Week & Continuous Online Monitoring | Environmental Engineer |
| 2. | Water Quality and level | pH, Turbidity, Colour, Odour, Taste, TDS, Total Hardness, Calcium hardness, Magnesium hardness, Chloride, Fluoride, Sulphate, Nitrates, Alkalinity, Iron, Copper, Manganese | Nearby Ground water sources and as per CTO conditions. | As per CGWA NOC condition / Pre-Monsoon & Post-Monsoon | Environmental Engineer |
| 3. | Soil Quality Analysis | pH, Electrical Conductivity, Texture, Salinity, Alkalinity, Nitrogen, Phosphorus, Potassium, Chloride, Fluoride, Sulphate, TOC, Mercury Analysis | 04 locations in and around plant site | Quarterly | Environmental Engineer |

| S. No. | Attributes / Aspects | Monitoring Parameter | Location | Frequency | Responsibility |
|---|---|---|---|---|---|
| 4. | Noise Level | Day & Night dB (A) | 04 locations in and around the Plant site. | Monthly & as per EC / CTO | Environmental Engineer |
| 5. | Medical Checkup | Spirometry, Audiometry, Biochemical Parameter (Urine, Blood) / Circulatory and Vision Test | Pre-placement Medical Checkup & Periodical Examination at Dispensary / Health Centre | Yearly / As per applicable norms | OHS Team |
| ***Operation Phase*** | | | | | |
| 1. | Meteorological data | Wind speed, Wind direction, Ambient temperature, Relative humidity, Rainfall | Plant Site | Hourly Continuous | Environmental Engineer |
| 2. | Ambient Air Quality Monitoring | | | | |
| | Manual | $PM_{10}$, $PM_{2.5}$, $SO_2$, $NO_x$, CO, as per NAAQS, 2009 | Plant Site, in up-Wind & down-Wind direction and as per EC / CTO conditions | Twice a Week | Environmental Engineer and Instrumentation team |
| | CAAQMS | PM | Cement Mill | Continuous Online | |
| 3. | Fugitive Emission Monitoring | SPM | Cement Mill, Packing Plant, Raw Materials Handling Area & Coal Yard. | Quarterly | Environmental Engineer |
| 4. | Stack Monitoring | | | | |
| | Manual | PM, SO2, NOx (Continuous monitoring) and HCl, HF, TOC, Metals, Dioxins and Furans to be | Raw Mill & Klin, Coal / Petcoke Mill, Clinker Cooler, Cement Mill and CPP Boiler | Monthly | Environmental Engineer |

| S. No. | Attributes / Aspects | Monitoring Parameter | Location | Frequency | Responsibility |
|---|---|---|---|---|---|
| | | monitored once in a year as per MoEF&CC notification G.S.R. 497 (E) 10th May, 2016 for Cement Plant with co-processing. | | | |
| | CEMS | PM10, PM2.5, $SO_2$, $NO_2$ | Raw Mill, clinker cooler, coal mill, cement mill and CPP Boiler | Continuous Online | Environmental Engineer and Instrumentation team |
| 5. | Water Quality | pH, Turbidity, Colour, Odour, Taste, TDS, Total Hardness, Calcium hardness, Magnesium hardness, Chloride, Fluoride, Sulphate, Nitrates, Alkalinity, Iron, Copper, Manganese | Plant Site, Nearby Ground water sources and as per CTO conditions | Quarterly / as per EC/ CTE/ CTO | Environmental Engineer |
| 6. | Water Level | - | Plant Site, Nearby Ground water sources and as per CTO conditions | Monthly /as per EC/ CTE/ CTO | Environmental Engineer |
| 7. | Waste Water | | | | |
| | STP | pH, BOD, COD, Oil & Grease, $Cl^-$, TDS, TSS | Inlet & Outlet | Monthly & as per CTO | Environmental Engineer |
| 8. | Noise Level | Day & Night dB (A) | Plant Boundary, High noise | Quarterly & as per EC/CTO | Environmental |

| S. No. | Attributes / Aspects | Monitoring Parameter | Location | Frequency | Responsibility |
|---|---|---|---|---|---|
| | | | generating areas within the Plant Boundary and as per CTO conditions | | Engineer |
| 9. | Soil Quality Analysis | pH, Electrical Conductivity, Texture, Salinity, Alkalinity, Nitrogen, Phosphorus, Potassium, Chloride, Fluoride, Sulphate, TOC, Mercury Analysis | 04 locations in and around plant site | Quarterly | Environmental Engineer |
| 10. | Medical Checkup | Spirometry, Audiometry, Biochemical Parameter (Urine, Blood) / Circulatory and Vision Test | Pre-placement Medical Checkup & Periodical Examination at Dispensary / Health Centre | Yearly / As per applicable norms | OHS Team |
| 11. | Performance evaluation of PCE's | Inlet & outlet of PCE's | Raw Mill / Klin Bag house, Coal Mill Bag house, Cement Mill Bag house, Clinker Cooler ESP and CPP ESP. | Six Monthly | Environmental Engineer |

### 6.2.4 Methodology Adopted

Post-project monitoring will be carried out as per conditions stipulated in Environmental Clearance issued by MoEF&CC, New Delhi; Consent issued by APPCB as-well-as according to CPCB guidelines.

Proposed plant site will be considered as core zone and the area lying within 10 km radius from the proposed plant site will be considered to be the buffer zone where slight impacts in close proximity may be observed on physical and biological environment and that too is occasional.

Details of Post Project Monitoring Programme are given in Table - 6.2.

**Table - 6.2**

**Post Project Monitoring**

| Attributes | Measurement Method | Test Procedure |
|---|---|---|
| **A. Meteorological data monitoring** | | |
| • Wind speed<br>• Wind direction<br>• Dry bulb temperature<br>• Wet bulb temperature<br>• Relative humidity<br>• Rainfall | Mechanical/ automatic weather station | - |
| **B. Ambient Air Quality Monitoring** | | |
| **Pollutant Monitoring** | | |
| PM10 | Gravimetric method | - |
| PM2.5 | | - |
| SO2 | EPA Modified West & Geake method | Absorption in Potassium Tetra Chloromercurate followed by Colorimetric estimation using P-Rosaniline hydrochloride and Formaldehyde (IS: 5182 Part-II) |
| NO2 | Arsenite modified Jacob & Hochheiser | Absorption in dil. NaOH and then estimated calorimetrically with sulphanilamide and N (I-Nepthyle) Ethylene diamine Dihydrochloride and Hydrogen Peroxide (CPCB Method). |
| **C. Stack Pollutant Monitoring** | | |
| Pollutant PM | As per CPCB guidelines | Gravimetric method/ CEMS |
| SOx | As per IS-11255-part (2) 1985 (Absorbing Solution of H2O2, isopropanol Reagent) | Absorption in H2O2, Isopropanol followed by Colorimetric estimation using Sulphuric acid and Barium Chloride as Per IS-11255-part (2) 1985 / CEMS |
| NOx | As per IS-11255-part (7) 2005 with NOx flask assembly | Absorption of Sample in NOx flask assembly Followed by Colorimetric estimation using Phenol-di-sulphonic acid and other reagent as Per IS-11255-part (7) 2005 / CEMS |
| Dioxin & Furans during co - processing | | |
| **D. Groundwater Level and Quality Monitoring** | | |
| pH, Turbidity, Colour, Odour, Taste, TDS, Total Hardness, Calcium hardness, Magnesium hardness, Chloride, Fluoride, Sulphate, Nitrates, Alkalinity, Iron, | As per IS 10500: 2012 | Samples for water quality should be collected and analyzed as per: IS: 2488 (Part 1-5) methods for sampling and testing of Industrial effluents. |

| Attributes | Measurement Method | Test Procedure |
|---|---|---|
| Copper, Manganese etc. . | | Standard methods for examination of water and wastewater analysis published by American Public Health Association. |
| **E. Waste Water Monitoring** | | |
| Waste Water<br>(PH, BOD, COD, Oil & Grease, Faecal coliforms etc.) | As per IS 3025 | Standard methods for examination of water and waste water analysis published by American Public Health Association. |
| **D. Noise Level Monitoring** | | |
| Noise levels at Day & night time - Leq dB (A) | As per CPCB procedure | As per CPCB norms |
| **E. Medical Check-up** | | |
| Spirometry, Audiometry, Biochemical Parameter (Sugar, Blood, Circulatory and Vision test etc.) | As per Factory act-1984 | - |
| H. Performance evaluation of APCEs/ Adequacy study | - | - |

**ONLINE CONTINUOUS EMISSION MONITORING STATION (OCEMS)**

Emission standards will be maintained within the prescribed standards by the MoEFCC Notification G.S.R. 497 (E) dated 10th May, 2016 and Installation of online monitoring system will be done as per the circular issued by CPCB *vide Letter* no. B-29016/04/06/PCI-II dated 23rd Dec., 2016, CPCB has specified the requirement for installation of OCEMS along with parameters to be monitored. OCEMS will be installed as per the directions and specified parameters will be monitored and data will be transmitted regularly to the CPCB & APPCB.

| Unit | Stacks attached to Process (with Parameters to be monitored) |
|---|---|
| Integrated Cement Plants (200 TPD and above) | o Raw Mill/Kiln - (PM, SO2, NOx)<br>o Clinker Cooler- (PM)<br>o Coal Mill- (PM)<br>o Cement Mill (PM) |
| Captive Power Plants | o CPP Boiler (PM, SO2, NOx) |

## 6.3 DATA ANALYSIS

Monitoring data analysis will be done by NABL / MoEF&CC approved laboratory as per CPCB guidelines & will be timely submitted to concerned authority (specified in Environment Clearance Letter issued by MoEFCC, New Delhi and Consent issued by APPCB) on regular basis.

## 6.4 REPORTING SCHEDULE

Environmental Monitoring Program will be conducted for various environmental components as per the conditions stipulated in Environmental Clearance Letter issued by MoEFCC, New Delhi & Consent to Establish / Consent to Operate issued by APPCB.

Six monthly compliance reports will be submitted on regular basis to IRO, MoEFCC by 01st of June and 01st of December and also will be upload to Parivesh web portal of MoEFCC, New Delhi

Quarterly Compliance Report for conditions stipulated in CTO/CTE will be submitted to APPCB on regular basis.

## 6.5 EMERGENCY PROCEDURES

Company will adopt emergency procedures for Environmental Monitoring as mentioned below:

***Planned Preventive Maintenance***

Maintenance programmes will be established at the facility for the following equipment systems

- Process equipment
- Environmental process equipment
- Continuous monitors
- Laboratory equipment
- Sampling equipment

***Procedure***

- Routine round the clock maintenance programmes for plant equipment
- Annual maintenance or half yearly shutdown.

***Emissions to Atmosphere***

In the event of an emission of Dust from any of potential emission points, the following action will be taken. The Emergency Response Team Leader on duty should be notified immediately, by telephone or by use of the internal communication system. The Leader will decide on what action to take:

- Identifying the source of the Emission
- Shutting down Production if necessary
- Contacting relevant members of staff and management
- Contacting the Local Authority
- Deciding with management what corrective action is deemed necessary

***Revision of Emergency Procedure***

The Emergency Procedure will be reviewed and updated as necessary to reflect legislative changes or changes to the Company's operation. These changes will be communicated to all employees through directors, managers, supervisors or environmental communications.

## 6.6 DETAILED BUDGET

The budget for Environment Monitoring for Proposed Integrated Cement Plant is as below:

- ✓ Capital Cost: Rs. 7.0 Crores (Phase I - 3.6 Crores & Phase II - 3.4 Crores)
- ✓ Recurring Cost: Rs. 0.06 Crore/ annum (Phase I - 0.03 Crores/annum & Phase II - 0.03 Crores/annum)

# *CHAPTER - 7*
# *ADDITIONAL STUDIES*

## 7.1 INTRODUCTION

As per EIA Notification dated 14th Sept., 2006 and as amended thereof; application (Form - 1/ ToR and Pre-Feasibility Report) for the Proposed project was submitted to MoEF&CC on 05th July, 2012 and ToR Letter was issued by MoEF&CC, New Delhi *vide Letter* No. J-11011/265/2012-IA II(I) dated 20th February, 2013; validity extended *Vide Letter* dated 18th Feb., 2016 for carrying out the Environmental Impact Assessment (EIA) study for the Proposed 5.0 Million TPA Integrated Cement Clinkerisation Plant, 8.0 Million TPA Cement Grinding Unit and 100 MW Captive Power Plant at Village: Gollapalle, Mandal: Mylavaram, District: Kadapa (YSR), Andhra Pradesh by M/s. ACC Limited.

The following Additional Studies were undertaken in order to comply with the conditions of the ToR obtained for the Integrated Cement Project:

1. Public Consultation
2. Risk Assessment and Disaster Management Plan

## 7.2 PUBLIC CONSULTATION

Public Hearing for the proposed Integrated Cement Plant was conducted on 20th October, 2016 at 10:30 AM at near proposed project site, near Gollapalli village, Malyavaram Mandal of YSR District and in the presence of District Collector, Environment Officers, Regional Office, Andhra Pradesh Pollution Control Board, Tirupati.

The press notification indicating date and venue of the public hearing was issued by member Secretary, Andhra Pradesh Pollution Control Board (APPCB) on 19th Sept., 2016 in prominent newspapers Viz. Telugu in 'Sakshi' and English in 'The Indian Express' with project details inviting suggestions views, comments and objections from the public regarding the above-mentioned project.

Accordingly, the public hearing was conducted on 20th October, 2016. Public Hearing Panel chaired by & members present.

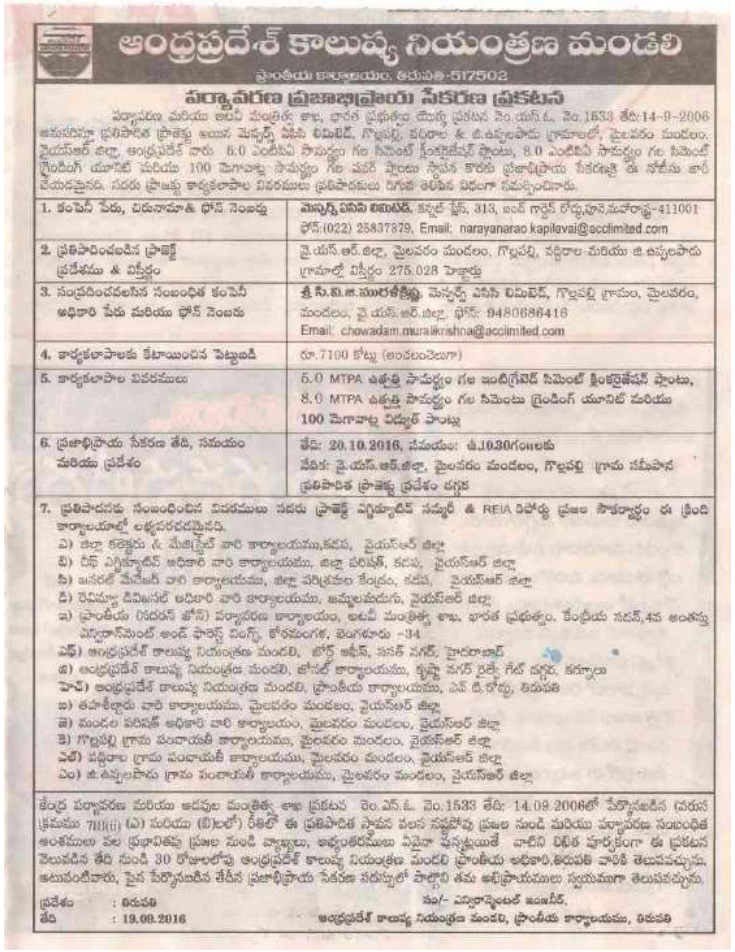
- Shri K.V. Satyanarayana, I.A.S (Kadapa [Y.S.R] District Collector); and
- Shri A. Narendra Babu, Env. Engineer, APPCB Regional Office.

Around 350 people were attended from 6 villages during public hearing. The details of public hearing conducted by the Andhra Pradesh pollution control board were obtained and incorporated in the subsequent section.

### 7.2.1 Public Hearing Proceedings

The minutes of meeting of public hearing & reply and commitment by management along with detailed proceedings are provided in **Annexure - 11.** The public hearing action plan is given in **Table - 7.1 (a), (b) and (c).**

## 7.2.2 Public Hearing Notice published in Newspapers



ఆంధ్రప్రదేశ్ కాలుష్య నియంత్రణ మండలి

ప్రాంతీయ కార్యాలయం, తిరుపతి-517502

**పర్యావరణ ప్రజాభిప్రాయ సేకరణ ప్రకటన**

పర్యావరణ మరియు అటవీ మంత్రిత్వ శాఖ, భారత ప్రభుత్వం యొక్క ప్రకటన నెం.యస్.ఓ. నెం.1533 తేదీ:14-9-2006 అనుసరిస్తూ ప్రభుపాదిత ప్రాజెక్టు అయిన మెస్సర్స్ ఏసిసి లిమిటెడ్, గొల్లపల్లి, వద్దిరాల & జి.ఉప్పలపాడు గ్రామాలలో, మైలవరం మండలం, వైయస్ఆర్ జిల్లా, ఆంధ్రప్రదేశ్ వారు 5.0 ఎంటిపిఏ సామర్థం గల సిమెంట్ క్లింకరైజేషన్ ప్లాంటు, 8.0 ఎంటిపిఏ సామర్థం గల సిమెంట్ గ్రైండింగ్ యూనిట్ మరియు 100 మెగావాట్ల సామర్థం గల మదర్ ప్లాంటు స్థాపన కొరకు ప్రజాభిప్రాయ సేకరణకై ఈ నోటీసు జారీ చేయడమైనది. సదరు ప్రాజెక్టు కార్యకలాపాల వివరములు ప్రతిపాదకులు దిగువ తెలిపిన విధంగా సమర్పించినారు.

| | |
|---|---|
| 1. కంపెనీ పేరు, చిరునామా& ఫోన్ నెంబర్లు | మెస్సర్స్ ఏసిసి లిమిటెడ్, కనాట్ ప్లేస్, 313, బండ్ గార్డెన్ రోడ్,పూనె,మహారాష్ట్ర-411001 ఫోన్:(022) 25837379, Email: narayanarao.kapilavai@acclimited.com |
| 2. ప్రతిపాదించబడిన ప్రాజెక్ట్ ప్రదేశము & విస్తీర్ణం | వై.యస్.ఆర్.జిల్లా, మైలవరం మండలం, గొల్లపల్లి, వద్దిరాల మరియు జి.ఉప్పలపాడు గ్రామాల్లో విస్తీర్ణం 275.028 హెక్టార్లు |
| 3. సంప్రదించవలసిన సంబంధిత కంపెనీ అధికారి పేరు మరియు ఫోన్ నెంబరు | శ్రీ సి.వి.జి.మురళీకృష్ణ, మెస్సర్స్ ఏసిసి లిమిటెడ్, గొల్లపల్లి గ్రామం, మైలవరం, మండలం, వై.యస్.ఆర్.జిల్లా, ఫోన్: 9480686416 Email: chowadam.muralikrishna@acclimited.com |
| 4. కార్యకలాపాలకు కేటాయించిన పెట్టుబడి | రూ.7100 కోట్లు (అంచలంచెలుగా) |
| 5. కార్యకలాపాల వివరములు | 5.0 MTPA ఎత్తత్తి సామర్థం గల ఇంటిగ్రేటెడ్ సిమెంట్ క్లింకరైజేషన్ ప్లాంటు, 8.0 MTPA ఎత్తత్తి సామర్థం గల సిమెంటు గ్రైండింగ్ యూనిట్ మరియు 100 మెగావాట్ల విద్యుత్ ప్లాంట్లు |
| 6. ప్రజాభిప్రాయ సేకరణ తేది, సమయం మరియు ప్రదేశం | తేది: 20.10.2016, సమయం: ఉ.10.30గంటలకు వేదిక: వై.యస్.ఆర్.జిల్లా, మైలవరం మండలం, గొల్లపల్లి గ్రామ సమీపాన ప్రతిపాదిత ప్రాజెక్టు ప్రవేశం వద్దన |

7. ప్రతిపాదనకు సంబంధించిన వివరములు సదరు ప్రాజెక్ట్ ఎగ్జిక్యూటివ్ సమ్మరీ & REIA రిపోర్టు ప్రజల సౌకర్యార్థం ఈ క్రింది కార్యాలయాల్లో లభ్యపరచడమైనది.

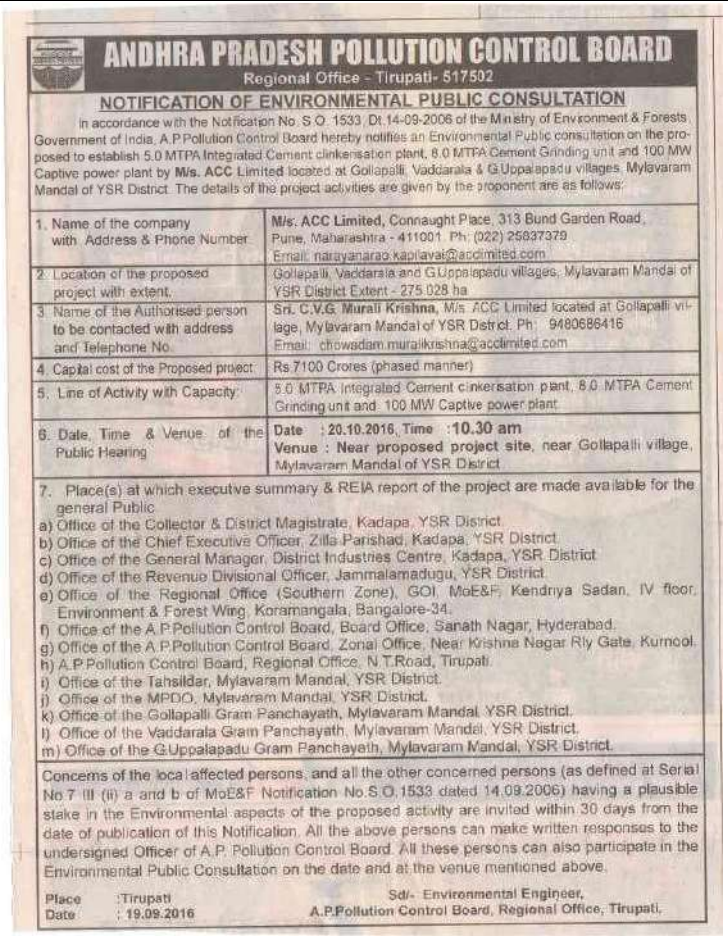
ఎ) జిల్లా కలెక్టరు & మేజిస్ట్రేట్ వారి కార్యాలయము,కడప, వైయస్ఆర్ జిల్లా
బి) చీఫ్ ఎగ్జిక్యూటివ్ అధికారి వారి కార్యాలయము, జిల్లా పరిషత్, కడప, వైయస్ఆర్ జిల్లా
సి) జనరల్ మేనేజర్ వారి కార్యాలయము, జిల్లా పరిశ్రమల కేంద్రం, కడప, వైయస్ఆర్ జిల్లా
డి) రెవిన్యూ డివిజనల్ అధికారి వారి కార్యాలయము, జమ్మలమడుగు, వైయస్ఆర్ జిల్లా
ఇ) ప్రాంతీయ (సదరన్ జోన్) పర్యావరణ కార్యాలయం, అటవీ మంత్రిత్వ శాఖ, భారత ప్రభుత్వం, కేంద్రీయ సదన్,4వ అంతస్తు ఎస్సార్సీ-కమ్మంట్ అండ్ ఫారెస్ట్ వింగ్స్, కోరమంగళ, బెంగళూరు -34
ఎఫ్) ఆంధ్రప్రదేశ్ కాలుష్య నియంత్రణ మండలి, బోర్డ్ ఆఫీస్, సనత్ నగర్, హైదరాబాద్
జి) ఆంధ్రప్రదేశ్ కాలుష్య నియంత్రణ మండలి, జోనల్ కార్యాలయము, కృష్ణా నగర్ రైల్వే గేట్ వద్దన, కర్నూలు
హెచ్) ఆంధ్రప్రదేశ్ కాలుష్య నియంత్రణ మండలి, ప్రాంతీయ కార్యాలయము, ఎన్.టి.రోడ్డు, తిరుపతి
ఐ) తహశీల్దారు వారి కార్యాలయము, మైలవరం మండలం, వైయస్ఆర్ జిల్లా
జె) మండల పరిషత్ అధికారి వారి కార్యాలయం, మైలవరం మండలం, వైయస్ఆర్ జిల్లా
కె) గొల్లపల్లి గ్రామ పంచాయతీ కార్యాలయము, మైలవరం మండలం, వైయస్ఆర్ జిల్లా
ఎల్) వద్దిరాల గ్రామ పంచాయతీ కార్యాలయము, మైలవరం మండలం, వైయస్ఆర్ జిల్లా
ఎం) జి.ఉప్పలపాడు గ్రామ పంచాయతీ కార్యాలయము, మైలవరం మండలం, వైయస్ఆర్ జిల్లా

కేంద్ర పర్యావరణ మరియు అటవీల మంత్రిత్వ శాఖ ప్రకటన నెం.ఎస్.ఓ. నెం.1533 తేదీ: 14.09.2006తో చేర్చబడిన (వరుస క్రమము 7(iii)(a) మరియు (బి)లలో) రీతిలో ఈ ప్రతిపాదిత స్థాపన పరన సర్వసాధారణ ప్రజల నుండి మరియు పర్యావరణ సంబంధిత అంశములు పరి ప్రభావితమయ్యే ప్రజల నుండి వ్యాఖ్యలు, అభ్యంతరములు ఏవైనా వున్నట్లయితే వాటిని రిజిస్టర్డ్ పూర్వకంగా ఈ ప్రకటన వెలువడిన తేది నుండి 30 రోజులలోపు ఆంధ్రప్రదేశ్ కాలుష్య నియంత్రణ మండలి ప్రాంతీయ అధికారి,తిరుపతి వారికి తెలుపవచ్చును. ఆటువంటివారు, పైన పేర్కొనబడిన తేదీన ప్రజాభిప్రాయ సేకరణ సదస్సులో పాల్గొని తమ అభిప్రాయములు స్వయముగా తెలుపవచ్చును.

ప్రదేశం : తిరుపతి
తేది : 19.09.2016

సం/- ఎన్విరాన్మెంటల్ ఇంజనీర్,
ఆంధ్రప్రదేశ్ కాలుష్య నియంత్రణ మండలి, ప్రాంతీయ కార్యాలయము, తిరుపతి

**Advertisement Published in Telegu "Sakshi"**
**Dated: 19th Sep., 2016.**



**ANDHRA PRADESH POLLUTION CONTROL BOARD**

Regional Office - Tirupati- 517502

**NOTIFICATION OF ENVIRONMENTAL PUBLIC CONSULTATION**

In accordance with the Notification No. S.O. 1533, Dt.14-09-2006 of the Ministry of Environment & Forests, Government of India, A.P.Pollution Control Board hereby notifies an Environmental Public consultation on the proposed to establish 5.0 MTPA Integrated Cement clinkerisation plant, 8.0 MTPA Cement Grinding unit and 100 MW Captive power plant by **M/s. ACC Limited** located at Gollapalli, Vaddarala & G.Uppalapadu villages, Mylavaram Mandal of YSR District. The details of the project activities are given by the proponent are as follows:

| | |
|---|---|
| 1. Name of the company with Address & Phone Number | **M/s. ACC Limited,** Connaught Place, 313 Bund Garden Road, Pune, Maharashtra - 411001. Ph: (022) 25837379 Email: narayanarao.kapilavai@acclimited.com |
| 2. Location of the proposed project with extent. | Gollapalli, Vaddarala and G.Uppalapadu villages, Mylavaram Mandal of YSR District Extent - 275.028 ha |
| 3. Name of the Authorised person to be contacted with address and Telephone No. | **Sri. C.V.G. Murali Krishna,** M/s. ACC Limited located at Gollapalli village, Mylavaram Mandal of YSR District. Ph: 9480686416 Email: chowadam.muralikrishna@acclimited.com |
| 4. Capital cost of the Proposed project | Rs.7100 Crores (phased manner) |
| 5. Line of Activity with Capacity | 5.0 MTPA Integrated Cement clinkerisation plant, 8.0 MTPA Cement Grinding unit and 100 MW Captive power plant |
| 6. Date, Time & Venue of the Public Hearing | **Date : 20.10.2016, Time : 10.30 am**<br>**Venue : Near proposed project site,** near Gollapalli village, Mylavaram Mandal of YSR District |

7. Place(s) at which executive summary & REIA report of the project are made available for the general Public

a) Office of the Collector & District Magistrate, Kadapa, YSR District.
b) Office of the Chief Executive Officer, Zilla Parishad, Kadapa, YSR District.
c) Office of the General Manager, District Industries Centre, Kadapa, YSR District.
d) Office of the Revenue Divisional Officer, Jammalamadugu, YSR District.
e) Office of the Regional Office (Southern Zone), GOI, MoE&F, Kendriya Sadan, IV floor, Environment & Forest Wing, Koramangala, Bangalore-34.
f) Office of the A.P.Pollution Control Board, Board Office, Sanath Nagar, Hyderabad.
g) Office of the A.P.Pollution Control Board, Zonal Office, Near Krishna Nagar Rly Gate, Kurnool.
h) A.P.Pollution Control Board, Regional Office, N.T.Road, Tirupati.
i) Office of the Tahsildar, Mylavaram Mandal, YSR District.
j) Office of the MPDO, Mylavaram Mandal, YSR District.
k) Office of the Gollapalli Gram Panchayath, Mylavaram Mandal, YSR District.
l) Office of the Vaddarala Gram Panchayath, Mylavaram Mandal, YSR District.
m) Office of the G.Uppalapadu Gram Panchayath, Mylavaram Mandal, YSR District.

Concerns of the local affected persons, and all the other concerned persons (as defined at Serial No.7 (II (ii) a and b of MoE&F Notification No.S.O.1533 dated 14.09.2006) having a plausible stake in the Environmental aspects of the proposed activity are invited within 30 days from the date of publication of this Notification. All the above persons can make written responses to the undersigned Officer of A.P. Pollution Control Board. All these persons can also participate in the Environmental Public Consultation on the date and at the venue mentioned above.

Place : Tirupati
Date : 19.09.2016

Sd/- Environmental Engineer,
A.P.Pollution Control Board, Regional Office, Tirupati.

**Advertisement Published in English "The Indian Express""**
**Dated: 19th Sept., 2016.**

## 7.2.3 Photographs of Public Hearing

### 7.2.4 Action Plan and issues raised during public hearing

***Table - 7.1(a)***
***Issues / Points / Opinions of Local Public raised verbally during the Public Hearing***

| S. No. | Name of the Person | Issues / Points / Opinions of Local Public | Reply by Project Proponent (During and After Public Hearing) | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| ***I.*** | ***Employment*** | | | |
| 1. | Sri V. Narasimhulu r/o. Gollpalli village, MPTC | ▪ Provide job opportunities to the local people according to the qualification.<br>▪ Establish skill development institute to train the unskilled/ agriculture labour for getting suitable jobs. | ▪ The proposed project will provide employment to about 499 persons during operation phase and to about 2400 persons during construction phase.<br>▪ The company will provide jobs to the land losers / their children on top priority based on qualification, if not, by skill development programme.<br>▪ ACC will establish DISHA Skill Development Centre (which is common for both plant and mine) to facilitate employability training under its skill development initiative (i.e. ACC DISHA initiative) and enhance their skill for employability and placement elsewhere. | ▪ The total manpower requirement (regular) during operation phase for the proposed project is 499 persons; and during construction phase, about 70 persons will be employed.<br>▪ In addition to this, approx. employment for 2330 persons will be generated for various contract labour work and approx. 500 persons will be benefited with indirect employment i.e. Transport business, vehicle drivers and attendants, repair workshops, grocery and retail stores, school, coaching centers, restaurants, self-employed persons like tailors, carpenters, plumbers, electricians, etc.<br>▪ ACC has allocated Rs. 35.5 Crore for establishment of DISHA Skill Development Centre. |
| 2. | Sri Surya Peddi Raju, r/o Voddiralla village | Requested written commitment on the job opportunities to the local public. | | |
| 3. | Sri. D.L. Gangi Reddy r/o Gollapalli | Requested the management to fulfil the promises made during land alienation in the year 1996 viz., providing of jobs. | | |
| 4. | Sri D. Venkata Subbaiah r/o Gollapalli | Requested the management to provide good no. of jobs to local people. | | |
| 5. | Sri. I.J. Pushparaj r/o Vaddira | | | |
| 6. | Sri N. Venkata Krishnaiah r/o Uppalapadu | Demanded from the management to give a written assurance for providing 500 nos of jobs | M/s. ACC Limited is a law-abiding Corporate that has existed for more than 80 years with a track record of compliance. ACC is fully committed to all the commitments given in response to queries raised during Public Hearing. | |
| ***II.*** | ***Environment Pollution*** | | | |

| S. No. | Name of the Person | Issues / Points / Opinions of Local Public | Reply by Project Proponent (During and After Public Hearing) | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| 1. | Sri V. Narasimhulu R/o. Gollpalli village, MPTC | Requested the management to take utmost care with regard to safe guarding the surrounding environment by adopting latest technology and installation of latest pollution control systems. | ▪ The company will install efficient pollution control equipment of latest available technology to control emissions within the stipulated standards.<br>▪ Installation of online monitoring system and uploading of the data to Central Pollution Control Board (CPCB) as well as State Pollution Control Boards (SPCB) will also be done.<br>▪ Bag filters will be provided at all material transfer points to control fugitive emissions; and will provide covered storage facilities within the proposed plant premises.<br>▪ Water sprinkling will be done to control dust emissions.<br>▪ Greenbelt will be developed in ~42.65% of the total plant area to arrest dust.<br>▪ The company will also adopt mass transportation and rail network to reduce the traffic and dust nuisance due to the movement of vehicles.<br>▪ The waste water generated from coal-based power plant will be utilized for dust suppression after treatment in neutralization pit. The company will maintain ZLD concept. | Company has earmarked an amount of Rs. 698 Crores as capital cost and Rs. 14.0 Crores/annum as recurring cost for Environment Protection measures; out of which,<br>▪ Rs. 559 Crores will be spent on air pollution control technologies as capital cost and Rs. 6.2 Crores/annum as recurring cost.<br>▪ Rs. 63 Crores will be spent on water pollution control technologies as capital cost and Rs. 2.3 Crores/annum as recurring cost.<br>▪ Rs. 13.9 Crores will be spent on greenbelt development as capital cost and Rs. 1.27 Crores/annum as recurring cost. |
| 2. | Sri. Mohammad r/o Chinna Vedurla | Expressed his concern regarding:<br>▪ Huge quantity of waste water generation from coal-based power plant<br>▪ Air pollution caused due to vehicle movement and it may cross the stipulated standards thereby causing dust nuisance on the surroundings. | | |
| 3. | Sri N. Venkata Krishnaiah r/o Uppalapadu | Demanded the management with a written assurance regarding zero pollution. | M/s. ACC Limited is a law-abiding Corporate that has existed for more than 80 years with a track | |

| S. No. | Name of the Person | Issues / Points / Opinions of Local Public | Reply by Project Proponent (During and After Public Hearing) | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| | | | record of compliance. ACC is fully committed to all the commitments given in response to queries raised during Public Hearing. | |
| 4. | Sri D. Venkata Subbaiah r/o Gollapalli | Requested to carry out the blasting operations without causing any nuisance to the surrounding agriculture lands. | The point is not related to proposed project proposal. The mining proposal is separate.<br>However, ACC will adopt all the preventive measures for control of pollution such as controlled blasting by NONEL technology, no secondary blasting etc. | - |
| 5. | Sri H. Madhu Babu, Environmental Activist | Stressed the importance on the sustainable development without causing any damage to the surrounding environment. | ACC noted and welcomed the suggestion and committed for sustainable development. | - |
| ***III.*** | ***Socio-Economic development*** | | | |
| 1. | Sri V. Narasimhulu R/o. Gollpalli village, MPTC | Establish corporate level educational facilities, hospitals etc. as they have incurred huge losses in last 20 years. | M/s. ACC Limited will improve the quality of education under ACC Vidya Utkarsh initiative. Medical facilities will be extended to all the nearby communities through ACC Plant hospital. | ▪ ACC has allocated Rs. 106.5 Crores for improving Quality of Education under ACC vidya Utkarsh initiative. |
| 2. | Sri Surya Peddi Raju, r/o Voddiralla village | Farmer's issues/demands should address with the CSR funds. | ACC requested the surrounding villagers to form a community advisory panel, according to the panel priorities/ choices, the CSR amounts will be spent on surrounding villages. | - |
| 3. | Sri. D.L. Gangi Reddy r/o Gollapalli | Requested the management to fulfil the promises made during land alienation in the year 1996 viz., village development, provide health and education facilities to the surrounding villages. | ▪ The company will take various initiatives for the development of the villages.<br>▪ M/s. ACC Limited will improve the quality of education under ACC Vidya Utkarsh initiative.<br>▪ Medical facilities will be extended to all the nearby communities through ACC Plant | ▪ ACC will spend Rs. 355 Crores for development of the surrounding villages. ACC has allocated Rs. 106.5 Crores for improving Quality of Education under ACC vidya Utkarsh initiative. |
| 4. | Sri. I.J. Pushparaj r/o Vaddira | Requested the management to provide education & health facilities to the local people. | | |

| S. No. | Name of the Person | Issues / Points / Opinions of Local Public | Reply by Project Proponent (During and After Public Hearing) | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| 5. | Sri. Lakshamaiah r/o Besta Vemula | Requested the management to work out on the possibilities of spending CSR amounts on education of the children hailing surrounding villages. | hospital. | |
| 6. | Smt. S.Gangamma, r/o Vaddiralla | Requested the management to help surrounding villages for all round development. | ▪ The company will take various initiatives for the development of the villages.<br>▪ Also, efforts will be made by ACC for all round development of the surrounding villages. | ▪ ACC will spend Rs. 355 Crores for development of the surrounding villages. |
| 7. | Sri Kota Venkata Subba Reddy r/o China Vedurla | Provide training for sheep farming. | ACC will provide training for sheep farming in proposed DISHA Skill Development Centre. | ACC has allocated Rs. 35.5 Crore for establishment of DISHA Skill Development Centre. |
| ***V.*** | ***Health*** | | | |
| 1. | Sri H. Madhu Babu, Environmental Activist | Health study could have been conducted by the project consultant. | Medical facilities will be extended to all the nearby communities through ACC Plant hospital. The management has also proposed to conduct Health audit of the employers of the industry and also of the surrounding villagers. | - |
| ***VI.*** | ***Land*** | | | |
| 1. | Sri V. Narasimhulu R/o. Gollpalli village, MPTC | Provide compensation to the surrounding farmers (land losers); as they have incurred huge losses in last 20 years. | The PP agreed to pay compensation to the house losers on par with the market<br>ACC informed during public hearing that, the main demand of the surrounding farmers i.e additional compensation to the land losers will be discussed in the ensuring board meeting (M/s ACC cement ltd) and he expressed his belief for finding out amicable solution in the interest of surrounding farmers within 3 months. | ACC proposes the following additional financial support under rehabilitation package to the land owners of 187 families (covering 195 ha area purchased till date and similar additional financial support under rehabilitation package will be extended to the families of balance 80.028 ha of plant area):<br>• Option 1: One time compensation of Rs. |
| 2. | Sri Surya Peddi Raju, r/o Voddiralla village | Compensation should be made to the farmers (land losers) as per demand; as huge losses were occurred to the surrounding farmers for the last 20 years. | | |
| 3. | A. Chandra Sekhar Reddy r/o Gollapalli | Requested the management to make necessary compensation to the re-habitated people; as no | | |

| S. No. | Name of the Person | Issues / Points / Opinions of Local Public | Reply by Project Proponent (During and After Public Hearing) | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| | | compensation was made by the Govt. | ***Action Plan is given in this table (Action Plan with Budgetary Allocation)*** | 1.5 lakhs/acre (on pro rata basis) to the land owners owning the land in the plant area of 187.1 ha.<br>**OR**<br>• Option 2: One time compensation of Rs.1.5 Lakhs/acre (on pro rata basis) to the land owners (owning land in the plant area) bifurcated into 60 instalments (with annual correction as per the prevailing price index rate) and provided in the form of Monthly Income Scheme (MIS). A MIS would help to ensure financial discipline and better usage of compensation money.<br>**OR**<br>• Option 3: ACC shall facilitate to provide suitable job to one member of the family either in the mines or in the proposed cement/power plant based on the qualification and skill possessed by the candidate from project affected family. Since the proposed project is a state of art project, there will be limited opportunity for the direct employment in the company operations at the location<br>Note: Project affected families which opt for financial rehabilitation package (option |
| 4. | Sri Kota Venkata Subba Reddy r/o China Vedurla | Requested the management:<br>▪ To pay the additional compensation to the surrounding farmers.<br>▪ For utilization of acquired land for agriculture purpose till the construction activities take place. | | |
| 5. | Sri. I.J. Pushparaj r/o Vaddira | Demanded the management to come out of appropriate decision on the compensation to the land losers. | | |
| 6. | Sri N. Venkata Krishnaiah r/o Uppalapadu | Demanded the management with a written assurance for providing compensation to house losers at Gollapalli. | | |

| S. No. | Name of the Person | Issues / Points / Opinions of Local Public | Reply by Project Proponent (During and After Public Hearing) | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| | | | | 1& 2) will not be eligible for employment option (option 3).<br>• In the past, ACC has paid compensation to G. Uppalapadu village people for the houses after verifying clear land titles as per Govt records based on the rates prescribed by the Hon'ble District Collector of Andhra Pradesh. |
| ***VII.*** | ***Water*** | | | |
| 1. | Sri. Mohammad r/o Chinna Vedurla | Expressed his worries regarding withdrawing the huge quantity of 7700 $m^3$ of water per day for industrial applications which may cause depletion of water in surrounding area. | The company will take up groundwater development programmes (rain water harvesting, water shed development etc.) in a big way to increase the ground water table of the surrounding area. | - |
| ***VIII.*** | ***Others*** | | | |
| 1. | Sri. S. Sreenivasa Reddy r/o Gollapalli | Requested the management to solve the demands of surrounding farmers as they have given their irrigated lands to the proposed industry with great hope. | ACC appreciated and welcomed the support of the villagers for setting up the project and assured that the issue will be considered and the company will work accordingly. | - |
| 2. | Sri H. Madhu Babu, Environmental Activist | Requested the management to solve the issues of local farmers on top priority. | | |

***Table - 7.1 (b)***

***Issues / Points / Opinions of Local Public raised by written representations in detail***

| S. No. | Name of the Person | Issues / Points / Opinions of Local Public | Reply by Project Proponent (During and After Public Hearing) | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| **A** | ***Employment*** | | | |
| 1 | Farmers of Mylavaram Mandal from Chinnaventurla Village | Employment should be provided to those who have lost their land, including educational opportunities for the uneducated. | • The proposed project will provide employment to about 499 persons during operation phase and to about 2400 persons during construction phase.<br>• The company will provide jobs to the land losers / their children on top priority based on qualification, if not, by skill development programme.<br>• ACC will establish DISHA Skill Development Centre to facilitate employability training under its skill development initiative (i.e. ACC DISHA initiative) and enhance their skill for employability and placement elsewhere. | ▪ The total manpower requirement (regular) during operation phase for the proposed project is 499 persons; and during construction phase, about 70 persons will be employed.<br>▪ In addition to this, approx. employment for 2330 persons will be generated for various contract labour work and approx. 500 persons will be benefited with indirect employment i.e. Transport business, vehicle drivers and attendants, repair workshops, grocery and retail stores, school, coaching centers, restaurants, self-employed persons like tailors, carpenters, plumbers, electricians, etc.<br>ACC has allocated Rs. 35.5 Crore for establishment of DISHA Skill Development Centre. |
| 2 | Chaitanya Yuvasangam, P. Chantrapthi, K. Umakanth, M. Murali Krishna, P. Laxminarayana | If the factory is built employment opportunities will arise, particularly for youth. | | |
| 3 | Farmers of Chinna Venturla village of Myalavaram Mandal, Kadapa | • Locals who have lost their land should be given priority for contract work and vehicle operations<br>• Employment opportunities should be provided to the landless and middle-aged individual of our community. | | |
| 4 | All Affected Villagers | • Farmers who lost their land should be employed in the construction of the factory from the beginning until completion.<br>• Permanent jobs should be provided for every farmer's family including unskilled labourers. | | |
| 5 | Residents of Mylavaram Mandal and Vaddirala villagers | Urged to provide job opportunities for children of farmers in our area to help improve their livelihoods | | |
| 6 | Farmers of Kallutla Village of Myalavaram Mandal | • ACC management must provide a written guarantee that jobs will be offered to farmers as soon as the demands are met and the factory is | M/s. ACC Limited is a law-abiding Corporate that has existed for more than 80 years with a track record of compliance. ACC is fully committed to all | |

| S. No. | Name of the Person | Issues / Points / Opinions of Local Public | Reply by Project Proponent (During and After Public Hearing) | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| | | constructed.<br>• At the time of purchase, it was promised that jobs will be provided to those who gave up their fields for the factory. | the commitments given in response to queries raised during public hearing. | |
| ***B*** | ***Environment Pollution*** | | | |
| 1 | ACC Land Victim farmers of Vaddirala, Gollapalle, G. Uppalapadu, Chinnavengurla, Bestavemula, Jangalapalle, Myalavaram Mandal, YSR District | • Establishment of green buffers through tree planting before construction to mitigate dust and air pollution.<br>• Stringent measures to control noise and air pollution, along with written guarantees of these measures. | • Greenbelt will be developed in ~42.65% of the total plant area to arrest dust.<br>• M/s. ACC Limited is a law-abiding Corporate that has existed for more than 80 years with a track record of compliance. ACC is fully committed to all the commitments given in response to queries raised during Public Hearing. | Company has earmarked an amount of Rs. 698 Crores as capital cost and Rs. 14.0 Crores/annum as recurring cost for Environment Protection measures; out of which,<br>▪ Rs. 559 Crores will be spent on air pollution control technologies as capital cost and Rs. 6.2 Crores/annum as recurring cost.<br>▪ Rs. 63 Crores will be spent on water pollution control technologies as capital cost and Rs. 2.3 Crores/annum as recurring cost.<br>Rs. 13.9 Crores will be spent on greenbelt development as capital cost and Rs. 1.27 Crores/annum as recurring cost. |
| 2 | All Affected Villagers | ACC should implement control measures during construction, and before the factory opens, they should plant trees to prevent environmental pollution | Greenbelt will be developed in ~42.65% of the total plant area to arrest dust. | |
| 3 | Prajabhi praya Sekharana | Cement plants are among the most polluting industries. This plant creates a situation where we have to live with polluted air. What is your response regarding the financial implications driven by a profit - oriented industry? | ▪ The company will install efficient pollution control equipment of latest available technology to control emissions within the stipulated standards.<br>▪ Installation of online monitoring system and uploading of the data to Central Pollution Control Board (CPCB) as well as State | |
| 4 | Prajabhi praya Sekharana | • The nitric oxide concentration in power plant emissions is listed as 350 mg/ cubic meter. On what | | |

| S. No. | Name of the Person | Issues / Points / Opinions of Local Public | Reply by Project Proponent (During and After Public Hearing) | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| | | criteria was this figure determined?<br>• The figures given on the increase in air pollution are suspicious and unreliable.<br>• There is dust due to vehicular traffic, how do air conditioning units protect our air from toxins?<br>• The pollution control Board is promoting the incineration of hazardous chemical waste in rotary kilns If this continues the level of loss will increase. | Pollution Control Boards (SPCB) will also be done.<br>▪ Bag filters will be provided at all material transfer points to control fugitive emissions; and will provide covered storage facilities within the proposed plant premises.<br>▪ Water sprinkling will be done to control dust emissions.<br>▪ Greenbelt will be developed in ~42.65% of the total plant area to arrest dust.<br>▪ The company will also adopt mass transportation and rail network to reduce the traffic and dust nuisance due to the movement of vehicles.<br>The waste water generated from coal-based power plant will be utilized for dust suppression after treatment in neutralization pit. The company will maintain ZLD concept. | |
| 5 | Farmers of Kallutla village of Myalavaram | The air pollution meeting should only be held after addressing the issues of land dwellers | ACC noted and welcomed the suggestion | - |
| **C** | ***Socio-Economic development*** | | | |
| 1 | ACC Land Victim farmers of Vaddirala, Gollapalle, G. Uppalapadu, Chinnavengurla, Bestavemula, Jangalapalle, Myalavaram | We Seek investments in local infrastructure, including water and health facilities, to support communities | ▪ The company will take various initiatives for the development of the villages.<br>▪ M/s. ACC Limited will improve the health facility of the villages under ACC Arogyam initiative. | ACC will spend Rs. 355 Crores for development of the surrounding villages. The company has allocated Rs. 17.75 Crores for enhancement of health and wellbeing |

| S. No. | Name of the Person | Issues / Points / Opinions of Local Public | Reply by Project Proponent (During and After Public Hearing) | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| | Mandal, YSR District | | ▪ Medical facilities will be extended to all the nearby communities through ACC Plant hospital.<br>▪ M/s. ACC Limited will improve the quality of education under ACC Vidya Utkarsh initiative. | |
| 2 | Farmers of Chinnaventurla of Mylavaram Mandal | Financial assistance for education, medical care and initiatives such as dairy and cow rearing for women should be offered. | | ACC has allocated Rs. 106.5 Crores for improvement the quality of education. |
| 3 | Chaitanya Yuvasangam, P. Chantrapthi, K. Umakanth, M. Murali Krishna, P. Laxminarayana | • Initiatives such as "Driving License" program and the Women's Association are already making strides in this direction and should continue to be supported.<br>• We request improvements in village infrastructure, including the installation of streetlight and better roads. Access to basic amenities and well – maintained infrastructure is crucial for the development of our community. | ACC will provide training in proposed DISHA Skill Development Centre. | ACC has allocated Rs. 35.5 Crore for establishment of DISHA Skill Development Centre. |
| 4 | All Affected Villagers | • Infrastructural facilities such as education, healthcare, water, electricity, and sanitation should be provided free of charge.<br>• Cement roads, drainage systems and mineral water plants should be established in every village.<br>• New temples should be built in Unalapadu villages along with all necessary infrastructure. | ▪ The company will take various initiatives for the development of the villages.<br>▪ M/s. ACC Limited will improve the health facility of the villages under ACC Arogyam initiative.<br>▪ Medical facilities will be extended to all the nearby communities through ACC Plant hospital.<br>▪ M/s. ACC Limited will improve the quality of education under ACC Vidya Utkarsh initiative. | • ACC will spend Rs. 355 Crores for development of the surrounding villages. The company has allocated Rs. 17.75 Crores for enhancement of health and wellbeing.<br>• ACC has allocated Rs. 106.5 Crores for improvement the quality of education. |
| 5 | Residents of Mylavaram Mandal and Vaddirala | We request that support provided to those who are losing their land, particularly in area such as | • The company will take various initiatives for the development of the villages. | ACC will spend Rs. 355 Crores for development of the surrounding |

| S. No. | Name of the Person | Issues / Points / Opinions of Local Public | Reply by Project Proponent (During and After Public Hearing) | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| | villagers | education, healthcare, and other essential services. | | villages. |
| 6 | Farmers of Kallutala Village | Proposes the following facilities to be funded through CSR:<br>• Construction of roads<br>• Development of freshwater and drainage systems<br>• Installation of a proper sewage system<br>• Establishment of community welfare posts | ACC requested the surrounding villagers to form a community advisory panel, according to the panel priorities/ choices, the CSR amounts will be spent on surrounding villages. | - |
| 7 | Villagers of Gollapalle | We request your assistance in providing medical and educational support to the children of the farmers who have faced financial drain. | | |
| ***D*** | ***Health*** | | | |
| 1 | ACC Land Victim farmers of Vaddirala, Gollapalle, G. Uppalapadu, Chinnavengurla, Bestavemula, Jangalapalle, Myalavaram Mandal, YSR District | Free medical care should be made available for those suffering health issues due to pollution. | Medical facilities will be extended to all the nearby communities through ACC Plant hospital. The management has also proposed to conduct Health audit of the employers of the industry and also of the surrounding villagers. | - |
| 2 | All affected Villagers | Medicine to the children of villages who have lost their lands | | |
| ***E*** | ***Land*** | | | |
| 1 | ACC Land Victim farmers of Vaddirala, Gollapalle, G. Uppalapadu, Chinnavengurla, | • Insisted that if any drilling or blasting occurs, proper compensation for damages to our homes be provided as per current rates.<br>• Every farmer who has lost their land deserves | The PP agreed to pay compensation to the house losers on par with the market<br>ACC informed during public hearing that, the main demand of the surrounding farmers i.e additional | ACC proposes the following additional financial support under rehabilitation package to the land owners of 187 families (covering 195 ha area purchased till date |

| S. No. | Name of the Person | Issues / Points / Opinions of Local Public | Reply by Project Proponent (During and After Public Hearing) | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| | Bestavemula, Jangalapalle, Myalavaram Mandal, YSR District | compensation according to current rates for each acre lost.<br>• We Urge that an environmental referendum be conducted after meaningful discussions with the affected farmers who have lost their land to ACC Limited. | compensation to the land losers will be discussed in the ensuring board meeting (M/s ACC cement ltd) and he expressed his belief for finding out amicable solution in the interest of surrounding farmers within 3 months.<br><br>***Action Plan is given in this table (Action Plan with Budgetary Allocation)*** | and similar additional financial support under rehabilitation package will be extended to the families of balance 80.028 ha of plant area):<br>• Option 1: One time compensation of Rs. 1.5 lakhs/acre (on pro rata basis) to the land owners owning the land in the plant area of 187.1 ha.<br>**OR**<br>• Option 2: One time compensation of Rs.1.5 Lakhs/acre (on pro rata basis) to the land owners (owning land in the plant area) bifurcated into 60 instalments (with annual correction as per the prevailing price index rate) and provided in the form of Monthly Income Scheme (MIS). A MIS would help to ensure financial discipline and better usage of compensation money.<br>**OR**<br>• Option 3: ACC shall facilitate to provide suitable job to one member of the family either in the mines or in the proposed cement/power plant based on the qualification and skill possessed by the candidate from project affected family. Since the proposed project is a |
| 2 | Farmers of Mylavaram Mandal from Chinnaventurla Village | • Farmers should be provided an opportunity to cultivate the land purchased by the factory initially.<br>• It should be ensured that there is no damage to houses and surrounding areas due to mining activities.<br>• A compensation amount of Rs 50,000/- and Rs 1,25,000/- should be provided at the rate of Rs 4,00,000/- per acre.<br>• Urged the elders to ensure that land is purchased upto the tarred road with the price of Rs. 1500000/ per acre.<br>• Vehicles and machinery, as well as contract work, should be allocated to local residents who have lost their land. | | |
| 3 | Farmers of Chinna Venturla village of Myalavaram Mandal, Kadapa | • Land should be purchased upto Betha Vemula road (above the palavagu)<br>• Compensation of Rs 50,000 and Rs 1,25,000 should be provided for the loss of land at the rate of Rs 4,00,300 per acre.<br>• Until the factory is operational, we request that the land we have sold be utilized for cultivation | | |

| S. No. | Name of the Person | Issues / Points / Opinions of Local Public | Reply by Project Proponent (During and After Public Hearing) | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| 4 | All Affected Villagers | • Compensation for every house surveyed by R&B in Gollapalle village in 2010, at prevailing rates.<br>• Compensation for land displaced persons of Vaddirala, Gollapalle, Uppalapadu, Bestavemula and janganapalle villages as per existing rates.<br>• Construction of the factory should commence as promised within the limits of the village panchayat where the land was acquired.<br>• Acc. To the land acquisition Act of 2013 30% of the company's production benefits should be allocated to the displaced farmers.<br>• Air pollution meetings should be held only after resolving the issues of the land dwellers.<br>• Surplus land next to those purchased by A.C.C before the construction of the factory and the lands within the factory area should be acquired at current market rates. | | state of art project, there will be limited opportunity for the direct employment in the company operations at the location<br>Note: Project affected families which opt for financial rehabilitation package (option 1& 2) will not be eligible for employment option (option 3).<br>• In the past, ACC has paid compensation to G. Uppalapadu village people for the houses after verifying clear land titles as per Govt records based on the rates prescribed by the Hon'ble District Collector of Andhra Pradesh. |
| 5 | Farmers from Kallutala Village | We request transparency regarding the use of land given for establishment of the factory. | | |
| ***F*** | ***Education*** | | | |
| **1** | All Affected Villagers | Educational institute should be setup in our area to provide free education for higher studies such as B. Tech. | M/s. ACC Limited will improve the quality of education under ACC Vidya Utkarsh initiative. | ACC has allocated Rs. 106.5 Crores for improving Quality of Education under ACC vidya Utkarsh initiative. |
| **G** | ***Water*** | | | |
| 1 | Prajabhi praya Sekharana | • This is a rain fed area, and we have relied on groundwater for generations. If you take away our | The company will take up groundwater development programmes (rain water harvesting, | - |

| S. No. | Name of the Person | Issues / Points / Opinions of Local Public | Reply by Project Proponent (During and After Public Hearing) | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| | | common resource, how will it be protected? Will we have to sacrifice our right to live and thrive for the sake of exploiting our natural resources?<br>What is the basis for this requirement? Please explain why this high volume of water is needed. | water shed development etc.) in a big way to increase the ground water table of the surrounding area. | |
| ***H*** | ***Others*** | | | |
| 1 | ACC Land Victim farmers of Vaddirala, Gollapalle, G. Uppalapadu, Chinnavengurla, Bestavemula, Jangalapalle, Myalavaram Mandal, YSR District | We Request regular updates and open communication regarding the factory's status and expected timeline for development. | ACC will always available for communication and Plant will be establish after necessary clearance. | - |
| 2 | Farmers from Chinnaventurla of Mylavaram Mandal | • The ACC cement factory should be constructed with care to fulfil the needs and wishes of the community.<br>• Welcome the establishment of the ACC factory and have no objections to its timely construction. | The PP agreed to pay compensation to the house losers on par with the market<br>ACC informed during public hearing that, the main demand of the surrounding farmers i.e additional compensation to the land losers will be discussed in the ensuring board meeting (M/s ACC cement ltd) and he expressed his belief for finding out amicable solution in the interest of surrounding farmers within 3 months.<br><br>Action Plan is given in this table (Action Plan with Budgetary Allocation) | *ACC proposes the following additional financial support under rehabilitation package to the land owners of 187 families (covering 195 ha area purchased till date and similar additional financial support under rehabilitation package will be extended to the families of balance 80.028 ha of plant area):*<br>• *Option 1: One time compensation of Rs. 1.5 lakhs/acre (on pro rata basis) to the land owners owning the land in the plant area of 187.1 ha.*<br>*OR*<br>*Option 2: One time compensation of Rs.1.5* |

| S. No. | Name of the Person | Issues / Points / Opinions of Local Public | Reply by Project Proponent (During and After Public Hearing) | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| | | | | *Lakhs/acre (on pro rata basis) to the land owners (owning land in the plant area) bifurcated into 60 instalments (with annual correction as per the prevailing price index rate) and provided in the form of Monthly Income Scheme (MIS). A MIS would help to ensure financial discipline and better usage of compensation money.*<br>*OR*<br>*Option 3: ACC shall facilitate to provide suitable job to one member of the family either in the mines or in the proposed cement/power plant based on the qualification and skill possessed by the candidate from project affected family. Since the proposed project is a state of art project, there will be limited opportunity for the direct employment in the company operations at the location*<br>*Note: Project affected families which opt for financial rehabilitation package (option 1& 2) will not be eligible for employment option (option 3).*<br>*In the past, ACC has paid compensation to G. Uppalapadu village people for the houses after verifying clear land titles as per Govt records based on the rates prescribed by the Hon'ble District Collector of Andhra* |

| S. No. | Name of the Person | Issues / Points / Opinions of Local Public | Reply by Project Proponent (During and After Public Hearing) | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| | | | | *Pradesh.* |
| 3 | B. Subbayya Setty, R/o Chinnaventurla village, Mylavaram Mandal | We express our support for the establishment of the ACC cement factory and hope it will fulfil our community's need. | ACC appreciated and welcomed the support of the villagers for setting up the project. | - |
| 4 | G.Baladasu, R/o Bestavemula | | | |
| 5 | Farmers of Chinna Venturla village of Myalavaram Mandal, Kadapa | | | |
| 6 | Villagers of Mylavaram Mandal and the residents of Dannavada | | | |
| 7 | Residents of Mylavaram Mandal and Vaddirala villagers | | | |
| 8 | All Affected Villagers | • Compensation, including bonuses, should be paid to all farmers from 1996 to the present.<br>• ACC should be allowed to quarry only in areas not designated for the factory.<br>• It should be ensured that there is no damage to houses and surrounding areas due to mining activities.<br>• Since, 1996, displaced farmers in all villages who have lost their jobs or jobs due to the non-construction of the factory should receive Rs. | The PP agreed to pay compensation to the house losers on par with the market<br>ACC informed during public hearing that, the main demand of the surrounding farmers i.e additional compensation to the land losers will be discussed in the ensuring board meeting (M/s ACC cement ltd) and he expressed his belief for finding out amicable solution in the interest of surrounding farmers within 3 months. | *ACC proposes the following additional financial support under rehabilitation package to the land owners of 187 families (covering 195 ha area purchased till date and similar additional financial support under rehabilitation package will be extended to the families of balance 80.028 ha of plant area):*<br>*Option 1: One time compensation of Rs. 1.5 lakhs/acre (on pro rata basis) to the land* |

| S. No. | Name of the Person | Issues / Points / Opinions of Local Public | Reply by Project Proponent (During and After Public Hearing) | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| | | 20,000/- in compensation.<br>• Requested that the factory should be built immediately after resolving all the problems of the land dwellers in all villages. | Action Plan is given in this table (Action Plan with Budgetary Allocation) | *owners owning the land in the plant area of 187.1 ha.*<br>*OR*<br>*Option 2: One time compensation of Rs.1.5 Lakhs/acre (on pro rata basis) to the land owners (owning land in the plant area) bifurcated into 60 instalments (with annual correction as per the prevailing price index rate) and provided in the form of Monthly Income Scheme (MIS). A MIS would help to ensure financial discipline and better usage of compensation money.*<br>*OR*<br>*Option 3: ACC shall facilitate to provide suitable job to one member of the family either in the mines or in the proposed cement/power plant based on the qualification and skill possessed by the candidate from project affected family. Since the proposed project is a state of art project, there will be limited opportunity for the direct employment in the company operations at the location*<br>*Note: Project affected families which opt for financial rehabilitation package (option 1& 2) will not be eligible for employment option (option 3).*<br>*In the past, ACC has paid compensation to* |
| 9 | Villagers of Gollapalle | • No compensation has been received by the villagers of Gollapalle<br>• The introduction of the industry has disrupted local agriculture and as a result the land has lost its fertility which has affected the livelihood.<br>• We urgently request to improve our financial situation; it is essential that we receive fair compensation and support for the fertile lands that have been impacted by the industry. | | |

| S. No. | Name of the Person | Issues / Points / Opinions of Local Public | Reply by Project Proponent (During and After Public Hearing) | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| | | | | *G. Uppalapadu village people for the houses after verifying clear land titles as per Govt records based on the rates prescribed by the Hon'ble District Collector of Andhra Pradesh.* |
| 10 | Villagers of Dhannawada, Chinnaventurla, Vaddirala, Bestavemula, Gollapalle, Uppalapadu, Andhra Pradesh | We urge ACC to take appropriate measures and consider our grievances seriously and address the issue impacting our livelihoods. | ACC appreciated and welcomed the support of the villagers for setting up the project and assured that the issue will be considered and the company will work accordingly. | - |
| 11 | Villagers of Vaddirala | We welcome the establishment of the ACC cement factory in our area and have no objection to its construction | ACC appreciated and welcomed the support of the villagers for setting up the project. | - |

***Table - 7.1 (C)***

***Summary of Issues / Points / Opinions of Local Public raised during the Public Hearing***

| S. No. | Issue | Issues / Points / Opinions of Local Public | Reply by Project Proponent | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| 1. | ***Employment*** | • Provide job opportunities to the local people according to the qualification.<br>• Establish skill development institute to train the unskilled/ agriculture labour for getting suitable jobs.<br>• Fulfil the promises made during land alienation in the year 1996 viz., providing of jobs.<br>• Provide good no. of jobs to local people.<br>• Give written committment on the job opportunities to the local public.<br>• Give a written assurance for providing 500 nos of jobs | • The proposed project will provide employment to about 499 persons during operation phase and to about 2400 persons during construction phase.<br>• The company will provide jobs to the land losers / their children on top priority based on qualification, if not, by skill development programme.<br>• ACC will establish DISHA Skill Development Centre (which is common for both plant and | ▪ The total manpower requirement (regular) during operation phase for the proposed project is 499 persons; and during construction phase, about 70 persons will be employed.<br>▪ In addition to this, approx. employment for 2330 persons will be generated for various contract labour work and approx. 500 persons will be benefited with indirect |

| S. No. | Issue | Issues / Points / Opinions of Local Public | Reply by Project Proponent | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| | | • Employment should be provided to those who have lost their land, including educational opportunities for the uneducated.<br>• If the factory is built employment opportunities will arise, particularly for youth. | mine) to facilitate employability training under its skill development initiative (i.e. ACC DISHA initiative) and enhance their skill for employability and placement elsewhere | employment i.e. Transport business, vehicle drivers and attendants, repair workshops, grocery and retail stores, school, coaching centers, restaurants, self-employed persons like tailors, carpenters, plumbers, electricians, etc.<br>• ACC has allocated Rs. 35.5 Crore for establishment of DISHA Skill Development Centre. |
| 2. | ***Environmental Pollution*** | • Adopt latest technology and install latest pollution control systems.<br>• Give written assurance regarding zero pollution<br>• Sustainable development without causing any damage to the surrounding environment.<br>• Establishment of green buffers through tree planting before construction to mitigate dust and air pollution.<br>• ACC should implement control measures during construction, and before the factory opens, they should plant trees to prevent environmental pollution.<br>• Cement plants are among the most polluting industries. This plant creates a situation where we have to live with polluted air. What is your response regarding the financial implications driven by a profit - oriented industry?<br>• The air pollution meeting should only be held after addressing the issues of land dwellers | • The company will install efficient pollution control equipment of latest available technology to control emissions within the stipulated standards.<br>• M/s. ACC Limited is a law-abiding Corporate that has existed for more than 80 years with a track record of compliance. ACC is fully committed to all the commitments given in response to queries raised during Public Hearing.<br>• Greenbelt will be developed in ~42.65% of the total plant area to arrest dust | Company has earmarked an amount of Rs. 698 Crores as capital cost and Rs. 14.0 Crores/annum as recurring cost for Environment Protection measures; out of which,<br>▪ Rs. 559 Crores will be spent on air pollution control technologies as capital cost and Rs. 6.2 Crores/annum as recurring cost.<br>▪ Rs. 63 Crores will be spent on water pollution control technologies as capital cost and Rs. 2.3 Crores/annum as recurring cost.<br>▪ Rs. 13.9 Crores will be spent on greenbelt development as capital cost and Rs. 1.27 Crores/annum as recurring cost. |
| 3. | ***Socio-Economic*** | • Establish corporate level educational facilities, hospitals | • Medical facilities will be extended to all the nearby communities through ACC Plant | • ACC has allocated Rs. 106.5 Crores for |

| S. No. | Issue | Issues / Points / Opinions of Local Public | Reply by Project Proponent | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| | ***Development*** | etc. as they have incurred huge losses in last 20 years.<br>• Farmer's issues/demands should address with the CSR funds.<br>• Fulfil the promises made during land alienation in the year 1996 viz., village development, provide health and education facilities to the surrounding villages.<br>• Provide education & health facilities to the local people.<br>• Spend CSR amounts on education of the children hailing surrounding villages.<br>• Help surrounding villages for all round development<br>• Provide training for sheep farming.<br>• We Seek investments in local infrastructure, including water and health facilities, to support communities | hospital.<br>• The company will take various initiatives for the development of the villages.<br>• M/s. ACC Limited will improve the quality of education under ACC Vidya Utkarsh initiative.<br>• Medical facilities will be extended to all the nearby communities through ACC Plant hospital.<br>• ACC will provide training for sheep farming in proposed DISHA Skill Development Centre. | improving Quality of Education under ACC vidya Utkarsh initiative.<br>• The company has allocated Rs. 355 Crore for development of the surrounding villages.<br>• ACC has allocated Rs. 35.5 Crore for establishment of DISHA Skill Development Centre. |
| 4. | ***Health*** | • Health study could have been conducted by the project consultant | Medical facilities will be extended to all the nearby communities through ACC Plant hospital. The management has also proposed to conduct Health audit of the employers of the industry and also of the surrounding villagers. | - |
| 5. | ***Land*** | • Provide compensation to the surrounding farmers (land losers).<br>• Insisted that if any drilling or blasting occurs, proper compensation for damages to our homes be provided as per current rates.<br>• Every farmer who has lost their land deserves compensation according to current rates for each acre lost.<br>• We Urge that an environmental referendum be conducted after meaningful discussions with the affected farmers who have lost their land to ACC | The PP agreed to pay compensation to the house losers on par with the market<br>ACC informed during public hearing that, the main demand of the surrounding farmers i.e additional compensation to the land losers will be discussed in the ensuring board meeting (M/s ACC cement ltd) and he expressed his belief for finding out amicable solution in the interest of surrounding farmers within 3 months. | ACC proposes the following additional financial support under rehabilitation package to the land owners of 187 families (covering 195 ha area purchased till date and similar additional financial support under rehabilitation package will be extended to the families of balance 80.028 ha of plant area):<br>• Option 1: One time compensation of Rs. 1.5 lakhs/acre (on pro rata basis) to the land owners owning the land in the plant area of |

| S. No. | Issue | Issues / Points / Opinions of Local Public | Reply by Project Proponent | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| | | Limited.<br>• Compensation for every house surveyed by R&B in Gollapalle village in 2010, at prevailing rates.<br>• Compensation of Rs 50,000 and Rs 1,25,000 should be provided for the loss of land at the rate of Rs 4,00,300 per acre<br>• According to the land acquisition Act of 2013 30% of the company's production benefits should be allocated to the displaced farmers.<br>• Surplus land next to those purchased by ACC before the construction of the factory and the lands within the factory area should be acquired at current market rate | | 187.1 ha.<br>**OR**<br>• Option 2: One time compensation of Rs.1.5 Lakhs/acre (on pro rata basis) to the land owners (owning land in the plant area) bifurcated into 60 instalments (with annual correction as per the prevailing price index rate) and provided in the form of Monthly Income Scheme (MIS). A MIS would help to ensure financial discipline and better usage of compensation money.<br>**OR**<br>• Option 3: ACC shall facilitate to provide suitable job to one member of the family either in the mines or in the proposed cement/power plant based on the qualification and skill possessed by the candidate from project affected family. Since the proposed project is a state of art project, there will be limited opportunity for the direct employment in the company operations at the location<br>Note: Project affected families which opt for financial rehabilitation package (option 1& 2) will not be eligible for employment option (option 3). |
| 6. | ***Water*** | • Depletion of water in surrounding area due to excessive | The company will take up groundwater development programmes (rain water harvesting, | - |

| S. No. | Issue | Issues / Points / Opinions of Local Public | Reply by Project Proponent | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| | | water use by the industry. | water shed development etc.) in a big way to increase the ground water table of the surrounding area. | |
| 7. | ***Others*** | • Solve the demands of surrounding farmers as they have given their irrigated lands to the proposed industry with great hope.<br>• Solve the issues of local farmers on top priority.<br>• We Request regular updates and open communication regarding the factory's status and expected timeline for development. | The issue will be considered and the company will work accordingly.<br>ACC will always available for communication and Plant will be establish after necessary clearance | - |

## 7.3 RISK ASSESSMENT AND DISASTER MANAGEMENT PLAN

### 7.3.1 Risk Assessment & Damage Control

Risk assessment is the determination of quantitative or qualitative value of risk related to a concrete situation and a recognized threat.

Accidental risk involves the occurrence or potential occurrence of some accident consisting of an event or sequence of events resulting into fire, explosion or toxic hazards to human health and environment.

Activities requiring assessment of risk due to occurrence of most probable instances of hazard and incident are both onsite and off-site.

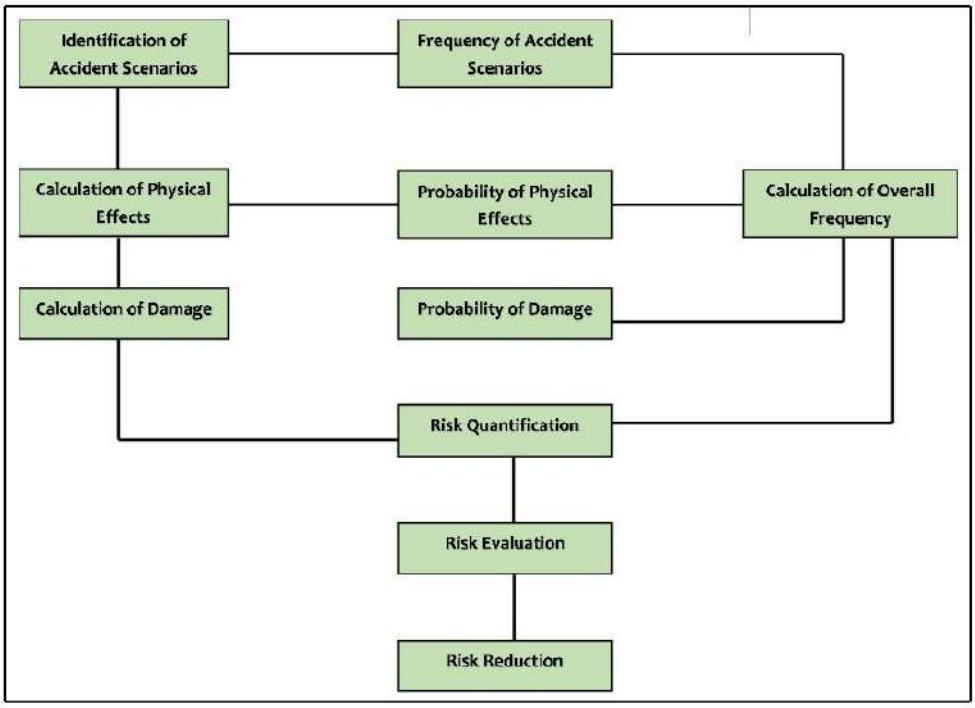



**Figure: 7.1: Risk Analysis Strategy**

### 7.3.2 Hazard Identification & Risk Assessment (HIRA) for Integrated Cement Project

Hazard Identification and Risk Analysis (HIRA) is a collective term that encompasses all activities involved in identifying hazards and evaluating risk at facilities, throughout their life cycle, to make certain that risk to employees, the public, or the environment are consistently controlled within the organization's risk tolerance. These studies typically address three main risk questions to a level of detail commensurate with analysis objectives, life cycle stage, available information and resources. A thorough Hazard Identification and Risk Analysis, or risk system is the core element in the RBPS pillar of understanding hazards and risk. The cement manufacturing industry is labor intensive. Cement industries experiences risk of a number of hazards inherent to the cement production process. The possible area, places, type of likely hazards identified are as under in Table - 7.2.

**Table - 7.2.**

**The possible area, places, type of likely hazards identified**

| ***Department / Location*** | ***Activity*** | ***Hazards / Impact*** |
|---|---|---|
| Mines | Mining | Inundation / Sudden in rush of water |
| Magazine | Storage if Explosive | Fire & Explosion |
| HEMM Workshop | Storage of Diesel, Lubricating oil | Fire & Air Pollution |
| Reclaimer & stacker | Stacker & reclaimer engulfment in pile | Fire |
| Raw Mill | Storage of Raw Mill in silo & operation of ESP | Fire, Collapse, Material spillage and explosion |
| Pre-heater & Kiln | Cleaning of jamming in preheater /kiln inlet | Backfire result in burnt/injuries to working people |
| Kiln girth gear | Use of oil & grease | Fire |
| Coal Mill | Coal grinding and storage of fine coal in coal bins | Fire & explosion in bag filter and material spillage |
| Coal Handling | Stacking of coal in open yard | Fire |
| Belt conveyer | Coal Handling | Fire |
| Clinker Silo | Storage of Clinker | Collapse and Material spillage |
| Compressor house | Operation of compressor | Fire & explosion |
| Pressure Vessels | Storage of Compressor air | Explosion |
| Store & scrap yard | Storage of oil drum, waste oil drums and DA Cylinders | Fire & explosion |
| Electrical | Transformer, MCC / Sub station | Fire & explosion |
| Store | Storage of lubricating oil | Fire |
| Packing plant | Storage of packing bags, Storage of cement in Silos | Fire, Collapse, Material spillage and explosion |
| CPP Boiler | Boiler | Fire and explosion |
| CPP turbine | Turbine Room | Fire and explosion |
| WHRS | WHRS Boiler | Fire and explosion |
| | Turbine | Fire and explosion |

Hazard Identification & Risk Assessment (HIRA) - Cement Manufacturing process -

| Activity/Products/ Services | Hazards | Risk | Location | Severity (5) | Probability of Occurrence (5) | Risk Rating | Control & Influence |
|---|---|---|---|---|---|---|---|
| All Hopper Cleaning | Asphyxiation | Occupational illness needing hospitalized treatment | Raw Mill & Coal Mill | 2 | 2 | 4 | Isolate inlet chute and Use of PPE |
| | Spillage of dust & material | Eye and body injury and requiring Hospitalization. | | 3 | 3 | 9 | Use appropriate PPE's |
| | Huge spillage of material / Silo | Fatal Injury | | 5 | 1 | 5 | Allot trained workmen, Toolbox talk before job, Use of PPE and Follow as per work permit |
| | Injury to hand | Injury Requiring Hospitalization. | | 2 | 4 | 8 | Allot trained workers, Use of PPE and Follow as per work permit |
| | Collapse of material leading to entrap | Fatal Injury | | 5 | 1 | 5 | Allot trained workers, Use of PPE and Follow as per work permit |
| | Sudden Inflow of material | Fatal Injury | | 4 | 1 | 4 | Allot trained workmen, Toolbox talk before job, Use of PPE and Follow as per work permit |
| Cyclone jam | Spillage of Hot meal outside cyclone and puffing of hot air | Injury leading to Permanent disability, Loss of body parts, Burns | Preheater | 4 | 3 | 12 | ○ While opening the pocking hole person shall not stand in front of the pocking hole, SOP to be followed and appropriate PPEs to be used.<br>○ Person should not be in front of hole and no body stand bottom of that area, SOP to be followed and appropriate PPEs to be used.<br>○ Combustible & flammable materials to be removed/protected and firefighting equipment to be available at site. |
| | Hot material falling on persons | Fatal | | 5 | 2 | 10 | 1. Area below jam cyclone floors to be cordoned. 2. Experienced people only allowed for jam removal and SOP to be followed |
| Kiln inlet & Raiser duct Cleaning | Splash of hot material | Injury leading to Permanent disability, Loss of body parts, Burns | | 4 | 2 | 8 | Draught & temperature of system & Process Controls and use of appropriate PPE's |
| | Rebound of hot | Injury leading to | | 3 | 2 | 6 | Draught & temperature of system & Process Controls and use |

| Activity/Products/ Services | Hazards | Risk | Location | Severity (5) | Probability of Occurrence (5) | Risk Rating | Control & Influence |
|---|---|---|---|---|---|---|---|
| | coating pieces | Burns | | | | | appropriate PPE's |
| Cooler Snow man removal | Burn injury | Injury leading to burn & partial disability | Cooler | 4 | 3 | 12 | 1) Maintain the kiln hood draft higher side. 2) Blaster to be switch off & empty out. 3) Use appropriate PPE's. |
| | Water hose hit to the person | Injury leading to Permanent disability, Loss of body parts, Burns | | 5 | 2 | 10 | 1) Keep one person nearer to UT Pump for emergency. 2) All pipe joints to be checked on routine basis. 3) Pressure to be maintained for safe job execution. |
| | Hot material bounce | Injury leading to burn & partial disability | | 4 | 3 | 12 | 1) Use appropriate PPE's. 2) Workmen should not stand in front of poking hole & maintain safe distance. |
| UT pump operation | Damaged or bursting the hoses | Injury leading to Permanent disability, Loss of body parts. | - | 5 | 2 | 10 | 1) Keep one person nearer to UT Pump for emergency. 2) All pipe joints to be checked on routine basis. 3) Pressure to be maintained for safe job execution/ under the capacity. |
| | Water hose hit to the person | Injury leading to Permanent disability, Loss of body parts. | - | 4 | 2 | 8 | 1) Keep one person nearer to UT Pump for emergency. 2) All pipe joints to be checked on routine basis. 3) Pressure to be maintained for safe job execution/ under the capacity. |
| Removal of hot dust material from kiln inlet hot dust area | Flush / Emission of hot material | Injury leading to Permanent disability, Loss of body parts, Burns | - | 5 | 3 | 15 | 1) Inlet slope area coating to be removed. 2) Kiln inlet seal to be checked. 3) Kiln inlet draft to be maintained to higher side. 4) Water Spray to be done on spliied hot material from a safe distance and then remove. 5) Use appropriate PPEs. |
| Scaffolding for process activities (PH Kiln inlet, outlet, kiln hood, cooler) | Dust emission | Injury leading to burn & partial disability | PH, Kiln inlet, outlet, kiln hood & cooler | 4 | 3 | 12 | Inspect all cyclones before entering into kiln/cyclone, if there is any coating then remove the coating. Provide the dummy above the working area. Close Supervision and Monitoring with safety personal. Scaffolding material changed from wood & rope to MS pipe & clamps for avoiding slippage. |
| | Body Injury | Injury leading to permanent disability, Loss of body parts, | | 5 | 3 | 15 | Close all air blasters, vent out the residual air if any. Keep the vent valve open. |

| Activity/Products/ Services | Hazards | Risk | Location | Severity (5) | Probability of Occurrence (5) | Risk Rating | Control & Influence |
|---|---|---|---|---|---|---|---|
| | Person may fall, material may fall | Injury leading to permanent disability, Loss of body parts, | | 5 | 2 | 10 | Ensure all coating, accumulations removed from the cyclones. Trained workmen to be deployed. Use appropriate PPEs (Full Body Harness,) |
| | Material may flush from cyclones | Injury leading to permanent disability, Loss of body parts, | | 5 | 2 | 10 | Clear the coating or accumulation before entering in to the cyclone and provide dummy in cyclone feed chute. |
| | Scaffolding may collapse. Scaffolding pipe may slip | Injury leading to permanent disability, Loss of body parts, | | 5 | 2 | 10 | Cross check the scaffolding as per the standard. Hazards to be explain to the workers through tool box talk before starting the job. |
| | Coating may collapse inside the kiln | Injury leading to permanent disability, Loss of body parts, | | 5 | 2 | 10 | Check the coating thickness, how strong it is. if it is weak, remove the coating and check the kiln. |
| | Ignition of flammables | Injury requiring First Aid. | | 2 | 2 | 4 | Use of PPE (Hand Gloves & Googles),Deploy trained person and space made free of flammable |
| Removal of Old Damaged Lining and Castable (Preheater) | Fall of person | Injury requiring hospitalization, Eye injury & Scald. | - | 5 | 2 | 10 | Restrict person movement by barricading. Use of safety nets, |
| | Fall of debris | Injury requiring hospitalization, Eye injury & Scald. | - | 5 | 2 | 10 | Tool box talk for material handling, |
| | Slip/fall of material or man. | Injury requiring hospitalization, Eye injury & Scald. | - | 5 | 2 | 10 | Allot trained workers, Conduct TBT before stating the job. Restrict person movement by barricading. Use of safety nets, |
| | Inhalation of dust | Injury requiring hospitalization, | - | 3 | 3 | 9 | Ensure PPE usage& ensure dust free environment. |

| Activity/Products/ Services | Hazards | Risk | Location | Severity (5) | Probability of Occurrence (5) | Risk Rating | Control & Influence |
|---|---|---|---|---|---|---|---|
| | | Eye injury & Scald. | | | | | |
| Refractory material& Scaffolding pipes shifting from yard to work place | Caught between, snake bite | Injury requiring hospitalization, Eye injury & Scald. | - | 5 | 2 | 10 | Inspect the area, Hazards to be explained to the workers through PEP talk. |
| | Fall of material, hoist failure | Injury requiring hospitalization, Eye injury & Scald. | - | 5 | 2 | 10 | Use only load tested lifting equipment. Cross check the rope, cage condition with check lists. Hoist operator is to be authorized. |
| | Rope may failure or improper position of rope | Injury requiring hospitalization, Eye injury & Scald. | - | 5 | 2 | 10 | Change the rope timely as per the suppliers guarantee. Use skilled man power for shifting the pallets. |
| | Scaffolding pipe, clamp, grit may slip | Injury requiring hospitalization, Eye injury & Scald. | - | 4 | 2 | 8 | Hazards to be explain to the workers through PEP talk (Nylon rope failure, pipe may slip if it is improper tightening) |
| Brick lining in Kiln | Slip/fall of material or man. | Injury requiring hospitalization, Eye injury & Scald. | - | 5 | 3 | 15 | Allot trained workers, SOP to be followed. |
| | Brick fall down may hit the person who is standing nearby. | Injury requiring hospitalization, Eye injury & Scald. | - | 5 | 3 | 15 | Walkway should not be block while brick transporting happens. Avoid working below the walkway/ net to be provided. Skilled person to be deployed on job. |
| Fine Coal bin Cleaning | Splash /spills of materials | Injury requiring hospitalization, | - | 4 | 3 | 12 | Use appropriate PPE's. Person should stand away in front of the door. |

| Activity/Products/ Services | Hazards | Risk | Location | Severity (5) | Probability of Occurrence (5) | Risk Rating | Control & Influence |
|---|---|---|---|---|---|---|---|
| | | Eye injury & Scald. | | | | | |
| Coal Grinding | Fire | Injury leading to permanent disability, Loss of body parts, Burns. | - | 5 | 2 | 10 | $CO_2$ purging interlock with high Temperature /CO-0.15%. Monitoring from CCR along with explosion vents. Avoid the entering of excess O2 by false air. |
| Coal Grinding | Explosion | Injury leading to permanent disability, Loss of body parts, Burns. | - | 5 | 2 | 10 | $CO_2$ purging interlock with high Temperature /CO- 0.15%. Monitoring from CCR along with explosion vents. Avoid the entering of excess O2 by false air. |
| Lifting of refractory & other materials to the heights by hydra | Falling of Material / Cage | Injury requiring hospitalization, Eye injury & Scald. | - | 4 | 2 | 8 | Use only load tested lifting equipment. Cross check the rope, cage condition with check lists. Hydra operator is to be authorized. |
| Kiln Firing with Diesel | Fire or explosion (Diesel may leak ) | Injury leading to Permanent disability, Loss of body parts, Burns | - | 5 | 2 | 10 | Thorough inspection of the diesel line before starting the pump. |
| | Body Injury (Diesel pipe may burst) | Injury leading to Permanent disability, Loss of body parts, Burns | - | 5 | 2 | 10 | Check the diesel pipe condition periodically as per supplier recommendation. |
| | Splash /spills of diesel in system | Injury leading to Permanent disability, Loss of body parts, Burns | - | 5 | 2 | 10 | Close all air blasters vent out the residual air if any. System (kiln) air to be vent by fresh air damper. |
| | Back Fire | Injury leading to Permanent disability, Loss of body parts, Burns | - | 5 | 2 | 10 | Use fire proof glass and fire proof face shield. Maintain appropriate draft in system. |

| Activity/Products/ Services | Hazards | Risk | Location | Severity (5) | Probability of Occurrence (5) | Risk Rating | Control & Influence |
|---|---|---|---|---|---|---|---|
| | Fire | Injury leading to Permanent disability, Loss of body parts, Burns | - | 5 | 2 | 10 | Control on coal feed. Maintain appropriate draught in system. |
| | Splash of gases | Injury leading to Permanent disability, Loss of body parts, Burns | - | 4 | 2 | 8 | Online gas analyzers (Kiln inlet, PC inlet & PH outlet) & draught control |
| Refractory Mixer machine Cleaning & Operation | Hand trap between blade & table | Injury requiring First Aid. | - | 4 | 2 | 8 | Use appropriate PPE (Hand Gloves & Googles), Deploy trained person. |
| | Electrocution | Injury requiring First Aid. | - | 4 | 2 | 8 | Use appropriate PPE (Hand Gloves & Googles), Deploy trained person |
| | Castable bag may slip | Injury requiring First Aid. | - | 2 | 2 | 4 | Use appropriate PPE (Hand Gloves & Googles), Deploy trained person |
| Flow Measurement | Slip/fall of socket, bolt Or spanners. | Injury requiring hospitalization, Eye injury | - | 3 | 2 | 6 | Conduct Tool box talks before performing the job. Allot the trained workmen with appropriate PPEs. |
| | Slip/fall of measuring equipment's | Injury requiring hospitalization, Eye injury | - | 3 | 2 | 6 | Conduct Tool box talks before performing the job. Allot the trained workmen with appropriate PPEs. |
| | May be touch the thermometer needle | Injury requiring hospitalization, Eye injury | - | 4 | 2 | 8 | Conduct Tool box talks before performing the job. Allot the trained workmen with appropriate PPEs. |
| | Sudden release of Gas & materials | Injury requiring hospitalization, Eye injury | - | 5 | 2 | 10 | Conduct Tool box talks before performing the job. Allot the trained workmen with appropriate PPEs. Inform to CCR to maintain the draught. |
| | Slip/fall of socket, bolt Or spanners. | Injury requiring hospitalization, Eye injury | - | 5 | 2 | 10 | Conduct Tool box talks before performing the job. Allot the trained workmen with appropriate PPEs. |

| Activity/Products/ Services | Hazards | Risk | Location | Severity (5) | Probability of Occurrence (5) | Risk Rating | Control & Influence |
|---|---|---|---|---|---|---|---|
| Degree of calcination sample collection | Splash of Hot material | Injury leading to Permanent disability, Loss of body parts, Burns | - | 3 | 2 | 6 | Use appropriate PPE's & trained person to be deployed. |
| Inspection of Kiln Flame condition | Splash of Hot material | Injury leading to Permanent disability, Loss of body parts, Burns | - | 3 | 2 | 6 | Fire proof glass to be used., Use appropriate PPE's & maintain proper hood draught. |
| Removal of coating at kiln inlet & burner pipe | Flush / Emission of hot material | Injury leading to Permanent disability, Loss of body parts, Burns | - | 3 | 2 | 6 | Use appropriate PPE's (Face shield & fire proximity suit). Maintain proper draught. |
| False air arresting | Material may be puffing back side | Injury requiring First Aid. | - | 2 | 2 | 4 | Conduct Tool box talks before performing the job. Allot the trained workmen with appropriate PPEs. |
| | Hand irritation | Injury requiring First Aid. | - | 2 | 2 | 4 | Conduct Tool box talks before performing the job. Allot the trained workmen with appropriate PPEs. |
| | Puffing of hot air or material, May material or hot gasses splash on body | Injury requiring First Aid. | - | 2 | 2 | 4 | Conduct Tool box talks before performing the job. Allot the trained workmen with appropriate PPEs. |
| Lining of Refractory in PH | Fall of person | Injury requiring hospitalization, Eye injury & Scald. | - | 5 | 2 | 10 | Restrict person movement by barricading, Use of safety nets, Ensure PPE usage& ensure dust free environment, SOP/PRO/011 |
| | Fall of Refractory material | Injury requiring First Aid. | - | 5 | 2 | 10 | Tool box talk for material handling, |
| | Slip/fall of debris | Injury requiring hospitalization, | - | 5 | 2 | 10 | Tool box talk for material handling |

| Activity/Products/ Services | Hazards | Risk | Location | Severity (5) | Probability of Occurrence (5) | Risk Rating | Control & Influence |
|---|---|---|---|---|---|---|---|
| | | Eye injury & Scald. | | | | | |
| | Slip/fall of material. | Injury requiring hospitalization, Eye injury & Scald. | - | 5 | 2 | 10 | Tool box talk for material handling, Dummy to made and Safety net should be use on top of the work place, Jallies also to be use on top of work place. |
| | Slip/fall of material or man. | Injury requiring hospitalization, Eye injury & Scald. | - | 5 | 2 | 10 | Ensure PPE usage & ensure dust free environment. Allot trained workers |

| Sr. No. | Probability/likelihood of occurrence: | Impact severity ratings: | Consideration during the review: |
|---|---|---|---|
| 1. | UNLIKELY may not occur | 1- Insignificant; Negligible | N - Normal Condition |
| 2. | SELDOM, unlikely but possible to occur (yearly) | 2- Minor, Minimal health & safety effect (minor effect on human health/first-aid needed) | A - Abnormal Condition |
| 3. | OCCASIONAL, likely to occur sometimes (monthly) | 3- Moderate, minor health & safety effect | E - Emergency Condition |
| 4. | LIKELY, will occur several times (weekly) | 4- Critical, minor health & safety effect | - |
| 5. | FREQUENTLY, likely to occur always (Daily) | 5- Catastrophic, major health & safety effect that cannot be controlled. (likely to result in severe injury or ill health & fatality). | - |

### 7.3.4 Disaster Management Plan

***Definition***

A major emergency in a work is one, which has the potential to cause serious injury or loss of life. It may cause extensive damage to property and serious disruption both inside and outside the work. It would require the assistance of emergency services to handle it in effective manner.

***Scope***

The aim of hazard control and disaster management is concerned with preventing accidents through good design, operation, maintenance and inspection, by which it is possible to reduce the risk of an accident, but it is not possible to eliminate it. Since, absolute safety is not achievable; an essential part of major hazard control must also include mitigating the effects of a major accident.

An important aspect of mitigation is emergency planning, i.e., identifying accidents as soon as possible, evaluating the consequences of such accidents and deciding on the emergency procedures, both on-site and off-site, that would need to be adapted in the event of an emergency.

***Objective***

The objectives of the emergency plan will be:

a) To protect plant personnel and general public.
b) To prevent and minimize damage to property and to the environment.
c) To help persons at site in a systematic manner meeting a disaster situation.
d) To restore the affected areas back to normal as soon as possible.
e) To review accident after it has occurred and to evaluate company's efforts in order to improve emergency management response in the future.

To deal with the below emergencies, the Emergency Plan is prepared.

| S. No. | Area | Possible Emergency | Hazard | Preventive Measures to be adopted |
|---|---|---|---|---|
| *a)* | Stores | Possibility of catching fire in stores materials | Fire | • Suitable fire extinguishers, fire hydrant system and fire buckets will be provided for fighting the fire during emergency.<br>• Stores staff will be imparted the training for first aid firefighting to prevent/extinguish the fire at initial stage. |
| *b)* | Oil Storage Tank - HSD Tank | Possibility of catching fire at the oil storage tanks and fuel oil handling system and Oil spillage from storage tanks | Fire and Explosion | • Fire hazard area will be declared as "No Smoking and No Naked Flame Zone" and regular check- up and maintenance of the fire prone area will be done.<br>• Suitable fire extinguishers and fire hydrant system will be provided at the tank enclosure and inside the pump room.<br>• Unloading of petroleum in bulk will not be allowed between sunset and sunrise. Tanker engine will be switched off before unloading and the tanker will be |

| S. No. | Area | Possible Emergency | Hazard | Preventive Measures to be adopted |
|---|---|---|---|---|
| | | | | earthed.<br>• Regular scheduled inspections of storage tank and the enclosed area will be carried out by the custodian with regard to proper earthling, presence of any combustible material or growth of wild vegetation, no breaches in the wire fencing, damage in the dyke wall etc. |
| *c)* | Packing Plant | Possibility of catching fire in the bag godown | Fire | • The packing plant will be declared as "No Smoking of Fire" area.<br>• Suitable fire extinguishers and fire hydrant systems will be provided for fire- fighting in emergency situation.<br>• Permission will be taken for working with welding/gas cutting in that area.<br>• Adequate drainage to immediately drain out the water used in fire- fighting will be provided to avoid water damage and the sheds will be properly ventilated.<br>• The sheds will be properly ventilated. |
| *d)* | Silos | Collapse of silos resulting in dust emission, material spillage & injury to person & damage to other property | Physical | • Structural Soundness of silos will be ensured and filling up of Silos will be avoided.<br>• Avoid over filing of silos<br>• Lighting arrestor at top of silos bucket elevator will be installed. |
| *e)* | Storage of Col | Catching fire due to material spillage leading to damage to property | Fire | • Flammable, ignitable, reactive and non-compatible wastes will be stored separately and will never be stored in the same storage shed<br>• Adequate storage capacity will be provided in the premises.<br>• Storage area will be designed to withstand the load of material stocked and any damage from the material spillage.<br>• Automatic smoke, heat detection system will be provided in the sheds.<br>• Adequate fire-fighting systems will be provided for the storage area, along with the areas in the facility.<br>• Coal will be stored in covered shed. |
| *f)* | Electrical Transformer | Catching fire in transformers | Fire and Explosion | • Predictive interlocks will be provided which will automatically give an alarm/trip the system.<br>• In case oil pressure inside the transformer tank increases, buchholtz relay provided will sound an alarm and if necessary, will trip the transformer and |

| S. No. | Area | Possible Emergency | Hazard | Preventive Measures to be adopted |
|---|---|---|---|---|
| | | | | thus avoid oil explosion.<br>• A diaphragm will be provided at the bottom of explosion vent to vent out high oil pressure whenever pressure is increased beyond limit. |
| *g)* | Transformer Yard and HT/LT Sub-Station | Possibility of fire and explosion | Fire and Explosion | • Transformers will be separated by brick wall up to height of transformer.<br>• Soak pits of suitable capacity will be provided to collect the leaked transformer oil in case of fire and explosion.<br>• Periodic maintenance of all electrical machinery apparatus will be done.<br>• In case of fire in HT transformer, first of all switch off 33/132 kV Incomer breaker<br>• In case of LT transformer fire/explosion, switch off the transformer feeder from HT line<br>• Emergency control room will be informed for fire brigade and other actions |
| *h)* | Electrical Cable Tunnels | Catching fire in electrical cables inside the tunnels | Fire | • Suitable fire extinguishers will be provided for fire-fighting.<br>• Good housekeeping will be ensured to avoid any fire rise.<br>• Exhaust fans will be provided to avoid suffocation. |
| *i)* | Conveyor Belts | Catching of fire in conveyors due to Gas cutting / welding<br>and Frictional heat | Fire | • Suitable Fire extinguishers will be provided for each transfer towers for firefighting during emergency<br>• Suitable fire equipment will be kept at hand during gas cutting / welding.<br>• Full cord system will be provided throughout its length to stop it in any emergency<br>• Preventive checks on frictional parts like drum and lagging of drum will be done. |
| *j)* | Failure of Lifting Tools and Tackles and Pressure Vessels | Injury to person and damage to equipment | Physical | • All lifting tools and tackles and pressure vessels will be tested/examined by competent person authorized by chief inspector of factories, Govt. of Andhra Pradesh as per statutory requirement and at defined frequency<br>• Safe working pressure range will be maintained in the Air receiver tank/pressure vessels<br>• Safe Working Load will not be violated while using cranes, hoists, ropes, chains and other lifting tools and tackles, only authorized personnel will be allowed to handle the same<br>• Regular and periodic maintenance will be done. |
| *k)* | Oil Tankers | Toppling of Oil Tankers | Physical | • Speed limit signboards will be displayed; no vehicle will be allowed to move beyond 20 km/hr |

| S. No. | Area | Possible Emergency | Hazard | Preventive Measures to be adopted |
|---|---|---|---|---|
| | | | | • In case oil is toppled, Plant Inventory department will be informed<br>• Sand will be sprayed on the oil to prevent further spread of oil and oil-soaked sand will be collected to fill in the land and cover with soil |
| *l)* | Working at Height | Fall from Height resulting in injury to person | Physical | • Information will be given immediately to Emergency Control Room/ OHC and to the Job Execution In-charge<br>• Rescue team member will rush at site with rescue kit<br>• Emergency team will be allotted to act as per Emergency organization structure<br>• Rescuers to access the probable risk for rescuing the victim |
| *m)* | Stockpiles | Engulfment in Stockpile | Physical | • Take permission before climbing on stock pile<br>• Pedestrian to maintain a safe distance from stock pile<br>• Person to work under close supervision<br>• *In case of Emergency, i*nform immediately to Emergency Control Room/OHC and to the Job Execution In-charge |
| *n)* | ESP | Release of Particulate matter in case of failure of chambers of ESP or tripping of ESP | Events Pertaining to Manufacturing Process | • All the stack will be equipped with Continuous Online Monitoring Systems and connected with Central Control Room in the plant for monitoring the emissions.<br>• All the arrangements will be done to avoid tripping in the ESP along with interlocking system.<br>• Proper maintenance of Air Pollution Control Equipment will be done periodically. |

### 7.3.4.1 Onsite Emergency Plan

The Onsite Emergency Management Plan is a master plan which contains the emergency organization structure, responsibilities of key members, communications mean and emergency response strategies to control a range of major incidents.

- ***Emergency Organization and its Responsibilities***

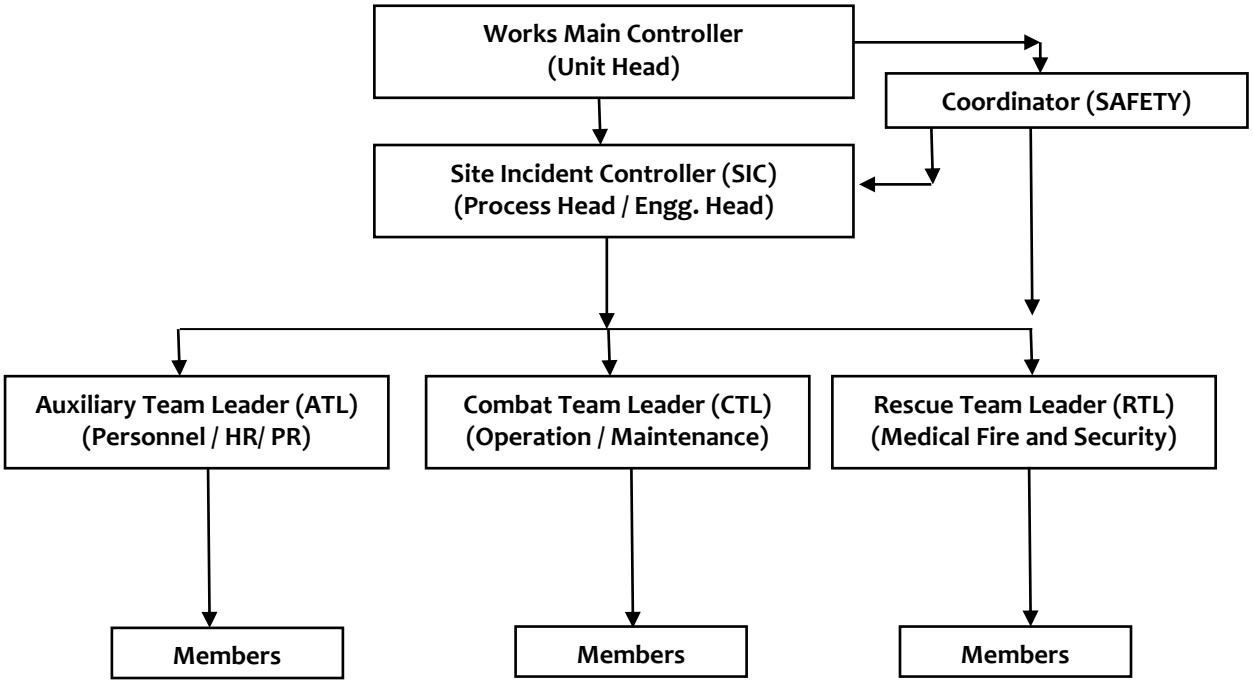



**Figure 7.2: Emergency Command Structure**

***Responsibilities and Duties of Personnel***

| S. No. | Designated roles of Emergency Command Structure | Responsibilities |
|---|---|---|
| 1. | **Works Main Controller** | • Relieve the site incident controller of responsibility for overall control.<br>• Ensure that the outside emergency services are called in.<br>• Ensure that key personnel are called in.<br>• Exercise direct operational control of those parts of the work outside the affected area.<br>• Maintain a speculative continuous review of possible developments and assess these to determine most probable course of events.<br>• Direct the shutting down of equipment and evacuation of areas in consultation with the site incident controller and key personnel.<br>• Ensure the casualties and receiving adequate attention. Arrange for additional help, if required. Ensure that relatives are advised.<br>• Liaise with Chief Officers of the fire and police services and with the experts on fire, safety, health etc. provide advice on possible effects on areas outside works.<br>• Where the emergency is prolonged, arrange for the relief of personnel and the provisions of catering facilities.<br>• Ensure the proper consideration is given to the preservation of evidences for investigations<br>• Ensure with site incident controller about instructions of "ALL CLEAR" communication.<br>• Ensure and control rehabilitation of affected areas.<br>• Communication to ACC followed by a written report about the |

| S. No. | Designated roles of Emergency Command Structure | Responsibilities |
|---|---|---|
| | | accident, including mitigation action taken. |
| **2.** | **Site Incident Controller (SIC)** | • Assess the scale of emergency and decide if a major emergency situation exists or is likely. On this decision, he will activate the subsequent major emergency procedure.<br>• Direct all operations within the affected area with the following priorities:<br>• Secure the safety of personnel<br>• Minimize damage to equipment, property and the environment<br>• Minimize loss of material<br>• Direct rescue and firefighting operations<br>• Ensure that the affected area is searched for unattended casualties.<br>• Ensure that all non-essential workers in the affected area evacuate to the appropriate assembly point.<br>• Direct the outside emergency services if called for emergency.<br>• Report all significant development to the site main controller. Provide advice and information, as required, to the senior officer of the Fire Brigade.<br>• Ensure the head counting for personnel.<br>• Control traffic movement within the works.<br>• Ensure that chronological record of the emergency to be maintained.<br>• Have regard to the need to preserve evidence that would facilitate any subsequent esquire into the cause and circumstances of the emergency.<br>• Direct the instructions about the "ALL CLEAR" communication through mobile phones & walkie-talkie |
| **3.** | **HR & ADMIN – Head** | • He handles the evacuation of the personnel from the emergency situation to the Assembly point.<br>• He takes the head count of the Evacuated personnel.<br>• He will assist the site controller in liaise with the local emergency authorities.<br>• Manage traffic movement towards the incident area and clears way to the Emergency vehicles. |
| **4.** | **Electrical – Head** | • He will be heading the Shutdown.<br>• After receiving the communication from the Incident controller, he will arrange to stop the power supply to the site and shutdown of the other equipment at site as per requirement.<br>• After receiving the "All Clear" communication from the incident controller, he will resume the power supply to site. |
| **5.** | **Mechanical – Head** | • He will be heading the heavy equipment<br>• After receiving the communication from the Incident controller, he will arrange to properly access at site.<br>• After receiving the "All Clear" communication from the incident controller, he will resume the tool tackles (welding machine, cutting machine, grinding machine etc.) to site. |

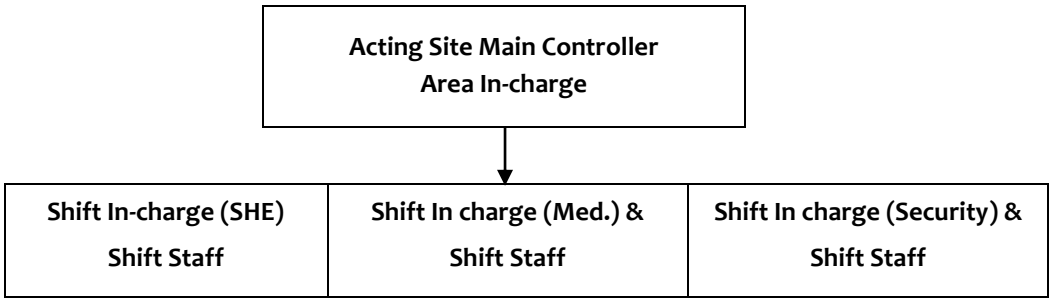
| S. No. | Designated roles of Emergency Command Structure | Responsibilities |
|---|---|---|
| 6. | **Fire Fighting Team** | • After receiving the emergency communication, they will immediately report to the Incident controller.<br>• As per his instruction they will mobilize the Fire Fighting equipment's and Leak control kits etc.<br>• They will control the fire & Gas leakages.<br>• In emergency situation other than Fire & Gas leakages, they will help the first aid team. |
| 7. | **First Aid Team** | • After receiving the emergency communication First aid team will immediately reports to the Incident controller<br>• First aid team will remove the causalities from the incident area to the safe place.<br>• They will provide the immediate first aid to the casualties.<br>• Help them to transport to the medical aid if warrants. |
| 8. | **Area in-charge of Emergency Affected Area** | • He will immediately proceed to the scene of incident to confirm and assess the situation.<br>• He will notify the nature of emergency to the fire station and security office to inform SIC / SMC and the concerned persons.<br>• Area In-charge should clearly indicate to fire station and security office about<br>I) Nature of emergency<br>II) Location of emergency<br>• He will ensure that all hot jobs including welding, cutting, grinding, chipping, open fire heating, etc. are stopped in the area.<br>• He will coordinate the actions of site emergency services, maintenance services and other services for quick control of the situation, he will also perform emergency control measures as per directions from SIC / SMC.<br>• He will furnish the full details about the incident to the Senior Management and Safety Officer, SMC / SIC, and other emergency services at site.<br>• He will set up an emergency control post on site for team leaders of assistance groups from where the control and direction of the emergency operation is safe and he will arrange some communication media e.g., telephone at the emergency control post.<br>• He will keep himself in constant touch with the emergency post and continue to pass on information / receive direction from emergency post to the concerned personnel.<br>• He will ask for spare manpower from the other area in-charges of the unaffected area. |

***Emergency organization during non-working hours***

The help of most of the personnel listed earlier will not be available and hence a separate working procedure has to be followed:

✓ All applicable duties for silent hours / enumerated earlier will apply.

- ✓ In-charge of the affected area will handle the situation with the available manpower and services, till the designated authorities of emergency organization reach the emergency site.




- ***Emergency Control Post***

  Emergency control post will be set up at the time of any major emergency, by the in-charge of the concerned area, for team leaders of assistance groups, from where the control and directions of the emergency operation is safe. Communication media e.g., telephone will also be provided at the control post.

- ***Assembly Points***

  The assembly points will be provided so as to cover the whole site area with the consideration of wind direction, nearby paging facility and more than one road approach on each point.

- ***Alarm System***

  Alarm systems vary and will depend on the size of the plant. There should be an adequate number of points from an audible warning, or indirectly, viz. a signal or message to a permanently manned location. There should be a reliable system for informing the emergency services as soon as the alarm is raised on site.

- ***Communication System***

  Communication is crucial factor in handling an emergency. It is the practice at many plants that any employee can raise an emergency alarm, so allowing the earliest possible action to be taken to control the situation. The possible communication can be given by telephone, shouting, messenger and walkie-talkie.

  Concerned SHE In-charge will inform the Fire Station through the quickest way possible for quick response and Security Office for passing of the information to the concerned persons and services. The following persons and services inside the work place will be informed in case of major emergencies like – major fire, major accident, major spillage, gas leak, cyclone, etc. These authorities and services will be notified by Security Officer as per the direction by the Head - SHE of the Site. Fire Station, Medical Centre / Medical In-charge, Plant head, SHE Staff and Security Staff.

- ***First Aid***

  A first aid center with adequate facilities will be provided. It will be maintained round the clock by a compounder cum dresser and a doctor. An auxiliary first aid squad will be identified, the

members of which will be spread in each shift in different departments. In the event of an emergency this squad will augment medical services. An Ambulance which will be available with plant will also be used at site to carry affected people to hospital. Assistance of these hospitals will be taken in case of any necessity.

- ***Safety***

The safety wing led by a Safety officer will meet the requirement of emergencies round the clock. The required safety appliances will be distributed at different locations of the plant to meet any eventualities. Poster/placards reflecting safety awareness will be placed at different locations in the plant area.

- ***Emergency Drills***

The emergency response plans and emergency preparedness level would be tested through the following drills:

a. Table-top exercise (TTE)
b. Functional exercise (FE)
c. Full-scale exercise (FSE)

All elements/procedures of the On-Site Emergency Plan would be first tested through TTE and perfected to the extent possible. The Plan then would be modified/ updated. Functional Exercises basically to ensure proper functioning of various equipment such as the fire-fighting equipment and the fire hydrant system. The Full-Scale Drill would be conducted to know the level of preparedness of all teams. Initially, TTE and FE would be conducted periodically.

The following drills will be conducted periodically:

a. Plant Emergency Drill for fire
b. Fire Drills at offices and admin building
c. Plant Emergency Drills (fire scenario involving evacuation)

- ***Personal Protective Equipment (PPEs)***

Personal protective equipment plays a vital role in overcoming major disastrous situation saving life during onsite emergency. List of recommended Personal Protective equipment (PPE) is given below in Table - 7.3.

**Table - 7.3**
**Summary of Recommended Personal Protective Equipment according to hazard onsite**

| Objective | Workplace Hazards | Suggested PPE |
|---|---|---|
| Eye and face protection | Flying particles, molten metal, liquid chemicals, gases or vapors, light radiation | Safety glasses with side-shields, protective shades, etc. |
| Head protection | Falling objects, inadequate height clearance, and overhead power cords | Plastic helmets with top and side impact protection |
| Hearing protection | Noise, ultra-sound | Hearing protectors (ear plugs or ear muffs) |
| Foot protection | Failing or rolling objects, points objects. Corrosive or hot liquids | Safety shoes and boots for protection against moving and failing objects, liquids and chemicals |

| Objective | Workplace Hazards | Suggested PPE |
|---|---|---|
| Hand protection | Hazardous materials, cuts or lacerations, vibrations, extreme temperatures | Gloves made of rubber or synthetic material (Neoprene), leather, steel, insulation materials, etc. |
| Respiratory protection | Dust, fogs, fumes, mists, gases, smokes, vapors | Facemasks with appropriate filters for dust removal and air purification (chemical, mists, vapors and gases). Single or multi-gas personal monitors, if available |
| | Oxygen deficiency | Portable or supplied air (fixed lines). Onsite rescue equipment |
| Body / leg protection | Extreme temperatures, hazardous materials, biological agents, cutting and laceration | Insulating clothing, body suits, aprons etc. of appropriate materials |
| Fly Ash | Fly ash handling and storage | Wear dust-proof goggles and rubber or PVC gloves. When using large quantities or where heavy contamination is likely, wear: coveralls. |

Apart from this, all the employees will be provided with helmets and safety shoes. It will be statutory on the part of the company employees to wear the appropriate safety gear given while attending duty in the factory.

### 7.3.4.2 Off-Site Emergency Planning

The off-site emergency plan is vital part of any hazard control system. It is based on those accidents identified by the works management, which could affect people and the environment outside the works. Thus, the off-site plan follows logically from the analysis that took place to provide the basis for the on-site plan and the two plans therefore complement each other. The roles of the various parties that may be involved in the implementation of an off-site plan are described below. The responsibility for the off-site plan will be likely to rest either with the works management or with the local authority. The plan must identify an emergency coordinating officer who would take overall command of the off-site activities. Consideration of evacuation may include the following factors:

- In the case of a major fire but without explosion risk (e.g. an oil storage tank), houses close to the fire are likely to need evacuation
- If fire is escalating very fast it is necessary to evacuate people nearby as soon as possible.
- In acute emergency people are advised to stay indoors and shield themselves from the fire.

***Organization***

Organizational details of command structure, warning systems, implementation procedures, emergency control centres include name and appointments of incident controller, site main controller, their deputies and other key personnel involved during emergency.

***Communications***

Identification of personnel involved, communication centre, call signs, network, list of telephone numbers.

***Special Emergency Equipment***

Details of availability and location of heavy lifting gear, specified fire-fighting equipment, fireboats etc.

***Voluntary Organizations***

Details of Voluntary organizations, telephone numbers nearby hospitals, Emergency helpline, resources etc. are to be available with chief authorities.

***Non-government Organizations (NGO)***

NGO's could provide a valuable source of expertise and information to support emergency response efforts. Members of NGOs could assist response personnel by performing specified tasks, as planned during the emergency planning process.

- Evacuation of personnel from the affected area
- Arrangements at rallying posts and parking yards
- Rehabilitation of evacuated persons

***Chemical information***

Details of the hazardous substances (MSDS information) and a summary of the risks associated with them are to be made available at respective site.

***Meteorological information***

There is to be arrangements for obtaining details of weather conditions prevailing at before the time of accident and weather forecasts updates.

***Humanitarian Arrangements***

Transport, evacuation centres, emergency feeding, treatment of injured, first aid, ambulances, temporary mortuaries.

***Public Information***

- Dealing with the media-press office
- Informing relatives, etc.

Assessment

- Collecting information on the causes of the emergency
- Reviewing the efficiency and effectiveness of all aspects of the emergency plan.

***Role of local authority***

Local Authorities like Panchayat, Sabha, Samiti, municipalities can help in combating emergency situation after assessing the impact scenario in rescue phase.

***Role of police***

- Concerned police will be available for controlling and guidance at the accident site, organizing evacuation and removing of any seriously injured people to hospitals.
- Co-ordination with the transport authorities, civil defence and home guards
- Co-ordination with army, navy, air force and state fire services

- Arrange for post mortem of dead bodies
- Establish communication centre with easy contact with ECC

***Role of Fire Brigade***

The fire brigade is to be organized to put out fires and provide assistance as required during emergency.

***Media***

- The media is to have ready and continuous access to designated officials with relevant information, as well as to other sources in order to provide essential and accurate information to public throughout the emergency and to avoid commotion and confusion.
- Efforts are made to check the clarity and reliability of information as it becomes available, and before it is communicated to public.
- Public health authorities are consulted when issuing statements to the media concerning health aspects of chemical accidents.
- Members of the media are to facilitate response efforts by providing means for informing the public with credible information about accidents involving hazardous substances.

***Role of health care authorities***

- Hospitals and doctors must be ready to treat all types of injuries to causalities during emergency
- Co-ordinate the activities of Primary Health Centres and Municipal Dispensaries & District Hospital to ensure required quantities of drugs and equipment.
- Securing assistance of medical and paramedical personnel from nearby hospitals/institutions
- Temporary mortuary and identification of dead bodies.

## 7.4 Conclusion

It has concluded that there will be no major risk involved due to Proposed Integrated Cement Plant. Suitable Risk Control Measures with respect to Risk Assessment will be implemented to minimize the risk to an acceptable level. Regular Training, Implementation of SOP's and compliance of relevant Personal Protective Equipment's (PPE's) will help to minimize the health hazards and incidental casualties. So, it is safe to say that there will be no major risk involved due to the proposed project.

# *CHAPTER - 8*
# *PROJECT BENEFITS*

## 8.1 INTRODUCTION

M/s. ACC Limited was among the first Indian companies to include commitment to environmental protection as one of its corporate objectives. Since inception, the company have integrated this commitment into all activities of their value chain, from mining to sales to promoting the use of alternative fuels and resources, resulting in one of the lowest carbon footprints in the cement industry.

In 2022, ACC became a part of Adani Group - the largest and fastest-growing portfolio of diversified sustainable businesses.

**ACC Vision**

*" To be a World Class leader in businesses that enrich lives and contribute to nation in building infrastructure through sustainable value creation."*

***ACC Culture***

*P - Passion*

*R - Results*

*I - Integration*

*D - Dedication*

*E - Entrepreneurship*

It is anticipated that as a consequence of this proposed project there will be employment opportunity including skilled, semi-skilled, and unskilled wages. It will be assured alongside that the industry will bring improvement of physical infrastructure at local area like, building/strengthening of existing roads, providing drinking water, drainage system, transportation facility etc. with improved educational facilities and professional practices and by extending healthcare facilities it can be expected that the project will lead towards further development in literacy, economic status and standards of living. Thus, the basic requirement of the community needs will be strengthened by the proposed project either by providing or by improving the existing facilities in the area, which will help in uplifting the quality of life of the local communities. Additionally, support in the areas of sports, recreation and environmental sanitation can also be undertaken to facilitate socioeconomic opportunities

## 8.2 PROPOSED PROJECT BENEFITS

The proposed project will provide various benefits across the nearby areas, which are attributed below:

1) Environment

2) Employment
3) Economic
4) Social

***1. Environmental Benefits***

***(a) Greenbelt Development***

Total project area for the Proposed Integrated Cement Project is 187.1 ha out of which approx. 79.8 ha (i.e., ~ 42.65 % of the total project area) will be developed under greenbelt & plantation and 15 m wide greenbelt & plantation will be done along the plant boundary and 20 meter wide towards the Village to attenuate the air pollution with native tree species in accordance with CPCB guidelines.

The greenbelt & plantation around the Cement industry will act as an effective barrier between plant and surroundings. The other benefits are mentioned as below -

- Strengthening/ development of Greenbelt & plantation within the project area will help in better harnessing of the run-off thereby helpful in potential recharge of the groundwater and also help in reducing the soil erosion.
- The development of greenbelt & plantation within the plant and colony area will help in capturing the fugitive emissions, attenuate the noise generated thereby maintaining the air quality and noise levels and will also improve the aesthetic beauty of the surrounding.
- The open spaces within the project area where tree plantation may not be possible will be covered with shrubs and grasses to prevent erosion of topsoil. Other open spaces within the project area will be converted to green areas in the form of lawns or flowering plants.
- Educational/Promotional activities will also be included to encourage the local villagers towards the importance of trees, on their management/care.

***(b) Rain water Harvesting***

The Integrated Cement Plant has proposed to implement rainwater harvesting practices inside the plant premises to harvest rainwater from different sections of the cement plant (roof-top as well as paved-cemented, greenbelt and open land). One pond will be constructed for the storage of runoff generated throughout the plant. To accommodate the total runoff generated in the project site which is (5,60250 $m^3$/annum), the area of the pond should be approximately, 41,500 $m^2$ which covers 4.15 Ha area.

***(c) Use of Hazardous/ Non-hazardous waste in Cement manufacturing as AFR***

Company has explored the possibility to use various types of Hazardous and Non- Hazardous industrial wastes in the nearby area. The numerous potential benefits possible through the use of hazardous and other wastes in cement manufacturing processes as AFR include: the recovery of the energy content of waste, conservation of non-renewable fossil fuels and natural resources, reduction of $CO_2$ emissions, reduction in production costs and reduce the problem of disposal of HW and thus reduce contamination.

Approx. 15% TSR (Thermal Substitution Rate) is proposed in co-processing of Hazardous Waste to reduce the dependency of natural resources i.e., Coal. This TSR may further increase/ decrease depending on the availability of AFR.

The hazardous waste / non-hazardous waste of the nearby industries i.e., MSW RDF, Solid Waste, Boiler Ash, Cloth Waste, FMCG Waste, Own Waste, Plastic Waste, Wooden Dust will be used for co-processing in the Kiln as per the availability in the market.

***(d) Use of Waste materials in cement manufacturing***

Fly ash is a fine powder generated during the burning of pulverized coal in Thermal Power Plants. This industrial waste creates significant environmental problems. This large quantity occupies a vast area for its disposal. It also leads to many health and environmental hazards. The fly ash generated from CPP (100% will be utilized), Raichur Thermal Power Station, Kothagudem Thermal Power Station and other nearby sources will be used in the manufacturing of Cement which saves the natural resource and the environment. The use of fly ash in cement has demonstrated long-term performance enhancements allowing manufacturers to reduce the environmental footprint while ensuring improved performance and increased durability.

***2. Employment Benefits (Direct & Indirect) due to the Project***

The proposed project will generate both direct & indirect employment. The manpower required for the proposed project during construction phase will be about 2400 and during operation phase will be about 499 persons. The proposed Project will also generate indirect employment of about 2000 persons in the area. Priority & Preference in employment in the proposed project will be given to land losers (whose land is being taken) & local peoples based on their skill, eligibility and experience. Apart from the above, various indirect employment opportunities are envisaged by the way of transportation, workshops, petty contractors and shopkeepers, network of retailers (Cement Stockists) throughout the state and in its marketing regions.

Plant activities will also result in numerous indirect employment avenues for the people such as truck owners, drivers, repair shops, tea-stalls, lenders etc.

As the cement plant operation will be majorly mechanized, employment opportunities will be limited as given in the manpower requirement and will also be skill oriented. However, ACC will work to the utmost for conducting various entrepreneurship programmes within the nearby impacted areas with the purpose of encouragement amongst villagers/locals or their qualified family members by awarding services, contracts for activities such as vehicle hiring, maintenance of gardens, office services and cleanliness, courier services, and material supplies.

***3. Economic benefits***

ACC will contribute substantially to the overall economy through their various socio-economic development activities. Proposed project will result in growth and development of the surrounding areas by increasing direct and indirect employment opportunities in the region which will not only

improve the socio-economic condition but will also help in raising the living standard of the local population.

The Indian cement sector has a robust demand profile, stimulated mostly by government plans to build physical and social infrastructure like ambitious Bharatmala Pariyojana, Sagarmala Project, Smart Cities Mission, AMRUT (Atal Mission for Rejuvenation and Urban Transformation) and PMAY (Pradhan Mantri Awas Yojana), and others. Increment of revenue to the State & Central exchequer from the proposed project and interlinked mine is also envisaged, in terms of taxes, royalty etc.

Apart from direct economic benefits in terms of taxes, royalty etc. The project will also contribute the economy indirectly through implementation of various socio-economic developmental programmes in the area which will increase the economic status and living status of the people; thus, contributing to the economy on larger scale. ACC across their various units has contributed substantially to the overall economy through their various CSR activities. Proposed project will result in growth and development of the surrounding areas by increasing direct and indirect employment opportunities in the region. Business opportunities for the local people will be enhanced like transport of cement in the market, maintenance & housekeeping contract work etc.

***4. Social Benefits***

The community has been a key stakeholder in business and environmental issues are a matter utmost priority for the company. The Management believes to being catalyst in the transformation of the communities around its business operations through partnership with local communities, Government, NGO's and other stake holders. For over seven decades the company addressed the issues of health and sanitation, education, rural infrastructure, women empowerment and other social development issues. The prime objective of our Corporate Social Responsibility Policy is to hasten social, economic and environmental progress. We remain focused on generating systematic and sustainable improvement for local communities surrounding our plants and project sites.

The operation zone for the socio-economic development activities for the proposed project will be extended to the nearby villages of project site. The company will propose plans to supplement the existing governmental programs among the local population. Environmental awareness will be created among people by organizing awareness camps. Keeping the view of achieving the national objective of sustainability, developmental activities will be carried out.

## 8.3 MOTION OF SOCIAL AND ECONOMIC STATUS

ACC will carry out various socio-economic development activities, which will contribute substantially to the overall economy and social development of the area. The beneficial aspects of the projects on the socio-economic environment of the area are in the areas of employment, service, trade, commerce, public utility, literacy, social awareness, health care facilities, recreation etc.

The operation zone of the above said development activities for the proposed project will be extended to the nearby villages of project site. The company will propose plans to supplement the existing governmental programs among the local population. Environmental awareness will be created among people by organizing awareness camps. Developmental activities will be carried out keeping sustainable development in mind.

Based on the issues raised during the public hearing, the socio-economic development plan for the proposed project has been customized and extended to the nearby villages of project site. The company will propose plans to supplement the existing governmental programs among the local population while partnering with government agencies, NGOs, local Panchayats for implementation. 'Village Development Committees' will be formed to engage with the community; plan, monitor and coordinate the development activities.

## 8.4 ENTERPRISE SOCIAL COMMITMENT

- Generation of employment and improved standard of living;
- Establishment of small and medium scale engineering ancillaries,
- Increased revenue to the state by way of royalty, taxes and duties;
- Superior communication and transport facilities etc.

ACC proposes to spend Rs. 184 crores in phase - I and 171 crores in phase - II towards the Enterprise Social Commitment. The company has developed a comprehensive Skill Development Programme under the ACC DISHA initiative and allocated ₹35.5 crores as part of its Enterprise Social Commitment.

**Table 8.1**

**Enterprise Social Commitment / CER for Phase - 1**

| Interventions | Total 10-year Budget | 1st Year | 2nd Year | 3rd Year | 4th Year | 5th Year | 6th Year | 7th Year | 8th Year | 9th Year | 10th year |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **ACC Vidya Utkarsh** - Improving Quality and Reach of Education | **55.20** | 3.31 | 5.52 | 6.62 | 7.18 | 7.73 | 6.62 | 6.07 | 4.42 | 3.86 | 3.86 |
| **ACC DISHA** - Skill Development of Youth and Placement | **18.40** | 1.10 | 1.84 | 2.21 | 2.39 | 2.58 | 2.21 | 2.02 | 1.47 | 1.29 | 1.29 |
| **ACC LEISA** - Low External Input for Sustainable Agriculture | **18.40** | 1.10 | 1.84 | 2.21 | 2.39 | 2.58 | 2.21 | 2.02 | 1.47 | 1.29 | 1.29 |
| **ACC Swawlamban** - Women Empowerment through SHGs and facilitating Micro Enterprises | **36.80** | 2.21 | 3.68 | 4.42 | 4.78 | 5.15 | 4.42 | 4.05 | 2.94 | 2.58 | 2.58 |
| **ACC Arogyam** - Enhancement of health and wellbeing | **9.20** | 0.55 | 0.92 | 1.10 | 1.20 | 1.29 | 1.10 | 1.01 | 0.74 | 0.64 | 0.64 |
| **ACC Sampoorn Swachchata** - Promote hygiene, ODF environment and safe disposal of waste | **18.40** | 1.10 | 1.84 | 2.21 | 2.39 | 2.58 | 2.21 | 2.02 | 1.47 | 1.29 | 1.29 |
| **ACC Sanrakshit Paryavaran** - Sustainability of resources for posterity | **18.40** | 1.10 | 1.84 | 2.21 | 2.39 | 2.58 | 2.21 | 2.02 | 1.47 | 1.29 | 1.29 |
| **ACC Drona** - Promotion of local Sports, Arts and Culture | **9.20** | 0.55 | 0.92 | 1.10 | 1.20 | 1.29 | 1.10 | 1.01 | 0.74 | 0.64 | 0.64 |
| **Total** | **184.00** | **11.04** | **18.40** | **22.08** | **23.92** | **25.76** | **22.08** | **20.24** | **14.72** | **12.88** | **12.88** |

**Table 8.2**

**Enterprise Social Commitment / CER for Phase - 1**

| Interventions | Total 10-year Budget (in Crores) | 1st Year | 2nd Year | 3rd Year | 4th Year | 5th Year | 6th Year | 7th Year | 8th Year | 9th Year | 10th Year |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **ACC Vidya Utkarsh** - Improving Quality and Reach of Education | **51.30** | 3.08 | 5.13 | 6.16 | 6.67 | 7.18 | 6.16 | 5.64 | 4.10 | 3.59 | 3.59 |
| **ACC DISHA** - Skill Development of Youth and Placement | **17.10** | 1.03 | 1.71 | 2.05 | 2.22 | 2.39 | 2.05 | 1.88 | 1.37 | 1.20 | 1.20 |
| **ACC LEISA** - Low External Input for Sustainable Agriculture | **17.10** | 1.03 | 1.71 | 2.05 | 2.22 | 2.39 | 2.05 | 1.88 | 1.37 | 1.20 | 1.20 |
| **ACC Swawlamban** - Women Empowerment through SHGs and facilitating Micro Enterprises | **34.20** | 2.05 | 3.42 | 4.10 | 4.45 | 4.79 | 4.10 | 3.76 | 2.74 | 2.39 | 2.39 |
| **ACC Arogyam** - Enhancement of health and wellbeing | **8.55** | 0.51 | 0.86 | 1.03 | 1.11 | 1.20 | 1.03 | 0.94 | 0.68 | 0.60 | 0.60 |
| **ACC Sampoorn Swachchata** - Promote hygiene, ODF environment and safe disposal of waste | **17.10** | 1.03 | 1.71 | 2.05 | 2.22 | 2.39 | 2.05 | 1.88 | 1.37 | 1.20 | 1.20 |
| **ACC Sanrakshit Paryavaran** - Sustainability of resources for posterity | **17.10** | 1.03 | 1.71 | 2.05 | 2.22 | 2.39 | 2.05 | 1.88 | 1.37 | 1.20 | 1.20 |
| **ACC Drona** - Promotion of local Sports, Arts and Culture | **8.55** | 0.51 | 0.86 | 1.03 | 1.11 | 1.20 | 1.03 | 0.94 | 0.68 | 0.60 | 0.60 |
| **Total** | **171.00** | **10.26** | **17.10** | **20.52** | **22.23** | **23.94** | **20.52** | **18.81** | **13.68** | **11.97** | **11.97** |

**Table No. 8.3**

**Skill Development Programme (ACC DISHA) (Phase - I)**

| S. No | Particulars | Details | Cost (in crores) |
|---|---|---|---|
| 1. | Programme Design & Development | • Curriculum development, Enhancement of qualifications, skills, knowledge, and behavior and to ensure that the training provided meets the needs of the industry.<br>• Spoken English course in the locality with the help of a graduate teacher.<br>• Providing coaching for competitive examinations for NEET / JEE. | 2.5 |
| 2. | Infrastructure & Facilities | • Infrastructure development, including construction or renovation of physical training centres.<br>• Construction/ renovation of boundary walls, construction of separate toilets for boys & girls, drinking water facility.<br>• Installation of smart classes in the Government schools to promote Digital education and development of an e-learning platform for delivering theoretical training.<br>• Development of libraries in nearby Govt. Schools in consultation with Gram Panchayat/concerned authorities. | 4.4 |
| 3. | Training Programs to villagers | • Training programs to specific needs within the construction industry, addressing both skilled and unskilled workers.<br>• Give workers basic skill training in areas including material handling, safety procedures, and the use of simple tools.<br>• Provide computer training to the unemployed youth. | 2.5 |
| 3. | Training & Facilitators | • Hiring of trainers who are certified in the relevant sectors.<br>• Hiring of SMEs for specialized knowledge and expert training delivery in sectors where deeper expertise is required.<br>• Ongoing professional development programs for trainers to keep them updated with the latest industry trends. | 3.5 |
| 4. | Training Materials & Resources | Distribution of Textbooks, stationary, sports kits, e-learning contents to the students. | 1.0 |
| 5. | Assessment & Certification | • Creating and putting into practice a system for evaluating students' proficiency in both theoretical and practical areas. This includes exam creation, practical assessments, and online evaluation. | 2.5 |

| S. No | Particulars | Details | Cost (in crores) |
|---|---|---|---|
| | | • Establishing systems for monitoring and assessing each student's development to make sure they fulfil the requirements for certification. | |
| 6. | Placement & Post-Training Support | • Organizing internships with affiliated groups.<br>• Mentorship, and funding resources for facilitating Micro Enterprises. | 2 |
| **Total Cost** | | | **18.40** |

**Table No. 8.4**

**Skill Development Programme (ACC DISHA) (Phase - II)**

| S. No | Particulars | Details | Cost (in crores) |
|---|---|---|---|
| 1. | Programme Design & Development | • Curriculum development, Enhancement of qualifications, skills, knowledge, and behavior and to ensure that the training provided meets the needs of the industry.<br>• Spoken English course in the locality with the help of a graduate teacher.<br>• Providing coaching for competitive examinations for NEET / JEE. | 2.0 |
| 2. | Infrastructure & Facilities | • Infrastructure development, including construction or renovation of physical training centres.<br>• Construction/ renovation of boundary walls, construction of separate toilets for boys & girls, drinking water facility.<br>• Installation of smart classes in the Government schools to promote Digital education and development of an e-learning platform for delivering theoretical training.<br>• Development of libraries in nearby Govt. Schools in consultation with Gram Panchayat/concerned authorities. | 3.5 |
| 3. | Training Programs to villagers | • Training programs to specific needs within the construction industry, addressing both skilled and unskilled workers.<br>• Give workers basic skill training in areas including material handling, safety procedures, and the use of simple tools.<br>• Provide computer training to the unemployed youth. | 2.5 |
| 3. | Training & Facilitators | • Hiring of trainers who are certified in the relevant sectors.<br>• Hiring of SMEs for specialized knowledge and expert training delivery in sectors where deeper expertise is required. | 3.1 |

| S. No | Particulars | Details | Cost (in crores) |
|---|---|---|---|
| | | • Ongoing professional development programs for trainers to keep them updated with the latest industry trends. | |
| 4. | Training Materials & Resources | Distribution of Textbooks, stationary, sports kits, e-learning contents to the students. | 1.0 |
| 5. | Assessment & Certification | • Creating and putting into practice a system for evaluating students' proficiency in both theoretical and practical areas. This includes exam creation, practical assessments, and online evaluation.<br>• Establishing systems for monitoring and assessing each student's development to make sure they fulfil the requirements for certification. | 3.0 |
| 6. | Placement & Post-Training Support | • Organizing internships with affiliated groups.<br>• Mentorship, and funding resources for facilitating Micro Enterprises. | 2 |
| **Total Cost** | | | **17.10** |

## 8.5 CONCLUSION

Apart from providing direct employment opportunities ACC Limited will generate a fair amount of indirect employment avenues in the area in the form of contractor, shopkeepers, agents, Stockists, transportation, workshop, etc. and other casual employment. The local economy will receive a boost due to employee spending and services generated by the company. The overall effect will improve the buying power of employees and thus a higher standard of living *viz.* better education, improved health and sanitation facilities, housing etc. This is envisaged as a major positive benefit, which will ultimately lead to the sustainable development of the region.

# *CHAPTER - 9*
# *ENVIRONMENTAL COST BENEFIT ANALYSIS*

## 9.1 ENVIRONMENTAL COST BENEFIT ANALYSIS

As per EIA Notification dated 14th Sept., 2006, and as amended thereof; the Chapter on "Environmental Cost Benefit Analysis" is applicable only, if the same is recommended at the Scoping stage.

As per the ToR points issued by MoEF&CC, New Delhi *Vide* Letter no. J-letter no. J-11011/265/2012-IA II(I) dated 20th February, 2013; validity extended *Vide* Letter dated 18th Feb., 2016 for the Proposed Project, the Environmental Cost Benefit Analysis is not required.

# *CHAPTER - 10*
# *ENVIRONMENT MANAGEMENT PLAN*

## 10.1 INTRODUCTION

The environmental management plan consists of a set of mitigation, management, monitoring and institutional measures to be taken during implementation and operation of a plant to eliminate adverse environmental impacts or reduce them to acceptable levels.

The environmental management plan addresses the components of environment affected during the different activities forming part of the processes of proposed plant.

Based on the evaluation of impacts and baseline conditions, an Environmental Management Plan (EMP) has been delineated to mitigate the adverse impacts on environment of the area due to the proposed project. EMP includes planning, implementation, monitoring & data analysis & corrective action.

The EMP is herein outlined after taking into account the various Acts, Rules and Regulations / Standards concerned with the environmental management.

*Environmental Management Plan is detailed under the following heads to meet the regulatory compliances:*

- Air Quality Management.
- Noise Management.
- Waste Water Management.
- Rain/Storm water Management.
- Solid & Hazardous Waste Management.
- Energy Conservation.
- Greenbelt Development & Plantation Programme.
- Occupational Health & Safety Measures.

***Purpose of EMP:***

- To control emission and waste minimization and proper disposal of waste so as to meet statutory requirement of appropriate technology.
- To support & implement best technology to achieve environmental standards.
- Judicious use of natural resources and water.
- To ensure good working condition for safety, welfare and good health of the work force.
- Ensure effective operation of all control measures.
- Vigilance towards probable disasters and accidents.
- Monitoring of cumulative and long-term impacts.
- To reduce accident hazards.
- Allocation of funds for environment management supplies.

- To promote greenbelt development & Plantation Programme.

***Elements of EMP:***

*EMP includes four major elements: -*

1. **Planning**: This includes identification of environmental impacts, legal requirement, commitments and policies, setting environmental objectives and environment, health, safety and social compliance requirements;
2. **Implementation**: This comprises of resources available for the project, accountability of employees, contractors and documentation of measures to be taken;
3. **Checking (Measurement & Evaluation):** This includes regular inspection, audits, monitoring corrective actions and record keeping; and
4. **Management Review**: Actions are taken to continually improve the environment, health, safety, and social performance of the organization.

The following Policies & programs will be developed to ensure proper implementation of EMP for the Cement Plant:

- Formulating Corporate Environment Policy (CEP)
- Formation of Environment Management Cell (EMC)
- Implementation of CPCB Guidelines for control of Fugitive Emissions
- Compliance of CREP Guidelines
- Concept of Waste Minimization, 3Rs Concept
- Energy and Natural Resource Conservation
- Greenbelt Development/plantation programme
- Occupational Health and Safety Measures
- Budgeting of Environmental Mitigation Measures

## 10.2 CORPORATE ENVIRONMENT POLICY

To achieve the goals of EMP, it is necessary to formulate Corporate Environment policies and to fulfill the others rules & regulation, EMC has to be formed.

Company has well laid Corporate Environmental Policy adopted by Board of Directors indicating clear framework to become Environmentally Sustainable organization. A hierarchical system or administrative order of the company has been framed to deal with the environmental issues and for ensuring compliance with the conditions stipulated in various clearances and consents.

The Corporate Environment Policy of the company has been given as under:

ACC adani Cement

**CORPORATE ENVIRONMENT POLICY**

As an integral part of our business philosophy, ACC Limited part of Adani Group is committed to contribute towards ensuring a clean and sustainable environment by continually improving our environmental performance.

This policy is applicable to all units with operational and financial control and extends to our value chain, vendors, suppliers, and logistics partners. The suppliers and value chain partners are expected to adhere to the policy and develop an Environment Policy for their own operations.

To achieve this goal, we wholeheartedly and proactively commit ourselves to:

- Conduct all our operations in an environmentally responsible manner that is better than statutory environment compliances and applicable standards.
- Ensure judicial use of resources including energy, water and raw materials.
- Adopt environmentally safe and advanced process technologies along with best practices for prevention & control of risks and adverse effects of the release of our pollutants to the environment (air, water, and soil) so as to protect health and safety of our employees, contract employees, and community.
- Continuously assess our environmental impacts and measure and improve our environmental performance by adopting best practices for prevention and control of pollution.
- Make continuous efforts to increase the use of non-carbonaceous raw material, renewable energy and fuels and co-processing of wastes to reduce our greenhouse gases (GHG) footprint as part of our Climate Change mitigation initiative.
- Promote circular economy through use of alternate fuels, raw materials and recuse and recycling of waste generated.
- Comply with applicable legal and other requirements including clearances of environment, forest and wildlife, consents, permits, licenses, standards, and leading industry initiatives.
- Make continuous efforts to reduce water intensity and fresh-water usage by increased use of harvested and recycled water in our operations.
- Assess biodiversity quality in all our extraction sites and strive to create a positive impact.
- Invest in research and development of environmentally sustainable products which have a low ecological footprint.
- Set targets and objectives to reduce environmental impacts of our operations and establish continuous monitoring mechanisms.
- Achieve No Net Deforestation as part of our operations.
- Encourage value chain partners to improve their environmental performances.
- Implement and continually improve the Environmental Management System across all our operations.
- Conduct regular training employees to understand the impacts of their work activities on the environment and on judicious use of resources.
- Raise awareness of environmental management policy and environmental impacts for internal and external stakeholders.
- Carry out Environmental Due diligence at the time of business mergers and acquisitions.
- Disclosure of our environmental performance to all applicable stakeholders on a regular basis.

**Roles and Responsibilities**

- Unit Heads of the respective sites are responsible for the implementation of this policy and EMS at unit level in consultation with Corporate Environment Head.
- Chief Sustainability Officer oversees and holds responsibilities of overall effectiveness of the system implementation, initiatives undertaken across the organizational boundaries.
- Environmental performance and issues are communicated to Management and Board of Directors during quarterly meetings and as per the requirement.

**Ajay Kapur**
**Chief Executive Officer**
**Cement Business, Adani Group**

**Figure 10.1: Corporate Environment Policy**

## 10.3 FORMATION OF ENVIRONMENTAL MANAGEMENT CELL (EMC)

In order to maintain the environmental quality within the standards, regular monitoring of various environmental components is necessary. ACC will maintain a full-fledged Environmental Management Cell (EMC) for environmental monitoring and management. The EMC team will take care of pollution monitoring aspects and implementation of control measures. A group of qualified and efficient engineers with technicians will be deputed for maintenance, up keeping and monitoring of the pollution control equipment, to keep them in working at the best of their efficiencies under the supervision of Environmental Manager in EMC.

### 10.3.1 Structure of EMC

Structure of Environment Management Cell at ACC which will be established at the Proposed Integrated Cement Plant is given in Figure 10.2.

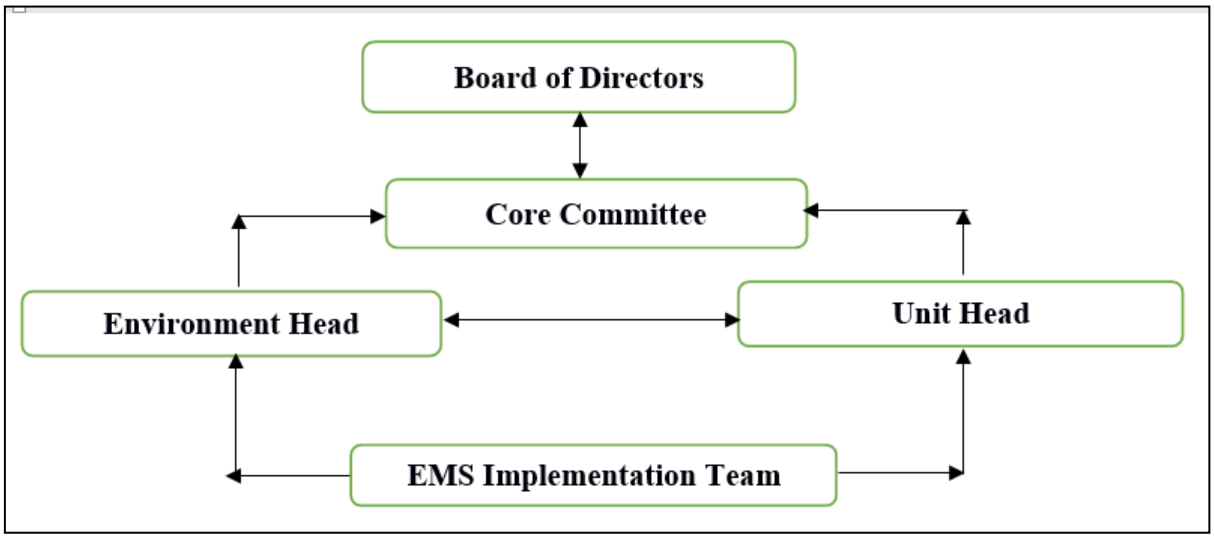



**Figure 10.2: Structure of EMC at ACC**

### 10.3.2 Responsibilities of EMC

The responsibilities of the EMC include the following:

- Procurement and commissioning of Pollution Control/Monitoring Equipment.
- Environmental monitoring of the core and buffer zone and evaluation of results. Keeping of records to track the surrounding environment quality status.
- Timely Calibration of Pollution Control Equipment and facilities.
- Specification and regulation of maintenance schedules for Pollution Control Equipment.
- Ensuring that prescribed standards are maintained.
- Regular Inspection, Monitoring & Auditing.
- Implementation of the mitigation measures as suggested in EIA/EMP Report.
- Ensuring greenbelt development/plantation & its maintenance.
- Compliance with guidelines and statutory requirements.

- Coordination with statutory bodies, functional groups of the unit, Corporate Project/Environment & Engineering department etc.
- Organizing meetings of the Environmental Management Committee.
- Interaction with engineering & operation team for implementation of any modification programmes intended to improve the availability / efficiency of pollution control devices / systems.
- Carry out proactive environmental studies and observe all precautions necessary to avert disasters and emergencies in the mining observations as well as nearby areas.
- Regular environmental review and performance appraisal (Internal) and organizing Environmental / Energy and Water Audits by independent agencies/ 3rd party agencies.
- Coordination with the vendors dealing in waste supplies and disposal.
- Ensuring that the waste handling and disposal is carried out as per prescribed conditions.
- Conducting regular training programmes on various environmental requirements especially sustainable development, climate change, environmental monitoring etc.
- Reporting of compliances and non–compliances (if any) to management and other stakeholders.

## 10.4 AIR QUALITY MANAGEMENT

The major air pollutant emitted from an Integrated Cement Plant is suspended particulate matters from various stacks and fugitive emissions due to material handling / transportation activities. Gaseous emission such as $SO_2$ and $NO_x$ also add to the air pollutant level due to burning of fuel in the Cement Plant and Captive power plant

***Fugitive Emissions***

Fugitive emissions are the air pollutants released in the air. Fugitive dust may be defined as "any solid particulate matter that becomes airborne by natural or man-made activities, excluding particulate matter emitted from an exhaust stack.

***Factors that influence emissions***

Factors affecting emissions include the following:

- Moisture content of the material
- Type of material processed
- Type of equipment
- Operating practices employed.

***Measures to Control Emissions***

- ***Transportation***
  - ✓ Transportation of clinker to the clinker silo will be done through covered conveyor belt in a very controlled manner; while that of the fly ash to fly ash silo will be done pneumatically from tankers. This helps in reducing the fugitive emissions.

- ✓ Movement of heavy trucks/vehicles on the non-metallic road generates substantial quantity of dust emission. This is due to the presence of dust over the road, which is carried away by wind. To control the generation of dust, all the roads inside the plant premises will be concreted.
- ✓ Regular sweeping of all the roads and floors will be done by vacuum sweeping machine.
- ✓ Sprinkling of water through tankers will be done on bare lands and roads.
- ✓ Speed of vehicles within the plant premises will be limited to 10 km/hr.
- ✓ Thick Greenbelt will be developed all along the road inside the premises.

#### *10.4.1.2 Compliance as per CPCB guidelines*

- ✓ For achieving effective prevention and control of potential fugitive emission sources in cement manufacturing plants, specific requirements along with guidelines have been laid down by CPCB, which will be followed specifically in the project operation.
- ✓ Regular inspection will be carried out for all fugitive control system and records will be maintained as per CPCB guidelines.

Measures in accordance to the CPCB guidelines that will be implemented in the Integrated Cement Plant to control the dust emission are given as below:

**1. Unloading Section (Limestone, Coal & Other Relevant Material)**

| S. No. | Guidelines | Control Measures to be Provided |
|---|---|---|
| 1. | The enclosures for the unloading sides could be flexible curtain type material covering up to height of dumpers discharge from the roof. | Enclosures of flexible curtain will be provided for all unloading operations covering height of dumpers from the roof. |
| 2. | A dust suppression system should be provided to spray water. The amount of water sprayed should preferably be optimized by employing proper design of spray system. Suitable systems may be adopted to reduce the problems like choking, jamming of the moving parts. | Water sprinklers proper design and suitable spray system will be provided for dust suppression. |

**2. Material Handling Section (Including Transfer Points)**

| S. No. | Guidelines | Control Measures to be Provided |
|---|---|---|
| 1. | The enclosures from all sides with the provision for access doors, which shall be kept, closed during operation. Spillages should be periodically removed. | Transfer point locations will be fully enclosed for the proposed project and spillage of cement will be removed regularly. |
| 2. | Either water spray system should be provided for suppressing the air borne dust or dry extraction cum bag filter with adequate extraction volume should be installed. | Bag filters (168 nos.) will be provided at all the material transfer points and required locations to avoid fugitive emissions. |
| 3. | Spray sufficient quantity of water to moist the top layer to avoid wind blowing of fine particles. | Water will be periodically sprayed on the stockpiles, so as to retain some moisture in the top layer. |

**3. Coal Storage Section**

| S. No. | Guidelines | Control Measures to be Provided |
|---|---|---|
| 1. | A board should be erected to display the area earmarked. | Coal and Petcoke yard/storage area will be clearly earmarked with a display Board. |
| 2. | Proper pathways with entry and exit point should be provided. | The pathways with entry and exit point in coal yard for vehicle movement will be paved. |
| 3. | Any deposits of dust on the concrete roads should be cleaned regularly by sweeping machines. | Accumulated dust will be removed / swept regularly. |
| 4. | Wherever blending activity is carried out by chaining in open ground, covered shed should be provided to reduce the fine coal dust getting airborne. The enclosure walls shall cover minimum three sides up to roof level. | Coal other than coal stockpile will be preferably stored under covered shed. Closed all three side upto roof if, covered open area, enclosure wall covering three sides will be provided. |
| 5. | The enclosure should be from three sides and roof so as to contain the airborne emissions. | Enclosure from three sides and roof will be provided for coal and pet coke storage. |
| 6. | Instead of dust extraction cum bag filter system, if dust suppression measure is used, following additional control measures should be provided. | |
| a. | Coal should be sufficiently moistened to suppress fines by spraying minimum quantity of water, if possible. | Water sprinkler system will be provided sprayed to suppress fine dust before unloading. |
| b. | Water spray should also be applied at crusher discharge and transfer points. | Water spray system will be provided at crusher discharge and transfer points. |

**4. Clinker Cooler Section**

| S. No. | Guidelines | Control Measures to be Provided |
|---|---|---|
| 1. | The possibilities especially in new cement plant may be explored for the following:<br>The unit may need to add on / install necessary provisions for separating fine particulates from the clinker cooler ESP collection. Fines separation may be achieved by passing collected dust through cyclone, the fines escaping cyclone to be separated, cyclone collection (coarse particles) could be recycled. The fines shall be recycled to the last possible destination (like clinker day silo) suitable or safely disposed. | Air borne fines extracted from clinker cooler will be separated and recycled.<br>ESP will be provided at clinker cooler and dust collected from the same will be recycled back to the process. |

**5. Clinker Stock Piles Section**

| S. No. | Guidelines | Control Measures to be Provided |
|---|---|---|
| 1. | Bag filter may be provided before venting out the gases. | Bag filter will be provided before venting out the gases. |

| S. No. | Guidelines | Control Measures to be Provided |
|---|---|---|
| 2. | The enclosures should have aventing arrangement located at transfer point where clinker is dropped to the stockpile. The extraction /venting should be sufficient enough. Clinker stockpile access door should be covered by mechanical gate or by flexible rubber curtain. The access doors shall be kept closed at all possible times. | Clinker will be stored in silo which will have venting arrangement along with a bag filter. |
| 3. | Extracted dust should be captured in bag filter and the collected dust should be avoided to feed back to the clinker stockpile, if layout permits. It may be recycled at last possible destination i.e., cement mill section through suitable arrangement, if possible. | The dust extracted and captured in bag filter will be avoided to feedback/recycled to the clinker stockpile, if possible. |
| 4. | Generally open storage of clinker should be avoided. Only in case of emergency clinker would be stored in open with following control measures. | |
| a | After earmarking the open storage area of clinker, a board should be erected to display the area earmarked. | No open storage of clinker will be done and proper silo will be provided for storage of clinker. |
| b | During the period when the openly stored clinker is inactive, it should be covered fully by HDPE or tarpaulin type sheets to prevent wind blowing of fugitive dust. | Cover will be provided if clinker would be stored in open to prevent wind blowing of fugitive dust. |
| c | Install three sided enclosures, which extend to average height of the stockpile, where ever feasible. | Wind break walls on three sides of open stock piles will be provided |
| d | Flexible type wind breaking enclosure should be provided covering the clinker retrieval area as wind barrier to prevent dust carry over by wind.<br>The enclosure could be of light weight material like molded plastic material or similar, which could be dismantled/assembled and shifted from one place to other. | Partial enclosure for retrieving area will be provided. |
| e | Travel areas path used by the front–end pay loader shall be paved with concrete. It should be regularly swept by high efficiency vacuum sweeper to minimize the material build – up. | The travel path of pay loaders would be paved and frequently swept by sweeping machine. |
| f | The possibilities especially in new cement plant may be explored for the following:<br>An enclosure fitted with bag filter could be located at the most central place adjacent to the clinker storage area. The pay loader moves to the fixed loading area from one end of the enclosure and the truck/trailer enters the enclosure from another end. | Loading of clinker by pay loaders into trucks/trailers will be carried out in an enclosure fitted with a bag filter. |

**6. Storage of Limestone, Gypsum, Fly ash and other additives**

| S. No. | Guidelines | Control Measures to be Provided |
|---|---|---|
| 1. | The enclosure walls shall cover minimum two sides up to roof level. | The raw material and finished product storage will be under covered shed and Silo respectively. |
| 2. | Fly ash shall be pumped directly from the tankers to silos pneumatically in closed loop or mechanically such that fugitive emissions do not occur. | Dry fly ash will be transported by closed tankers/ bulkers and will be pumped directly from the tankers to silos pneumatically / closed unloading hopper in closed loop. |
| 3. | The silo vent will be provided with a bag filter type system to vent out the air borne fines. | Dry Fly ash will be stored in silos only provided with a bag filter system to vent out air borne fines. |
| 4. | If possible, the dry fly ash should be sent to closed silos. Otherwise, fly ash should be transported through closed belt conveyors to avoid wind carryover of fly ash. | Fly ash will be sent to closed silos by pneumatically enclosed loop. |

**7. Cement Packing Section**

| S. No. | Guidelines | Control Measures to be Provided |
|---|---|---|
| 1. | The packing machines should be equipped with dust extraction arrangement such that the packing operation is performed under negative pressure. The dust may be captured in bag filters. | Dust extraction arrangement for packing machines will be provided and dust collected in Bag filters will be recycled back to the process. |
| 2. | Adequate ventilation for the packing hall should be provided for venting out suspended particulate thereby ensuring dust free work environment. | Adequate ventilation for the packing hall will be provided to ensure dust free work environment. |
| 3. | The spilled cement from the packing machine should be collected properly and sent for recycling.<br>The spilled cement on the shop floor should be swept by vacuum sweeping machines periodically.<br>Proper engineering controls to prevent the fugitive emissions may include arrangements like providing guiding plate, scrapper brush for removing adhered dust on cement bag etc. | The spilled cement from the packing machine will be collected properly and sent for recycling in the process.<br>Spillage of cement on floor will be minimized and swept by vacuum sweeping machines periodically to prevent fugitive emissions. |
| 4. | The vibratory screen provided for screening/ recycling spilled cement should be provided with a dust extraction arrangement to prevent fugitive emission from that section. | Emissions from the recycling screen will be prevented by installing appropriate dust extraction system. |

**8. Silo Section**

| S. No. | Guidelines | Control Measures to be Provided |
|---|---|---|
| 1. | The bag filter should be operated and maintained properly, especially the cleaning of bags to avoid pressurization of silos thereby causing fugitive emissions from leakages etc. | The silo vent will be provided with a bag filter type system to vent out the air borne fines. |

**9. Roads**

| S. No. | Guidelines | Control Measures to be Provided |
|---|---|---|
| 1. | The paved roads should be maintained as paved at all times and necessary repairs to be done immediately after damages to the road if any. | All roads in the plant premises on which vehicle movement of raw materials or products take place will be paved and will be repaired immediately after damage. |
| 2. | Limit the speed of vehicle to 10 Km/h for heavy vehicles within the plant premises to prevent the road dust emissions. | Limit the speed of vehicle will be limited to 10 Km/h for heavy vehicles within the plant premises to prevent the road dust emissions. |
| 3. | Preventive measures include covering of trucks and paving of access areas to unpaved areas. | Preventive measures such as covering of truck and paving of access area to upward area etc. will be employed to minimize dust build up on roads. |
| 4. | Mitigative controls include vacuum sweeping, water flushing. | Regular sweeping of roads will be done to minimize emissions. |

## 10.5 COMPLIANCE OF CREP RECOMMENDATIONS

Following recommendations as mentioned in CREP guidelines of CPCB for Cement Plants will be implemented.

**Table - 10.1**
**Implementation of CREP guidelines**

| S. No. | CONDITIONS | STATUS |
|---|---|---|
| 1. | Cement Plants which are not complying with notified standards:<br>o Augmentation of existing Air Pollution Control Devices - by July 2003.<br>o Replacement of existing Air Pollution Control Devices - by July 2004. | ACC will comply with all the Stipulated standards given by MoEFCC/APPCB. |
| 2. | Cement plants located in critically polluted or urban areas (including 5km distance outside urban boundary) will meet 100 mg/Nm3 limit of particulars matter by December 2004 and continue working to reduce the emission of particulate matter to 50 mg/ Nm3. As per Gazette Notification MoEFCC G.S.R 497(E)dated 10th May, 2016, emission standards for PM have been prescribed as 30 mg / Nm3 | Emission levels will be maintained <30mg/$Nm^3$ for PM. |
| 3. | The new cement kilns to be accorded NOC/Environmental Clearance w.e.f. 01.04.2003 will meet the limit of 50 mg/ Nm3 for particulate matter emissions | Emission levels will be maintained <30mg/$Nm^3$ for PM. |
| 4. | CPCB will evolve load-based standards by December 2003. | ACC will be complying with all the Stipulated standards given by MoEFCC, New Delhi. |
| 5. | CPCB and NCBM will evolve $SO_2$ and $NO_2$ emission standard by June 2004. The above referred | ACC will comply all the Stipulated standards given by MoEFCC, New Delhi. |

| S. No. | CONDITIONS | STATUS |
|---|---|---|
| | Notification has stimulated emission standards for SO2 - 100 mg / Nm3 and NOx - 600 mg / Nm3 | |
| 6. | The cement industries will control fugitive emissions from all the raw material and products storage and transfer points by December 2003. However, the feasibility for the control of fugitive emissions from limestone and coal storage areas will be decided by the National Task Force (NTF). The NTF shall submit its recommendation within three months. | ACC will take the following measures to control Fugitive dust emission.<br>o Clinker will be stored in silo while Raw meal, Cement and fly ash will be stored in silos.<br>o Iron Ore, Bauxite, Pond ash, Gypsum, Coal, Petcoke, will be stored in the covered sheds.<br>o Bag filters will be provided at all material Transfers Points.<br>o Water spraying system will be provided on raw material unloading hoppers (Limestone, Coal, Petcoke & Iron ore).<br>o All movement area will be concreted to avoid fugitive dust emission.<br>o Vacuum sweeping machines will be deployed for better housekeeping.<br>o Fly ash transfer by pneumatic/ mechanical transportation |
| 7. | CPCB, NCBM, BIS and Oil refineries will jointly prepare the policy on use of petroleum coke as fuel in cement kiln by July 2003. | Petcoke will be used in cement plant as feed stock to conserve natural coal. |
| 8. | After performance evaluation of various types of continuous monitoring equipment and feedback from the industries and equipment manufacturers, NTF will decide feasible unit operations/sections for installation of continuous monitoring equipment. The industry will install the continuous monitoring systems (CMS) by December 2003. | ACC Cement works will be installing the Continuous Stack Emissions. Monitoring System at following locations.<br>o Kiln / Raw mill<br>o Coal mill stack<br>o Clinker cooler stack<br>o Cement mill stack<br>Stack emission data online transmitted to APPCB server. |
| 9. | Tripping in ESP to be minimized by July 2003 as per recommendation of NFT. | The whole plant process will be inter-connected to each other and in case of tripping of ESP, the whole plant will be shut down. |
| 10. | Industries will submit the target date to enhance the utilization of waste material by April 2003. | ACC will continuously put efforts to use waste materials:<br>o Waste material (fly ash) from own CPP & other Thermal Power Plant will be used in utilized in PPC Manufacturing Process.<br>o Used ore for substituting laterite requirement.<br>o Hazardous waste will be utilized in kiln after getting permission from APPCB. |

| S. No. | CONDITIONS | STATUS |
|---|---|---|
| 11. | NCBM will carry out a study on hazardous waste utilization in cement kiln by December 2003. | Hazardous waste in the form of AFR will be utilized in kiln for co-processing after getting permission from APPCB. |
| 12. | Cement industries will carry out feasibility study and submit target dates to CPCB for co-generation of power by July 2003. | Company is proposing installation of WHRS (25 MW) for recovery of waste heat. |

## 10.6 NOISE QUALITY MANAGEMENT PLAN

**Source:** Cement Mill, Raw mill and crusher are the three major noise emission sources. As crusher is located adjacent to the lease area of the proposed Limestone Mine, major source of the noise from the proposed plant premises will be cement mill and raw mill. Exposure of high noise level to the workers for long duration of period may lead to Noise induced hearing loss (NIHL). In order to keep the generated noise level below the prescribed standards, following measures will be adopted.

***Management Plan***

In order to keep the generated noise level below the prescribed standards, as exposure of high noise level to workers for long duration may lead to certain occupational diseases, following management plan will be adopted.

- Properly insulated enclosures will be provided to equipment generating excessive noise.
- Improved silencers within the equipment generating high noise.
- Isolation of continuously vibrating structures/ machines by proper and secured mountings.
- Installation of compressors and turbine in closed building.
- Proper maintenance, oiling and greasing of machines at regular intervals will be done to reduce generation of noise.
- Personal Protective Equipment (PPEs) like earplugs and earmuffs will be provided to the workers exposed to high noise level.
- Greenbelt development will be done along the plant boundary and plantation areas scattered in operation area to attenuate the noise generated by the cement plant and its transportation activity. The impact due to the plant operational activity is observed to have a minimal impact on the surrounding habitation as the manufacturing activity is planned away from the nearby habitation.
- Regular monitoring of noise level will be carried out and corrective measures will be adopted accordingly.
- Working hours will be limited in high noisy section of plant.
- DG sets will be housed in enclosed room with in-built silencer

## 10.7 CONCEPT OF WASTE MINIMIZATION, 3R'S (REUSE, RECYCLE and RECOVER TECHNIQUES)

### 10.7.1 Waste Minimization - 3R's

#### 10.7.1.1 Reuse

- Waste generated from construction activity will be utilized in leveling of land & road construction.
- STP Sludge (~30 kg/month) will be used as manure for greenbelt development & plantation.
- Biodegradable waste generated from kitchen waste will be converted to Organic Manure through Organic Waste Convertor (OWC) and it will be further utilized in Greenbelt & plantation.
- WTP reject water from CPP & WHRS (120 KLD), Boiler Blowdown (67 KLD) will be treated in Neutralization Pit and treated water will be use in Dust Separation.
- Fly Ash (~1029 TPD) generated from CPP will be totally reused in cement manufacturing process.
- Sewage Treatment Plant (STP) of capacity 300 KLD will be installed for the treatment of domestic waste water.

#### 10.7.1.2 Recycle

- Dust (500 TPD) collected from pollution control equipment i.e., (6 Nos.) Bag House, (4 Nos.) ESP & (168 Nos.) Bag filters will be recycled in the process.

#### 10.7.1.3 Recovery

- Waste heat generated from preheater & cooler will be utilized for power generation through WHRS (25 MW).

## 10.8 ENERGY & NATURAL RESOURCE CONSERVATION MEASURES

### 10.8.1 Energy Conservation

Cement manufacturing is an energy-intensive process. ACC has proposed following energy conservation measures in the proposed Cement Plant to conserve the resources which will be implemented for numerous process control measures as well as energy efficient technologies which will further ensure proficient management of its energy resources.

- Installation of WHRS (Waste Heat Recovery System - 25 MW) for energy conservation.
- Procurement of energy efficient machineries.
- Energy Audits will be conducted at regular intervals.
- Power saving by interlocking of Equipment.
- Power Saver Beblac P-20 lighting panel (Installation of Energy Saver (Power Boss) Panel in Lighting System).
- APFC (Automatic Power Factor Control) panel for HT and LT line to improve power factor (Unity) of the system.
- Minimizing idle running of vehicle, machines and electrical appliances.

- Optimizing loads and periodic preventive maintenance and lubrication.
- Prevention of leakages of compressed air.
- Installation of Solar based LED lights instead of conventional lighting in Plant and Colony area.
- Energy saving by using day light by installing light pipe and using transparent sheet [day light] in Workshop, Store and raw materials yard.
- Switching off unnecessary lights by micro based timer.
- Automatic Star Delta starter for load varying application like conveyer belts etc.
- Installation of Variable Frequency Drive for all the auxiliary bag filter fans for energy saving.
- Installation of power less bag diverters for packing plant instead of conventional motorized bag diverters.
- Installation of Solar Geyser at guest house.
- Internal & external training and awareness programs on energy conservation.

***Energy Conservation Option and possible savings are showing below:***

| S. No. | Energy Conservation Option | Possible Savings |
|---|---|---|
| **Energy Efficient technology and equipments** | | |
| 1. | Gyratory crushers, mobile crushers and single stage crushers<br>Vertical Roller Mills | Upto 30% on electrical energy<br><br>15-30% compared to power consumption of ball mill |
| 2. | **Roller press** | 4-8 kWh/t of cement in pre-grinding system |
| 3. | High efficiency separators | Upto 30% on electrical energy |
| 4. | Variable speed AC drives | Upto 30% on power consumption of the drive |
| 5. | Solid state motor controllers and soft starters | Upto 2% on power consumption of the drive |
| 6. | Energy efficient motor | Upto 5% on power consumption of the drive |
| 7. | Mechanical conveying systems over pneumatic conveying systems for dry raw meal and cement | Upto 5% on power consumption of the drive |
| 8. | High efficiency fans | 10-30% on power consumption of the drive |
| 9. | Improved multi-channel burners | About 2% on heat consumption |
| 10. | 6 – stage preheaters | 30-40 kcal/kg clinker |
| **Input Substitution and Output Modification** | | |
| 11. | Manufacture of blended cements like PPC, PSC | Heat energy in kcal/kg cement: 20% in case of PPC; Electrical Energy: PPC 10-15% |
| **Organizational Measures** | | |
| 1. | Proper maintenance, monitoring and preventive maintenance to minimize downtime of machinery and plant | Depends on the extent of equipment availability and on stream days of the plants |
| 2. | Depends on the extent of equipment availability and on stream days of the plants | Upto 10% on thermal energy and upto 2% on electrical energy depending on extent of false air |
| 3. | Regular inspection and maintenance of capacitor banks and installing additional banks, if required | Dependent on extent of power factor improvement |
| 4. | Effective load management | Upto about 15% in maximum demand |

| S. No. | Energy Conservation Option | Possible Savings |
|---|---|---|
| 5. | Regular inspection of motors for identifying underloading, and reshuffling of the same | Depends on extent of under loading and size of motor |

### 10.8.2 NATURAL RESOURCE CONSERVATION

- ***Water Conservation***

The following measures will be adopted to minimize fresh water consumption:

- ✓ Domestic wastewater (252 KLD) generated from plant premises will be treated in STP of 300 KLD and the treated water (206 KLD) will be utilized for greenbelt development/ plantation.
- ✓ Periodic preventive maintenance of water distribution systems.
- ✓ Use of water efficient and saving devices such as Low flow high efficiency faucet aerators, Automatic shutoff nozzles, and low flow water efficient water heads.
- ✓ Water will be used via water sprinkler for Horticulture activity, at various storage facilities and transportation purpose activity to conserve the water demand.
- ✓ Water conservation and awareness programmes within the premises as well as in the nearby schools and village for fresh water conservation.
- ✓ To conserve water and to replenish ground water resources of the area, rain water harvesting system will be installed for long term sustenance of the industry

- ***Conservation of Limestone***

- ✓ Process waste i.e., Fly ash generated by own CPP & Thermal Power plant will be blended with clinker and help them in getting rid of waste in most sustainable manner by converting into useful product i.e., Cement (PPC). This practice conserves large amount of limestone reserves and the land which otherwise will be occupied for storage of these process waste.

- ***Conservation of Fossil Fuel***

- ✓ Installation of multistage Pre-heater/ pre-calciner for pre-treatment of limestone will significantly reduce the requirement of fuel (i.e., coal).
- ✓ Use of waste material (AFR materials etc.) in co- processing which are having high calorific content (as per availability) also conserves fuel (i.e., coal).
- ✓ Use of railway facility and covered Belt Conveyor for transportation of raw material and finished products will significantly reduce the dependency on fuel.
- ✓ Installation of Waste Heat Recovery System (25 MW) uses the waste heat generated from PH & AQC Boiler for generation of electricity, which result in reduction of $CO_2$ emission and conservation of fossil fuel.

### 10.8.3 DECARBONIZATION PLAN/CARBON CREDIT

**ACL Climate Commitment**

Committed SBTi in 2021 to reduce Sp. Gross $CO_2$ emissions from 680 to 532 kg $CO_2$/t cementitious material (~21.7% reduction) by 2030 from base year 2020.

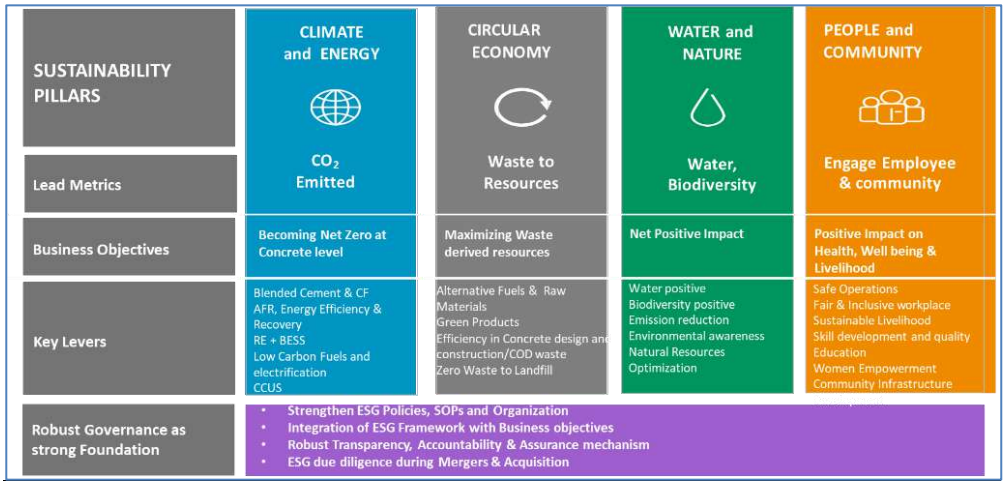
**Reduced Sp. Gross $CO_2$ emission by 17% (565 kg CO2/t) in FY 23-24 Q1 and surpassed 2025 SBTi target and very close to meet the 2030 target.**

Joined the UNFCC's "Race to Zero" under the aegis of GCCA for net zero carbon at concrete by 2050 and have targeted to reduce net Scope 1 carbon emissions by 19.8% to achieve a target of 465 kg CO2/t cementitious material by 2030 from a baseline of 580 kg CO2/t in FY 20.

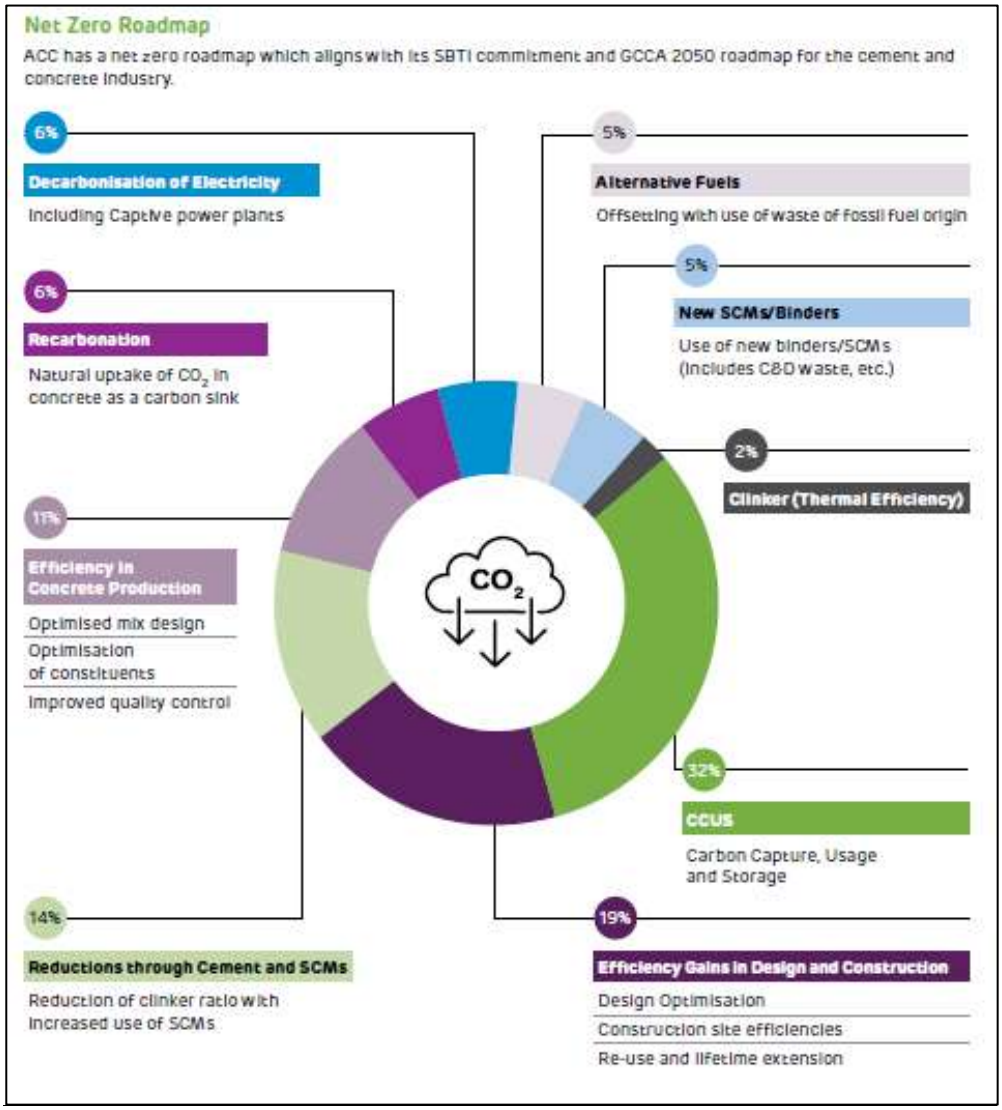
**Reduced Net CO2 emission by 12% (510 kg CO2/t) in FY 26-27 Q1.**

Committed energy compact to increase Green Power Mix upto 50% (FY30).

***Sustainability Framework***




***Net Zero Road Map***




***Decarbonization Actions by ACC Limited***

| **Action Plan of Adani Cement to achieve Five commitments announced by Hon'ble Prime Minister during COP 26 climate change summit at Glasgow.** | |
|---|---|
| **COP 26 Commitment** | **Action Plan** |
| **1 – By 2030, India will bring its non - fossil energy capacity to 500 GW.** | Adani Cement Business: Setting up 1006 MW capacity of which first 200 MW solar plant at Khavda is charged on 30.09.2024<br>**WHRS:**<br>Existing capacity: **~190 MW** (ACC - 64 MW) - Target ~ 376 MW |
| **2 – By 2030, India will fulfil 50 percent of its energy requirements with renewable energy.** | Adani Cement Business plans to consume >60% its energy from green power sources by 2030. |
| **3 – India will reduce one billion tonnes of the total projected Carbon emission between now and** | ○ ACC will reduce scope 1 GHG emissions 21.3% per ton of cementitious material by 2030 from a 2018 base year. ACC Limited also commits to reduce scope 2 GHG emissions 48.4% per ton of |

| | |
|---|---|
| **2030.** | cementitious material within the same timeframe. |
| **4 – By 2030, India will bring its economy's Carbon intensity down to 45%.** | ○ **Low clinker factor products** & utilizing waste materials as fuel – **Helping both on policy advocacy as well as on R&D efforts for development of New standards for sustainable cement**<br>○ Adani Cement Business: Planted nearly 2 Lakh trees in FY'24. Budget for FY'25 is 2.85 Lakh trees cumulative target to reach to 83.5 Lakh trees by 2030 to achieve Group's **100 million Tree Plantation Ambition by 2030 to help in** carbon sequestration |
| **5 – India will achieve the targets of net zero emission by 2070.** | Adani Cement (Ambuja Cements Ltd. and ACC Ltd.) targets to achieve Net Zero by 2050 at concrete level. |

## 10.9 SOLID & HAZARDOUS WASTE MANAGEMENT PLAN

### 10.9.1 SOLID WASTE MANAGEMENT PLAN

Solid waste generation from the proposed integrated cement plant and their end use is given in table below:

**Table - 10.2**
**Solid Waste Generation and their end use**

| S. No. | Type of Waste | End Use / Disposal Plan |
|---|---|---|
| 1. | Dust (500 TPD) collected from air pollution control equipment | Dust collected from various APCEs will be totally recycled into the process. |
| 2. | Sludge from Sewage Treatment Plant (~30 kg/Month) | Used as manure for greenbelt development & plantation |
| 3. | Fly ash from CPP (~10290nnes / Day) | Used in manufacturing of Portland Pozzolana Cement |
| 4. | Refractory bricks lining in the kiln having high recycling values | Disposed off to external vendors for their use in other industries |
| 5. | Municipal waste ~100 Tonnes/ Annum) (domestic and or commercial wastes) | Waste will be collected & segregated into bio-degradable & non– degradable. Further, Bio-degradable waste will be used for Bio gas generation in Bio gas plant and non–degradable waste will be sold to authorized vendor from CPCB/SPCB as per scientifically in compliance of Solid Waste Management rules 2016, as amended thereof. |
| 6. | Redundant machinery or equipment | Occasionally, scraps as and when generated segregated, stored & sold to vendors. |
| 7. | Horticultural waste | Horticultural wastes generated from gardens/greenbelt will be composted. |
| 8. | C & D Waste (200 Tonnes / annum) | Will be used in levelling and filling. |
| 9. | Plastic Waste | Will be sold to authorized vendors/used in Co – processing in Kiln after getting permission from APPCB. |

### 10.9.2 HAZARDOUS WASTE MANAGEMENT PLAN

The hazardous waste that will be generated shall be temporarily stored at earmarked place and handled as per Hazardous and other Waste (Management &Trans-boundary Movement) Rules, 2019. Details are given in table below:

**Table - 10.3**
**Hazardous Waste Generation**

| S. No. | Type of Waste | Waste Category | Quantity | Treatment/Disposal Plan |
|---|---|---|---|---|
| 1. | Used or Spent Oil | Sch. I, Cat.- 5.1 | ~ 120 KL/Annum | Will be used in Kiln as co-processing as per Hazardous Waste Management Rules, 2016 and Empty barrels Will be sold to APPCB/CPCB registered recycler as per Hazardous Waste Management Rules, 2016. |
| 2. | Empty barrels | Sch. I, Cat.- 33.1 | ~300 Nos. / Annum | |
| 3. | E-Waste | - | ~15 Tonnes/annum | Will be sold to registered vendors as per E-Waste Management Rules, 2016. |
| 4. | Used Lead Acid Batteries | - | ~100 Nos./Annum | Will be sold to APPCB/CPCB registered recycler as per Batteries (Management & Handling) Rules, 2001. |

### 10.10 RAIN/STORM WATER MANAGEMENT PLAN

#### 10.10.1 Storm water management plan

- Storm water drains will be made immediately after starting construction activity. The drains will be properly aligned in conformity with the site drainage pattern so that the alteration is kept to the minimum and flooding or soil erosion does not occur.
- Sedimentation pits will be provided at appropriate location to trap the silt laden runoff water and prevent excessive silt from going outside. The storm water drains will be diverted to a water reservoir to collect the runoff. This stored water will be utilized for civil construction purpose.
- In the operation phase of the project, proper storm water drain will be constructed for Rain water harvesting.
- During the industrial activity there may be a chance of contamination of ground water by leachate generation from spillage of hazardous chemicals, storage of raw materials, finish products and solid waste., etc. Thus, following mitigation measures will be taken to avoid contamination of ground water. which are follows:
  - Raw materials (i.e., limestone and clay etc.) and solid waste (Steel scrap, Plastic wrappers, bursted bags, STP sludge, MSW etc.) will be stored in separate stockyards.
  - Any spillage of hazardous waste or contamination will be immediately removed.
  - Regular ground water monitoring will be carried out.
  - AFR storage yard will be construct in such a way that leachates will be prevented.

### *10.10.2 Proposed Rainwater Harvesting*

Detailed Hydro-geological Study along with Rainwater Harvesting Plan is enclosed as ***Annexure - 8*** along with this EIA/EMP Report.

Rainwater harvesting is to be done to minimize the undesirable effect on groundwater status. It is necessary that groundwater storage of an area must be arranged by rainwater harvesting so that the existence of any industry does not adversely affect the groundwater situation.

ACC is proposing Rain water harvesting in the proposed plant and Summarization of Rainfall Run-off within Industrial Premises is as below:

| Sl. no | Facility Name | Particular | Length (m) | Width (m) | Depth (m) | Area (m) | Volume ($m^3$) | remarks |
|---|---|---|---|---|---|---|---|---|
| 1. | Rainwater Harvesting Pond | Dimension of pond | **250** | **166** | **4.5** | **41,500** | **186750** | |
| | | Capacity of pond ($m^3$/Y) | **560250** | | | | | **3 filling seasons** |
| | | Total capacity of pond ($m^3$/Y) | **560250** | | | | | |

*Source: Hydro-geological Study Report*

**Summary of Rainwater Harvesting**

| | |
|---|---|
| Water Requirement ($m^3$/Y) | **9,64,260** |
| Total Runoff generated in Project Site ($m^3$/Y) | **5,59,784** |
| Runoff to be Stored ($m^3$/Y) | **5,59,784** |
| Capacity of RW Harvesting Pond ($m^3$/Y) | **5,60,250** |

*Source: Hydro-geological Study Report*

- To accommodate the total runoff generated in the project site which is (5,60250 $m^3$/Y), the area of the pond should be approximately, 41,500 $m^2$ which covers 4.15 Ha area.
- As the capacity of the Rainwater Harvesting Pond is higher than that of the runoff which is to be stored, 100% runoff water can be stored.
- The capacity of the rainwater harvesting pond with respect to the water requirement is 58%.

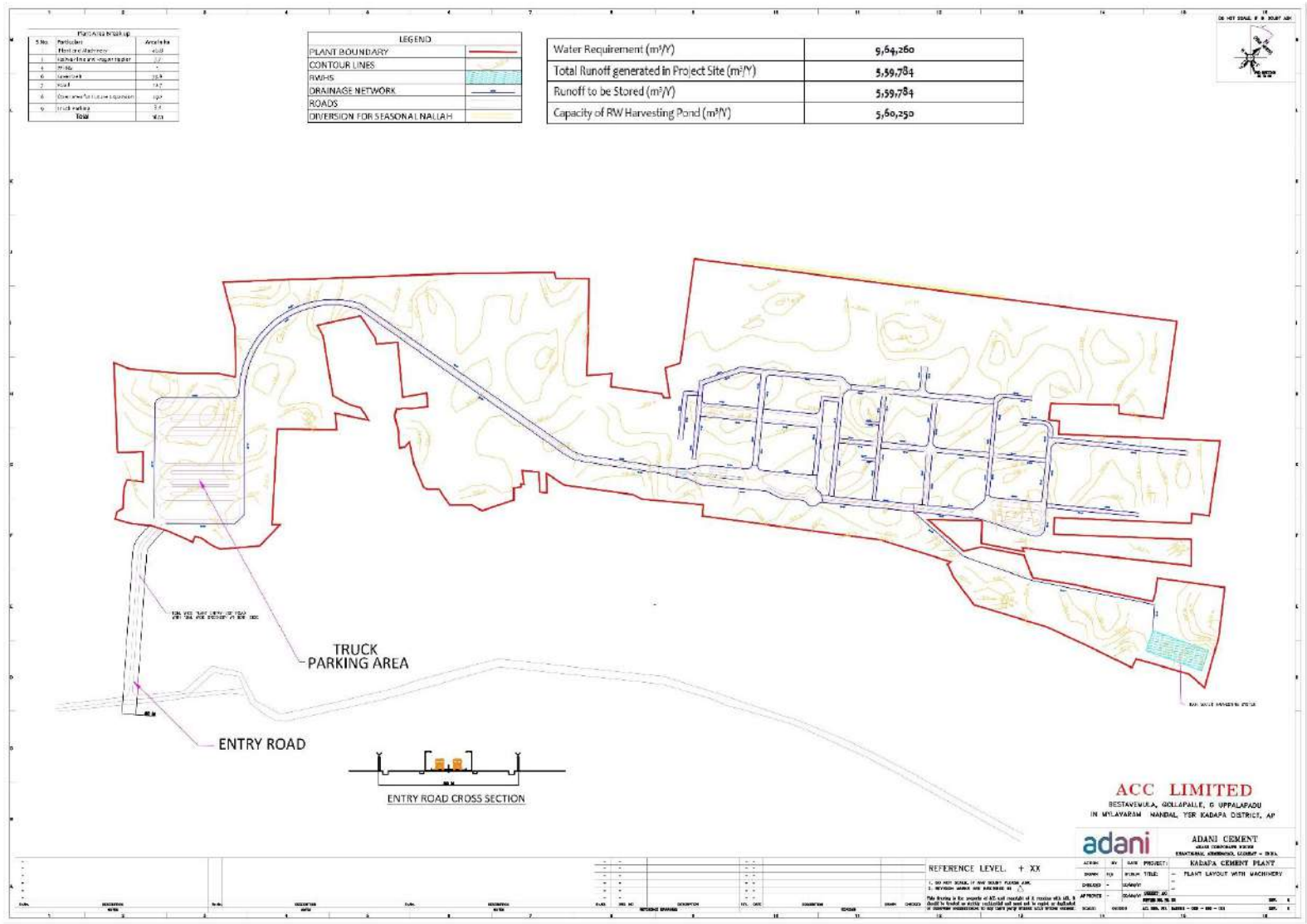



**Figure 10.3: Contour Drainage Map**

## 10.11 GREENBELT DEVELOPMENT & PLANTATION PROGRAMME/MANAGEMENT PLAN

### 10.12.1 Objective

Greenbelt development/plantation is an important task which helps to negate the impact of any project on surrounding environment and plantation of native species help to maintain the local eco-system. In order to enhance land use as well as to compensate for any loss in ecology during construction & operation, adequate plantation programme has been planned and shall be adopted with plantation of adequate number of trees. Greenbelt is a set of rows of trees planted such a way that they form an effective barrier between the plant and the surroundings. The main purpose of greenbelt development is to contribute to the following factors:

- To attenuate noise levels generated from the plant;
- To improve the aesthetics of the plant area;
- To trap the vehicular emissions and fugitive dust emissions;
- To maintain ecological homeostasis;
- To prevent soil erosion and to protect the natural vegetation; and
- To utilize the treated effluents.
- To improve aesthetic beauty of the area.

Provision of wide greenbelt around the plant has been foreseen to reduce any adverse impacts on the surrounding population due to emissions from the Proposed Cement Plant. Plantation of grass, flowers, bushes and trees will be taken-up to reduce generation of dust from bare earth and to enhance the aesthetic/scenic value.

### 10.12.2 Guidelines for greenbelt development

Following guidelines will be followed for the Greenbelt Development Plan in the project area:

- Soil and other environment should be very encouraging and the expected growth rate will be about 90%.
- Trees growing to a height of 5m or more will be planted.
- Plantation of trees will be undertaken in around the area in alternating rows to prevent horizontal pollution dispersion.
- Trees will be planted along road sides, to arrest auto-exhaust and noise pollution, and in such a way that there is no direct line of sight to the installation when viewed from a point outside the foliage perimeter.
- Since, tree trunks are normally devoid of foliage (up to 3 m), it will be appropriated to have shrubbery in form of such trees to give coverage to this portion.
- Fast growing trees with thick perennial foliage will be grown, as it will take many years for trees to grow to their full height.
- Three tier plantations will be undertaken all along the Plant boundary.

### 10.12.3 Greenbelt/ Plantation Programme

The total project area is 187.1 ha, out of which ~ 42.65 % of the total project area i.e., 79.8 ha has been earmarked to be developed as greenbelt development & plantation.

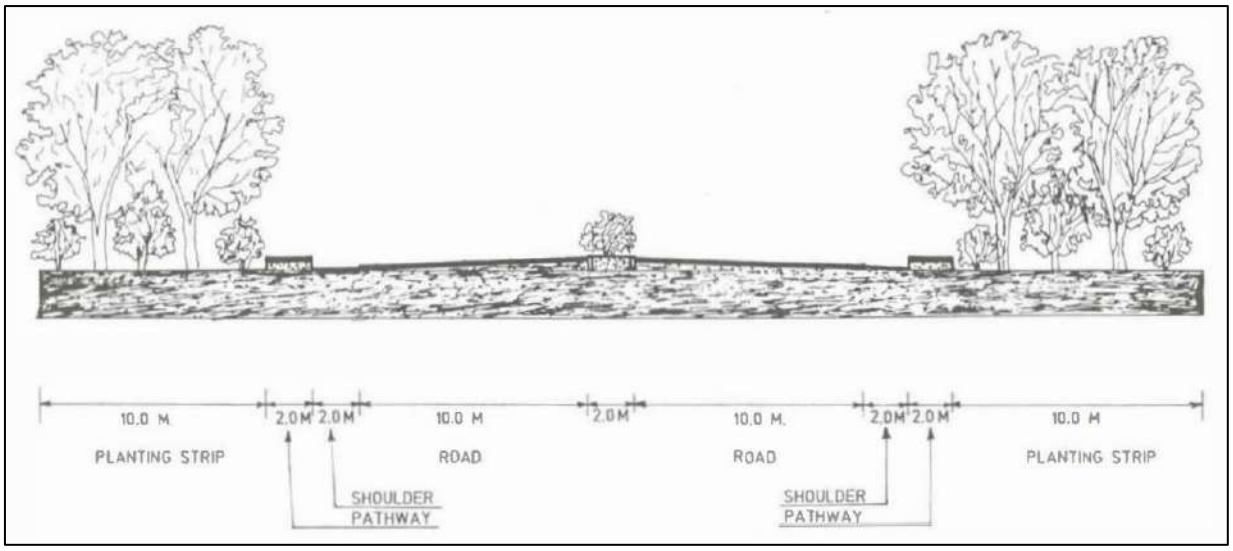
The proposed greenbelt development & plantation area will be developed in upcoming 3 years with 199,500 numbers of trees with density of plantation is 2500 trees per ha. Native & fruits bearing species, medical value types will be planted as per CPCB guidelines in consultation with DFO.

Proposed action plan for greenbelt development & plantation within plant area is given in Table 10.4:

**Table - 10.4**
**Proposed Action Plan for Greenbelt Development & Plantation within Plant Area**

| S. No. | Year Wise plantation after EC. | Area in ha | Proposed No's of Plantation | Survival Rate |
|---|---|---|---|---|
| 1. | 1st Year | 63.84 | 159,600 | 90% |
| 2. | 2nd Year | 7.98 | 19,950 | 90% |
| 3. | 3rd Year | 7.98 | 19,950 | 90% |
| **Total** | | 79.8 | 199,500 | 90% |

*Note: It is proposed to plant @ 2500 trees per hectare considering the survival rate of about 90%.*




*Source: CBCB Guidelines for developing greenbelts*

**Figure: 10.4 - Typical Road side plantation**

**Species to be planted:**

As district Kadapa (YSR) falls in Southern plateau and hills region of bioclimatic zone of India thus Following native plant species will be planted to arrest noise and pollution:

| S. No | Species name | Local Name | S1 | S2 | | CPCB S3 | Location | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | DC | NC | GE | | UR/LR | ISA | RD |
| 1. | *Acacia catechu (i)* | Khair | | | | Sd | (+) | - | - |
| 2. | *Acacia nilotica (+) (i)* | Babul. Desi baval | 6.12 | | | Sd | (+) | - | - |
| 3. | *Acacia Senegal (i)* | Kumat | | | | Sd | (+) | - | - |
| 4. | *Aegle marmelos (+) (i)* | Bel, Bili Patra, | 18.9 | NC | | Sd/Rc | (+) | (+) | (+) |
| 5. | *Albizia amara (i)* | Tugli | | | | Sd/Rc | (+) | (+) | - |
| 6. | *Albizia lebbeck (+)* | Siris, Karo Sirish | 18.3 | NC | GE | Sd | (+) | (+) | (+) |
| 7. | *Albizia odoratissima (i)* | Black Siris | | | | Sd | - | (+) | - |
| 8. | *Albizia procera (i)* | White Siris | | | | Sd | - | (+) | - |
| 9. | *Alstonia scholaris (+) (i)* | Satani | 25.39 | NC | GE | Sd | - | (+) | (+) |
| 10. | *Anogeissus latifolia (i)* | Dhaura | | | | Sd | (+) | - | - |
| 11. | *Annona squamosa(+) (i)* | Jamfal | 12.09 | | | Sd/Gf | - | (+) | - |
| 12. | *Azadirachta indica(+)* | Neem | 25.54 | NC | GE | Sd | (+) | (+) | (+) |
| 13. | *Bauhinia racemose (i)* | Apta | | | | Sd | - | (+) | - |
| 14. | *Bauhinia variegata(+)(i)* | Kanchnar | 18.58 | | | Sd | - | (+) | - |
| 15. | *Butea monosperma (+)* | Palas, Kesudo | 24.44 | NC | | | (+) | - | (+) |
| 16. | *Bauhinia purpurea(+)* | Khairwal | | | | Sd | - | (+) | - |
| 17. | *Cassia fistula (+) (i)* | Amaltas | 23.03 | | | Sd | - | (+) | (+) |
| 18. | *Citrus limon (+) (i)* | Nebu | 15.59 | | | Sd/Ct | - | (+) | - |
| 19. | *Dalbergia sissoo (+) (i)* | Shesham | 17.02 | | | Sd | (+) | (+) | (+) |
| 20. | *Delonix regia (+) (i)* | Gulmohar | 18.05 | | | Sd | - | (+) | - |
| 21. | *Diospyros melanoxylon (+)* | Tendu | | NC | | Sd/Rs | (+) | - | (+) |
| 22. | *Ficus benghalensis (+)* | Banyan, Vad | 7.72 | NC | | | - | (+) | (+) |
| 23. | *Ficus racemose (+) (i)* | Pipal | | NC | | Ct/Sd | - | - | (+) |
| 24. | *Ficus religiosa (+) (i)* | Peepal, Piplo | 12.94 | NC | GE | Ct/Sd | - | - | (+) |
| 25. | *Holoptelea integrifolia (+)* | Kanjo, Papada | 35.01 | | | | (+) | - | (+) |

| S. No | Species name | Local Name | S1 | S2 | | CPCB S3 | Location | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | DC | NC | GE | | UR/LR | ISA | RD |
| 26. | *Millingtonia hortensis - (i)* | Buch | | | | Sd/Ct | - | - | - |
| 27. | *Madhuca indica - (i)* | Mahwa | | | | Sd | - | - | - |
| 28. | *Mangifera indica (+)* | Mango, Aam | 12.25 | | | Sd | - | (+) | - |
| 29. | *Manilkara zapota (+)* | Chikkoo | 16.39 | | | | - | (+) | - |
| 30. | *Melia azedarach (+)* | Melia, BakaniNim | 31.77 | NC | GE | | (+) | | (+) |
| 31. | *Psidium guajava (+)* | Amrood, Jamphal | 13.33 | | | | - | (+) | - |
| 32. | *Pithecolobium dulce (+) (i)* | Jangalijalabi | 19.21 | | | Sd | (+) | - | - |
| 33. | *Phoenix sylvestris (+) (i)* | Khajur | 32.07 | NC | | Sd | - | - | (+) |
| 34. | *Polyalthia longifolia (+) (i)* | Ashoka, | 29.84 | NC | GE | Sd | - | (+) | (+) |
| 35. | *Pongamia pinnata(+)* | Karanja | | NC | | Sd | | (+) | (+) |
| 36. | *Prosopis cineraria (+) (i)* | Jungli Babul | | | | Sd | (+) | - | - |
| 37. | *Syzygium cumini (+)(i)* | Jamun, Jambu | 14.39 | NC | | Sd | - | (+) | (+) |
| 38. | *Tamarindus indica (i)* | Imli | | NC | | Sd | - | (+) | (+) |
| 39. | *Tectona grandis (+) (i)* | Teak, Sag, | 14.94 | | | Sd | - | (+) | - |
| 40. | *Terminalia arjuna (+) (i)* | Arjun Sadad | 30.54 | NC | GE | Sd/Ct | (+) | (+) | (+) |
| 41. | *Terminalia bellirica(+) (i)* | Bahera | | | | Sd/Ct | (+) | (+) | - |
| 42. | *Terminalia catappa(+)* | Desi Badam | 30.12 | NC | | | - | (+) | - |
| 43. | *Thevetia peruviana(+)* | Kaner.Piri Karen | 12.56 | | | | (+) | (+) | (+) |

*UP-Upper Reservoir, LE-Lower Reservoir, ISA-Infrastructure and Admirative Buildings, RD-Road*

*DC-Dust capture, NC –Noise control, GE –Absorb Gaseous emission, Sd –by seeds, Ct- by Cutting, Rt –Root cutting, Rs-By Root sucker, CZ – Core zone species, BZ- Buffer zone species, (+)- species reported in the study area, (i)- species listed in CPCB and reported in the study area*

*Source: CPCB Guidelines for greenbelt development*

### 10.12.4 Greenbelt/Plantation Management Plan

- In order, to facilitate the proper growth of plants, limited measures involving preparation of seed bed with suitable number of fertilizers and treatment with mulches will be taken. The topsoil will be used for greenbelt development.
- The following characteristics will be taken into consideration while selecting plant species for greenbelt development and tree plantation.
  - They should be fast growing and tall trees.
  - They should be mix of perennial evergreen and deciduous trees.
  - They should have thick canopy cover.
  - The planting should be in appropriate alternate rows around the site to prevent lateral pollution dispersion.
  - The trees should maintain regional ecological balance and conform the soil and hydrological conditions. Indigenous species will be preferred.
- Company will provide all necessary facilities/equipment for greenbelt development & plantation.
- Horticulturist with the member of team will be assigned for proper management and care for the greenbelt development.
- Timely use of fertilizers for the healthy and dense greenbelt development will be done.

For replantation, if required, company will acquire sapling from local private/government nursery.

## 10.13 OCCUPATIONAL HEALTH AND SAFETY MEASURES

To control and minimize the risks at workplace, ACC will implement Health, Safety and Environment Policy (HSE) with the following objectives:

- To prevent hazards
- To provide safe and healthy environment to all the employees.

The company, therefore, will adopt the HSE policy set below for the purpose of creating and maintaining safe and healthy environment.

### 10.13.2 Health and Safety Policy

- Health, Safety and Environmental Protection (HSE) is a vital part of ACC commitment to conduct the activities in harmony with society and nature. The company expects all its employees to implement the HSE Policy.
- Integration process of H&S must start at the inception of a project since HSE consideration must be addressed at the design stage, which also helps in optimizing the support process.
- ACC has Integrated Health, Safety and Environment Protection (HSE) into the business strategies to add value to the enterprise, to manage risk and to enhance the reputation.

- The health and safety of the employees, neighbors, customers and consumers, and the protection of the environment are company's priorities consistently pursued throughout.
- Each employee will be made to comply with the HSE guidelines and the laws applicable to her or his area of operational responsibility.

### 10.13.3 Occupational Health and Safety Hazards

Following are the Occupational Health and safety Hazards from the project activity:

- Dust
- Noise
- Heat stress
- Electrical Hazards
- Fire and Explosion
- Other Hazards

**(1) Dust**

*A) **Risks involved***

- ✓ Cement & other dust may cause pulmonary disease, Respiratory disease, Skin diseases, Eyes burning etc.

*B) **Management Plan***

- ✓ Adequate dust control systems will be implanted and good housekeeping will be practiced. Protective masks and respirators will be provided at areas where high dust exposure is going to be encountered even for a very short duration.

*C) **Exposure Levels as per Norms will be maintained***

| Description | Personal Exposure, time weighted average 8 hr. RSPM in µg/m³ |
|---|---|
| | Norms |
| Coal and Petcoke Dust | 2000 |
| Limestone Dust | 5000 |
| Cement Dust | 5000 |

*Source: CPCB guidelines*

**(2) Noise**

*A) **Risks involved***

Following risks are involved:

- ✓ Hearing Impairment, Hypertension, Increased Pulse rate
- ✓ Annoyance, Tinnitus, Sleep Disturbances

B) ***Management Plan***

- ✓ Proper maintenance of machineries
- ✓ Installation of compressors in closed buildings
- ✓ Regular monitoring of noise level
- ✓ Display of noise level with permission level

- ✓ Display instructions for using PPEs at high noise level area
- ✓ Periodic health checkup for Audiometry for the individuals working in high noise area

C) ***Exposure Levels as per Norms will be maintained***

| S. No. | Area | dB(A) |
|---|---|---|
| 1. | Compressor House | 90 dB(A) as per Factory Act 1948 |
| 2. | Turbine Area | |
| 3. | Crusher | |
| 4. | Raw Mill | |
| 5. | Coal/ Petcoke Mill | |
| 6. | Cement Mill | |
| 7. | Packing Area | |
| 8. | D.G. Sets | |

**(3) Heat stress**

A) ***Risks involved***

Following risks are involved:

Cement plants operate at high temperatures up to 1400°C with high loads of raw material which can lead to various skin and cardio diseases.

B) ***Management Plan***

- ✓ Scheduling hot jobs in cooler part of the day
- ✓ Monitor those workers who are at risk of heat stress
- ✓ Provide rest periods with water breaks
- ✓ Use of personal protective equipment

**(4) Electrical Hazards**

A) ***Risks involved***

Following risks are involved such as Electric Shock, Electric Burns, Fires and Explosions which can lead to loss of life/organs. These electric hazards can be caused due to:

- ✓ Insulation Failure, Equipment Failure, Poor Maintenance.
- ✓ Wrong Work Methods, Substandard Material and workmanship
- ✓ Unauthorized personnel & Lack of Training and Knowledge, etc.

B) ***Management Plan***

Following protection measures will be taken:

- ✓ Proper Earthing as per IS 3043 will be done
- ✓ Low Voltage Supply will be ensured
- ✓ Isolating Transformers
- ✓ Double Insulated Tools
- ✓ Over Load Protection
- ✓ Protection Against Leakages (G.F.C.I.)
- ✓ Flame- Proof Equipment

- ✓ Lightning Protection
- ✓ Protection against Static Electricity and safely using ladders and scaffolds

**(5) Fire and Explosion**

*A)* ***Risks involved***

Fire catching in store, bag go-down, conveyors, cable tunnel, oil storage area and coal storage, transformers and HT/LT substation etc. can results in facility/ material damage, loss of life.

*B)* ***Management Plan***

- ✓ Suitable fire extinguisher, fire buckets and fire hydrant system. Dry power type in oil and fire buckets will be kept near transformer, cable, general store and office area. Hydrant line at all location in plant area along with coal, clinker storage area. Fire tender is to be kept ready at plant main gate.
- ✓ Oil and Flammable Gases storage area will be fenced and declared as Fire Hazardous Area-No Smoking Area"
- ✓ Permit and safety instruction will be given to use welding / gas cutting in the area of oil, gas, coal and bag go down.
- ✓ Predictive interlock in transformers so as to give alarm and trip the system.
- ✓ Adequate height of brick walls for separation of all transformers, soak pits for storage of oil leakages from transformers will be done.

**(6) Other Hazards**

***A) Risks involved***

Following risks are involved:

- ✓ Silo and Building Collapse
- ✓ Person falling from height, Dropping of tools and object
- ✓ Failure of lifting pressure vessel, tools and tackles
- ✓ Occupational injuries
- ✓ Hit by moving, flying or falling object

***B) Management Plan***

Following protection measures will be taken:

- ✓ Silos and buildings will be constructed as per the structural design as per IS Codes.
- ✓ Installing light arrestors at all tall buildings.
- ✓ Permit to be taken to work at height with work instruction to use safety belts etc.
- ✓ Testing of all lifting tools, tackles and pressure vessel to avoid failure.
- ✓ Safe working pressure maintained in air receiver.
- ✓ Safe working load on cranes and ropes etc.
- ✓ Good housekeeping & Speed limit of vehicles will be 15 km/hr. inside the proposed plant area.

- ✓ Display of emergency number at all suitable location.
- ✓ Fire tender, ambulance and emergency staff ready at the plant main gate at all the time
- ✓ First aid kits are kept at the sites and training provided
- ✓ Use of mobile while driving, alcohol, smoking etc. are ban inside the proposed plant area.
- ✓ Proper illumination in plant area (100 to 150 LUX), office (250 to 300 LUX) and road area (20 to 30 LUX).

### 10.13.4 Occupational Health Surveillance

In cement plant, the occupational health surveillance of the employee will be done on a regular basis and records of the same will be maintained as per the Factories Act. The occupational health surveillance Programme will include lung function; sputum analysis and audiometric analysis on regular basis to observe any contraction due to exposure to dust and noise and corrective measures will be taken accordingly.

Vocational training programmes will also be conducted. Under vocational training the workers will be given training related to all safety and health aspects pertaining to their vocation and thereafter every quarter special training courses/ Awareness Programme for Malaria eradication, HIV and health effects on exposure to dust, heat, noise, chemicals will be organized for employed person.

Periodical medical camps with specialized doctors of various disciplines will be organized to provide the specialized medical assistance to employees as well as neighboring communities.

**A. List of Equipment for Occupational Health Monitoring**

- ECG
- Noise Monitoring device (dosimeter)
- Spiro meter
- X-ray machine
- Audiometric device
- Vision screener
- Tele Medicine Facility

**B. Pre-Placement and Periodical Health Status**

Pre / post-employment checkup will be carried out and following test will be conducted:

- BMI (Body Mass Index)
- Chest x ray PA view
- Vision testing (Far & Near vision, color vision and any other ocular defect)
- ECG
- Haemogram (examination of the blood)
- Blood Pressure &Blood Sugar Fasting
- Serum Cholesterol
- Renal Function Test (Blood Urea, Serum Creatinine)

- Liver Function Test (S. Bilirubin, Alk. Phosphatase, SGOT and SGPT)
- Urine (Routine and Microscopic)
- Complete physical examination
- Post-employment occupational health check-up such as lung function, audiometry, CBC, Blood Sugar, Lipid Profile etc.
- Medical records of each employee will be maintained separately and will be updated as per finding during monitoring.
- Medical records of the employee at the end of his / her term will be updated.

**C. Frequency of Medical Examination**

Yearly and half- yearly medical examination of workers working at highly dusty / hazardous area.

**D. Personal Protective Devices and Measures**

- Industrial Safety helmets,
- Face shield
- Safety goggles and Gas Cutting Goggles
- Welders equipment for eye and face protection i.e. welding shield
- Ear muffs and Ear Plugs
- Full body Safety harness
- Hand gloves, Asbestos hand gloves, Electrical hand gloves, Heat Resistive hand gloves, Chemical hand gloves and Cut resistance hand gloves
- Safety net, Barricading net
- Industrial safety shoes with steel toe
- Electrical safety shoes without steel toe and Gum boots
- Retractable and fall arrestors
- Reflective Jackets
- Protective clothing, Dangari etc.
- Safety belt / line man's safety belt
- Rope grabs fall arrestor.

**E. Anticipated Occupational &Safety Hazardous**

- Heat Stress and Stroke
- Physical activity
- Dehydration
- Skin disorders
- Dust Exposure
- Noise
- Burns and shocks due to electricity

### 10.13.5 Implementation of OHS standards as per OSHAS/USEPA

The overall objective of the company is to provide a system that is capable of delivering healthy and safe workplace. Following measures will be adopted for implementation of OHS standards.

- Well-equipped Occupational Health Centre with adequate paramedical staff
- Routine and special investigation related to occupational health
- Health surveillance and maintenance of health record
- Rules and procedure for effective implementation of Safety Health and Environment policy and made to know all employees
- Round the clock Ambulance facility
- Sufficient number of First aid boxes
- Implementation of OHSAS 18001 for Occupational Health and Safety Management System
- Implementation of ISO 14001 for Environment Management System
- Formulation of OHS implementation team/ cell
- Risk assessment of each and every activity
- Implementation of OHS management program
- Displaying the safety and health policy and instructions at various locations
- Display of safe operating procedure (SOP) at various locations
- Job safety analysis
- Carry out daily plant safety inspection by internal safety department
- Investigation of fatal, serious accidents and near miss accident
- Investigation of reports of occupational diseases
- Monthly safety meeting of all employees & workers to discuss last month accident if any, reason and corrective measures taken.
- Organize campaigns, competitions, contests etc. to promote safety
- Organize safety training, seminars for safe working and safe vehicle and traffic movement within the plant premises and regular training for safe driving outside the plant premises
- Prepare annual reports of accidents and occupational diseases.
- Ensure use of PPEs according to the job like helmet, safety shoes, goggle, dust mask, ear plug and hand gloves etc.
- Establishment of Occupational Health Centre for pre and periodic medical examination of workers and staff to detect any onset of occupational disease and corrective manures
- Display Material Safety Data Sheets (MSDS) for use of every hazardous substance
- Periodic Safety Audits both internal and external, review and implementation of recommendations.

### 10.13.6 Safety Committee

A safety committee will be formed and manned by equal participation from management and workers with the following functions:

a) Accident prevention and control including ensuring the use of safety appliances.

b) Publicity, propaganda, education and training.

c) Assisting and cooperating with the management in achieving the aims and objectives outlined in the "Health and Safety Policy" of the occupier.

d)Carrying out health and safety surveys for identifying unsafe working condition/practices, which causes accident.

**10.13.7 Medical Facilities**

The medical facility will adequately be manned by doctors and paramedical staff to provide round the clock services in case of any emergency.

**10.13.8 Investigation Facility**

Full-fledged pathological laboratory, X-ray machine with routine and specialized investigation facilities will be made available at the plant.

**10.13.9 Ambulance Services**

The Health Centre will be provided with an ambulance to bring the patients to Health Centre in case of emergency.

**10.13.10 First Aid Boxes**

First aid boxes will be provided at prominent places with following items:

- Small size sterilized dressing.
- Medium size sterilized dressing.
- Large size sterilized dressing.
- Burnol Ointment.
- Packets of sterilized cotton wool.
- Bottle (120 ml) of cetrimide solution (1%) of suitable antiseptic solution.
- Mercurochrome solution (in 2% water).
- Scissors.
- Adhesive plaster (2cm x 1 m).
- Sterilized eye pads in separate sealed packets.
- Aspirin tablets.
- Potassium Permanganate crystals.

First aid boxes will be kept in every department for emergency. First aid training will be organized for the employees.

**10.13.11 Plan & Fund allocation for Occupational & Safety Hazards**

Plan and fund allocation to ensure the occupational health & safety of all contracts and sub-contract workers is given in Table - 10.5.

**Table - 10.5**
**Fund allocation for Occupational and Safety Hazards**

| Safety Expenses (Rs. In Crores) | | | Health Expenses (Rs. In Crores) | | Remarks |
|---|---|---|---|---|---|
| **Year** | **Capex** | **Recurring** | **Capex** | **Recurring** | Health Expenses includes cost of Medicines, first aid Material, repair of equipment, Visiting Specialist Fees, running & maintenance expenses of health care Centre and Periodical medical examination expenses. |
| 1st Year | 1.67 | 0.014 | 1.8 | 0.018 | |
| 2nd Year | 1.67 | 0.013 | 1.8 | 0.016 | |
| 3rd Year | 1.66 | 0.013 | 1.8 | 0.016 | |
| **Total** | **5.0** | **0.04** | **5.4** | **0.05** | |

## 10.14 BUDGETORY PROVISION FOR ENVIRONMENT MANAGEMENT FOR PROPOSED INTEGRATED CEMENT PLANT

The budget proposed for the project and that for the environmental protection measures is given as below: Cost for Environmental Protection Measures is as below -

- ✓ Capital Cost: Rs. 698 Crores (Phase I: Rs. 362 Crores, Phase - II: Rs. 336 Crores)
- ✓ Recurring Cost: Rs. 14 Crores/ annum (Phase I: Rs. 7.1 Crores/annum, Phase - II: Rs. 6.9 Crores/annum).

*EMP Cost Break-up is given in Table - 10.6 below:*

**Table - 10.6**
**Cost Break up of EMP**

| Sr. No. | Environmental Monitoring | Cost in Crores | | | |
|---|---|---|---|---|---|
| | | Phase - I | | Phase - II | |
| | | Capital | Recurring | Capital | Recurring |
| 1. | Air Pollution Control | 290 | 3.3 | 269 | 2.9 |
| 2. | Water Pollution Control | 33 | 1.2 | 30 | 1.1 |
| 3. | Noise Pollution Control | 7.2 | 0.51 | 6.7 | 0.39 |
| 4. | Environmental Monitoring | 3.6 | 0.06 | 3.4 | 0.3 |
| 5. | Hazardous Waste Storage & Handling | 1.8 | 0.03 | 1.7 | 0.01 |
| 6. | Occupational Health & Safety | 5.4 | 0.54 | 5.0 | 0.31 |
| 7. | Greenbelt and plantation | 7.2 | 0.72 | 6.7 | 0.55 |
| 8. | Drip irrigation System & Water Sprinkling | 2.9 | 0.29 | 2.7 | 0.21 |
| 9. | RWH pond and Storm Water Management | 1.8 | 0.03 | 1.7 | 0.01 |
| 10. | Organic Waste Converter & Its Facilities | 1.8 | 0.03 | 1.7 | 0.01 |
| 11. | Others (Housekeeping and Municipal Waste Management) | 7.6 | 0.33 | 7.1 | 1.11 |
| | **Total** | **362** | **7.1** | **336** | **6.9** |

## 10.15 CONCLUSION

As discussed, it is safe to say that the proposed project will not cause any significant impact on the surrounding environment and ecology of the area, as adequate preventive measures will be adopted to contain various pollutants within the permissible limits. Greenbelt & plantation development along the periphery and inside the plant area would also be taken up as an effective pollution mitigation technique, as well as to control the pollutants released from the project premises of ACC.

# *CHAPTER - 11*
# *SUMMARY & CONCLUSION*

## 11.0 PROJECT DESCRIPTION

## 11.1 INTRODUCTION

M/s. ACC Limited is one of the leading cement producers of India, with 16 cement plants across 12 states with a total installed cement capacity of 38.55 MTPA (Million Tonne Per Annum) ("MTPA") and 85+ ready mix concrete plants across 17 states, a vast distribution network of 50,000+ dealers & retailers and a countrywide spread of sales offices, it contributes tremendously to the landscape of the country.

### 11.1.1 Identification of the Project

The company had obtained ToR for Proposed 5.0 MTPA Integrated Cement Clinkerisation Plant, 8.0 MTPA Cement Grinding Unit and 100 MW Captive Power Plant and 7.0 MTPA Captive Limestone Mine with mining lease area of 997.08 ha at Gollapalle, Village of Mylavaram Mandal, Kadapa (YSR) District, Andhra Pradesh by M/s. ACC Limited *Vide* Letter No. J-11011/265/2012-IA II (I) dated 20th Feb., 2013; Validity extended *Vide* Letter dated 18th Feb., 2016. After that, corrigendum in ToR validity extension Letter was obtained on 27th April, 2016.

Baseline monitoring was conducted during Summer Season (March to May, 2013) and Public Hearing was conducted on 20th October, 2016. Final EIA/EMP Report excluding the Mining components and including the outcomes of Public Hearing was submitted to MoEF&CC for obtaining environmental clearance to the Ministry online on 27th Jan., 2027 *vide* Online Application No. IA/AP/IND/62090/2012.

Thereafter, the project was considered for appraisal in 16th EAC (Industry - I) Meeting held on 06th March, 2017 and after detailed deliberations, the committee advised to submit few details for further consideration of project.

ADS could not be closed due to unavailability of mining lease deed, the lease deed has been executed on 14th May, 2024. As because it is the captive mine for proposed cement plant hence, both the projects got struck.

After merger & acquisition with Adani Group the management reviewed and proposed to complete the EC process for execution of both the proposals.

Meanwhile, the EIA consultant is also replaced with JM. EnviroNet Pvt. Ltd. for final submission of EIA/EMP Report with fresh baseline data conducted during Summer Season (March to May, 2024) incorporating all the points of ADS raised by EAC to complete the EC process.

Earlier total land area proposed for the Project was approx. 275.028 ha (Including Plant, Colony & CPP). ToR was obtained from MoEF&CC for the same area on 20th February, 2013 and Public Hearing has also conducted for the same area and same configuration.

However, due to the existence of Village Gollapalle and unavailability of land ACC dropped the proposal for colony and exclude specific part of the project site from the earlier submitted proposal which results in reduction of proposed project area reduce from 275.028 ha to 187.1 ha.

## 11.2 Site Selection for the project

Keeping in view of proximity to the Captive Limestone Mine, accessibility to SH - 57, Rail network and other Raw material sources, the proposed site has been selected for setting up of Integrated Cement Plant at Village - Gollapalle, of Mandal - Mylavaram, District - Kadapa (YSR), Andhra Pradesh. Following criteria were considered for selection of site in order to ensure minimum environmental impact on account of proposed project activity:

- Location of Site w.r.t close proximity from the captive limestone mine to fulfilling the limestone requirement of the Cement Plant.
- Adequate land availability (187.1 ha).
- Better connectivity to road network through State Highway (SH - 57) and Rail Network and this will help in minimizing the lead distance, time and the impact on transportation.
- Non - existence of National Park, Sanctuaries, Biosphere Reserve, Tiger / Elephant Reserve and migratory corridors of wildlife, Notified Forest and Deemed Forest within 10 km radius of the Integrated Cement Plant project area.
- The area is devoid of any Environmental sensitive features.
- Non-involvement of any forest area etc.
- Proximity to power source and its availability.

## 11.3 DETAILS ABOUT THE PROJECT

### 11.3.1 Brief Description of the Project

Brief description about the Project is given in Table - 11.1.

**Table - 11.1**
**Brief Description of the Project**

| S. NO. | PARTICULARS | DETAILS |
|---|---|---|
| **A.** | **Nature of the Project** | Greenfield Integrated Cement Project |
| **B.** | **Size of the Project** | ○ Clinker (5.0 Million TPA)<br>○ Cement (8.0 Million TPA)<br>○ CPP (100 MW)<br>○ WHRS (25 MW) -<br>○ DG Sets - 2000 KVA<br>○ Railway siding: Part of the Project |
| **C.** | **Location Details** | |
| 1. | Village | Gollapalle |

| S. NO. | PARTICULARS | DETAILS | |
|---|---|---|---|
| 2. | Taluka | Mylavaram | |
| 3. | District | Kadapa (YSR) | |
| 4. | State | Andhra Pradesh | |
| **D.** | GPS Coordinates | ***As per ToR (Project Site)*** | ***As per applied EC (Project Site)*** |
| 1. | Latitude | 14°58'06" N to 14°59'59" N | 14°57'56.36" N to 14°58'58.08" N |
| 2. | Longitude | 78°16'50" E to 78°18'38" E | 78°16'21.07" E to 78°18'07.46" E |
| 3. | Toposheet No. | Core Zone: D44G5 (57J/5)<br>Buffer Zone: D44G5 (57J/5), D44G1 (57J/1), D44A4 (57I/4) & D44A8 (57I/8) | |
| 4. | Sy. No. (Khasra No.) | **Gollapalle:** 135, 139/1, 139/2, 139/3, 139/4, 139/5, 134/1, 134/2, 134/3, 130/1, 130/2, 130/3, 130/4, 133, 132, 131/1, 131/3, 42, 41/3A, 41/3B, 41/4, 41/5, 43, 44/1, 44/2, 87, 88/1, 88/2, 89/1, 89/1, 78/1A, 78/1B, 78/2, 78/3A, 78/3B, 78/4, 94/2, 46/3, 46/3, 46/2, 72/1, 72/2, 72/3, 73/1, 73/2, 73/3, 76/3, 76/4, 77, 85, 83/1, 83/2, 83/3, 83/4, 83/5, 83/6, 83/7, 82/1, 82/3, 82/5, 82/6, 82/7, 82/8, 82/9, 82/9, 81/2, 81/3, 81/4, 81/5, 81/6, 81/7, 81/8A, 81/8B, 71/1, 71/2, 71/3, 80/1, 80/2, 80/3, 80/4, 80/5, 80/6, 80/7, 80/10, 80/11, 80/12A, 80/12B, 80/13, 80/14, 74/1, 74/2, 74/2, 74/3, 75/8, 75/9, 75/10, 75/11, 75/12, 75/13, 75/14, 84/1, 79.<br>**G.Uppalapadu:** 74/1, 74/2, 72, 75, 76, 76, 79/1, 79/2, 77, 78, 127, 128, 129, 130, 132, 133, 137, 139/1, 139/2, 140, 136, 138, 144/1, 144/2, 145, 43, 44, 45, 46/1A, 46/1B, 46/1C, 46/2, 47/1, 47/2, 47/3, 48, 146, 147, 148, 150, 151/1, 42, 152, 153, 154, 155, 29, 30, 31, 32, 33, 34/1A, 34/1B, 34/1C, 34/2, 35/1, 35/2, 35/3, 36, 156, 158/1, 158/2, 161/1, 161/2, 162/1A, 162/1B, 162/2, 163/1, 163/2, 163/2, 164, 165/1, 165/2, 166/1, 166/2, 61, 60/1, 60/2, 59/1, 59/2, 55, 56/1, 56/2, 57/1, 57/2A, 57/2B, 58, 54, 20, 25, 21, 26, 28/A, 24, 27, 23, 37, 38, 39, 40, 41, 49, 50, 51, 52, 52, 141/1, 141/2A, 141/2B, 142/1, 142/2, 143, 131/1, 131/2, 135, 80, 134, 172, 173/1, 173/2, 174, 175/1, 175/2, 177/1, 177/2, 178/1, 178/2, 179, 53, 66, 67/1, 67/2, 67/3, 67/4, 67/5, 68/1, 68/2, 69/1, 69/2, 69/3, 70/1, 70/2, 70/3, 70/4, 70/5, 71, 65, 65, 64/1<br>**Besthavemula:** 103/1, 103/2, 103/3, 64/1, 64/2, 64/3, 63/1, 63/2, 63/3, 63/4, 62, 61, 60. | |
| **E.** | **Area Details** | | |
| 1. | Project area | ***As per ToR (Project Site)*** | ***As per applied EC (Project Site)*** |
| | | 275.028 ha | 187.1 ha |
| 2. | Greenbelt / Plantation area | 79.8 ha (~42.65%) | |
| **F.** | **Environmental Setting Details** ***(with approximate aerial distance and direction from the plant site)*** | | |
| 1. | Nearest Village | Gollapalle (0.25 km in SSE direction) | |
| 2. | Nearest Town/City | Kadapa (79 km in SE direction) | |
| 3. | Nearest National / State Highway | ○ SH-57 (0.5 km in SSW direction) | |
| 4. | Nearest Railway station | ○ S. Uppalapadu (11.5 km in SE direction)<br>○ Kondapuram (24 km, SSW direction) | |
| 5. | Nearest Airport | ○ Kadapa Airport (70.5 km in SE direction)<br>○ Tirupati (195 km in SE direction) | |

| S. NO. | PARTICULARS | DETAILS |
|---|---|---|
| 6. | National Parks, Wildlife Sanctuaries, Biosphere Reserves, Reserve / Protected Forests within 10 km radius | No National Park, Wildlife Sanctuary, Biosphere Reserve, Reserve Forests exists within 10 km radius of the plant site. |
| 7. | Reserve Forests (RF) / Protected Forests (PF) etc. within 10 km radius | No Reserved Forests (RF) / Protected Forests (PF) etc. within 10 km radius of the plant site. |
| 8. | River/Water Body within 10 km radius | o Nallah (Adjacent in south)<br>o Nallah Cheruvu (6.5 km in NW direction)<br>o Tigaleru River (7.0 km in ESE direction)<br>o Pond (3.0 km in North direction)<br>o Pond Near Kallutla (2.5 km in ENE direction)<br>o Pond (4.0 km in South direction)<br>o Pond (4.1 km in South direction) |
| 9. | Critically Polluted areas (CPA), SPA & OPA | There are no Critically Polluted areas (CPA), SPA & OPA within the 10 Km radius of study area. |
| 10. | Seismic Zone | Zone - II [as per IS 1893 (Part-I): 2002] |
| **F.** | **Cost details** | |
| 1. | Total Cost of the Project | Rs. 7100 Crores |
| 2. | Cost for Environmental Protection Measures | o Capital Cost: Rs. 698 Crores (Phase I: Rs. 362 Crores, Phase - II: Rs. 336 Crores)<br>o Recurring Cost: Rs. 14 Crores/ annum (Phase I: Rs. 7.1 Crores/annum, Phase - II: Rs. 6.9 Crores/annum) |
| 3. | Cost for implementation of commitments made during PH | o Rs. 355 Crores (Phase I: Rs. 184 Crores, Phase - II: (171 Crores) |
| 4. | Cost for Wildlife Conservation Plan | o Rs. 5.07 Crores |

### 11.3.2 Break-up of land use of proposed plant

Details of the proposed plant area breakup for the major units are summarized in table 11.2:

**Table - 11.2**

**Proposed Project Area Break-up**

| S. No. | Particulars | Area (ha) | Area (%) |
|---|---|---|---|
| i | Plant and Machinery | 46.8 | 25.01 |
| ii | Railway line and wagon tippler | 7.7 | 4.12 |
| iii | WHRS Area | 1 | 0.53 |
| iv | Road & Paved area | 12.7 | 6.80 |
| v | Greenbelt development /plantation area | 79.8 | 42.65 |
| vi | Open area for Future Expansion | 29.7 | 15.87 |
| vii | Truck Parking | 9.4 | 5.02 |
| **Total Project area** | | **187.10** | **100** |

### 11.3.3 Major Requirements for Proposed Project

#### 11.3.3.1 Raw Material Requirement

Major raw material required for Clinker and Cement Production is Limestone, clay, bauxite, Iron ore, gypsum/ phospo-gypsum & Fly ash. The type of Cement product will be manufactured is OPC & PPC. Details regarding quantity of raw materials required, their source along with distance and mode of transportation given below in Table - 11.3.

**Table - 11.3**
**Raw Material Requirement**

| S. No. | Material | Quantity MTPA | | | Source | Mode of Transportation with approx. distance |
|---|---|---|---|---|---|---|
| | | Phase-I | Phase-II | Total | | |
| 1. | Limestone | 3.5 | 3.5 | 7.0 | Captive Kadapa Limestone Mine | Belt Conveyor / 0.5 km |
| 2. | Clay | 0.14 | 0.14 | 0.28 | Open Market | Road / 0.5 km |
| 3. | Bauxite | 0.025 | 0.025 | 0.05 | Andru Minerals & AP/Belgaum Minerals-Karnataka and Bellary | Rail & Road, 250 - 500 km |
| 4. | Iron ore | 0.02 | 0.02 | 0.04 | Sai Sindhu industries-AP/KEJ Minerals Pvt. Ltd. & Janaki Corporation Ltd Karnataka | Rail & Road / 250 km |
| 5. | Gypsum / Phospho gypsum | 0.24 | 0.24 | 0.48 | CFL, Spic, Sterlite, Fact | Rail & Road / 450 km |
| 6. | Fly ash* | 1.40 | 1.40 | 2.80 | CPP, KPCL Raichur Thermal Power Plant, Kothagudem Thermal Power Station VII stage | Rail / Road / 250 km to 550 km |

*Note: **Out of Total Fly ash requirement of 2.80 Million TPA, 0.339 Million TPA will be generated from CPP which will be 100% utilized for PPC production.*

#### 11.3.3.2 Fuel and Feed Stock Requirement

Estimated quantity of proposed Fuel and Feed Stock, their source along with distance and mode of transportation are given in Table - 11.4.

**Table - 11.4**
**Fuel & Feedstock Requirement**

| S. No. | Name of Fuel | Quantity in Million TPA | | | Source | Calorific Value | Ash (in %) | Sulphur (in %) | Distance & Mode of Transportation |
|---|---|---|---|---|---|---|---|---|---|
| | | Phase-I | Phase-II | Total | | | | | |
| **Cement Plant** | | | | | | | | | |
| 1. | Coal | 0.55 | 0.55 | 1.10 | Singareni Coalfields (SCCL) in Andhra Pradesh | 4200-4800 | 30-35 | 0.4-0.5 | Road / Rail 590 km |
| 2. | Petcoke requiremen | 0.27 | | 0.27 | US/ Saudi/ RIL / Essar/ IOCL *via* | 7800 - 8300 | 0.5-2.0 | 6-9 | Road / Rail 250 km |

| S. No. | Name of Fuel | Quantity in Million TPA | | | Source | Calorific Value | Ash (in %) | Sulphur (in %) | Distance & Mode of Transportation |
|---|---|---|---|---|---|---|---|---|---|
| | | Phase-I | Phase-II | Total | | | | | |
| | t in cement plant (100% uses) | | | | Krishnapatnam Port | | | | |
| 3 | AFR | 0.20 | | 0.20 | Nearby area of Telangana and Andhra Pradesh | 2500 - 4000 | 30-35 | <2 | Road 100 to 300 km |
| **Captive Power Plant** | | | | | | | | | |
| 3. | Coal (Indian / Imported) | 0.485 | 0.485 | 0.97 | Indigenous: Singareni Coalfields (SCCL) in Andhra Pradesh. Imported: Indonesian coal/ South African Coal | Indigenous | | | Rail /Road 590 km Sea route & then by rail 250 km |
| | | | | | | 4200-4800 | 30-35 | 0.4-0.5 | |
| | | | | | | Imported | | | |
| | | | | | | 5000-5800 | 6-10 | 0.5-0.6 | |

#### 11.3.3.3 Other Basic Requirement

Other basic requirements for the proposed project are given in Table - 11.5.

**Table - 11.5**

**Basic Requirements for the Project**

| S. No. | Particular | | Requirement | Source |
|---|---|---|---|---|
| 1. | Water (KLD) | | 2922 | Initially groundwater and later on from captive limestone mine pit & rainwater harvesting |
| 2. | Power (MW) | | 125 | CPP (100 MW), WHRS (25 MW) & State Grid Power Supply |
| 3. | Manpower (No. of Persons) | Construction phase | 2400 | Skilled & unskilled labour from local/outside |
| | | Operation Phase | 499 | |

## 11.4 PROCESS DESCRIPTION

### 11.4.1 Manufacturing Process- Cement Plant

The proposed Integrated Cement Plant will be based on the dry process technology for Cement manufacturing with Pre-Heating and Pre-Calciner Technology. The dry process used will offer more advantages, particularly in fuel & water consumption. In the dry process, the raw materials are dried in a combined drying-cum-grinding installation to reduce the moisture content to below 1%. The drying in the grinding unit is achieved by using kiln exhaust gases for normal moisture and is supplemented by auxiliary hot air furnace for rainy season etc. for high moisture. The ground raw mix is then homogenized in silos and fed into the rotary kiln. Heat required for evaporation of added moisture is eliminated in this process. The latest technological innovation is to replace the

conventional suspension pre-heater by well-designed suspension pre-heater having high efficiency, low pressure drop cyclone and pre-calciner.

The cement manufacturing process largely comprises of the following steps:

- Transport of crushed limestone from Limestone Mine to the crusher, use of stacker and reclaimer
- Raw Mix Preparation & Homogenization
- Preheating, calcination and Clinkerization
- Clinker Cooling
- Clinker storage in silos & part of surplus to split located Grinding Units
- Cement Grinding, Storage, Packing & Dispatch

### 11.4.2 Captive Power Plant (Coal Based - 100 MW)

M/s. ACC Ltd. is proposing 100 MW Captive Power Plant. Power will be generated by the utilization of thermal energy of steam in turbine that in turn rotates an alternator. The steam will be generated in the CFBC boiler by burning of various fuels. In the Proposed Power Plant, coal will be used as the fuel & it will burn in the boiler to generate steam.

### 11.4.3 Waste Heat Recovery Boiler (25 MW)

M/s. ACC Limited is also proposing to install Waste Heat Recovery System (WHRS) of 25 MW (Phase I: 12.5 MW & Phase II: 12.5 MW) for re-utilization of the exhaust gases from the Pre-heater & Cooler to generate electric power and consequently reduce consumption of grid power. The project will contribute to the more efficient use of energy and will reduce reliance on exhaustible fossil fuel.

### 11.4.4 DG Sets

M/s. ACC Ltd. is proposing installation of DG sets of 2000 KVA for use in case of shutdown or non-supply of State Electricity Board/Grid and in case of emergency.

## 11.5 DESCRIPTION OF ENVIRONMENT

***a) Presentation of Results (Air, Noise, Water & Soil)***

The baseline study was conducted during the Summer Season (March, 2013 to May, 2013) by earlier consultant Vimta Labs Ltd. as the baseline data was 3 years old & hence expired; therefore, in compliance to the MoEFCC OM dated 8th June, 2022 a fresh baseline study has been conducted during Summer Season (March, 2024 to May, 2024) in the study area covering an area of 10 km radius from the proposed project site in accordance with the guidelines of MoEF&CC. The dominant wind direction of the area was from the SE during Summer Season (March, 2024 to May, 2024).

| Parameters | Summer Season (March, 2024 to May, 2024) | | Standards |
|---|---|---|---|
| | No. of Location | Description | |
| Ambient Air Quality Monitoring | 13 Locations | PM10 - 36.4 to 76.5 µg/m³ | 100 µg/m³ (24 hours) |
| | | PM2.5 - 20.1 to 41.8 µg/m³ | 60 µg/m³ (24 hours) |

| Parameters | Summer Season (March, 2024 to May, 2024) | | Standards |
|---|---|---|---|
| | No. of Location | Description | |
| | | $SO_2$ - 4.1 to 11.7 µg/$m^3$ | 80 µg/$m^3$ (24 hours) |
| | | $NO_2$ - 8.9 to 22.2 µg/$m^3$ | 80 µg/$m^3$ (24 hours) |
| | | CO - BDL to 0.67 mg/$m^3$ | 4 mg/$m^3$ (1 hours) |
| Noise Level Monitoring | 11 Locations | Noise Level During Day Time - 47.5 to 53.9 Leq dB (A) | 75 Leq dB (A) |
| | | Noise Level During Night Time - 37.7 to 42.6 Leq dB(A) | 70 Leq dB (A) |
| Surface Water | 7 Location | Surface water sample was not collected as all the water bodies were found dry during the study period | - |
| Ground Water Sampling | 9 locations | pH - 7.38 to 7.78 | 6.5 to 8.5 |
| | | Total Hardness - 239.17 to 736.4 mg/l | 600 mg/l |
| | | Alkalinity - 185.6 to 585.9 mg/l | 600 mg/l |
| | | TDS - 475 to 1582 mg/l | 2000 mg/l |
| Soil Sampling | 10 Locations | Soil nature - Slightly Alkaline<br>pH - 8.0 to 8.63, Organic Matter - 0.55 to %, Nitrogen - 174.02 to 318.18 kg/ha, Phosphorous 8.93 to 37.76 kg/ha, Potassium - 300.63 to 591.96 kg/ha | - |

***b) Biological Environment***

**Flora Diversity:**

**Flora:** Within the Core and buffer zone of proposed project site, a total of 21 species of trees, 10 species of Shrubs, 9 species of Herbs were recorded and observed within the studied area based on primary observation as well as based on information collected from the secondary data.

**Fauna:** Among faunal diversity, within the 10 km radius of buffer zone, 20 species of mammals, 8 species of reptiles & 7 species of amphibians, 66 species of Avi fauna and 36 species of Butterfly were reported in 10 km radius of project sites.

List of flora & fauna has been submitted for authentication to Chief Wildlife Warden, Guntur, Andhra Pradesh, on 20th Sept., 2024. Copy of the submission receipt is enclosed as ***Annexure - 3*** along with this EIA/EMP report.

16 schedule - I species viz. Four horned Antelope, Asiatic Wild Dog, Bonnet Macaque, Sambar, Sloth Bear, Indian Grey Mongoose, Small Indian Civet, Masked Palm Civet, Golden Jackel, Bengal Monitor Lizard, Indian Star Tortoise, Indian rat snake, Checkered Keeback, Grey Junglefowl, Shikra, Indian Peafowl Indian Species were found in the study area of the proposed project site as per the Primary & Secondary Survey done by Greentech Solutions.

Company has prepared Wildlife Conservation for the proposed integrated cement plant and allocated Rs. 5.07 Crores for conservation of schedule - I species. Wildlife Conservation Plan has been submitted to Chief Wildlife Warden, Guntur, Andhra Pradesh, on 20th Sept., 2024 for further

approval. Copy for conservation plan along with the submission receipt is enclosed as Annexure - 10 along with this EIA/EMP report.

### 11.5.5 Socio-Economic Environment

The 10 km radius study area from plant and mine site, comprises of District YSR, Andra Pradesh is covered under 10 km radius. Total no. of villages observed within the 10 km radius from the project area are 36.

As per 2011 Census, the population recorded is 70,693 (for 10 km radius buffer zone). Total no. of household is 2575, 6081 and 8930 respectively in primary, secondary and outer zone. Sex ratio is 1001, 998 and 1000 (females per 1000 males) observed in primary, secondary and outer zone respectively. SC population distribution is 1522, 2856 and 7059 respectively in primary, secondary and outer zone. ST population distribution is 299, 671 and 439 respectively in primary, secondary and outer zone respectively. Average household size is 5 which is the standard family size in India. The literacy rate of the study area is 60.4% which is lower than the District Average i.e., 67.88 %. The sex ratio of the study area is 1000.

## 11.6 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Anticipated environmental impacts due to operation of the proposed plant along with mitigation measures in respect of air, water, noise, soil and the green cover of the plant site and nearby villages summarized in table along with the anticipated environmental impacts and mitigation measures and suggested Environmental Management Plan (EMP) is given below:

| Discipline | Anticipated Impact | Mitigation Measures & EMP |
|---|---|---|
| ***Construction Phase*** | | |
| Air | Increase in Dust and $NO_x$ concentration due to Leveling activity and Heavy vehicular movement | * Sprinkling of water in the construction area and on nearby unpaved roads<br>* Proper maintenance of vehicles will be done. Use of vehicles meeting PUC norms<br>* Construction site will be covered. |
| Noise | Increase in noise level due to Construction Equipment | * Equipment will be kept in good condition to keep the noise level within 90 dB (A).<br>* Workers will be provided necessary protective equipment e.g., ear plugs, earmuffs. |
| Water | Increase in suspended solids due to soil run-off during heavy precipitation due to Loose soil at construction site | * Storm water drains will be made immediately after starting construction activity. The drains will be properly aligned in conformity with the site drainage pattern so that the alteration is kept to the minimum and flooding or soil erosion does not occur. |
| ***Operation Phase*** | | |
| Air | Increase concentration of Particulate Matter Emissions & Gaseous emission *(Dust, Fugitive Emission, Sox, Nox, CO)* | * Bag filters (168 nos.) at various material handling & transfer points will be provided<br>* Clinker, fly ash and Cement will be stored in the silos<br>* Gypsum, Slag, Coal and Petcoke will be stored in the covered storage yard |

| Discipline | Anticipated Impact | Mitigation Measures & EMP |
|---|---|---|
| | | * Greenbelt will be developed around/ within the premises of the plant site to control the fugitive emissions.<br>* Unloading of trucks and railway wagons will be carried out with proper care avoiding dropping of the materials from height.<br>* Sprinkling of water will be done along the internal roads in the plant in order to control the dust arising due to the movement of vehicles<br>* Proper maintenance of vehicles will be done to reduce gaseous emissions<br>* All the movement area will be concreted<br>* Vacuum sweeping machine (1 large & 2 small) for better housekeeping will be used.<br>* Greenbelt development & plantation will be done in 42.65 % of the total project area in and around the plant boundary and avenue plantation to attenuate air pollution.<br>* Preference to rail transportation |
| Noise | Increase in noise level within the plant area | * Personal Protective Equipments (PPEs) like earplugs and earmuffs will be provided to the employees exposed to high noise level.<br>* Proper maintenance, oiling and greasing of machines at regular intervals will be done to reduce generation of noise.<br>* Greenbelt will be developed all along the plant boundary.<br>* Regular monitoring of noise levels will be carried out and corrective measures in concerned machinery will be adapted accordingly to the possible extent. |
| Water | Generation of waste water and rain water harvesting | * No waste water will be generated from the Cement manufacturing process.<br>* Domestic wastewater generated from plant and will be treated in STP of 300 KLD and treated water (206 KLD) will be utilized for greenbelt development / plantation.<br>* Blow down and RO / DM reject water (235 KLD) will be will be used for dust suppression (210 KLD) after treated in neutralization pit. |
| Soil | Degradation of soil quality due to settling of air borne dust | * Use of efficient pollution control systems.<br>* Proper stack height will be maintained.<br>* Soil samples will be collected periodically and soil quality will be tested. |
| Solid and Hazardous waste | Generation of solid waste | * Dust collected from various air pollution control equipment will be recycled into the process.<br>* Fly ash (~1029 TPD) generated from CPP will be utilized in manufacturing of PPC grade cement. |

| Discipline | Anticipated Impact | Mitigation Measures & EMP |
|---|---|---|
| | | * Sewage sludge (30 kg/month) generated from STP (300 KLD) will be used as manure in greenbelt development/ plantation.<br>* Small quantity of used oil and grease will be generated, which will be sold to the CPCB authorized recyclers.<br>* Hazardous waste like used or spent oil (Cat. 5.1) (~ 120 KL/annum), Contaminated cotton rags or other cleaning materials (Cat. 33.2) (~2.0 TPA) and Empty barrels/containers/liners contaminated with hazardous chemicals /wastes (~ 300 Barrels/ Nos.) will be generated as per Schedule I of Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016. Apart from these wastes various other wastes including hazardous wastes, shall be used in kiln as co-processing depending upon availability & feasibility and obtaining requisite authorization under above rule. |
| Biological Environment | | |
| Greenbelt development | Migration and habitat loss | * Out of the total project area i.e., 187.1 ha; ~42.65% area i.e., 79.8 ha will be developed under greenbelt & plantation along the periphery and inside the plant premises with tree density 2500 per ha<br>* Avenue plantation will also be done along the approach road of the proposed plant. |
| a. Terrestrial Ecology | | Greenbelt of appropriate width will be developed and maintained by ACC in the area. |
| b. Aquatic Ecology | | No effluent will be discharged outside the plant premises. |
| Socio-economic Environment | Livelihood loss<br>Long term Health Impacts | Overall development of the area in respect of the infrastructure development, educational growth, health facilities etc. |

## 11.7 COST FOR ENVIRONMENT MANAGEMENT PLAN

EMP Cost Break-up is given in the below mentioned table:

**Table - 11.6**

**Cost Break up of EMP**

| Sr. No. | Environmental Monitoring | Cost in Crores | | | |
|---|---|---|---|---|---|
| | | Phase - I | | Phase - II | |
| | | Capital | Recurring | Capital | Recurring |
| 1. | Air Pollution Control | 290 | 3.3 | 269 | 2.9 |
| 2. | Water Pollution Control | 33 | 1.2 | 30 | 1.1 |
| 3. | Noise Pollution Control | 7.2 | 0.51 | 6.7 | 0.39 |
| 4. | Environmental Monitoring | 3.6 | 0.06 | 3.4 | 0.3 |
| 5. | Hazardous Waste Storage & Handling | 1.8 | 0.03 | 1.7 | 0.01 |
| 6. | Occupational Health & Safety | 5.4 | 0.54 | 5.0 | 0.31 |
| 7. | Greenbelt and plantation | 7.2 | 0.72 | 6.7 | 0.55 |

| Sr. No. | Environmental Monitoring | Cost in Crores | | | |
|---|---|---|---|---|---|
| | | Phase - I | | Phase - II | |
| | | Capital | Recurring | Capital | Recurring |
| 8. | Drip irrigation System & Water Sprinkling | 2.9 | 0.29 | 2.7 | 0.21 |
| 9. | RWH pond and Storm Water Management | 1.8 | 0.03 | 1.7 | 0.01 |
| 10. | Organic Waste Converter & Its Facilities | 1.8 | 0.03 | 1.7 | 0.01 |
| 11. | Others (Housekeeping and Municipal Waste Management) | 7.6 | 0.33 | 7.1 | 1.11 |
| | **Total** | **362** | **7.1** | **336** | **6.9** |

## 11.8 ENVIRONMENTAL MONITORING PROGRAMME

Details of the environmental monitoring schedule / frequency, which will be undertaken for various environmental components, as per conditions of EC / CTE / CTO are given Table -11.7.

**Table - 11.7**
**Post Project Monitoring**

| S. No. | Description | Frequency of Monitoring | Location |
|---|---|---|---|
| 1. | Meteorological Data | Hourly | Plant Site |
| 2. | Ambient Air Quality | Twice a Week & Continuous Online Monitoring | Near to the entrance Gate of Plant Site and towards the Villages in upwind & downwind direction from the plant site, as per the max. GLC obtained and as per EC / CTO conditions. |
| 3. | Fugitive Monitoring | Quarterly | Cement Mill, Packing Plant, Raw Materials Handling Area & Coal Yard |
| 4. | Stack Monitoring | Monthly/ Continuous Online Monitoring | Raw Mill & Kiln, Coal Mill, Cement Mill, Clinker Cooler & CPP Boiler |
| 5. | Water Quality | Quarterly / as per EC/ CTE/ CTO | Plant Site, Nearby Ground water sources and as per CTO conditions |
| 6. | Waste Water Monitoring (STP outlet) | Monthly & as per CTO | Inlet & Outlet |
| 7. | Water Level | Monthly /as per EC/ CTE/CTO | Plant Site, Nearby Ground water sources and as per CTO conditions. |
| 8. | Noise Level Monitoring | Quarterly & as per EC/CTO | Plant Boundary, High noise generating areas within the plant Boundary and as per CTO conditions |
| 9. | Soil Quality Analysis | Quarterly | 04 locations in and around plant site |
| 10. | Medical Checkup of Employee | Yearly / As per applicable norms | Pre-placement Medical Checkup & Periodical Examination at Dispensary / Health Centre |
| 11. | Performance evaluation of PCE's | Six Monthly | Raw Mill / Klin Bag house, Coal Mill Bag house, Cement Mill Bag house, Clinker Cooler ESP and CPP ESP. |

## 11.9 ADDITIONAL STUDIES

As per EIA Notification dated 14$^{th}$ Sept., 2006 and as amended thereof; application (Form - 1/ ToR and Pre-Feasibility Report) for the Proposed project was submitted to MoEF&CC on 05$^{th}$ July, 2012

and ToR Letter was issued by MoEF&CC, New Delhi *Vide Letter* No. J-11011/265/2012-IA II(I) dated 20th February, 2013; validity extended *Vide Letter* dated 18th Feb., 2016 for carrying out the Environmental Impact Assessment (EIA) study for the Proposed 5.0 Million TPA Integrated Cement Clinkerisation Plant, 8.0 Million TPA Cement Grinding Unit and 100 MW Captive Power Plant at Village: Gollapalle, Mandal: Mylavaram, District: Kadapa (YSR), Andhra Pradesh by M/s. ACC Limited.

The following Additional Studies were undertaken in order to comply with the conditions of the ToR obtained for the Integrated Cement Project:

1. Public Consultation
2. Risk Assessment and Disaster Management Plan

## 11.10 PUBLIC HEARING

In accordance with the notification S.O. 1533 dated: 14.09.2006 of Ministry of Environment & Forests, Government of India, New Delhi, Andhra Pradesh Pollution Control Board, Regional Office, Tirupati issued a notification pertaining to Environmental Public Hearing for the proposed 5.0 MTPA Integrated Cement Clinkerisation Plant, 8.0 MTPA Cement Grinding Unit, 100 MW Captive Power Plant at Gollapalle Village of Mylavaram Mandal, Kadapa (YSR) District, Andhra Pradesh State.

The press notification indicating date and venue of the public hearing was issued by member Secretary, Andhra Pradesh Pollution Control Board (APPCB) on 19th Sept., 2016 in prominent newspapers Viz. Telugu in 'Sakshi' and English in 'The Indian Express' with project details inviting suggestions views, comments and objections from the public regarding the above-mentioned project. The major issues raised during the Public Hearing were regarding employment, environment & pollution, health, socio- economic development related etc. Company has allocated Rs. 355 Crores (Phase I: Rs. 184 Crores, Phase - II: (171 Crores) for implementation of the commitments made during Public Hearing. The Issues / Points / Opinions of Local Public raised during the public hearing are given in Chapter 7, Section 7.2.4 of this EIA / EMP Report.

## 11.11 PROJECT BENEFITS

The project will help in combating the growing demand of cement in the market and hence will help in the economic growth of the country. M/s. ACC Limited will be actively involved in the Socio - economic developmental activities in the nearby villages of the plant site. Infrastructure development in the nearby villages, creating education promotion, Health & Family welfare, Community Infrastructure development and Religious and social Development are some of the activities further to be undertaken under Enterprise Social Commitment / CER for the development and upliftment of the society. The company has prepared the action plan to implement the suggestions/ objections/ issues raised during the Public Hearing as well as the needs identified in Socio-economic study.

## 11.12 ENVIRONMENT MANAGEMENT PLAN

The major sources of pollution in Cement Plant are Particulate Matter. Air pollution is the major concern to be looked upon for the plant activity. No major water, noise and soil pollution is envisaged

from the plant activity. Various mitigation measures have been proposed to take care of the environment in respect of air, water, noise, soil and the green cover of the plant site and nearby villages.

| Particulars | Details |
|---|---|
| *Air Quality Management* | ℘ Raw Mill / Kiln, Cement Mill, Coal Mill will be provided with bag house and Clinker Cooler will be provided ESP and will maintain the emission level within limits of <30 mg/Nm$^3$.<br>℘ Low $NO_x$ burner and De $NO_x$ System will be provided.<br>℘ Bag filters will be provided at all material transfer points to control dust emitted from various dust generating points in the plant.<br>℘ Clinker, Cement and Fly Ash will be stored in silos and Slag & Gypsum in covered sheds.<br>℘ Roads within the plant premises will be concreted and regular cleaning by sweeping machine will be done to control fugitive dust emissions.<br>℘ Greenbelt will be developed within the premises of the plant.<br>℘ Proper maintenance of vehicles will be done to reduce gaseous emissions.<br>℘ CPCB and CREP guidelines will be followed.<br>℘ Regular ambient air quality and stack emission monitoring will be carried out as per CPCB norms to ensure that ambient air quality standards will be met all the time. |
| *Water Management* | ℘ No waste water will be generated from the Cement manufacturing process.<br>℘ Domestic wastewater generated from plant and colony will be treated in STP of 300 KLD and treated water (206 KLD) will be utilized for greenbelt development / plantation.<br>℘ Rain water harvesting will be practised inside the plant premises. |
| *Noise Management* | ℘ Walls and ceilings of the concerned buildings will be lined with sound absorbing materials<br>℘ Properly insulated enclosures with equipment generating excessive noise will be provided.<br>℘ Proper maintenance, oiling and greasing of machines at regular intervals to reduce generation of noise will be done.<br>℘ Personal Protective Equipment (PPEs) like earplugs and earmuffs will be provided to the workers exposed to high noise level.<br>℘ Greenbelt of appropriate width inside the plant premises and at the plant boundary has will be developed<br>℘ Regular monitoring of noise level and corrective measures accordingly. |
| *Solid & Hazardous Waste Management* | ℘ Dust collected (500 TPD) from various air pollution control equipment will be recycled into the process.<br>℘ Sewage sludge (30 kg/month) generated from STP will be used as manure in greenbelt development/ plantation.<br>℘ Solid waste (100 TPA) generated from plant canteen will be disposed after segregating the waste into bio-degradable and non-degradable. Bio degradable waste will be composted and non-degradable wastes will be disposed off.<br>℘ Small quantity of used oil and grease will be generated, which is Hazardous waste like used or spent oil (Cat. 5.1) and the same will be sold to the CPCB authorized recyclers. |
| *Rainwater Harvesting* | The Integrated Cement Plant has proposed to implement rainwater harvesting practices inside the plant premises to harvest rainwater from different sections of the cement plant (roof-top as well as paved-cemented, greenbelt and open land). One pond will be constructed for the storage of runoff generated throughout the plant. To accommodate the total runoff generated in the project site which is (5,60250 m$^3$/annum), the area of the pond should be approximately, 41,500 m$^2$ which covers 4.15 Ha area. |

| Particulars | Details |
|---|---|
| *Greenbelt Development / Plantation* | ➢ Out of the total project area i.e., 187.1 ha; ~42.65% area i.e., 79.8 ha will be developed under greenbelt & plantation along the periphery and inside the plant premises with tree density 2500 per ha. |

### 11.13 Occupational Health Hazard

To control and minimize the risks at workplace, M/s. ACC Ltd. will implement Safety Health and Environment Policy (SHE) with the following objectives:

- To prevent hazards.
- To provide safe and healthy environment to all the employees.

The company, therefore, has adopted the policy and allocated total Rs. 10.4 lakhs funds for the purpose of creating and maintaining safe and healthy environment.

### 11.14 CONCLUSION

The proposed project will be beneficial to the local people as more infrastructure development, improvement in education and health facilities, roads, etc. in near-by villages will be done. There will be increase in revenue generation to the Government by way of excise and government taxes etc. There will be no significant impact on the area, as adequate preventive measures will be adopted to contain the various pollutants within permissible limits. Regular monitoring of all the components of environment will be done. Increased social welfare measures taken by the company will lead to development in the nearby villages. Greenbelt development will also be developed around the project area; this will help to mitigate the pollutants released from the premises of M/s. ACC Limited.

# *CHAPTER- 12*
# *DISCLOSURE OF THE CONSULTANT ENGAGED*

## 12.1 DISCLOSURE OF THE CONSULTANT ENGAGED

J.M. EnviroNet Pvt. Ltd. (JMEPL) has prepared this Final EIA / EMP Report revised covering ToR points as prescribed by MoEFCC, New Delhi *vide* letter no. J-11011/265/2012-IA II(I) dated 20th February, 2013 and ADS points raised by EAC (Industry - 1).

Baseline study of the study area was conducted during *Summer Season (March to May, 2013)* by earlier consultant. Thereafter, J.M. EnviroNet Pvt. Ltd. (JMEPL) has reviewed this data in Final EIA/EMP Report and due to expiry of earlier the baseline data fresh baseline monitoring was done during Summer Season *(March to May, 2024)*.

***Brief description of the company is given as under:***

J.M. EnviroNet Pvt. Ltd. was established in the year 1993. 'JM' in the name of the Company is derived from the name of 'Lord Shiva' - the Temple of 'Jharkhand Mahadev' (JM). The Temple is located at Queens Road, Vaishali Nagar, Jaipur.

The Registered office of JMEPL is at 403, 04th Floor, Jaipur Centre, B2 Bye pass, Tonk Road, Jaipur, Rajasthan- 302 018. Its Delhi-NCR Corporate office is at Emaar Digital Greens, Tower - B, Unit No. 1517, Golf Course, Ext. Road, Sector - 61, Gurgaon - 122 001 (Haryana).

J.M. EnviroNet Pvt. Ltd. is accredited with ISO-9001:2008 for EIA Division. EIA Division is also approved by National Accreditation Board for Education and Training (NABET) formerly NRBPT (Quality Council of India) *vide* Certificate no. NABET/EIA/23-26/RA 0308 and validity of the same is till 7th Aug., 2026. Copy of the NABET Certificate is enclosed as ***Annexure - 12*** along with this EIA/EMP Report.

J.M. EnviroNet Pvt. Ltd. is listed at serial no. "126" of the List of Accredited EIA Consultant Organization displayed on MoEFCC website (*http://www.qcin.org/nabet/EIA/documents/Accredited%20consultants.pdf*), as updated on 17th Sept., 2024.

JMEPL is offering Environmental Consultancy Services in various sectors viz. Mining, Thermal power plants, Coal Washeries, Mineral Beneficiation, Metallurgical industries (ferrous & non-ferrous), Cement plants, Coke oven plants, Manmade Fibers manufacturing, Synthetic organic chemicals industry, Distilleries, Pulp & paper industry, Oil & gas transportation pipeline, Real Estate projects etc.

In the Mining sector, JMEPL is covering mines of minerals viz. Limestone, Bauxite, Chromite, Coal, Zinc, Copper, Gypsum, Soapstone, Iron and Manganese ore, Clay, Silica Sand, Feldspar, Quartz etc.

JMEPL has a highly qualified team of Subject Experts. As senior executives / Heads of the EIA Division, we have ex-employees of the Reputed Business Group, STP and ETP Designing Experts, Senior Mining and Geology Experts with vast experience in their respective fields.

JM Group's business is spread over 23 States viz.: Telangana, Andhra Pradesh, Kerala, Gujarat, Maharashtra, Odisha, Tamil Nadu, Goa, Jammu and Kashmir, Himachal Pradesh, Punjab, Haryana, Delhi, Rajasthan, Uttar Pradesh, Madhya Pradesh, Chhattisgarh, Assam, West Bengal, Karnataka, Jharkhand, Bihar and Uttarakhand.

JMEPL outsources its laboratory services from J.M. EnviroLab Pvt. Ltd., an Environmental Laboratory at Gurugram (Haryana) approved under EPA (Environment Protection Act) from the Ministry of Environment and Forests, Govt. of India, New Delhi and by the National Accreditation Board for Testing and Calibration Laboratories, Government of India {NABL (NABL/T/ - 0884/17)} having the Accreditation certificate no. TC-6821.

This MoEF&CC and NABL approved Environmental Laboratory of JM Group is also providing Analytical Laboratory Services of various elements and environmental parameters.

Annual monitoring as per MoEF&CC/CPCB/SPCB guidelines, Risk Assessment and Disaster Management Plan, consultancy for Rain Water Harvesting Plan, detailed Hydro-geological Study, preparation of Environmental Statement Reports (Environmental Clearance Compliance Conditions) etc. are amongst the various other consultancy services offered by the Company.

***Details of Other Consultants involved:***

1. Baseline Study {Seasonal: Summer Season (March to May, 2013)} was conducted by Vimta Labs Limited (VLL), Hyderabad. Earlier EIA Division of Vimta Labs Limited (VLL), Hyderabad is approved by National Accreditation Board for Education and Training (NABET) formerly NRBPT (Quality Council of India) vide Certificate no. NABET/EIA/1992/RA 0226.
2. Wildlife Conservation Plan has been prepared by M/s. Greentech Solutions, Pune, Maharashtra.

# FINAL ENVIRONMENTAL IMPACT ASSESSMENT REPORT

# &

# ENVIRONMENTAL MANAGEMENT PLAN

For

# Proposed 5.0 Million TPA Integrated Cement Clinkerisation Plant, 8.0 Million TPA Cement Grinding Unit and 100 MW Captive Power Plant

At
Village: Gollapalle, Mandal: Mylavaram,
District: Kadapa (YSR), Andhra Pradesh

Baseline Study Period: Summer Season (March to May, 2024)

Public Hearing Date: 20.10.2016

APPLICANT

ACC

M/s. ACC Limited

Adani Corporate House.
Shantigram, Near Vaishno Devi Circle,
SG Highway, Khodiyar,
Ahmedabad 382 421,
Gujarat, India

EIA CONSULTANT

J.M. EnviroNet Pvt. Ltd.

(Registered EIA Consultant Organization from NABET-QCI)
Certificate No.:NABET/EIA/2326/RA 0308 valid upto 7th August, 2026
Emaar Digital Greens, Tower – B, Unit No. 1517,
Golf Course Ext. Road, Sector – 61, Gurugram (Haryana) – 122 011
E-mail: jmenviron@hotmail.com
NABL Approved Lab: JM EnviroLab Pvt. Ltd.
(Certificate No.:TC-6821)

No.5(9)/2006-Cement
Government of India
Ministry of Commerce & Industry
Department of Industrial Policy & Promotion

Udyog Bhavan, New Delhi
Dated, the 21st Jan., 2008.

ACC Ltd.
New Cement Plant
Gollapalli,
Guddeph. AP

Subject :- Standing Linkage Committee (Long-term) for coal linkage to cement plants adding capacity.

Sir,

I am directed to say that your application for sanction of long-term coal linkage to meet the coal requirement for your Greenfield cement project has been considered by the Standing Linkage Committee (Long-term) in its meeting held on 20th November, 2007 and the long-term linkage for your plant has been approved as under :-

(LTPA)

| Capacity | Additional Expansion | Total Capacity | LT Linkage @ 17% consumption norms | FSA quantity as per new Coal Distribution Policy | Preferred Source |
|---|---|---|---|---|---|
| 80.00 | - | 80.00 | 13.60 | 10.20 | SCCL |

2. The supplies would be subject to actual availability of coal from the approved source and in case of non-availability of coal from the approved source, efforts would be made to meet coal requirement from the alternative sources.

3. Since the expanded capacity has already been commissioned, you are requested to contact Coal India Ltd for signing of Fuel Supply Agreement (FSA) directly.

Yours faithfully,

(R. Muralidhar)
Under Secretary to the Govt of India
Tel. No. 23061147

Copy to :-

1. Shri G. Srinivasan, Under Secretary, Ministry of Coal, Shastri Bhawan, New Delhi.
2. Director (Marketing), CIL, Kolkata.

**QUESTIONNAIRE FOR ENVIRONMENTAL APPRAISAL**

***(INDUSTRY SECTOR PROJECTS)***

| | |
|---|---|
| Note 1: | All information given in the form of Annexures should be part of this file itself. Annexures as separate files will not be accepted. |
| Note 2: | Please enter x in appropriate box where answer is Yes/No |

**I General Information**

| | | |
|---|---|---|
| A. | Name of the Project | Proposed 5.0 MTPA Integrated Cement Clinkerisation Plant, 8.0 MTPA Cement Grinding Unit and 100 MW Captive Power Plant, at Village: Gollapalle, Mandal: Mylavaram, District: Kadapa (YSR), Andhra Pradesh by M/s. ACC Limited. |
| 1. | Existing project / proposed project/expansion project / modernization project | Proposed Project |
| 2. | If Existing / expansion / modernization project, whether Environmental Clearance has been obtained | Not Applicable |
| B | Plant Capacity (TPA) | |

| Units | Proposed Capacity | | |
|---|---|---|---|
| | Phase - I | Phase - II | Total |
| Clinker | 2.5 million TPA | 2.5 Million TPA | 5.0 Million TPA |
| Cement (OPC, PPC) | 4.0 Million TPA | 4.0 Million TPA | 8.0 Million TPA |
| Captive Power Plant | 50 MW | 50 MW | 100 MW |
| WHRS | 12.5 MW | 12.5 MW | 25 MW |
| DG Sets | 1000 KVA | 1000 KVA | 2000 KVA |
| Railway Siding | Part of the Project | | |

C Location

| Village | Tehsil / Mandal | District | State |
|---|---|---|---|
| Gollapalle, G.Uppalapadu & Besthavemula | Mylavaram | Kadapa (YSR) | Andhra Pradesh |

| | | | |
|---|---|---|---|
| D | Geographical Information | | |
| | | ***As per ToR (Project Site)*** | ***As per applied EC (Project Site)*** |
| | | 14°58'06" N to 14°59'59" N | 14°57'56.36" N to 14°58'58.08" N |
| | | *78°16'50" E to 78°18'38" E* | *78°16'21.07" E to 78°18'07.46" E* |
| 1. | Latitude | | |

| | | |
|---|---|---|
| 2. | Longitude | |
| 3. | Elevation above Mean Sea Level (meters) | 227 to 240 m |
| 4. | Total Area envisaged for setting up of project (in Ha.) | 187.1 hac |
| 5. | Nature of terrain (hilly, valley, plains, Coastal plains etc.) | Slightly undulating |
| 6. | Nature of Soil (sandy, clayey, sandy loam etc.). | Sandy Loam to Silty |
| 7. | Permeability (cm/sec) | 0.00069 |
| E | Alternate sites considered | |
| | No, as the proposed project site has been considered near to the Captive Limestone Mine. | |
| F | Reasons for selecting the proposed site based on comparative evaluation of environmental considerations-<br>• Availability of limestone (major raw material) in nearby area.<br>• Availability of adequate power and water.<br>• Adequate land availability.<br>• Proximity of proper connectivity of the unit with SH and NH.<br>• Non - involvement of any forest area etc. | |

**II Environmental Setting**

**A** Current land usage of the proposed project site Area (in hectares)

| | | | |
|---|---|---|---|
| 1. | Notified Industrial Area/Estate | --- | |
| 2. | Agricultural | - | |
| 3. | Homestead | - | |
| 4. | Forest | - | - |
| 5. | Grazing | - | - |
| 6. | Fallow | - | - |
| 7. | Marshy | - | - |
| 8. | Mangroves | | - |
| 9. | Others (Pl. specify) Private Agricultural land | 187.1 Ha | |
| | **Total** | 187.1 Ha | |

B Please indicate area earmarked for each of the following (in Ha.)

| | | |
|---|---|---|
| 1. | Plant Facilities (Cement Plant & CPP) | 46.8 ha |

| | | |
|---|---|---|
| 2. | Ash Disposal | - |
| 3. | Storage (Fuel) | - |
| 4. | Storage (Water) | - |
| 5. | Storage (Hazardous Waste) | - |
| 6. | Storage (Hazardous Chemicals) | - |
| 7. | Storage (Others) | - |
| 8. | Approach Road(s) | - |
| 9. | Township | - |
| 10. | Green Belt | 79.8 |
| 11. | Others (Please specify) | |
| | Total | **187.1 Ha** |

C Is the proposed site located in a low- lying area?

**Yes** [ ] **No.** [√]

If Yes,

1. Level before filling (above MSL, in meters) **Not Applicable**
2. Level after filling (above MSL in meters) **Not Applicable**

| | Quantity of Fill Material required (in cum.) in MTPA | | | | |
|---|---|---|---|---|---|
| Sl no | Material | Phase-I | Phase-II | Total | Source |
| 1. | Limestone | 3.5 | 3.5 | 7.0 | Captive Limestone Mine Lease |
| 2. | Clay | 0.14 | 0.14 | 0.28 | Captive Mine Lease |
| 3. | Bauxite | 0.025 | 0.025 | 0.05 | Andru Minerals & AP/Belgaum Minerals-Karnataka and Bellary |
| 4. | Iron ore | 0.02 | 0.02 | 0.04 | Sai Sindhu industries-AP/KEJ Minerals Pvt. Ltd. & Janaki Corporation Ltd Karnataka |
| 5. | Gypsum/Phospho gypsum | 0.24 | 0.24 | 0.48 | CFL, Spic, Sterlite, Fact |
| 6. | Fly ash* | 1.40 | 1.40 | 2.80 | CPP, KPCL Raichur Thermal Power Plant, Kothagudem Thermal Power Station VII stage |

D. Proximity to sea/water bodies:

| | Sea | Other Water bodies like River/creek/lake etc. (Please specify) |
|---|---|---|
| Distance of site* boundary (in m) | None | • Nallah (Adjacent in south)<br>• Nallah Cheruvu (6.5 km in NW direction)<br>• Tigaleru River (7.0 km in ESE direction) |

| | | |
|---|---|---|
| | | • Pond (3.0 km in North direction)<br>• Pond Near kallutla (2.5 km in ENE direction)<br>• Pond (4.0 km in South direction)<br>• Pond (4.1 km in South direction) |
| Distance of plant facilities (in m) | None | None within 10 Km radius of the Proposed Project Area |

*** From highest flood line/high tide line**

E. Whether any of the following exist within 7 km. of the periphery of the project site. If so, please indicate aerial distance and the name of the eco-system as given under the Table.

| S. No. | | Name | Area falling within 7 km periphery of project (ha.) | Aerial Distance (in km.) |
|---|---|---|---|---|
| 1 | National Park/Wildlife Sanctuary | None | - | - |
| 2 | Tiger Reserve /Elephant Reserve / Turtle Nesting Ground | None | - | - |
| 3 | Core Zone of Biosphere Reserve | None | - | - |
| 4 | Habitat for migratory birds | None | - | - |
| 5 | Lakes/Reservoir/Dams | None | - | - |
| 6 | Stream/Rivers | Tigaleru River | - | 7.0 km in ESE direction |
| 7 | Estuary/Sea | None | - | - |
| 8 | Mangroves | None | - | - |
| 9 | Mountains/Hills | None | - | - |
| 10 | Notified Archaeological sites | None | - | - |
| 11 | Any other Archaeological sites | None | - | - |
| 12 | Industries/Thermal Power Plants | Cement Plant (Dalmia Cement Bharat Ltd.) | - | 3.5 km in ESE direction |
| 13 | Defense Installation | None | - | - |
| 14 | Airports | None | - | - |
| 15 | Railway Lines* | None | - | - |
| 16 | National / State Highways* | SH - 57 | - | 0.5 Km in SSW Direction |

*** 0.5 km from Railway lines/National / State Highway should be maintained.**

F. Description of the flora/vegetation within 7 km under following headings.

**List of the same has been incorporated in Chapter III of final EIA/ EMP Report, page no. 189 to 196.**

1. Agricultural crops
2. Commercial crops
3. Plantation
4. Natural Vegetation/Forest Type **None**
5. Grass Lands **None**
6. Endangered species **None**
7. Endemic species **None**
8. Others (Please Specify) -

| | | | |
|---|---|---|---|
| G | Description of fauna (non-domesticated) within 7 km under following headings. | | |
| 1. | Total listing of faunal elements | Incorporated in Chapter-III of Final EIA/EMP Report, Section No. 3.5.11.1 Page no.197 to 201 | |
| 2. | Endemic fauna species | **None** | |
| 3. | Endangered Species | **None** | |
| 4. | Migratory species | **None** | |
| 5. | Route of migratory species of birds and mammals | **None** | |
| 6. | Details of aquatic fauna (if applicable) | | |

**III** H Meteorological Parameters

A Seasonal – Monitoring Data (continuous monitoring for one full season except monsoon should be carried out)

**Monitoring was done during Summer Season (March, 2024 to May, 2024)**

1. Temperature (in °C)
   (a) Maximum: 42.1 **°C**
   (b) Minimum: 27.6 **°C**
   (c) Mean - **34.85 °C**
2. Rain fall (in mm)
   (a) Maximum: **1290.49 mm**
   (b) Minimum: **412.74 mm**
   (c) Mean**: 851.61 mm (Average for last 10 years)**
3. Mean value of humidity (in %)
   **Max. - 60%**
   **Min. - 38%**
4. Inversion occurrence
   **Incorporated in Chapter - III of Final EIA /EMP Report, Section no. 3.5.6.2 Table No. - 3.8, page no. 158**
   (a) In percentage
   (b) Height in meters
5. Seasonal Wind-rose pattern (16 points on compass scale)
   **Wind rose diagram at site is incorporated in Final EIA/ EMP Report in Chapter - III, Fig. No. 3.9(b), Page No.157**
6. Hourly Mean Meteorological data (based on one full season data collected at site required as input for air quality modeling):
   **Hourly Meteorological data has been enclosed as *Annexure - 3* along with this Final EIA/EMP Report.**

| Hour | Low/Medium Cloud amount (in OCTAS) | Wind Speed in (Km/h) | Predominant wind direction | Ambient air temperature (in deg K) | Hourly stability | Mixing depth (in m) |
|---|---|---|---|---|---|---|
| 1. | | | | | | |

Attach additional sheet as required.

**IV. Ambient Air Quality Data**

[Frequency of Monitoring should be as per guidelines of CPCB and monitoring should cover one full season (excluding monsoon)]

A. Season and period for which monitoring has been carried out

**Summer Season (March., 2024 to May., 2024)**

B. Frequency of sampling:

**Twice in a week**

C. Number of samples collected at each site.

**24 samples from each site.**

| Date, Time & Location | Wind direction & Speed | 24 hourly Concentration as monitored (inμg/m3.) SPM, RPM, SO2,Nox,CO | Permissible Standard (As per EPA/SPCB consent) | Remarks (Name of the instrument and sensitivity) |
|---|---|---|---|---|
| | | | | |

**Details of AAQ Monitoring have been incorporated in Chapter - III of Final EIA/EMP Report, Section 3.5.7, page no. 159.**

D. 24 hourly concentrations (in $\mu g/m^3$)

| Pollutant(s) | Maximum | Minimum | Mean | 98% |
|---|---|---|---|---|
| $PM_{2.5}$ | 41.8 | 20.1 | 30.95 | - |
| $PM_{10}$ | 76.5 | 36.4 | 56.45 | - |
| $SO_2$ | 11.7 | 4.1 | 7.9 | - |
| $NO_2$ | 22.2 | 8.9 | 15.55 | - |
| PAH | BDL | BDL | - | - |

**Detailed AAQM Tables are enclosed as *Annexure - 7* along with the Final EIA/EMP Report.**

E. Specific air pollution issues in the project area. **None**

## V. Manufacturing Process details

A. Raw materials (including process chemicals, catalysts, & additives).

| S. No. | Material | Quantity MTPA | | | Source | Mode of Transportation with approx. distance |
|---|---|---|---|---|---|---|
| | | Phase-I | Phase-II | Total | | |
| 1. | Limestone | 3.5 | 3.5 | 7.0 | Captive Limestone Mine Lease | Belt Conveyor / 0.5 km |
| 2. | Clay | 0.14 | 0.14 | 0.28 | Captive Mine Lease | Road / 0.5 km |
| 3. | Bauxite | 0.025 | 0.025 | 0.05 | Andru Minerals & AP/Belgaum Minerals- Karnataka and Bellary | Rail & Road, 250 - 500 km |
| 4. | Iron ore | 0.02 | 0.02 | 0.04 | Sai Sindhu industries-AP/KEJ Minerals Pvt. Ltd. & Janaki Corporation Ltd Karnataka | Rail & Road / 250 km |
| 5. | Gypsum / Phospho gypsum | 0.24 | 0.24 | 0.48 | CFL, Spic, Sterlite, Fact | Rail & Road / 450 km |

| | | | | | | |
|---|---|---|---|---|---|---|
| 6. | Fly ash* | 1.40 | 1.40 | 2.80 | CPP, KPCL Raichur Thermal Power Plant, Kothagudem Thermal Power Station VII stage | Rail / Road / 250 km to 550 km |

***Out of Total Fly ash requirement of 2.80 Million TPA, 0.628 Million TPA will be generated from CPP which will be 100% utilized for PPC production***

B. Brief description of the process –

**Process Details have been given in Final EIA/EMP report in Chapter - II, Section 2.7, and page no. 94.**

Details of process technology know how/collaboration:

**Process Details have been given in Final EIA/EMP report in Chapter - II, Section 2.7, and page no. 94.**

C. Production profile (tones/year)

| Name of Products, Byproducts and Intermediate Products | Existing | Proposed activity (new/modernization/expansion) (TPA) | Total |
|---|---|---|---|
| A. Main Products | | | |
| 1. Clinker | - | 5.0 Million TPA | 5.0 Million TPA |
| 2. Cement | - | 8.0 Million TPA | 8.0 Million TPA |
| 3. CPP | - | 100 MW | 100 MW |
| 4. WHRS | - | 25 MW | 25 MW |
| 5. DG Sets | - | 2000 KVA | 2000 KVA |
| B. By-Products | None | None | None |
| C. Intermediate Products | None | None | None |

**D.** Means of transportation of raw material and final products

| S. No. | Material | Quantity MTPA | | | Mode of Transportation with approx. distance |
|---|---|---|---|---|---|
| | | Phase-I | Phase-II | Total | |
| 1. | Limestone | 3.5 | 3.5 | 7.0 | Belt Conveyor / 0.5 km |
| 2. | Clay | 0.14 | 0.14 | 0.28 | Road / 0.5 km |
| 3. | Bauxite | 0.025 | 0.025 | 0.05 | Rail & Road, 250 - 500 km |
| 4. | Iron ore | 0.02 | 0.02 | 0.04 | Rail & Road / 250 km |
| 5. | Gypsum/Phospho gypsum | 0.24 | 0.24 | 0.48 | Rail & Road / 450 km |
| 6. | Fly ash* | 1.40 | 1.40 | 2.80 | Rail / Road / 250 km to 550 km |

**VI. Water**

A. Water Requirement (cum/day) - 2922 $m^3$/day. The water balance has been incorporated in Final EIA/EMP Report, Chapter 2nd, Figure no: 2.6, Page no- 92.

| Purpose | Avg. Demand | Peak Demand | Source | Type Treated/untreated/ Fresh/ recycled | Remarks |
|---|---|---|---|---|---|
| 1. Project<br>(i) Process<br>(ii) Cooling water<br>(iii) DM water<br>(iv) Dust Suppression<br>(v) Drinking<br>(vi) Greenbelt | | - | | - | - |

B. Source of Raw Water Supply

| S.No. | Source | Cu.m./hr | Cu.m./day |
|---|---|---|---|
| 1. | Sea | - | - |
| 2. | River | - | - |
| 3. | Groundwater | - | **2922** |
| 4. | Other surface water bodies (Mine Pit) | - | - |
| Initially groundwater and later on from limestone mine pit & rainwater harvesting | | | |

C. Lean Season flow in case of surface water source (cusecs/cumecs) **-Not Applicable**

D. Groundwater (a) Recharge Rate/Withdrawal rate

(a) Recharge Rate: **mcm/annum**

(b) Withdrawal Rate: **1.066. mcm/annum**

E. Ground Water Level (Meters)

(i) Pre-Monsoon **21.4 to 47.4 m bgl**

(ii) Post – Monsoon **17.5 to 47.4 m bgl**

(To be obtained from Central/State Ground water authorities)

E. Competing Users of the Water Source:

Water requirement will be met initially from ground water sources. Once mine will get developed same will be used to fulfill the water requirements. Rainwater harvesting will be done inside the premises. Site specific data about the competing uses of the water is not available.

| S.No. | Usage | Present Consumption (mcm /annum) | | Addition Proposed as per local plan (mcm/annum) | | Total (mcm/annum) | |
|---|---|---|---|---|---|---|---|
| | | Surface | Ground | Surface | Ground | Surface | Ground |
| 1 | Irrigation | | | | | | |
| 2 | Industry | | | | | | |
| 3 | Drinking | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 4 | Others (Livestock) | | | | | | |
| | Total | | | | | | |

G. Physico-chemical analysis of Raw Water at intake point:

**Details have been incorporated in Chapter III of Final EIA/EMP Report, section no. 3.5.9.2, Page no. 172.**

H. Physio- chemical analysis of treated water to be used in project/township.

**Not Applicable**

I. Waste Water Management–

- No industrial waste water will be generated from cement manufacturing process.
- Effluent generated from CPP will be used for dust suppression after proper neutralization.
- Sewage Treatment Plant will be provided for the treatment of domestic effluent generated from Plant, colony and treated water will be used for horticulture purpose.
- Rain water harvesting will be practiced at plant.
- Zero effluent discharge will be maintained from plant premises.
- Regular monitoring of water quality will be carried out.

1. Description of waste water treatment plan with flow chart:
**Details have been incorporated in Chapter - X of Final EIA/EMP Report, section no. 10.8.2 page no. 375.**

2. Characteristics of discharge stream(s) before and after treatment: **Not Applicable**

| Item | Characteristics | |
|---|---|---|
| | Before | After |
| | | |

3. Daily discharge ($m^3$/day) from different sources

| | | |
|---|---|---|
| (a) | Plant operation | 0 |
| (b) | Workshop | -- |
| (c) | D.M. Plant effluent | -- |
| (d) | Domestic | 252 |
| (e) | Other (specify) | |
| | Total | 252 |

4. Quantity of water recycled

| | | |
|---|---|---|
| (a) | (in %) | 82.4 |
| (b) | (in cum/day) | **252 cum/day** |

5. Details of recycling mechanism — After proper treatment wastewater generated from CPP will be used for dust suppression. 100 %Treated wastewater will be utilized in Greenbelt

6. Mode of final discharge/disposal of treated effluent - **Treated water from STP will be used for green belt development. The proposed ICP will be Zero Effluent Discharge.**

| Mode | Length (in m.) | Quantity (in $m^3$/day) |
|---|---|---|
| (i) Open Channel | - | - |
| (ii) Pipeline | - | |
| (iii) Others (Please specify) | - | KLD |
| **Total** | **-** | |

7. Point of final discharge

| Final Point | Quantity discharged (in $m^3$/day) |
|---|---|
| (i) Green belt within the plant/township& Dust Suppression | |
| (ii) Agricultural land | - |
| (iii) Fallow Land | - |
| (iv) Forest Land | - |
| (v) River/Stream | - |
| (vi) Lake | - |
| (vii) Estuary | - |
| (viii) Sea | - |
| Total | |

8. Lean season flow rate in case of discharge in a river/stream (cusecs) **Not Applicable**

9. Downstream users of water (in case of river, reservoir, lake(cusecs) **Not Applicable**

(a) Human
(b) Irrigation
(c) Industry
(d) Others (Pl. specify)

10. Analysis of river water 100 metres upstream of discharge point and 100 metres downstream of discharge point (except in rainy/monsoon season) along with details of aquatic life.:
**Not Applicable**

11. What is the predicted impact on water quality of the receiving body due to discharge? (Briefly state the prediction tool adopted):
**Not Applicable**

## VII. Solid Waste Management

1. Details

| S.No | Source | Qty (TPM) | Form (Sludge/Dry/Slurry etc.) | Composition |
|---|---|---|---|---|
| 1. | Raw water treatment plant | - | | - |
| 2. | STP | **0.03** | **Sludge** | - |

| | | | | |
|---|---|---|---|---|
| 3. | Process | **18000** | **Fly ash (CPP)** | - |
| 4. | Spent Catalyst | - | - | - |
| 5. | Oily Sludge | - | **Oil** | |
| 6. | Others (Pl. Specify) | - | | - |

A. If waste(s) contain any hazardous/toxic substance/radioactive materials or heavy metals, provide data and proposed precautionary measures.

**Used oil & Oily sludge will be collected in steel drums and stored in covered shed constructed as per norms of HW (M&H) Rules.**

**Hazardous waste generation and Management**

| ***S. No.*** | ***Type of Waste*** | ***Waste Category*** | ***Quantity*** | ***Treatment/Disposal Plan*** |
|---|---|---|---|---|
| *1.* | *Used or Spent Oil* | *Sch. I, Cat.- 5.1* | *~ 120 KL/Annum* | *Will be used in Kiln as co-processing as per Hazardous Waste Management Rules, 2016 and Empty barrels Will be sold to APPCB/CPCB registered recycler as per Hazardous Waste Management Rules, 2016.* |
| *2.* | *Empty barrels* | *Sch. I, Cat.- 33.1* | *~300 Nos. / Annum* | |
| *3.* | *E-Waste* | - | *~15 Tonnes/annum* | *Will be sold to registered vendors as per E-Waste Management Rules, 2016.* |
| *4.* | *Used Lead Acid Batteries* | - | *~100 Nos./Annum* | *Will be sold to APPCB/CPCB registered recycler as per Batteries (Management & Handling) Rules, 2001.* |

B. What are the possibilities of recovery and recycling of wastes?

- Fly ash generated from Captive Power Plant will be used in manufacturing of PPC grade cement.
- Dust collected from air pollution control equipment will be recycled in process.
- Sludge from Sewage Treatment Plant (STP) will be used as manure for green belt development/ plantation.
- Municipal Solid waste from plant and colony will be collected in dustbins, provided at the respective places and will be transported in the closed area to avoid any adverse effects on the surrounding environment.
- Waste generated from construction activity will be utilized in leveling of land & road construction.
- STP Sludge (~30 kg/month) will be used as manure for greenbelt development & plantation.
- Biodegradable waste generated from kitchen waste will be converted to Organic Manure through Organic Waste Convertor (OWC) and it will be further utilized in Greenbelt & plantation.
- WTP reject water from CPP & WHRS (120 KLD), Boiler Blowdown (67 KLD) will be treated in Neutralization Pit and treated water will be use in Dust Separation.
- Fly Ash (~750 TPD) generated from CPP will be totally reused in cement manufacturing process.
- Sewage Treatment Plant (STP) of capacity 300 KLD will be installed for the treatment

of domestic waste water.

C. Possible users of Solid Waste (s).

- No solid waste will be generated from the cement manufacturing process.
- Fly ash from Captive Power Plant and dust collected from air pollution control equipment will be totally recycled in the process.
- Sludge from Sewage Treatment Plant (STP) will be used as manure for green belt development.
- Solid waste from plant and colony will be collected in dustbins, provided at the respective places and shall be transported in the closed area to avoid any adverse effect on the surrounding environment.

D. Method of disposal of solid waste (s) **Not Applicable**

| | **Method** | **Qty (TPM)** |
|---|---|---|
| 1. | Landfill | - |
| 2. | Incineration | - |
| 3. | Recovery | - |
| 4. | Downstream users | - |

E. In case of landfill **Not Applicable**

| | | **Yes** | **No** |
|---|---|---|---|
| 1. | Is solid waste amendable for landfill | | |
| 2. | Dimensions of landfill | | |
| 3. | Life of landfill | | |
| 4. | Proposed precautionary and mitigative measures along with design features | | |

F. In case of incineration: **Not Applicable**

1. Details of incinerator

(i) Type
(ii) Size
(iii) Capacity
(iv) Fuel

2. Likely composition and quantum of emissions

| **S. No.** | **Composition** | **Quantity (in cu.m/hr)** |
|---|---|---|
| | | |

## VIII. Noise Pollution Control and Management

| | | |
|---|---|---|
| A. | Source | **Construction activities & Operation of Plant Machineries.** |

B. Level at source (dB) **<75 dB(A)**

C. Level at project boundary capacity (dB) **<70 dB(A)**

D. Abatement measures (give source-wise details)

- Properly insulated enclosures will be provided to equipment making excessive noise.
- Improved silencers within the equipment generating high noise.
- Proper maintenance, oiling and greasing of machines at regular intervals will be done to reduce generation of noise.
- Personal Protective Equipment like earplugs and earmuffs will be provided to the workers exposed to high noise level.
- Green Belt of appropriate width inside the plant premises and at the plant boundary will be developed.
- Regular monitoring of noise level will be carried out and corrective measures in concerned machinery will be adapted accordingly to the possible extent.
- Isolation of continuously vibrating structures/ machines by proper and secured mountings.
- Installation of compressors and turbine in closed building.
- DG sets will be housed in enclosed room with in-built silencer.

## IX. Fuel/Energy Requirements

A. Total Power Requirement (MW)

| | **Project** | **Township** | **Other (pl. specify)** | **Total** |
|---|---|---|---|---|
| Present (in existing) | Nil | Nil | Nil | Nil |
| Proposed | 125 | Nil | Nil | 125 |
| **Total** | 125 | Nil | Nil | 125 |

B. Source of Power (MW)

| | SEB/Grid | Captive Power Plant | WHRB |
|---|---|---|---|
| Present | Nil | Nil | Nil |
| Proposed | Nil | 100 | 25 |
| **Total** | Nil | 100 | 25 |

C. Details of Fuel used

| **S. No.** | **Fuel** | **Daily Consumption (MTPA)** | | **Calorific value (Kcals/kg)** | **% Ash** | **% Sulphur** |
|---|---|---|---|---|---|---|
| | | Existing | Proposed | | | |
| 1 | Gas | - | - | - | - | - |
| 2 | Naphtha | - | - | - | - | - |
| 3 | HSD | - | - | - | - | - |
| 4 | Fuel Oil | - | - | - | - | - |
| 5 | Imported Coal/India | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Coal/ Pet Coke | | | | | |
| | Cement Plant | Coal | 1.10 | 4200-4800 | 30-35 | 0.4-0.5 |
| | | Pet coke | 0.27 | 7800 -8300 | 0.5-2.0 | 6-9 |
| | CPP | | | | | |
| 6 | Lignite | - | - | - | - | - |
| 7 | Other (Pl. specify) | - | - | - | - | - |

The annual coal requirement for integrated cement plant (Phase-I & II) will be 1.10 MTPA and CPP (Phase-I & II) will be about 0.97 MTPA which will be sourced from Singereni Collieries Company Limited (SCCL) alternatively imported coal will be used. The average GCV coal as <3800 Kcal/kg..

| | | |
|---|---|---|
| D. | Source of Fuel (Distance in km) | |
| 1. | Port | -- |
| 2. | Mine | - |
| 3. | Refinery | -- |
| 4. | Storage Depot/Terminal | - |
| E. | Mode of Transportation of fuel to site | **Road/Railway** |
| 1. | Trucks (numbers/day) | - |
| 2. | Pipeline (length in km.) | - |
| 3. | Railway Wagons (numbers/day) | - |

## X. Atmospheric Emissions

**Details have been incorporated in Chapter – III of Final EIA/EMP Report, section no. 2.9.4 page no. 116 to 118.**

A. Flue gas characteristics (SPM, $SO_2$, $NO_x$, CO)

| S. No. | Pollutant | Source of Emission | Emission rate (kg/hr) | Concentration in flue gas (g/m$^3$) |
|---|---|---|---|---|
| 1. | PM | | | |
| 2. | RPM | - | - | - |
| 3. | $SO_2$ | | | |
| 4. | NOx | | | |
| 5. | CO | | | |

B. Size distribution of SPM at the top of the stack

| S. No. | Range | % by weight |
|---|---|---|
| 1 | Micron | - |
| 2 | 1-10 Micron | 10 |
| 3 | 10-20 Micron | 70 |
| 4 | <20 Micron | 20 |

C. Stack emission Details (All the stacks attached to process units, Boilers, captive power plant, D.G. Sets, Incinerator both for existing and proposed activity).

**Stack emission details have been given in Chapter IV; Table no. 4.6 of Final EIA/EMP Report, Page no. 235.**

| Plant section & units* | Stack No. | Height from ground level (m) | Internal Diameter (Top) (m) | Emission Rate (kg/hr)* | Temp. of Exhaust Gases (deg K) | Exit Velocity (m/sec) | Exhaust Gas | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Temp° C | Density Kg/m3 | Specific Heat | Volumetric Flow ($m^3$/hr) |
| Limestone crusher | | | | | | | | | | |
| Kiln/RM | | | | | | | | | | |
| Coal mill | | | | | | | | | | |
| Cooler | | | | | | | | | | |
| TPP | | | | | | | | | | |
| Cement mill | | | | | | | | | | |

*Note: Please indicate the specific section to which the stack is attached. For e.g.: Process section, D.G. Set, Boiler, Power Plant, incinerator etc.

Emission rate (kg/hr.) for each pollutant (SPM, $SO_2$, $NO_x$ etc. should be specified.

D. Details of fugitive emissions (Indicate the points of fugitive emissions and quantities estimated)

- **Details of the same are given in Chapter- X of Final EIA/EMP Report, section no. 10.4.1.1, page no. 365**
- **Measures in accordance to the CPCB guidelines that will be implemented in the Integrated Cement Plant to control the dust emission are given as below:-**

**1. Unloading Section (Limestone, Coal & Other Relevant Material)**

| S. No. | Guidelines | Control Measures to be Provided |
|---|---|---|
| 1. | The enclosures for the unloading sides could be flexible curtain type material covering up to height of dumpers discharge from the roof. | Enclosures of flexible curtain will be provided for all unloading operations covering height of dumpers from the roof. |
| 2. | A dust suppression system should be provided to spray water. The amount of water sprayed should preferably be optimized by employing proper design of spray system. Suitable systems may be adopted to reduce the problems like choking, jamming of the moving parts. | Water sprinklers proper design and suitable spray system will be provided for dust suppression. |

**2. Material Handling Section (Including Transfer Points)**

| S. No. | Guidelines | Control Measures to be Provided |
|---|---|---|
| 1. | The enclosures from all sides with the provision for access doors, which shall be kept, closed during operation. Spillages should be periodically removed. | Transfer point locations will be fully enclosed for the proposed project and spillage of cement will be removed regularly. |
| 2. | Either water spray system should be provided for suppressing the air borne dust or dry extraction cum bag filter with adequate extraction volume should be installed. | Bag filters (168 nos.) will be provided at all the material transfer points and required locations to avoid fugitive emissions. |
| 3. | Spray sufficient quantity of water to moist the top layer to avoid wind blowing of fine particles. | Water will be periodically sprayed on the stockpiles, so as to retain some moisture in the top layer. |

**3. Coal Storage Section**

| S. No. | Guidelines | Control Measures to be Provided |
|---|---|---|
| 1. | A board should be erected to display the area earmarked. | Coal and Petcoke yard/storage area will be clearly earmarked with a display Board. |
| 2. | Proper pathways with entry and exit point should be provided. | The pathways with entry and exit point in coal yard for vehicle movement will be paved. |
| 3. | Any deposits of dust on the concrete roads should be cleaned regularly by sweeping machines. | Accumulated dust will be removed / swept regularly. |
| 4. | Wherever blending activity is carried out by chaining in open ground, covered shed should be provided to reduce the fine coal dust getting airborne. The enclosure walls shall cover minimum three sides up to roof level. | Coal other than coal stockpile will be preferably stored under covered shed. Closed all three side upto roof if, covered open area, enclosure wall covering three sides will be provided. |
| 5. | The enclosure should be from three sides and roof so as to contain the airborne emissions. | Enclosure from three sides and roof will be provided for coal and pet coke storage. |
| 6. | Instead of dust extraction cum bag filter system, if dust suppression measure is used, following additional control measures should be provided. | |
| a. | Coal should be sufficiently moistened to suppress fines by spraying minimum quantity of water, if possible. | Water sprinkler system will be provided sprayed to suppress fine dust before unloading. |
| b. | Water spray should also be applied at crusher discharge and transfer points. | Water spray system will be provided at crusher discharge and transfer points. |

**4. Clinker Cooler Section**

| S. No. | Guidelines | Control Measures to be Provided |
|---|---|---|
| 1. | The possibilities especially in new cement plant may be explored for the following: | Air borne fines extracted from clinker cooler will be separated and |

| | | |
|---|---|---|
| | The unit may need to add on / install necessary provisions for separating fine particulates from the clinker cooler ESP collection. Fines separation may be achieved by passing collected dust through cyclone, the fines escaping cyclone to be separated, cyclone collection (coarse particles) could be recycled. The fines shall be recycled to the last possible destination (like clinker day silo) suitable or safely disposed. | recycled.<br>ESP will be provided at clinker cooler and dust collected from the same will be recycled back to the process. |

**5. Clinker Stock Piles Section**

| S. No. | Guidelines | Control Measures to be Provided |
|---|---|---|
| 1. | Bag filter may be provided before venting out the gases. | Bag filter will be provided before venting out the gases. |
| 2. | The enclosures should have aventing arrangement located at transfer point where clinker is dropped to the stockpile. The extraction /venting should be sufficient enough. Clinker stockpile access door should be covered by mechanical gate or by flexible rubber curtain. The access doors shall be kept closed at all possible times. | Clinker will be stored in silo which will have venting arrangement along with a bag filter. |
| 3. | Extracted dust should be captured in bag filter and the collected dust should be avoided to feed back to the clinker stockpile, if layout permits. It may be recycled at last possible destination i.e., cement mill section through suitable arrangement, if possible. | The dust extracted and captured in bag filter will be avoided to feedback/recycled to the clinker stockpile, if possible. |
| 4. | Generally open storage of clinker should be avoided. Only in case of emergency clinker would be stored in open with following control measures. | |
| a | After earmarking the open storage area of clinker, a board should be erected to display the area earmarked. | No open storage of clinker will be done and proper silo will be provided for storage of clinker. |
| b | During the period when the openly stored clinker is inactive, it should be covered fully by HDPE or tarpaulin type sheets to prevent wind blowing of fugitive dust. | Cover will be provided if clinker would be stored in open to prevent wind blowing of fugitive dust. |
| c | Install three sided enclosures, which extend to average height of the stockpile, where ever feasible. | Wind break walls on three sides of open stock piles will be provided |
| d | Flexible type wind breaking enclosure should be provided covering the clinker retrieval area as wind barrier to prevent dust carry over by wind.<br>The enclosure could be of light weight material like molded plastic material or similar, which could be dismantled/assembled and shifted from one place to other. | Partial enclosure for retrieving area will be provided. |

| S. No. | Guidelines | Control Measures to be Provided |
|---|---|---|
| e | Travel areas path used by the front–end pay loader shall be paved with concrete. It should be regularly swept by high efficiency vacuum sweeper to minimize the material build – up. | The travel path of pay loaders would be paved and frequently swept by sweeping machine. |
| f | The possibilities especially in new cement plant may be explored for the following:<br>An enclosure fitted with bag filter could be located at the most central place adjacent to the clinker storage area. The pay loader moves to the fixed loading area from one end of the enclosure and the truck/trailer enters the enclosure from another end. | Loading of clinker by pay loaders into trucks/trailers will be carried out in an enclosure fitted with a bag filter. |

**6. Storage of Limestone, Gypsum, Fly ash and other additives**

| S. No. | Guidelines | Control Measures to be Provided |
|---|---|---|
| 1. | The enclosure walls shall cover minimum two sides up to roof level. | The raw material and finished product storage will be under covered shed and Silo respectively. |
| 2. | Fly ash shall be pumped directly from the tankers to silos pneumatically in closed loop or mechanically such that fugitive emissions do not occur. | Dry fly ash will be transported by closed tankers/ bulkers and will be pumped directly from the tankers to silos pneumatically / closed unloading hopper in closed loop. |
| 3. | The silo vent will be provided with a bag filter type system to vent out the air borne fines. | Dry Fly ash will be stored in silos only provided with a bag filter system to vent out air borne fines. |
| 4. | If possible, the dry fly ash should be sent to closed silos. Otherwise, fly ash should be transported through closed belt conveyors to avoid wind carryover of fly ash. | Fly ash will be sent to closed silos by pneumatically enclosed loop. |

**7. Cement Packing Section**

| S. No. | Guidelines | Control Measures to be Provided |
|---|---|---|
| 1. | The packing machines should be equipped with dust extraction arrangement such that the packing operation is performed under negative pressure. The dust may be captured in bag filters. | Dust extraction arrangement for packing machines will be provided and dust collected in Bag filters will be recycled back to the process. |
| 2. | Adequate ventilation for the packing hall should be provided for venting out suspended particulate thereby ensuring dust free work environment. | Adequate ventilation for the packing hall will be provided to ensure dust free work environment. |
| 3. | The spilled cement from the packing machine should be collected properly and sent for recycling.<br>The spilled cement on the shop floor should be swept by vacuum sweeping machines | The spilled cement from the packing machine will be collected properly and sent for recycling in the process. |

| S. No. | Guidelines | Control Measures to be Provided |
|---|---|---|
| | periodically.<br>Proper engineering controls to prevent the fugitive emissions may include arrangements like providing guiding plate, scrapper brush for removing adhered dust on cement bag etc. | Spillage of cement on floor will be minimized and swept by vacuum sweeping machines periodically to prevent fugitive emissions. |
| 4. | The vibratory screen provided for screening/ recycling spilled cement should be provided with a dust extraction arrangement to prevent fugitive emission from that section. | Emissions from the recycling screen will be prevented by installing appropriate dust extraction system. |

**8. Silo Section**

| S. No. | Guidelines | Control Measures to be Provided |
|---|---|---|
| 1. | The bag filter should be operated and maintained properly, especially the cleaning of bags to avoid pressurization of silos thereby causing fugitive emissions from leakages etc. | The silo vent will be provided with a bag filter type system to vent out the air borne fines. |

**9. Roads**

| S. No. | Guidelines | Control Measures to be Provided |
|---|---|---|
| 1. | The paved roads should be maintained as paved at all times and necessary repairs to be done immediately after damages to the road if any. | All roads in the plant premises on which vehicle movement of raw materials or products take place will be paved and will be repaired immediately after damage. |
| 2. | Limit the speed of vehicle to 10 Km/h for heavy vehicles within the plant premises to prevent the road dust emissions. | Limit the speed of vehicle will be limited to 10 Km/h for heavy vehicles within the plant premises to prevent the road dust emissions. |
| 3. | Preventive measures include covering of trucks and paving of access areas to unpaved areas. | Preventive measures such as covering of truck and paving of access area to upward area etc. will be employed to minimize dust build up on roads. |
| 4. | Mitigative controls include vacuum sweeping, water flushing. | Regular sweeping of roads will be done to minimize emissions. |

E. Predicted impact on air quality (as per CPCB Guidelines for conducting the air quality modeling).

- **Details of the same are given in Chapter- IV of Final EIA/EMP Report, section no 4.6 (iv), page no. 235.**

**XI. Pollution load statement (Applicable to Expansion and Modernization Projects only):**

**Not Applicable**

| Parameter | Existing Plant | Proposed Expansion/Modernization | Total | Remarks |
|---|---|---|---|---|
| 1. Land area (ha) | | | | |
| 2. Raw water(m3/day) | | | | |
| 3. Power (MW) | | | | |
| 4. Waste water (effluent generation) (m3/day)<br>a. Process<br>b. Domestic | | | | |
| 5. Air emissions (gms/hr.)<br>a. PM<br>b. CO<br>c. $SO_2$<br>d. NOx<br>e. Others (like HC, $Cl_2$, $NH_3$ etc.) | | | | |
| 6. HazardousChemical Storage (give item-wise) | | | | |
| 7. Solid waste(TPD)<br>a. Non- Hazardous<br>b. Hazardous | | | | |

**XII. Storage of chemicals (inflammable/explosive/hazardous/toxic substances):**

**Not Applicable**

| S. No | Name | Number of Storage's | Capacity (TPD) | Physical and Chemical Composition | Consumption (in TPD) | Maximum Quantity of storage at any point of time | Source of Supply | Means of transportation |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |

**XIII. Occupational Health and Industrial Hygiene.**

A. What are the major occupational health and safety hazards anticipated? (Explain briefly).

**Following occupational health & safety hazards have been anticipated from the proposed expansion project.**

- **Exposure to dust**
- **Exposure to High temperatures**

- **Noise exposure**
- **Physical Hazards**
- **Chemical hazards and other industrial hygiene issues**

B. What provisions have been made/propose to be made to conform to health/safety requirements? (Explain briefly).

- **Control of dust through implementation of good housekeeping and maintenance;**
- **Use of air–conditioned, closed cabins;**
- **Use of dust extraction and recycling systems to remove dust from work areas, especially in grinding mills;**
- **Use of PPE, as appropriate (e.g. masks and respirators) to address residual exposures following adoption of the above-referenced process and engineering controls.**
- **Use of vacuum sweeping machine for road sweeping**

C. Details of personal protective equipment provided/to be provided to the workers.

- **Dust mask, safety helmets, safety shoes, safety goggles, safety jacket, ear plug, etc**

D. Details of proposed measures for control of fugitive emission/odour nuisance from different sources.

**Details of the same are given in Chapter -X, Point No. 10.4.1, Page No. 365 of Final EIA/EMP Report.**

E. Details of fire protection and safety measures envisaged to take care of fire and explosion hazards.

**Details of the same are given in Chapter – VII, Point No.7.3.4, Page No. 327 to 334 of Final EIA/EMP Report.**

## XIV. Pollution Control Aspects

A. Details of Pollution Control Systems:

| S. No | | Existing | Proposed to be installed |
|---|---|---|---|
| i) | Air | | ꕥ All major stacks (Raw Mill & Kiln, Clinker Cooler, Coal Mill, and Cement Mill & Boiler) will be provided with bag house & ESP to maintain the emission level within limits for cement plant & power plant, respectively.<br>ꕥ Bag filters will be provided to control dust emitted from various dust generating points in the plant & at all material transfer points.<br>ꕥ Cement, Clinker & Fly Ash will be stored in silos.<br>ꕥ Lime dosing will be done in CPP to control $SO_2$ Emissions.<br>ꕥ All raw materials will be stored in covered sheds.<br>ꕥ For controlling fugitive emissions, proper maintenance of vehicles will be done regularly. |

| | | | |
|---|---|---|---|
| | | | ꕥ Roads within the plant premises will be concreted and regular cleaning by sweeping machine will be done to control fugitive dust emissions due to transportation activities.<br>ꕥ Regular sprinkling of water on roads, storage area etc. will be done.<br>ꕥ Periphery of plant and surrounding areas of office building will be covered by thick green belt which acts as a dust preventive barrier.<br>ꕥ CPCB & CREP guidelines will be followed.<br>ꕥ Fugitive dust emission control guidelines will be followed.<br>ꕥ Regular ambient air quality & stack emission monitoring will be carried out as per CPCB / SPCB norms to ensure that ambient air quality standards are being met all the time |
| ii) | Water | | ꕥ No industrial waste water will be generated during cement manufacturing process.<br>ꕥ Waste water generated from CPP after proper neutralization and treatment will be used for dust suppression.<br>ꕥ STP will be proposed to treat the domestic waste water.<br>ꕥ Rain water harvesting will be practiced at plant |
| Iii) | Noise | | ꕥ Properly insulated enclosures will be provided to equipment's making excessive noise.<br>ꕥ Improved silencers within the equipment's generating high noise.<br>ꕥ Proper maintenance, oiling and greasing of machines at regular intervals will be done to reduce generation of noise.<br>ꕥ Personal Protective Equipment's like earplugs and earmuffs will be provided to the workers exposed to high noise level.<br>ꕥ Green Belt of appropriate width inside the plant premises and at the plant boundary will be developed.<br>ꕥ Regular monitoring of noise level will be carried out and corrective measures in concerned machinery will be adapted accordingly to the possible extent |
| iv) | Solid Waste | | ꕥ No solid waste will be generated from the cement manufacturing process.<br>ꕥ Flyash generated from Captive Power Plant will be used in manufacturing of PPC grade cement.<br>ꕥ Dust collected from Air Pollution Control Equipment will be totally recycled in the process.<br>ꕥ Sludge from Sewage Treatment Plant (STP) will be used as manure for green belt development.<br>ꕥ Solid waste from plant and colony will be collected in dustbins, provided at the respective places and will be transported in the closed area to avoid any adverse effect on the surrounding environment. |

B. Efficiency of each pollution control equipment/system installed.

1. Existing Units **Not Applicable**

| S.No. | Name of the System Equipment | Design Efficiency % | Present Working efficiency % |
|---|---|---|---|
| | | | |
| | | | |

2. Proposed Project

| S.No. | Name of the System Equipment | Design Efficiency % |
|---|---|---|
| 1. | Bag house | **99.99%** |
| 2. | ESP | **99.99%** |
| 3. | Bag Filter | **99.99%** |

## XV. Green Belt Plan

| | | |
|---|---|---|
| A. | Total area of project/township (in ha.) | **187.1 Ha** |
| B. | Area already afforested (for existing projects), in ha. | **Nil** |
| C | Area proposed to be afforested (in ha.) | **79.8 Ha** |
| D | Plant species proposed | |
| | 1) Indigenous | **Neem, Babool, Khair, Seesam etc.** |
| | 2) Exotic | |
| E | Width of green belt (minimum, in m.) | |
| | 1) Along plant boundary | **10 m** |
| | 2) Roads and avenues within the plant | **3-5 mt.** |
| | 3) Ash Dike | - |
| | 4) Township | **3-5 mt.** |
| | 5) Other-ornamental, garden spaces | - |
| | 6) Commercial plantations etc. | - |
| F. | Trees planted & proposed Nos. | |
| | 1. Planted | Not Applicable |
| | 2. Survival rate | Not Applicable |
| | 3. List of Species Planted | Not Applicable |
| | 4. Proposed | 199,500 |
| | | Acacia catechu, Acacia nilotica, Acacia Senegal etc. |

5. List of Species

## XVI. Construction Phase Management Aspects

A. Estimated during of construction in months — **1.5 Years after getting statutory clearances.**

B. Number of persons to be employed for construction

**Total Man power required during construction Phase is 2400 skilled and unskilled labour from local and out side**

| | | |
|---|---|---|
| a) | Peak | - |
| b) | Average | - |

C. What provision has been made for the sewage treatment for the construction workers?

**NA**

D. How the fuel (kerosene/wood, etc.) requirement of labour force will be met to avoid cutting of trees from the adjoining areas

**Fuel will be provided to the labors as per the requirement.**

E. Proposed Health Care Measures with emphasis on protection from endemic diseases.

**No endemic diseases are in the area however first aid Dispensary with ambulance has been provided at the site.**

F. Educational and other social welfare measures proposed.

**Details are incorporated in Chapter -VIII, Table - 8.3, Page No. 364 of Final EIA/EMP Report.**

## XVII. Human Settlement:

| S.No. | | Aerial distance from the periphery of the site | | |
|---|---|---|---|---|
| | | Up to 500m from periphery | 500m to 3000 m from the periphery | 3000m to 7000m from the periphery |
| 1 | Population | -- | 10105 | 23978 |
| 2 | Number of Houses | -- | 2575 | 6081 |
| 3 | Present Occupational Pattern | -- | | |

## XVIII. Rehabilitation & Resettlement Plan (Wherever applicable):

**Not Applicable**

A. Village(s) affected by the project: **Not Applicable**

| S. No. | Village (Tribal/Others) | Population | Occupation | Average Income per annum |
|---|---|---|---|---|
| | | | | |

B. Population to be displaced: **Not Applicable**

| S.No | Name of Village | Population | | |
|---|---|---|---|---|
| | | Landoustees only | Homestead oustees only | Land and Homestead oustees |
| | | | | |
| | | | | |
| | | | | |

C. Salient features of Rehabilitation Plan. **Not Applicable**

(i) Site where the people are proposed to be resettled

(ii) Facilities proposed at the resettlement site

(iii) Compensation package

(iv) Agency/Authority responsible for their resettlement.

## XIX. Expenditure on Environmental Measures

A. Capital cost of the project (as proposed to approved by the funding agency/financial Institutions (Rs. Lakhs)

Rs. 7100 Crores

B. Cost of environmental protection measures (Rs. Lakhs)

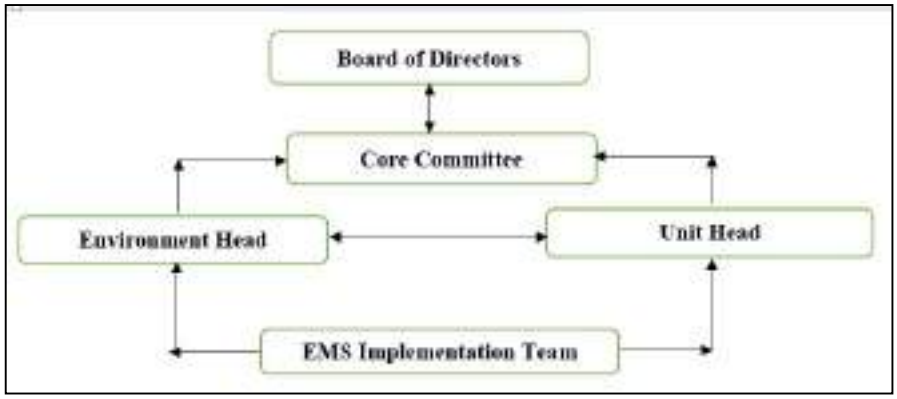
**Capital Cost**- 698 Crores
**Recurring Cost –** 6 Crores/ annum

| S. No. | Particulars | Capital Cost | | Recurring Cost / annum | |
|---|---|---|---|---|---|
| | | Phase - I | Phase - II | Phase - I | Phase - II |
| 1 | Air Pollution Control | 290 | 2.48 | 269 | 2 |
| 2 | Water Pollution Control | 33 | 0.28 | 30 | 0.3 |
| 3 | Noise Pollution Control | 7.2 | 0.06 | 6.7 | 0.06 |
| 4 | Environmental Monitoring | 3.6 | 0.03 | 3.4 | 0.03 |
| 5 | Hazardous Waste Storage & Handling | 1.8 | 0.02 | 1.7 | 0.01 |
| 6 | Occupational Health & Safety | 5.4 | 0.05 | 5.0 | 0.04 |
| 7 | Greenbelt and plantation | 7.2 | 0.06 | 6.7 | 0.06 |

| | | | | | |
|---|---|---|---|---|---|
| 8 | Drip irrigation System & Water Sprinkling | 2.9 | 0.02 | 2.7 | 0.02 |
| 9 | RWH pond and Storm Water Management | 1.8 | 0.02 | 1.7 | 0.01 |
| 10 | Organic Waste Converter & Its Facilities | 1.8 | 0.02 | 1.7 | 0.01 |
| 11 | Others (Housekeeping and Municipal Waste Management) | 7.6 | 0.07 | 7.1 | 0.06 |
| **Total** | | **362** | **3.1** | **336** | **2.9** |

C Details of organizational set up/cell for environmental management and monitoring.

Environment Management Cell has been made and the same has been incorporated in **Chapter - VI of Final EIA/EMP Report, Figure 6.1, page no. 119.**




D Details of community welfare/peripheral development programmes envisaged /being undertaken by the project proponent:

**Details are given in Chapter - VIII of Final EIA / EMP Report, Page No. 358.**

**XX. Public Hearing details:**

A. Date of Advertisement — 19th Sep, 2016

B. Newspapers in which the advertisement appeared (with copies) — **English – The Indian Express**, **Telugu- Sakshi**

C. Date of Hearing — **20th Oct, 2016**

D. Panel Present

1. **Shri K.V. Satyanarayana, I.A.S (Kadapa [Y.S.R] District Collector),**
2. **Shri A. Narendra Babu, Env. Engineer, APPCB Regional Office,**

E. List of public present along with address and occupation

**Around 350 people were attended from 6 villages during public hearing.**

**Incorporated as Annexure 12of Final EIA/EMP Report.**

F. Summary/details of public hearing report -

**Details have been incorporated in Chapter VII of Final EIA/EMP Report, section no. 7.2, page no. 291.**

| S. No. | Name of the Person | Issues / Points / Opinions of Local Public | Reply by Project Proponent (During and After Public Hearing) | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| ***I.*** | ***Employment*** | | | |
| 1. | Sri V. Narasimhulu r/o. Gollpalli village, MPTC | ▪ Provide job opportunities to the local people according to the qualification.<br>▪ Establish skill development institute to train the unskilled/ agriculture labour for getting suitable jobs. | ▪ The proposed project will provide employment to about 499 persons during operation phase and to about 2400 persons during construction phase.<br>▪ The company will provide jobs to the land losers / their children on top priority based on qualification, if not, by skill development programme.<br>▪ ACC will establish DISHA Skill Development Centre (which is common for both plant and mine) at the location i.e. Gollapalle, Golla Uppalapadu Madhavapuram, Vaddirala, Talamanchipatna, Janganapalle to facilitate employability training under its skill development initiative (i.e. ACC DISHA | ▪ The total manpower requirement (regular) during operation phase for the proposed project is 499 persons; and during construction phase, about 70 persons will be employed.<br>▪ In addition to this, approx. employment for 2330 persons will be generated for various contract labour work and approx. 500 persons will be benefited with indirect employment i.e. Transport business, vehicle drivers and attendants, repair workshops, grocery and retail stores, school, |
| 2. | Sri Surya Peddi Raju, r/o Voddiralla village | Requested written commitment on the job opportunities to the local public. | | |
| 3. | Sri. D.L. Gangi Reddy r/o Gollapalli | Requested the management to fulfil the promises made during land alienation in the year 1996 viz., providing of jobs. | | |
| 4. | Sri D. Venkata Subbaiah r/o Gollapalli | Requested the management to provide good no. of jobs to local people. | | |
| 5. | Sri. I.J. Pushparaj r/o Vaddira | | | |

| S. No. | Name of the Person | Issues / Points / Opinions of Local Public | Reply by Project Proponent (During and After Public Hearing) | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| | | | initiative) and enhance their skill for employability and placement elsewhere. | coaching centers, restaurants, self-employed persons like tailors, carpenters, plumbers, electricians, etc. |
| 6. | Sri N. Venkata Krishnaiah r/o Uppalapadu | Demanded from the management to give a written assurance for providing 500 nos of jobs | M/s. ACC Limited is a law-abiding Corporate that has existed for more than 80 years with a track record of compliance. ACC is fully committed to all the commitments given in response to queries raised during Public Hearing. | ▪ ACC has allocated Rs. 1.2 Crore for establishment of DISHA Skill Development Centre. An allocation of additional Rs. 50 Lakhs per annum would be made towards continuance of regular operations of DISHA Centre. |
| ***II.*** | ***Environment Pollution*** | | | |
| 1. | Sri V. Narasimhulu R/o. Gollpalli village, MPTC | Requested the management to take utmost care with regard to safe guarding the surrounding environment by adopting latest technology and installation of latest pollution control systems. | ▪ The company will install efficient pollution control equipment of latest available technology to control emissions within the stipulated standards.<br>▪ Installation of online monitoring system and uploading of the data to Central Pollution Control Board (CPCB) as well as State Pollution Control Boards (SPCB) will also be done.<br>▪ Bag filters will be provided at all material transfer points to control fugitive emissions; and will provide covered storage facilities within the proposed plant premises. | Company has earmarked an amount of Rs. 698 Crores as capital cost and Rs. 6.0 Crores/annum as recurring cost for Environment Protection measures; out of which,<br>▪ Rs. 599 Crores will be spent on air pollution control technologies as capital cost and Rs. 4.48 Crores/annum as recurring cost.<br>▪ Rs. 63 Crores will be spent on water pollution control technologies as capital cost and Rs. 0.58 Crores/annum as recurring cost. |
| 2. | Sri. Mohammad r/o Chinna Vedurla | Expressed his concern regarding:<br>▪ Huge quantity of waste water generation from coal-based power plant<br>▪ Air pollution caused due to vehicle movement and it may cross the stipulated standards thereby causing dust nuisance on the surroundings. | | |

| S. No. | Name of the Person | Issues / Points / Opinions of Local Public | Reply by Project Proponent (During and After Public Hearing) | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| | | | ▪ Water sprinkling will be done to control dust emissions.<br>▪ Greenbelt will be developed in ~42.65% of the total plant area to arrest dust.<br>▪ The company will also adopt mass transportation and rail network to reduce the traffic and dust nuisance due to the movement of vehicles.<br>▪ The waste water generated from coal-based power plant will be utilized for dust suppression after treatment in neutralization pit. The company will maintain ZLD concept. | ▪ Rs. 13.9 Crores will be spent on greenbelt development as capital cost and Rs. 0.12 Crores/annum as recurring cost. |
| 3. | Sri N. Venkata Krishnaiah r/o Uppalapadu | Demanded the management with a written assurance regarding zero pollution. | M/s. ACC Limited is a law-abiding Corporate that has existed for more than 80 years with a track record of compliance. ACC is fully committed to all the commitments given in response to queries raised during Public Hearing. | |
| 4. | Sri D. Venkata Subbaiah r/o Gollapalli | Requested to carry out the blasting operations without causing any nuisance to the surrounding agriculture lands. | The point is not related to proposed project proposal. The mining proposal is separate.<br>However, ACC will adopt all the preventive measures for control of pollution such as controlled blasting by NONEL technology, no secondary blasting etc. | - |
| 5. | Sri H. Madhu Babu, Environmental Activist | Stressed the importance on the sustainable development without causing any damage | ACC noted and welcomed the suggestion and committed for sustainable development. | - |

| S. No. | Name of the Person | Issues / Points / Opinions of Local Public | Reply by Project Proponent (During and After Public Hearing) | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| | | to the surrounding environment. | | |
| ***III.*** | ***Socio-Economic development*** | | | |
| 1. | Sri V. Narasimhulu R/o. Gollpalli village, MPTC | Establish corporate level educational facilities, hospitals etc. as they have incurred huge losses in last 20 years. | M/s. ACC Limited will construct a high standards school for serving surrounding people.<br>Medical facilities will be extended to all the nearby communities through ACC Plant hospital. | ▪ ACC has allocated Rs. 1.8 Crores for establishment of high standard school. |
| 2. | Sri Surya Peddi Raju, r/o Voddiralla village | Farmer's issues/demands should address with the CSR funds. | ACC requested the surrounding villagers to form a community advisory panel, according to the panel priorities/ choices, the CSR amounts will be spent on surrounding villages. | - |
| 3. | Sri. D.L. Gangi Reddy r/o Gollapalli | Requested the management to fulfil the promises made during land alienation in the year 1996 viz., village development, provide health and education facilities to the surrounding villages. | ▪ The company is proposing to develop 06 villages i.e. Gollapalle, Golla Uppalapadu Madhavapuram, Vaddirala, Talamanchipatna, Janganapalle into model village.<br>▪ M/s. ACC Limited will construct a high standards school for serving surrounding people.<br>▪ Medical facilities will be extended to all the nearby communities through ACC Plant hospital. | ▪ ACC will spend Rs. 1.5 Crores for model village development.<br>▪ The company has allocated Rs. 1.8 Crores for establishment of high standard school. |
| 4. | Sri. I.J. Pushparaj r/o Vaddira | Requested the management to provide education & health facilities to the local people. | | |
| 5. | Sri. Lakshamaiah r/o Besta Vemula | Requested the management to work out on the possibilities of spending CSR amounts on education of the children hailing surrounding villages. | | |
| 6. | Smt. S.Gangamma, r/o Vaddiralla | Requested the management to help surrounding villages for all round | ▪ The company is proposing to develop 06 villages i.e. Gollapalle, Golla Uppalapadu | ▪ ACC will spend Rs. 1.5 Crores for model village development. |

| S. No. | Name of the Person | Issues / Points / Opinions of Local Public | Reply by Project Proponent (During and After Public Hearing) | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| | | development. | Madhavapuram, Vaddirala, Talamanchipatna, Janganapalle into model village.<br>▪ Also, efforts will be made by ACC for all round development of the surrounding villages. | ▪ The company has allocated Rs. 70.71 Crore for socio-economic development of the surrounding villages. |
| 7. | Sri Kota Venkata Subba Reddy r/o China Vedurla | Provide training for sheep farming. | ACC will provide training for sheep farming in proposed DISHA Skill Development Centre. | ACC has allocated Rs. 1.2 Crore for establishment of DISHA Skill Development Centre. |
| ***V.*** | ***Health*** | | | |
| 1. | Sri H. Madhu Babu, Environmental Activist | Health study could have been conducted by the project consultant. | Medical facilities will be extended to all the nearby communities through ACC Plant hospital. The management has also proposed to conduct Health audit of the employers of the industry and also of the surrounding villagers. | - |
| ***VI.*** | ***Land*** | | | |
| 1. | Sri V. Narasimhulu R/o. Gollpalli village, MPTC | Provide compensation to the surrounding farmers (land losers); as they have incurred huge losses in last 20 years. | The PP agreed to pay compensation to the house losers on par with the market<br>ACC informed during public hearing that, the main demand of the surrounding farmers i.e additional compensation to the land losers will be discussed in the ensuring board meeting (M/s ACC cement ltd) and he expressed his belief for finding out amicable solution in the | ACC proposes the following additional financial support under rehabilitation package to the land owners of 187 families (covering 195 ha area purchased till date and similar additional financial support under rehabilitation package will be extended to the families of balance 80.028 ha of plant area): |
| 2. | Sri Surya Peddi Raju, r/o Voddiralla village | Compensation should be made to the farmers (land losers) as per demand; as huge losses were occurred to the surrounding farmers for the last 20 years. | | |
| 3. | A. Chandra Sekhar Reddy r/o Gollapalli | Requested the management to make necessary compensation to the re-habitated | | |

| S. No. | Name of the Person | Issues / Points / Opinions of Local Public | Reply by Project Proponent (During and After Public Hearing) | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| | | people; as no compensation was made by the Govt. | interest of surrounding farmers within 3 months.<br><br>***Action Plan is given in this table (Action Plan with Budgetary Allocation)*** | • Option 1: One time compensation of Rs. 1.5 lakhs/acre (on pro rata basis) to the land owners owning the land in the plant area of 187.1 ha.<br>**OR**<br>• Option 2: One time compensation of Rs.1.5 Lakhs/acre (on pro rata basis) to the land owners (owning land in the plant area) bifurcated into 60 instalments (with annual correction as per the prevailing price index rate) and provided in the form of Monthly Income Scheme (MIS). A MIS would help to ensure financial discipline and better usage of compensation money.<br>**OR**<br>• Option 3: ACC shall facilitate to provide suitable job to one member of the family either in the mines or in the proposed cement/power plant based on the qualification and skill possessed by the candidate from project affected family. Since the proposed project is a state of art project, there will be limited opportunity for the direct |
| 4. | Sri Kota Venkata Subba Reddy r/o China Vedurla | Requested the management:<br>▪ To pay the additional compensation to the surrounding farmers.<br>▪ For utilization of acquired land for agriculture purpose till the construction activities take place. | | |
| 5. | Sri. I.J. Pushparaj r/o Vaddira | Demanded the management to come out of appropriate decision on the compensation to the land losers. | | |
| 6. | Sri N. Venkata Krishnaiah r/o Uppalapadu | Demanded the management with a written assurance for providing compensation to house losers at Gollapalli. | | |

| S. No. | Name of the Person | Issues / Points / Opinions of Local Public | Reply by Project Proponent (During and After Public Hearing) | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| | | | | employment in the company operations at the location<br>Note: Project affected families which opt for financial rehabilitation package (option 1& 2) will not be eligible for employment option (option 3).<br>• In the past, ACC has paid compensation to G. Uppalapadu village people for the houses after verifying clear land titles as per Govt records based on the rates prescribed by the Hon'ble District Collector of Andhra Pradesh. |
| ***VII.*** | ***Water*** | | | |
| 1. | Sri. Mohammad r/o Chinna Vedurla | Expressed his worries regarding withdrawing the huge quantity of 7700 $m^3$ of water per day for industrial applications which may cause depletion of water in surrounding area. | The company will take up groundwater development programmes (rain water harvesting, water shed development etc.) in a big way to increase the ground water table of the surrounding area. | - |
| ***VIII.*** | ***Others*** | | | |
| 1. | Sri. S. Sreenivasa Reddy r/o Gollapalli | Requested the management to solve the demands of surrounding farmers as they have given their irrigated lands to the proposed industry with great hope. | ACC appreciated and welcomed the support of the villagers for setting up the project and assured that the issue will be considered and the company will work accordingly. | - |
| 2. | Sri H. Madhu Babu, Environmental Activist | Requested the management to solve the issues of local farmers on top priority. | | |

*Issues / Points / Opinions of Local Public raised by written representations in detail*

| S. No. | Name of the Person | Issues / Points / Opinions of Local Public | Reply by Project Proponent (During and After Public Hearing) | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| ***A*** | ***Employment*** | | | |
| 1 | Farmers of Mylavaram Mandal from Chinnaventurla Village | Employment should be provided to those who have lost their land, including educational opportunities for the uneducated. | • The proposed project will provide employment to about 499 persons during operation phase and to about 2400 persons during construction phase.<br>• The company will provide jobs to the land losers / their children on top priority based on qualification, if not, by skill development programme.<br>• ACC will establish DISHA Skill Development Centre (which is common for both plant and mine) at the location i.e. Gollapalle, Golla Uppalapadu Madhavapuram, Vaddirala, Talamanchipatnam, Janganapalle to facilitate employability training under its skill development initiative (i.e. ACC DISHA initiative) and enhance their skill for employability and placement elsewhere. | ▪ The total manpower requirement (regular) during operation phase for the proposed project is 499 persons; and during construction phase, about 70 persons will be employed.<br>▪ In addition to this, approx. employment for 2330 persons will be generated for various contract labour work and approx. 500 persons will be benefited with indirect employment i.e. Transport business, vehicle drivers and attendants, repair workshops, grocery and retail stores, school, coaching centers, restaurants, self-employed persons like tailors, carpenters, plumbers, electricians, etc.<br>ACC has allocated Rs. 1.2 Crore for establishment of DISHA Skill Development Centre. An allocation of |
| 2 | Chaitanya Yuvasangam, P. Chantrapthi, K. Umakanth, M. Murali Krishna, P. Laxminarayana | If the factory is built employment opportunities will arise, particularly for youth. | | |
| 3 | Farmers of Chinna Venturla village of Myalavaram Mandal, Kadapa | • Locals who have lost their land should be given priority for contract work and vehicle operations<br>• Employment opportunities should be provided to the landless and middle-aged individual of our community. | | |
| 4 | All Affected Villagers | • Farmers who lost their land should be employed in the construction of the factory from the beginning until completion.<br>• Permanent jobs should be provided for every farmer's family including unskilled labourers. | | |
| 5 | Residents of Mylavaram Mandal and Vaddirala villagers | Urged to provide job opportunities for children of farmers in our area to help improve their livelihoods | | |

| S. No. | Name of the Person | Issues / Points / Opinions of Local Public | Reply by Project Proponent (During and After Public Hearing) | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| 6 | Farmers of Kallutla Village of Myalavaram Mandal | • ACC management must provide a written guarantee that jobs will be offered to farmers as soon as the demands are met and the factory is constructed.<br>• At the time of purchase, it was promised that jobs will be provided to those who gave up their fields for the factory. | M/s. ACC Limited is a law-abiding Corporate that has existed for more than 80 years with a track record of compliance. ACC is fully committed to all the commitments given in response to queries raised during public hearing. | additional Rs. 50 Lakhs per annum would be made towards continuance of regular operations of DISHA Centre. |
| ***B*** | ***Environment Pollution*** | | | |
| 1 | ACC Land Victim farmers of Vaddirala, Gollapalle, G. Uppalapadu, Chinnavengurla, Bestavemula, Jangalapalle, Myalavaram Mandal, YSR District | • Establishment of green buffers through tree planting before construction to mitigate dust and air pollution.<br>• Stringent measures to control noise and air pollution, along with written guarantees of these measures. | • Greenbelt will be developed in ~42.65% of the total plant area to arrest dust.<br>• M/s. ACC Limited is a law-abiding Corporate that has existed for more than 80 years with a track record of compliance. ACC is fully committed to all the commitments given in response to queries raised during Public Hearing. | Company has earmarked an amount of Rs. 698 Crores as capital cost and Rs. 6.0 Crores/annum as recurring cost for Environment Protection measures; out of which,<br>▪ Rs. 599 Crores will be spent on air pollution control technologies as capital cost and Rs. 4.48 Crores/annum as recurring cost.<br>▪ Rs. 63 Crores will be spent on water pollution control technologies as capital cost and Rs. 0.58 Crores/annum as recurring cost.<br>Rs. 13.9 Crores will be spent on greenbelt development as capital cost and Rs. 0.12 Crores/annum as recurring cost. |
| 2 | All Affected Villagers | ACC should implement control measures during construction, and before the factory opens, they should plant trees to prevent environmental pollution | Greenbelt will be developed in ~42.65% of the total plant area to arrest dust. | |
| 3 | Prajabhi praya Sekharana | Cement plants are among the most polluting industries. This plant creates a situation where we have to live with polluted air. What is your response regarding the financial implications driven by a profit - oriented industry? | ▪ The company will install efficient pollution control equipment of latest available technology to control emissions within the stipulated standards. | |

| S. No. | Name of the Person | Issues / Points / Opinions of Local Public | Reply by Project Proponent (During and After Public Hearing) | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| 4 | Prajabhi praya Sekharana | • The nitric oxide concentration in power plant emissions is listed as 350 mg/ cubic meter. On what criteria was this figure determined?<br>• The figures given on the increase in air pollution are suspicious and unreliable.<br>• There is dust due to vehicular traffic, how do air conditioning units protect our air from toxins?<br>• The pollution control Board is promoting the incineration of hazardous chemical waste in rotary kilns If this continues the level of loss will increase. | ▪ Installation of online monitoring system and uploading of the data to Central Pollution Control Board (CPCB) as well as State Pollution Control Boards (SPCB) will also be done.<br>▪ Bag filters will be provided at all material transfer points to control fugitive emissions; and will provide covered storage facilities within the proposed plant premises.<br>▪ Water sprinkling will be done to control dust emissions.<br>▪ Greenbelt will be developed in ~42.65% of the total plant area to arrest dust.<br>▪ The company will also adopt mass transportation and rail network to reduce the traffic and dust nuisance due to the movement of vehicles.<br>The waste water generated from coal-based power plant will be utilized for dust suppression after treatment in neutralization pit. The company will maintain ZLD concept. | |
| 5 | Farmers of Kallutla village of Myalavaram | The air pollution meeting should only be held after addressing the issues of land dwellers | ACC noted and welcomed the suggestion | - |
| **C** | ***Socio-Economic development*** | | | |

| S. No. | Name of the Person | Issues / Points / Opinions of Local Public | Reply by Project Proponent (During and After Public Hearing) | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| 1 | ACC Land Victim farmers of Vaddirala, Gollapalle, G. Uppalapadu, Chinnavengurla, Bestavemula, Jangalapalle, Myalavaram Mandal, YSR District | We Seek investments in local infrastructure, including water and health facilities, to support communities | ▪ The company is proposing to develop 06 villages i.e. Gollapalle, Golla Uppalapadu Madhavapuram, Vaddirala, Talamanchipatnam, Janganapalle into model village.<br>▪ M/s. ACC Limited will construct a high standards school for serving surrounding people.<br>▪ Medical facilities will be extended to all the nearby communities through ACC Plant hospital. | ▪ ACC will spend Rs. 1.5 Crores for model village development. |
| 2 | Farmers of Chinnaventurla of Mylavaram Mandal | Financial assistance for education, medical care and initiatives such as dairy and cow rearing for women should be offered. | | ACC has allocated Rs. 1.8 Crores for establishment of high standard school. |
| 3 | Chaitanya Yuvasangam, P. Chantrapthi, K. Umakanth, M. Murali Krishna, P. Laxminarayana | • Initiatives such as "Driving License" program and the Women's Association are already making strides in this direction and should continue to be supported.<br>• We request improvements in village infrastructure, including the installation of streetlight and better roads. Access to basic amenities and well – maintained infrastructure is crucial for the development of our community. | ACC will provide training in proposed DISHA Skill Development Centre. | ACC has allocated Rs. 1.2 Crore for establishment of DISHA Skill Development Centre. |
| 4 | All Affected Villagers | • Infrastructural facilities such as education, healthcare, water, electricity, and sanitation should be provided free of charge.<br>• Cement roads, drainage systems and mineral water plants should be established in every | • The company is proposing to develop 06 villages i.e. Gollapalle, Golla Uppalapadu Madhavapuram, Vaddirala, Talamanchipatnam, Janganapalle into model village. | • ACC will spend Rs. 1.5 Crores for model village development.<br>• The company has allocated Rs. 1.8 Crores for establishment of high standard school. |

| S. No. | Name of the Person | Issues / Points / Opinions of Local Public | Reply by Project Proponent (During and After Public Hearing) | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| | | village.<br>• New temples should be built in Unalapadu villages along with all necessary infrastructure. | • M/s. ACC Limited will construct a high standards school for serving surrounding people.<br>• Medical facilities will be extended to all the nearby communities through ACC Plant hospital. | |
| 5 | Residents of Mylavaram Mandal and Vaddirala villagers | We request that support provided to those who are losing their land, particularly in area such as education, healthcare, and other essential services. | • The company is proposing to develop 06 villages i.e. Gollapalle, Golla Uppalapadu Madhavapuram, Vaddirala, Talamanchipatna, Janganapalle into model village. | • ACC will spend Rs. 1.5 Crores for model village development. |
| 6 | Farmers of Kallutala Village | Proposes the following facilities to be funded through CSR:<br>• Construction of roads<br>• Development of freshwater and drainage systems<br>• Installation of a proper sewage system<br>• Establishment of community welfare posts | ACC requested the surrounding villagers to form a community advisory panel, according to the panel priorities/ choices, the CSR amounts will be spent on surrounding villages. | - |
| 7 | Villagers of Gollapalle | We request your assistance in providing medical and educational support to the children of the farmers who have faced financial drain. | | |
| ***D*** | ***Health*** | | | |
| 1 | ACC Land Victim farmers of Vaddirala, Gollapalle, G. Uppalapadu, Chinnavengurla, | Free medical care should be made available for those suffering health issues due to pollution. | Medical facilities will be extended to all the nearby communities through ACC Plant hospital. The management has also proposed to conduct Health audit of the employers of | - |

| S. No. | Name of the Person | Issues / Points / Opinions of Local Public | Reply by Project Proponent (During and After Public Hearing) | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| | Bestavemula, Jangalapalle, Myalavaram Mandal, YSR District | | the industry and also of the surrounding villagers. | |
| 2 | All affected Villagers | Medicine to the children of villages who have lost their lands | | |
| ***E*** | ***Land*** | | | |
| 1 | ACC Land Victim farmers of Vaddirala, Gollapalle, G. Uppalapadu, Chinnavengurla, Bestavemula, Jangalapalle, Myalavaram Mandal, YSR District | • Insisted that if any drilling or blasting occurs, proper compensation for damages to our homes be provided as per current rates.<br>• Every farmer who has lost their land deserves compensation according to current rates for each acre lost.<br>• We Urge that an environmental referendum be conducted after meaningful discussions with the affected farmers who have lost their land to ACC Limited. | The PP agreed to pay compensation to the house losers on par with the market<br>ACC informed during public hearing that, the main demand of the surrounding farmers i.e additional compensation to the land losers will be discussed in the ensuring board meeting (M/s ACC cement ltd) and he expressed his belief for finding out amicable solution in the interest of surrounding farmers within 3 months.<br><br>***Action Plan is given in this table (Action Plan with Budgetary Allocation)*** | ACC proposes the following additional financial support under rehabilitation package to the land owners of 187 families (covering 195 ha area purchased till date and similar additional financial support under rehabilitation package will be extended to the families of balance 80.028 ha of plant area):<br>• Option 1: One time compensation of Rs. 1.5 lakhs/acre (on pro rata basis) to the land owners owning the land in the plant area of 187.1 ha.<br>**OR**<br>• Option 2: One time compensation of Rs.1.5 Lakhs/acre (on pro rata basis) to the land owners (owning land in the plant area) bifurcated into 60 instalments (with annual correction |
| 2 | Farmers of Mylavaram Mandal from Chinnaventurla Village | • Farmers should be provided an opportunity to cultivate the land purchased by the factory initially.<br>• It should be ensured that there is no damage to houses and surrounding areas due to mining activities.<br>• A compensation amount of Rs 50,000/- and Rs 1,25,000/- should be provided at the rate of Rs 4,00,000/- per acre. | | |

| S. No. | Name of the Person | Issues / Points / Opinions of Local Public | Reply by Project Proponent (During and After Public Hearing) | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| | | • Urged the elders to ensure that land is purchased upto the tarred road with the price of Rs. 1500000/ per acre.<br>• Vehicles and machinery, as well as contract work, should be allocated to local residents who have lost their land. | | as per the prevailing price index rate) and provided in the form of Monthly Income Scheme (MIS). A MIS would help to ensure financial discipline and better usage of compensation money.<br>**OR**<br>• Option 3: ACC shall facilitate to provide suitable job to one member of the family either in the mines or in the proposed cement/power plant based on the qualification and skill possessed by the candidate from project affected family. Since the proposed project is a state of art project, there will be limited opportunity for the direct employment in the company operations at the location<br>Note: Project affected families which opt for financial rehabilitation package (option 1& 2) will not be eligible for employment option (option 3).<br>• In the past, ACC has paid compensation to G. Uppalapadu village people for the houses after verifying clear land titles as per Govt |
| 3 | Farmers of Chinna Venturla village of Myalavaram Mandal, Kadapa | • Land should be purchased upto Betha Vemula road (above the palavagu)<br>• Compensation of Rs 50,000 and Rs 1,25,000 should be provided for the loss of land at the rate of Rs 4,00,300 per acre.<br>• Until the factory is operational, we request that the land we have sold be utilized for cultivation | | |
| 4 | All Affected Villagers | • Compensation for every house surveyed by R&B in Gollapalle village in 2010, at prevailing rates.<br>• Compensation for land displaced persons of Vaddirala, Gollapalle, Uppalapadu, Bestavemula and janganapalle villages as per existing rates.<br>• Construction of the factory should commence as promised within the limits of the village panchayat where the land was acquired.<br>• Acc. To the land acquisition Act of 2013 30% of the company's production benefits should be allocated to the displaced farmers. | | |

| S. No. | Name of the Person | Issues / Points / Opinions of Local Public | Reply by Project Proponent (During and After Public Hearing) | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| | | • Air pollution meetings should be held only after resolving the issues of the land dwellers.<br>• Surplus land next to those purchased by A.C.C before the construction of the factory and the lands within the factory area should be acquired at current market rates. | | records based on the rates prescribed by the Hon'ble District Collector of Andhra Pradesh. |
| 5 | Farmers from Kallutala Village | We request transparency regarding the use of land given for establishment of the factory. | | |
| ***F*** | ***Education*** | | | |
| **1** | All Affected Villagers | Educational institute should be setup in our area to provide free education for higher studies such as B. Tech. | M/s. ACC Limited will construct a high standards school for serving surrounding people. | |
| **G** | ***Water*** | | | |
| 1 | Prajabhi praya Sekharana | • This is a rain fed area, and we have relied on groundwater for generations. If you take away our common resource, how will it be protected? Will we have to sacrifice our right to live and thrive for the sake of exploiting our natural resources?<br>What is the basis for this requirement? Please explain why this high volume of water is needed. | The company will take up groundwater development programmes (rain water harvesting, water shed development etc.) in a big way to increase the ground water table of the surrounding area. | - |
| ***H*** | ***Others*** | | | |
| 1 | ACC Land Victim farmers of Vaddirala, Gollapalle, G. | We Request regular updates and open communication regarding the factory's status and expected timeline for development. | ACC will always available for communication and Plant will be establish after necessary clearance. | - |

| S. No. | Name of the Person | Issues / Points / Opinions of Local Public | Reply by Project Proponent (During and After Public Hearing) | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| | Uppalapadu, Chinnavengurla, Bestavemula, Jangalapalle, Myalavaram Mandal, YSR District | | | |
| 2 | Farmers from Chinnaventurla of Mylavaram Mandal | • The ACC cement factory should be constructed with care to fulfil the needs and wishes of the community.<br>• Welcome the establishment of the ACC factory and have no objections to its timely construction. | The PP agreed to pay compensation to the house losers on par with the market<br>ACC informed during public hearing that, the main demand of the surrounding farmers i.e additional compensation to the land losers will be discussed in the ensuring board meeting (M/s ACC cement ltd) and he expressed his belief for finding out amicable solution in the interest of surrounding farmers within 3 months.<br><br>Action Plan is given in this table (Action Plan with Budgetary Allocation) | *ACC proposes the following additional financial support under rehabilitation package to the land owners of 187 families (covering 195 ha area purchased till date and similar additional financial support under rehabilitation package will be extended to the families of balance 80.028 ha of plant area):*<br>• *Option 1: One time compensation of Rs. 1.5 lakhs/acre (on pro rata basis) to the land owners owning the land in the plant area of 187.1 ha.*<br>*OR*<br>*Option 2: One time compensation of Rs.1.5 Lakhs/acre (on pro rata basis) to the land owners (owning land in the plant area) bifurcated into 60 instalments (with annual correction as per the prevailing price index rate) and provided in the form of Monthly Income Scheme (MIS). A MIS would help to* |

| S. No. | Name of the Person | Issues / Points / Opinions of Local Public | Reply by Project Proponent (During and After Public Hearing) | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| | | | | *ensure financial discipline and better usage of compensation money.*<br>*OR*<br>*Option 3: ACC shall facilitate to provide suitable job to one member of the family either in the mines or in the proposed cement/power plant based on the qualification and skill possessed by the candidate from project affected family. Since the proposed project is a state of art project, there will be limited opportunity for the direct employment in the company operations at the location*<br>*Note: Project affected families which opt for financial rehabilitation package (option 1& 2) will not be eligible for employment option (option 3).*<br>*In the past, ACC has paid compensation to G. Uppalapadu village people for the houses after verifying clear land titles as per Govt records based on the rates prescribed by the Hon'ble District Collector of Andhra Pradesh.* |
| 3 | B. Subbayya Setty, R/o Chinnaventurla village, Mylavaram Mandal | | | |

| S. No. | Name of the Person | Issues / Points / Opinions of Local Public | Reply by Project Proponent (During and After Public Hearing) | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| 4 | G.Baladasu, R/o Bestavemula | We express our support for the establishment of the ACC cement factory and hope it will fulfil our community's need. | ACC appreciated and welcomed the support of the villagers for setting up the project. | - |
| 5 | Farmers of Chinna Venturla village of Myalavaram Mandal, Kadapa | | | |
| 6 | Villagers of Mylavaram Mandal and the residents of Dannavada | | | |
| 7 | Residents of Mylavaram Mandal and Vaddirala villagers | | | |
| 8 | All Affected Villagers | • Compensation, including bonuses, should be paid to all farmers from 1996 to the present.<br>• ACC should be allowed to quarry only in areas not designated for the factory.<br>• It should be ensured that there is no damage to houses and surrounding areas due to mining activities.<br>• Since, 1996, displaced farmers in all villages who have lost their jobs or jobs due to the non-construction of the factory should receive Rs. 20,000/- in compensation.<br>• Requested that the factory should be built immediately after resolving all the problems of the land dwellers in all villages. | The PP agreed to pay compensation to the house losers on par with the market<br>ACC informed during public hearing that, the main demand of the surrounding farmers i.e additional compensation to the land losers will be discussed in the ensuring board meeting (M/s ACC cement ltd) and he expressed his belief for finding out amicable solution in the interest of surrounding farmers within 3 months.<br><br>Action Plan is given in this table (Action Plan with Budgetary Allocation) | *ACC proposes the following additional financial support under rehabilitation package to the land owners of 187 families (covering 195 ha area purchased till date and similar additional financial support under rehabilitation package will be extended to the families of balance 80.028 ha of plant area):*<br>*Option 1: One time compensation of Rs. 1.5 lakhs/acre (on pro rata basis) to the land owners owning the land in the plant area of 187.1 ha.*<br>*OR* |

| S. No. | Name of the Person | Issues / Points / Opinions of Local Public | Reply by Project Proponent (During and After Public Hearing) | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| 9 | Villagers of Gollapalle | • No compensation has been received by the villagers of Gollapalle<br>• The introduction of the industry has disrupted local agriculture and as a result the land has lost its fertility which has affected the livelihood.<br>• We urgently request to improve our financial situation; it is essential that we receive fair compensation and support for the fertile lands that have been impacted by the industry. | | *Option 2: One time compensation of Rs.1.5 Lakhs/acre (on pro rata basis) to the land owners (owning land in the plant area) bifurcated into 60 instalments (with annual correction as per the prevailing price index rate) and provided in the form of Monthly Income Scheme (MIS). A MIS would help to ensure financial discipline and better usage of compensation money.*<br>*OR*<br>*Option 3: ACC shall facilitate to provide suitable job to one member of the family either in the mines or in the proposed cement/power plant based on the qualification and skill possessed by the candidate from project affected family. Since the proposed project is a state of art project, there will be limited opportunity for the direct employment in the company operations at the location*<br>*Note: Project affected families which opt for financial rehabilitation package (option 1& 2) will not be eligible for employment option (option 3).*<br>*In the past, ACC has paid compensation to G. Uppalapadu village people for the* |

| S. No. | Name of the Person | Issues / Points / Opinions of Local Public | Reply by Project Proponent (During and After Public Hearing) | Action Plan along with Budgetary Allocation |
|---|---|---|---|---|
| | | | | *houses after verifying clear land titles as per Govt records based on the rates prescribed by the Hon'ble District Collector of Andhra Pradesh.* |
| 10 | Villagers of Dhannawada, Chinnaventurla, Vaddirala, Bestavemula, Gollapalle, Uppalapadu, Andhra Pradesh | We urge ACC to take appropriate measures and consider our grievances seriously and address the issue impacting our livelihoods. | ACC appreciated and welcomed the support of the villagers for setting up the project and assured that the issue will be considered and the company will work accordingly. | - |
| 11 | Villagers of Vaddirala | We welcome the establishment of the ACC cement factory in our area and have no objection to its construction | ACC appreciated and welcomed the support of the villagers for setting up the project. | - |

## LIST OF DOCUMENTS TO BE ATTACHED WITH THE QUESTIONNAIRE

### (Industry Sector Projects)

| S.No | Documents to be Attached | Details |
|---|---|---|
| 1. | Topographic map of the site indicating contours (1:2500 scale) | Environmental Setting Map with topographic features is incorporated in Chapter - I of Final EIA/EMP Report, Figure 1.2, Page no. 25. |
| 2. | Topographic map covering 7 kms radius from the periphery of the site indicating main features | |
| 3. | Wind rose diagram of the site (Seasonal) | Incorporated in Chapter - III, Figure 3.9, page no. 61, |
| 4. | Wind rose diagram of the site (Artificial) | - |
| 5. | Site map indicating the positions of ambient air quality monitoring stations vis-à-vis wind direction | Incorporated in Chapter - III, Figure no 3.10, Page no. 63. |
| 6. | Flow sheet of the process adopted indicating mass input/output, brief description of the process including technological and engineering details | Incorporated in Chapter II, Figure no. 2.1, Page no. 30. |
| 7. | Alternative technologies considered along with details of criteria used for selecting the technology and results of evaluation | Not Applicable |
| 8. | Approval of ground water board/ irrigation department/ Municipality etc. for supply of water | Application for obtaining permission for withdrawal of Ground water has been submitted to Commissioner Rural development, Andhra Pradesh (as per Andhra Pradesh Water, land and Trees Act) and the same is under process. |
| 9. | Mass balance for water used by the project in a flow chart | Incorporated in Chapter - II, Figure no. 2.1, page no. 30. |
| 10. | Flow chart for waste water treatment with mass balance | Incorporated in Chapter - X, Figure no. 10.2 & 10.3, page no.198. |
| 11. | Site map indicating solid waste disposal facilities | Not Applicable |
| 12. | Approval of electricity connection and supply of electricity | Not Applicable |
| 13. | Lay out map of the plant showing the position of stacks for deciding the inter stack distance | Incorporated in Chapter - II, Figure no. 2.3, page no. 34. |
| 14. | Site map indicating the storage facilities | Incorporated in Chapter - II, Figure no. 2.3, page no. 34. |
| 15. | Approval of Chief controller of explosives for lay out and storage of hazardous substances | Not Applicable |
| 16. | Layout of green belt indicating width on all sides, trees, lawns and bushes | Incorporated in Chapter - II, Figure no. 2.3, page no. 34. |
| 17. | Copy of advertisement issued in respect of public hearing | Incorporated in Chapter VII, section no. 7.2.2, page no. 125. |
| 18. | No objection certificate from the pollution control board | -- |
| 19 | In case of proposals for expansion copies of renewals of consent from SPCB / PCC | Not Applicable |
| 20. | In case of expansion proposal copy of approval of factory inspector | -- |
| 21. | Copy of the application submitted to the State Government for the forest clearance in case diversion of forest land is involved | Not Applicable |
| 22. | Comments/Observations/Recommendation of Chief Wildlife Warden in case wildlife habitat/ migration path exists within 25 kilometers of the project site | Not Applicable |
| 23. | Hydrogeological report in case ground water is to be used and/or the area is drought prone or the waste water is likely to be discharged on land | Incorporated in Chapter - VII, section no. 7.3, page no. 135. |
| 24. | Environmental Audit report for the previous two years in case of expansion of existing undertaking | Not Applicable |
| 25. | In case the proposal involves installations in coastal zone, copy of the application forwarded by the State Government | Not Applicable |

adani Cement

ACC

**Ref. No.:** ACC/ENV/CUD - Forest/09-24/01

**Date:** 20.09.2024

To,
**Chief Wildlife Warden,**
Office Aranya Bhavan, P.V.S. Landmark,
Near APIIC Towers, Mangalagiri,
Guntur District-522503,
Andhra Pradesh.

**Subject:** Authentication of List of Flora and Fauna, Location Map & Composite Wildlife Conservation Plan and Biodiversity Report for Integrated Cement Plant and Limestone Mine proposed by M/s ACC Ltd. at Village Gollapalli, Mylavaram Mandalam, District Kadapa (YSR), Andhra Pradesh.

**Ref.:**

1. ToR issued by MoEF&CC, New Delhi for Integrated Cement Clinkerisation plant *vide* file no. J-11011/265/2012-IA II (I) dated 20.02.2013,
2. ToR issued by MoEF&CC, New Delhi for Limestone mine (ML Area 997.08 ha) *vide* file no. J-11015/133/2012-IA II (M) dated 30.10.2012.
3. Minutes of 16th EAC meeting (Industry-I) held during 6th -7th March 2017.
4. Minutes of EAC (Non – coal mining) held during 23rd to 25th November 2016
5. The Wildlife Protection Act, 1972 and The Wildlife Protection (Amendment) Act, on 20.12.2022 & 01.04.2023

Dear Sir,

With reference to the aforesaid subject, we would like to apprise you that M/s. ACC Limited is in process to obtain the Environment Clearance (EC) for the Integrated Cement Clinkerisation plant and Limestone Mine (ML Area 997.08 ha) at District-Kadapa (YSR), State- Andhra Pradesh from MoEF&CC, New Delhi.

MoEF&CC, New Delhi has issued ToR of above both plant & mine projects *vide* file no. J-11011/265/2012-IA II (I) dated 20th February, 2013 (***Annexure - 1)*** and file no. J-11015/133/2012-IA II (M) dated 30th October, 2012 (***Annexure - 2)*** respectively.

Based on ToR points issued by MoEF&CC for plant (condition no. 58 & 60) & mine (Point no. 12); authentication of list of flora & fauna is to be obtained.

Based on the primary study conducted, a list of flora and fauna was prepared considering condition no. 58 & 60 of ToR - plant (***Annexure - 1)*** and condition no. 12 of ToR - mine (***Annexure - 2)*** and submitted to Office of Divisional Forest Officer, Proddatur (WL) Division dated 18.11.2016 for authentication.

Subsequently, DFO has asked ACC to prepare and submit the revised mitigation plan incorporating conservation of *Melurus ursinus* (Sloth Bear).

ACC Limited
Cement House,
121, Maharshi Karve Road,
Mumbai 400 020, India
www.acclimited.com

adani Cement

ACC

The above both projects of plant & mine was considered for appraisal for grant of Environmental Clearance and EAC (Ind-I) & EAC (Non coal mining) of MoEF&CC asked to submit the authenticated list of flora & fauna vide their MoM (Copies attached ***Annexure - 3 & Annexure - 4***).

The list of flora & fauna has been revised and updated as per the Wildlife (Protection) Amendment Act, 2022 dated 19.12.2022 which came into force from 01.04.2023 as per the MoEFCC Notification vide S.O. 1394(E) dated 22.03.2023.

Accordingly, Composite Wildlife Conservation Plan is also updated incorporating "*Melurus ursinus* (Sloth Bear)" and we are herewith submitting the List of Flora and Fauna, Location Map & Composite Wildlife Conservation Plan and Biodiversity Report for Integrated Cement Plant and Limestone Mine proposed by M/s ACC Ltd. at Village Gollapalli, Mylavaram Mandalam, District Kadapa (YSR), Andhra Pradesh as **Annexure – 5, Annexure – 6 & *Annexure - 7*** respectively for authentication.

Our humble request to authenticate and do the needful as early as possible.

Thanking you and with regards,

**For M/s. ACC Limited**

Prasad

**Sanjay Prasad**

**Authorized Signatory**

***Enclosed: As above***

23.09.2024

**CC To:**

1. Principal Chief Conservator of Forests (HOFF & PCCF), Andhra Pradesh
2. Chief Conservator of Forests (CCF), Kurnool, Andhra Pradesh
3. Divisional Forest Officer, Proddatur (WL) Division, Andhra Pradesh

**Enclosed:**

***Annexure 1. ToR Letter for Integrated Cement Clinkerisation Plant***
***Annexure 2. ToR Letter for Limestone mine(ML Area 997.08 ha)***
***Annexure 3. Minutes of Meeting of EAC (IND- I)***
***Annexure 4. Minutes of Meeting of EAC (Non-coal mining)***
***Annexure 5. Revised List of Flora and Fauna found in 10 km radius of study area.***
***Annexure 6. Location Map of 10 km radius of study area***
***Annexure 7. Composite Wildlife Conservation Plan and Biodiversity Report***

ACC Limited
Cement House,
121, Maharshi Karve Road,
Mumbai 400 020, India
www.acclimited.com

## ROR1b Report

| District : YSR - YSR | Mandal : MYLAVARAM , Mylavaram | Village : BESTAVEMULA , Bestavemula | Khata No: : 2000 |
|---|---|---|---|

| serial number | Name of the graduate | Name of father/husband | Account no | Survey No./ Sub Division No | Land description | area | How was the pattadaru infected/cultivated? | Date of acceptance of mutation |
|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 1 | ACC Ltd. | ACC Ltd. | 2000 | 1 | Metta | 4.2500 | purchase | |
| 2 | ACC Ltd. | ACC Ltd. | 2000 | 100/1 | Metta | 4.5000 | purchase | |
| 3 | ACC Ltd. | ACC Ltd. | 2000 | 100/2A | Metta | 1.9300 | purchase | |
| 4 | ACC Ltd. | ACC Ltd. | 2000 | 100/2b | Metta | 2.2200 | purchase | |
| 5 | ACC Ltd. | ACC Ltd. | 2000 | 103/1 | Metta | 2.3000 | purchase | |
| 6 | ACC Ltd. | ACC Ltd. | 2000 | 103/2 | Metta | 2.2000 | purchase | |
| 7 | ACC Ltd. | ACC Ltd. | 2000 | 103/3 | Metta | 4.3000 | purchase | |
| 8 | ACC Ltd. | ACC Ltd. | 2000 | 104 | Metta | 6.4600 | purchase | |
| 9 | ACC Ltd. | ACC Ltd. | 2000 | 105 | Metta | 4.9500 | purchase | |
| 10 | ACC Ltd. | ACC Ltd. | 2000 | 106 | Metta | 2.8200 | purchase | |
| 11 | ACC Ltd. | ACC Ltd. | 2000 | 107 | Metta | 2.4900 | purchase | |
| 12 | ACC Ltd. | ACC Ltd. | 2000 | 108/1 | Metta | 1.6200 | purchase | |
| 13 | ACC Ltd. | ACC Ltd. | 2000 | 108/2 | Metta | 1.5800 | purchase | |
| 14 | ACC Ltd. | ACC Ltd. | 2000 | 109 | Metta | 5.9500 | purchase | |
| 15 | ACC Ltd. | ACC Ltd. | 2000 | 110/1 | Metta | 2.6000 | purchase | |
| 16 | ACC Ltd. | ACC Ltd. | 2000 | 110/2 | Metta | 2.6400 | purchase | |
| 17 | ACC Ltd. | ACC Ltd. | 2000 | 110/3 | Metta | 2.4000 | purchase | |
| 18 | ACC Ltd. | ACC Ltd. | 2000 | 110/4A | Metta | 3.0000 | purchase | |
| 19 | ACC Ltd. | ACC Ltd. | 2000 | 110/4b | Metta | 2.8000 | purchase | |
| 20 | ACC Ltd. | ACC Ltd. | 2000 | 110/5 | Metta | 1.3000 | purchase | |
| 21 | ACC Ltd. | ACC Ltd. | 2000 | 110/6 | Metta | 1.3000 | purchase | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 22 | ACC Ltd. | ACC Ltd. | 2000 | 110/7 | Metta | 2.7000 | purchase | |
| 23 | ACC Ltd. | ACC Ltd. | 2000 | 111 | Metta | 21.5900 | purchase | |
| 24 | ACC Ltd. | ACC Ltd. | 2000 | 131-D | Metta | 4.1500 | purchase | |
| 25 | ACC Ltd. | ACC Ltd. | 2000 | 131-C | Metta | 1.0400 | purchase | |
| 26 | ACC Ltd. | ACC Ltd. | 2000 | 132-1C1 | Metta | 1.0000 | purchase | |
| 27 | ACC Ltd. | ACC Ltd. | 2000 | 132-2b | Metta | 1.0500 | purchase | |
| 28 | ACC Ltd. | ACC Ltd. | 2000 | 133-1A | Metta | 1.1600 | purchase | |
| 29 | ACC Ltd. | ACC Ltd. | 2000 | 133-2 | Metta | 1.5600 | purchase | |
| 30 | ACC Ltd. | ACC Ltd. | 2000 | 133-3 | Metta | 0.8000 | purchase | |
| 31 | ACC Ltd. | ACC Ltd. | 2000 | 133-4A | Metta | 1.5700 | purchase | |
| 32 | ACC Ltd. | ACC Ltd. | 2000 | 133-5b | Metta | 0.4000 | purchase | |
| 33 | ACC Ltd. | ACC Ltd. | 2000 | 134-1 | Metta | 1.4000 | purchase | |
| 34 | ACC Ltd. | ACC Ltd. | 2000 | 134-2 | Metta | 1.7000 | purchase | |
| 35 | ACC Ltd. | ACC Ltd. | 2000 | 134-3 | Metta | 3.0000 | purchase | |
| 36 | ACC Ltd. | ACC Ltd. | 2000 | 135-2b | Metta | 2.1500 | purchase | |
| 37 | ACC Ltd. | ACC Ltd. | 2000 | 137-1b2 | - | 2.9700 | purchase | |
| 38 | ACC Ltd. | ACC Ltd. | 2000 | 137-2 | Metta | 1.4800 | purchase | |
| 39 | ACC Ltd. | ACC Ltd. | 2000 | 137-3 | Metta | 1.5000 | purchase | |
| 40 | ACC Ltd. | ACC Ltd. | 2000 | 139-4b | Metta | 1.0100 | purchase | |
| 41 | ACC Ltd. | ACC Ltd. | 2000 | 140-2A | Metta | 1.5800 | purchase | |
| 42 | ACC Ltd. | ACC Ltd. | 2000 | 141-2 | Metta | 2.9900 | purchase | |
| 43 | ACC Ltd. | ACC Ltd. | 2000 | 141-3A | Metta | 0.1300 | purchase | |
| 44 | ACC Ltd. | ACC Ltd. | 2000 | 141-3C | Metta | 3.1300 | purchase | |
| 45 | ACC Ltd. | ACC Ltd. | 2000 | 143-1 | Metta | 2.1800 | purchase | |
| 46 | ACC Ltd. | ACC Ltd. | 2000 | 144-1B | Metta | 0.0500 | purchase | |
| 47 | ACC Ltd. | ACC Ltd. | 2000 | 147-2A | Metta | 0.3400 | purchase | |
| 48 | ACC Ltd. | ACC Ltd. | 2000 | 147-2d | Metta | 0.3400 | purchase | |
| 49 | ACC Ltd. | ACC Ltd. | 2000 | 147-2b | Metta | 0.3500 | purchase | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 50 | ACC Ltd. | ACC Ltd. | 2000 | 147-2C | Metta | 0.3500 | purchase | |
| 51 | ACC Ltd. | ACC Ltd. | 2000 | 162-3A | Metta | 3.0000 | purchase | |
| 52 | ACC Ltd. | ACC Ltd. | 2000 | 162-4A | Metta | 0.3300 | purchase | |
| 53 | ACC Ltd. | ACC Ltd. | 2000 | 163-F | Metta | 2.0000 | purchase | |
| 54 | ACC Ltd. | ACC Ltd. | 2000 | 163-B | Metta | 4.1200 | purchase | |
| 55 | ACC Ltd. | ACC Ltd. | 2000 | 163-C | Metta | 2.0600 | purchase | |
| 56 | ACC Ltd. | ACC Ltd. | 2000 | 164-3 | Metta | 2.3300 | purchase | |
| 57 | ACC Ltd. | ACC Ltd. | 2000 | 174-B | Metta | 4.3300 | purchase | |
| 58 | ACC Ltd. | ACC Ltd. | 2000 | 178-A2 | - | 1.4300 | Village Service Inam made FreeHold in 2023 | |
| 59 | ACC Ltd. | ACC Ltd. | 2000 | 179-B | Metta | 5.0800 | purchase | |
| 60 | ACC Ltd. | ACC Ltd. | 2000 | 180-2 | - | 0.2200 | purchase | |
| 61 | ACC Ltd. | ACC Ltd. | 2000 | 188-1A | Metta | 2.1000 | purchase | |
| 62 | ACC Ltd. | ACC Ltd. | 2000 | 188-2A | Metta | 0.2800 | purchase | |
| 63 | ACC Ltd. | ACC Ltd. | 2000 | 188-5 | Metta | 0.9700 | purchase | |
| 64 | ACC Ltd. | ACC Ltd. | 2000 | 2 | - | 2.3300 | purchase | |
| 65 | ACC Ltd. | ACC Ltd. | 2000 | 3 | - | 1.3900 | purchase | |
| 66 | ACC Ltd. | ACC Ltd. | 2000 | 4 | - | 4.1000 | purchase | |
| 67 | ACC Ltd. | ACC Ltd. | 2000 | 45 | - | 2.4700 | Village Service Inam made FreeHold in 2023 | |
| 68 | ACC Ltd. | ACC Ltd. | 2000 | 46 | - | 3.5600 | Village Service Inam made FreeHold in 2023 | |
| 69 | ACC Ltd. | ACC Ltd. | 2000 | 47 | - | 1.9000 | purchase | |
| 70 | ACC Ltd. | ACC Ltd. | 2000 | 48/1 | Metta | 0.3500 | purchase | |
| 71 | ACC Ltd. | ACC Ltd. | 2000 | 48/2 | Metta | 0.4100 | purchase | |
| 72 | ACC Ltd. | ACC Ltd. | 2000 | 48-1 | - | 0.3500 | purchase | |
| 73 | ACC Ltd. | ACC Ltd. | 2000 | 48-2 | - | 0.4100 | purchase | |
| 74 | ACC Ltd. | ACC Ltd. | 2000 | 49/1 | Metta | 2.1300 | Village Service Inam made FreeHold in 2023 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 75 | ACC Ltd. | ACC Ltd. | 2000 | 49/2 | Metta | 2.4300 | Village Service Inam made FreeHold in 2023 | |
| 76 | ACC Ltd. | ACC Ltd. | 2000 | 49-1 | - | 2.1300 | Village Service Inam made FreeHold in 2023 | |
| 77 | ACC Ltd. | ACC Ltd. | 2000 | 49-2 | - | 2.4300 | Village Service Inam made FreeHold in 2023 | |
| 78 | ACC Ltd. | ACC Ltd. | 2000 | 4a | Metta | 4.1000 | degree holder | |
| 79 | ACC Ltd. | ACC Ltd. | 2000 | 4-b | Metta | 1.0000 | - | |
| 80 | ACC Ltd. | ACC Ltd. | 2000 | 5 | - | 2.8400 | purchase | |
| 81 | ACC Ltd. | ACC Ltd. | 2000 | 50/1 | Metta | 3.2300 | purchase | |
| 82 | ACC Ltd. | ACC Ltd. | 2000 | 50/2 | Metta | 3.6900 | purchase | |
| 83 | ACC Ltd. | ACC Ltd. | 2000 | 50/3 | Metta | 5.2400 | purchase | |
| 84 | ACC Ltd. | ACC Ltd. | 2000 | 50-1 | - | 3.2300 | purchase | |
| 85 | ACC Ltd. | ACC Ltd. | 2000 | 50-2 | - | 3.6900 | purchase | |
| 86 | ACC Ltd. | ACC Ltd. | 2000 | 50-3 | - | 5.2400 | purchase | |
| 87 | ACC Ltd. | ACC Ltd. | 2000 | 51/1 | Metta | 3.4900 | purchase | |
| 88 | ACC Ltd. | ACC Ltd. | 2000 | 51/2 | Metta | 3.2900 | purchase | |
| 89 | ACC Ltd. | ACC Ltd. | 2000 | 51-1 | - | 3.4900 | purchase | |
| 90 | ACC Ltd. | ACC Ltd. | 2000 | 51-2 | - | 3.2900 | purchase | |
| 91 | ACC Ltd. | ACC Ltd. | 2000 | 52/1A | Metta | 1.9800 | purchase | |
| 92 | ACC Ltd. | ACC Ltd. | 2000 | 52/1d | Metta | 3.9600 | purchase | |
| 93 | ACC Ltd. | ACC Ltd. | 2000 | 52/1B | Metta | 2.0000 | purchase | |
| 94 | ACC Ltd. | ACC Ltd. | 2000 | 52/1C | Metta | 1.8800 | purchase | |
| 95 | ACC Ltd. | ACC Ltd. | 2000 | 52/2 | Metta | 4.8600 | purchase | |
| 96 | ACC Ltd. | ACC Ltd. | 2000 | 52/3 | Metta | 4.8200 | purchase | |
| 97 | ACC Ltd. | ACC Ltd. | 2000 | 52-1A | - | 1.9800 | purchase | |
| 98 | ACC Ltd. | ACC Ltd. | 2000 | 52-1d | - | 3.9600 | purchase | |
| 99 | ACC Ltd. | ACC Ltd. | 2000 | 52-1B | - | 2.0000 | purchase | |
| 100 | ACC Ltd. | ACC Ltd. | 2000 | 52-1C | | 1.8800 | purchase | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 101 | ACC Ltd. | ACC Ltd. | 2000 | 52-2 | - | 4.8600 | purchase | |
| 102 | ACC Ltd. | ACC Ltd. | 2000 | 52-3 | - | 4.8100 | purchase | |
| 103 | ACC Ltd. | ACC Ltd. | 2000 | 53 | - | 3.1400 | purchase | |
| 104 | ACC Ltd. | ACC Ltd. | 2000 | 54/1 | Metta | 1.7400 | purchase | |
| 105 | ACC Ltd. | ACC Ltd. | 2000 | 54/2 | Metta | 1.5800 | purchase | |
| 106 | ACC Ltd. | ACC Ltd. | 2000 | 54-1 | - | 1.7400 | purchase | |
| 107 | ACC Ltd. | ACC Ltd. | 2000 | 54-2 | - | 1.5800 | purchase | |
| 108 | ACC Ltd. | ACC Ltd. | 2000 | 55 | - | 4.5700 | purchase | |
| 109 | ACC Ltd. | ACC Ltd. | 2000 | 56 | Metta | 4.1100 | purchase | |
| 110 | ACC Ltd. | ACC Ltd. | 2000 | 57 | Metta | 4.9800 | purchase | |
| 111 | ACC Ltd. | ACC Ltd. | 2000 | 58 | Metta | 4.5100 | purchase | |
| 112 | ACC Ltd. | ACC Ltd. | 2000 | 59 | Metta | 4.2300 | purchase | |
| 113 | ACC Ltd. | ACC Ltd. | 2000 | 6 | - | 2.6800 | purchase | |
| 114 | ACC Ltd. | ACC Ltd. | 2000 | 60 | Metta | 4.0700 | purchase | |
| 115 | ACC Ltd. | ACC Ltd. | 2000 | 61 | Metta | 6.5300 | purchase | |
| 116 | ACC Ltd. | ACC Ltd. | 2000 | 62 | Metta | 5.9300 | Village Service Inam made FreeHold in 2023 | |
| 117 | ACC Ltd. | ACC Ltd. | 2000 | 63/1 | Metta | 1.5600 | purchase | |
| 118 | ACC Ltd. | ACC Ltd. | 2000 | 63/2 | Metta | 0.8400 | purchase | |
| 119 | ACC Ltd. | ACC Ltd. | 2000 | 63/3 | Metta | 0.7800 | purchase | |
| 120 | ACC Ltd. | ACC Ltd. | 2000 | 63/4 | Metta | 3.1000 | purchase | |
| 121 | ACC Ltd. | ACC Ltd. | 2000 | 64/1 | Metta | 2.8200 | purchase | |
| 122 | ACC Ltd. | ACC Ltd. | 2000 | 64/2 | Metta | 1.9000 | purchase | |
| 123 | ACC Ltd. | ACC Ltd. | 2000 | 64/3 | Metta | 0.8800 | purchase | |
| 124 | ACC Ltd. | ACC Ltd. | 2000 | 65/1 | Metta | 2.8800 | purchase | |
| 125 | ACC Ltd. | ACC Ltd. | 2000 | 65/2 | Metta | 3.0800 | purchase | |
| 126 | ACC Ltd. | ACC Ltd. | 2000 | 65/3A | Metta | 1.7300 | purchase | |
| 127 | ACC Ltd. | ACC Ltd. | 2000 | 65/3b | Metta | 1.7300 | purchase | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 128 | ACC Ltd. | ACC Ltd. | 2000 | 65/4 | Metta | 3.2800 | purchase | |
| 129 | ACC Ltd. | ACC Ltd. | 2000 | 65/5 | Metta | 3.0800 | purchase | |
| 130 | ACC Ltd. | ACC Ltd. | 2000 | 65/6 | Metta | 3.0000 | purchase | |
| 131 | ACC Ltd. | ACC Ltd. | 2000 | 66/1A | Metta | 2.8600 | purchase | |
| 132 | ACC Ltd. | ACC Ltd. | 2000 | 66/1B | Metta | 2.8700 | purchase | |
| 133 | ACC Ltd. | ACC Ltd. | 2000 | 66/2A | Metta | 3.2300 | purchase | |
| 134 | ACC Ltd. | ACC Ltd. | 2000 | 66/2B | Metta | 3.2200 | purchase | |
| 135 | ACC Ltd. | ACC Ltd. | 2000 | 66/3 | Metta | 3.0500 | purchase | |
| 136 | ACC Ltd. | ACC Ltd. | 2000 | 66/4 | Metta | 2.9500 | purchase | |
| 137 | ACC Ltd. | ACC Ltd. | 2000 | 67/1 | Metta | 2.8600 | purchase | |
| 138 | ACC Ltd. | ACC Ltd. | 2000 | 67/2 | Metta | 3.0600 | purchase | |
| 139 | ACC Ltd. | ACC Ltd. | 2000 | 67/3A | Metta | 1.5400 | purchase | |
| 140 | ACC Ltd. | ACC Ltd. | 2000 | 67/3B | Metta | 1.5400 | purchase | |
| 141 | ACC Ltd. | ACC Ltd. | 2000 | 67/4 | Metta | 2.9800 | purchase | |
| 142 | ACC Ltd. | ACC Ltd. | 2000 | 68-4 | Metta | 1.8000 | purchase | |
| 143 | ACC Ltd. | ACC Ltd. | 2000 | 7 | - | 3.7800 | Village Service Inam made FreeHold in 2023 | |
| 144 | ACC Ltd. | ACC Ltd. | 2000 | 72-2b | Metta | 3.5400 | Village Service Inam made FreeHold in 2023 | |
| 145 | ACC Ltd. | ACC Ltd. | 2000 | 7-b | Metta | 3.7800 | Village Service Inam made FreeHold in 2023 | |
| 146 | ACC Ltd. | ACC Ltd. | 2000 | 8 | - | 1.6300 | purchase | |
| 147 | ACC Ltd. | ACC Ltd. | 2000 | 8/2 | Metta | 0.1200 | purchase | |
| 148 | ACC Ltd. | ACC Ltd. | 2000 | 8/3 | Metta | 1.3300 | purchase | |
| 149 | ACC Ltd. | ACC Ltd. | 2000 | 8-1 | Metta | 0.1800 | purchase | |
| 150 | ACC Ltd. | ACC Ltd. | 2000 | 97-2e2 | - | 2.6800 | purchase | |
| 151 | ACC Ltd. | ACC Ltd. | 2000 | 98/2 | Metta | 2.2500 | purchase | |
| 152 | ACC Ltd. | ACC Ltd. | 2000 | 98-1A | Metta | 0.1800 | purchase | |
| 153 | ACC Ltd. | ACC Ltd. | 2000 | 98-1B | Metta | 1.2500 | purchase | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 154 | ACC Ltd. | ACC Ltd. | 2000 | 99 | Metta | 3.9000 | purchase | |

This revenue record is printed from your land website on 09/10/2024 5:45 pm.

The information contained made available through this web site is for information only and cannot be utilized as certified / authenticated copy for producing in any court or for enforcing any legal claims etc. under the existing relevant Acts / Rules framed by the Government of Andhra Pradesh in this context.

# ROR1b Report

| District : YSR - YSR | | | | Mandal : MYLAVARAM - Mylavaram | | | | Village : GOLLA UPPALAPADU - Golla Uppalapadu | | | | Khata No : 2000 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| serial number | Account no. | Graduate's Name – (Father's/Husband's Name) | LP Number | Old Survey No. / Sub-Division | ULPIN | Nature of Earth | Bhumi is the sub nature | Classification of land | Land sub-classification | LP Extent (Acres-Cents) | Experiential nature | Aadhaar no. / Mobile no. / e-mail Id | Remarks |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 1 | 2000 | ACC Ltd. / ACC Ltd. | 1 | 15 | - | reward | Rythwari Patta / - | Metta / Meraka / Khushki | Graduate / - | 7.4600 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 2 | 2000 | ACC Ltd. / ACC Ltd. | 2 | 10,11,12,13/1,13/2,14/1,14/2,14/3,14/4,5/1,5/2,6,7/1,7/2,7/ 3,8/1,8/2a,8/2b,9/1,9/2 | - | Patta/Jairiti land | - / - | Metta / Meraka / Khushki | Graduate / - | 49.7400 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 3 | 2000 | ACC Ltd. / ACC Ltd. | 4 | 2,3,4,5/4 | - | Patta/Jairiti land | - / - | Metta / Meraka / Khushki | Graduate / - | 18.7800 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 4 | 2000 | ACC Ltd. / ACC Ltd. | 5 | 1/1,1/2 | - | reward | Rythwari Patta / - | Metta / Meraka / Khushki | Graduate / - | 5.6300 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 5 | 2000 | ACC Ltd. / ACC Ltd. | 10 | 54 | - | Village service inam made freehold in 2023 | - / - | Metta / Meraka / Khushki | Graduate / - | 1.2600 | Village service inam made freehold in 2023 | XXXX-XXXX-5019 / 94XXXXXX93 | - Village Service Inam Lands Made Freehold, |
| 6 | 2000 | ACC Ltd. / ACC Ltd. | 11 | 55 | - | reward | Rythwari Patta / - | Metta / Meraka / Khushki | Graduate / - | 1.1200 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 7 | 2000 | ACC Ltd. / ACC Ltd. | 14 | 56/1,56/2,57/1,57/2A,57/2B,58 | - | Patta/Jairiti land | - / - | Metta / Meraka / Khushki | Graduate / - | 5.1900 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 8 | 2000 | ACC Ltd. / ACC Ltd. | 15 | 59/1,59/2 | - | reward | Rythwari Patta / - | Metta / Meraka / Khushki | Graduate / - | 9.9000 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 9 | 2000 | ACC Ltd. / ACC Ltd. | 18 | 62-A | - | reward | Service Award / - | Metta / Meraka / Khushki | Graduate / - | 1.2000 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 10 | 2000 | ACC Ltd. / ACC Ltd. | 19 | 61-A | - | Village service inam made freehold in 2023 | - / - | Metta / Meraka / Khushki | Graduate / - | 2.7100 | Village service inam made freehold in 2023 | XXXX-XXXX-5019 / 94XXXXXX93 | - Village Service Inam Lands Made Freehold, |
| 11 | 2000 | ACC Ltd. / ACC Ltd. | 20 | 63/1,63/2 | - | reward | Rythwari Patta / - | Metta / Meraka / Khushki | Graduate / - | 6.3400 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 12 | 2000 | ACC Ltd. / ACC Ltd. | 21 | 64/1,64/2 | - | Village service inam made freehold in 2023 | - / - | Metta / Meraka / Khushki | Graduate / - | 7.2600 | Village service inam made freehold in 2023 | XXXX-XXXX-5019 / 94XXXXXX93 | - Village Service Inam Lands Made Freehold, |
| 13 | 2000 | ACC Ltd. / ACC Ltd. | 22 | 65 | - | reward | Rythwari Patta / - | Metta / Meraka / Khushki | Graduate / - | 4.3800 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 14 | 2000 | ACC Ltd. / ACC Ltd. | 24 | 67/1A,67/1B,67/2,67/3,67/4,67/5,68/1,68/2,69/1A,69/1B,69/2A,69/2B,69/ 3 | - | reward | Rythwari Patta / - | Metta / Meraka / Khushki | Graduate / - | 10.1500 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 15 | 2000 | ACC Ltd. / ACC Ltd. | 25 | 70/1A,70/2A,70/3A,70/4A,70/5A | - | reward | Service Award / - | Metta / Meraka / Khushki | Graduate / - | 4.1500 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 16 | 2000 | ACC Ltd. / ACC Ltd. | 26 | 79/1D,79/1B,79/2,79-1A,79-1C,80-1 | - | Patta/Jairiti land | - / - | Metta / Meraka / Khushki | Graduate / - | 9.6300 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 17 | 2000 | ACC Ltd. / ACC Ltd. | 27 | 71-A | - | reward | Rythwari Patta / - | Metta / Meraka / Khushki | Graduate / - | 1.9300 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 18 | 2000 | ACC Ltd. / ACC Ltd. | 28 | 73A | - | reward | Service Award / - | Metta / Meraka / Khushki | Graduate / - | 1.5400 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 19 | 2000 | ACC Ltd. / ACC Ltd. | 29 | 77 | - | reward | Rythwari Patta / - | Metta / Meraka / Khushki | Graduate / - | 4.7400 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 20 | 2000 | ACC Ltd. / ACC Ltd. | 30 | 128,78a,78b | - | reward | Service Award / - | Metta / Meraka / Khushki | Graduate / - | 8.2600 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 21 | 2000 | ACC Ltd. / ACC Ltd. | 31 | 129 | - | reward | Rythwari Patta / - | Metta / Meraka / Khushki | Graduate / - | 4.4100 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 22 | 2000 | ACC Ltd. / ACC Ltd. | 32 | 130 | - | Village service inam made freehold in 2023 | - / - | Metta / Meraka / Khushki | Graduate / - | 2.9000 | Village service inam made freehold in 2023 | XXXX-XXXX-5019 / 94XXXXXX93 | - Village Service Inam Lands Made Freehold, |
| 23 | 2000 | ACC Ltd. / ACC Ltd. | 33 | 132,139/1a,139/1b,139/2,140 | - | reward | Rythwari Patta / - | Metta / Meraka / Khushki | Graduate / - | 15.9700 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 24 | 2000 | ACC Ltd. / ACC Ltd. | 34 | 131/1,131/2,141/1,141/2A,141/2B,142/1,142/2 | - | Patta/Jairiti land | - / - | Metta / Meraka / Khushki | Graduate / - | 10.1200 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 25 | 2000 | ACC Ltd. / ACC Ltd. | 35 | 143,50,51 | - | reward | Rythwari Patta / - | Metta / Meraka / Khushki | Graduate / - | 13.0800 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 26 | 2000 | ACC Ltd. / ACC Ltd. | 36 | 52 | - | Village service inam made freehold in 2023 | - / - | Metta / Meraka / Khushki | Graduate / - | 6.4100 | Village service inam made freehold in 2023 | XXXX-XXXX-5019 / 94XXXXXX93 | - Village Service Inam Lands Made Freehold, |
| 27 | 2000 | ACC Ltd. / ACC Ltd. | 38 | 39,40 | - | reward | Rythwari Patta / - | Metta / Meraka / Khushki | Graduate / - | 1.3700 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 28 | 2000 | ACC Ltd. / ACC Ltd. | 39 | 41 | - | reward | Service Award / - | Metta / Meraka / Khushki | Graduate / - | 0.4600 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 29 | 2000 | ACC Ltd. / ACC Ltd. | 40 | 37,38 | - | Village service inam made freehold in 2023 | - / - | Metta / Meraka / Khushki | Graduate / - | 9.2800 | Village service inam made freehold in 2023 | XXXX-XXXX-5019 / 94XXXXXX93 | - Village Service Inam Lands Made Freehold, |
| 30 | 2000 | ACC Ltd. / ACC Ltd. | 41 | 20,21,22,23,24 | - | reward | Rythwari Patta / - | Metta / Meraka / Khushki | Graduate / - | 16.3000 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 31 | 2000 | ACC Ltd. / ACC Ltd. | 43 | 18/1 | - | Patta/Jairiti land | - / - | Metta / Meraka / Khushki | Graduate / - | 0.4600 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 32 | 2000 | ACC Ltd. / ACC Ltd. | 44 | 17 | - | reward | Rythwari Patta / - | Metta / Meraka / Khushki | Graduate / - | 3.9900 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 33 | 2000 | ACC Ltd. / ACC Ltd. | 45 | 25,26 | - | reward | Service Award / - | Metta / Meraka / Khushki | Graduate / - | 20.4200 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 34 | 2000 | ACC Ltd. / ACC Ltd. | 46 | 27,28-A | - | Patta/Jairiti land | - / - | Metta / Meraka / Khushki | Graduate / - | 7.6700 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 35 | 2000 | ACC Ltd. / ACC Ltd. | 49 | 168,169 | - | reward | Rythwari Patta / - | Metta / Meraka / Khushki | Graduate / - | 3.2600 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 36 | 2000 | ACC Ltd. / ACC Ltd. | 50 | 161/1,161/2,162/1A,162/1B,162/2,163/1,163/2A,163/2B,164A,164B,165/1A,165/1B,165/2,166/1,166/2 | - | Patta/Jairiti land | - / - | Metta / Meraka / Khushki | Graduate / - | 28.4700 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 37 | 2000 | ACC Ltd. / ACC Ltd. | 52 | 29,30-a,30b,31,32,33 | - | reward | Rythwari Patta / - | Metta / Meraka / Khushki | Graduate / - | 10.8300 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 38 | 2000 | ACC Ltd. / ACC Ltd. | 53 | 34/1A,34/1B1,34/1B2,34/1C,34/2,35/1,35/2,35/3 | - | Patta/Jairiti land | - / - | Metta / Meraka / Khushki | Graduate / - | 2.3500 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 39 | 2000 | ACC Ltd. / ACC Ltd. | 54 | 36 | - | reward | Service Award / - | Metta / Meraka / Khushki | Graduate / - | 1.2400 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 40 | 2000 | ACC Ltd. / ACC Ltd. | 56 | 144/1,144/2,145,48,49 | - | reward | Service Award / - | Metta / Meraka / Khushki | Graduate / - | 17.0700 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 41 | 2000 | ACC Ltd. / ACC Ltd. | 57 | 46/1A,46/1B1,46/1C,46/2,46-1B2,47/1,47/2,47/3 | - | Patta/Jairiti land | - / - | Metta / Meraka / Khushki | Graduate / - | 6.5700 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 42 | 2000 | ACC Ltd. / ACC Ltd. | 58 | 43,44,45 | - | reward | Rythwari Patta / - | Metta / Meraka / Khushki | Graduate / - | 6.9000 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 43 | 2000 | ACC Ltd. / ACC Ltd. | 61 | 146,147,151/1 | - | Patta/Jairiti land | - / - | Metta / Meraka / Khushki | Graduate / - | 6.2000 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 44 | 2000 | ACC Ltd. / ACC Ltd. | 63 | 158/1,158/2,170,171,172,173/1,173/2,174,175/1,175/2a,175/2b | - | Patta/Jairiti land | - / - | Metta / Meraka / Khushki | Graduate / - | 27.0000 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 45 | 2000 | ACC Ltd. / ACC Ltd. | 65 | 177/1,177/2,178/1,178/2,179 | - | Patta/Jairiti land | - / - | Metta / Meraka / Khushki | Graduate / - | 11.3100 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 46 | 2000 | ACC Ltd. / ACC Ltd. | 66 | 156E, 156D, 156B, 156C | - | reward | Service Award / - | Metta / Meraka / Khushki | Graduate / - | 7.4300 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 47 | 2000 | ACC Ltd. / ACC Ltd. | 67 | 148,150 | - | reward | Service Award / - | Metta / Meraka / Khushki | Graduate / - | 5.3800 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 48 | 2000 | ACC Ltd. / ACC Ltd. | 68 | 136,137,138 | - | reward | Service Award / - | Metta / Meraka / Khushki | Graduate / - | 8.1900 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 49 | 2000 | ACC Ltd. / ACC Ltd. | 70 | 127,133a,133b | - | Patta/Jairiti land | - / - | Metta / Meraka / Khushki | Graduate / - | 7.5600 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 50 | 2000 | ACC Ltd. / ACC Ltd. | 161 | 107/2,107/3 | - | Patta/Jairiti land | - / - | Metta / Meraka / Khushki | Graduate / - | 0.3100 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 51 | 2000 | ACC Ltd. / ACC Ltd. | 198 | 86/2A1,86/2A2,86/2B | - | Patta/Jairiti land | - / - | Metta / Meraka / Khushki | Graduate / - | 1.2400 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 52 | 2000 | ACC Ltd. / ACC Ltd. | 212 | 72,76 | - | reward | Rythwari Patta / - | Metta / Meraka / Khushki | Graduate / - | 3.3200 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 53 | 2000 | ACC Ltd. / ACC Ltd. | 338 | 135,149/2 | - | Patta/Jairiti land | - / - | Metta / Meraka / Khushki | Graduate / - | 1.4800 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 54 | 2000 | ACC Ltd. / ACC Ltd. | 350 | 19/2 | - | Patta/Jairiti land | - / - | Metta / Meraka / Khushki | Graduate / - | 1.3700 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 55 | 2000 | ACC Ltd. / ACC Ltd. | 353 | 153,154,155 | - | Patta/Jairiti land | - / - | Metta / Meraka / Khushki | Graduate / - | 4.8900 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 56 | 2000 | ACC Ltd. / ACC Ltd. | 360 | 74/1,74/2a,74/2b,75 | - | reward | Service Award / - | Metta / Meraka / Khushki | Graduate / - | 6.5400 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 57 | 2000 | ACC Ltd. / ACC Ltd. | 375 | 61-3 | - | reward | Rythwari Patta / - | Metta / Meraka / Khushki | Graduate / - | 1.6900 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |
| 58 | 2000 | ACC Ltd. / ACC Ltd. | 377 | 60/1,60/2 | - | reward | Service Award / - | Metta / Meraka / Khushki | Graduate / - | 1.2300 | purchase / purchase | XXXX-XXXX-5019 / 94XXXXXX93 | - |

This revenue record is printed from your land website on 09/10/2024 5:40 pm.

The information contained made available through this web site is for information only and cannot be utilized as certified / authenticated copy for producing in any court or for enforcing any legal claims etc. under the existing relevant Acts / Rules framed by the Government of Andhra Pradesh in this context.

# ROR1b Report

| District : YSR - YSR | Mandal : MYLAVARAM , Mylavaram | Village : GOLLA PALLE , Gollapalle | Khata No: : 2000 |
|---|---|---|---|

| serial number | Name of the graduate | Name of father/husband | Account no | Survey No./ Sub Division No | Land description | area | How was the pattadaru infected/cultivated? | Date of acceptance of mutation |
|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 1 | ACC Limited | ACC Limited | 2000 | 10 | Metta | 3.1100 | | |
| 2 | ACC Limited | ACC Limited | 2000 | 101-1A | Metta | 0.4000 | | |
| 3 | ACC Limited | ACC Limited | 2000 | 101-1b | Metta | 0.3900 | | |
| 4 | ACC Limited | ACC Limited | 2000 | 101-2 | Metta | 0.7900 | | |
| 5 | ACC Limited | ACC Limited | 2000 | 101-3A | Metta | 0.4800 | | |
| 6 | ACC Limited | ACC Limited | 2000 | 101-3b | Metta | 0.4600 | | |
| 7 | ACC Limited | ACC Limited | 2000 | 101-4 | Metta | 0.4000 | | |
| 8 | ACC Limited | ACC Limited | 2000 | 101-5 | Metta | 0.2000 | | |
| 9 | ACC Limited | ACC Limited | 2000 | 101-6 | Metta | 0.3700 | | |
| 10 | ACC Limited | ACC Limited | 2000 | 101-7 | Metta | 0.2500 | | |
| 11 | ACC Limited | ACC Limited | 2000 | 101-8 | Metta | 0.8600 | | |
| 12 | ACC Limited | ACC Limited | 2000 | 10-1A1 | Metta | 0.0500 | Inheritance | |
| 13 | ACC Limited | ACC Limited | 2000 | 102-1 | - | 0.0100 | purchase | |
| 14 | ACC Limited | ACC Limited | 2000 | 102-1E | Metta | 0.0200 | | |
| 15 | ACC Limited | ACC Limited | 2000 | 102-1A | Metta | 0.0100 | | |
| 16 | ACC Limited | ACC Limited | 2000 | 102-1d | Metta | 0.0200 | | |
| 17 | ACC Limited | ACC Limited | 2000 | 102-1b | Metta | 0.0200 | | |
| 18 | ACC Limited | ACC Limited | 2000 | 102-1C1 | Metta | 0.0100 | | |
| 19 | ACC Limited | ACC Limited | 2000 | 102-2A | Metta | 0.9700 | | |
| 20 | ACC Limited | ACC Limited | 2000 | 102-2b | Metta | 0.9800 | | |
| 21 | ACC Limited | ACC Limited | 2000 | 102-2C | Metta | 0.9700 | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 22 | ACC Limited | ACC Limited | 2000 | 102-3 | Metta | 2.5200 | | |
| 23 | ACC Limited | ACC Limited | 2000 | 102-4 | Metta | 1.9000 | | |
| 24 | ACC Limited | ACC Limited | 2000 | 102-5 | Metta | 0.9900 | purchase | |
| 25 | ACC Limited | ACC Limited | 2000 | 102-6 | Metta | 1.0900 | | |
| 26 | ACC Limited | ACC Limited | 2000 | 102-7 | Metta | 0.5900 | | |
| 27 | ACC Limited | ACC Limited | 2000 | 107-1 | Metta | 0.4200 | | |
| 28 | ACC Limited | ACC Limited | 2000 | 107-2A | Metta | 0.2800 | | |
| 29 | ACC Limited | ACC Limited | 2000 | 107-2b | Metta | 0.2800 | | |
| 30 | ACC Limited | ACC Limited | 2000 | 107-2C | Metta | 0.2800 | | |
| 31 | ACC Limited | ACC Limited | 2000 | 107-3 | Metta | 0.7900 | | |
| 32 | ACC Limited | ACC Limited | 2000 | 107-4 | Metta | 0.5200 | | |
| 33 | ACC Limited | ACC Limited | 2000 | 107-5A | Metta | 0.2900 | | |
| 34 | ACC Limited | ACC Limited | 2000 | 107-5b | Metta | 0.3000 | | |
| 35 | ACC Limited | ACC Limited | 2000 | 107-6A | Metta | 0.1100 | | |
| 36 | ACC Limited | ACC Limited | 2000 | 107-6b | Metta | 0.1100 | | |
| 37 | ACC Limited | ACC Limited | 2000 | 1-1 | Metta | 3.0600 | | |
| 38 | ACC Limited | ACC Limited | 2000 | 11-1 | Metta | 3.6100 | | |
| 39 | ACC Limited | ACC Limited | 2000 | 11-2 | Metta | 2.0500 | | |
| 40 | ACC Limited | ACC Limited | 2000 | 11-3 | Metta | 1.9800 | | |
| 41 | ACC Limited | ACC Limited | 2000 | 12-1 | Metta | 1.3600 | | |
| 42 | ACC Limited | ACC Limited | 2000 | 12-2 | Metta | 0.6900 | | |
| 43 | ACC Limited | ACC Limited | 2000 | 123-1 | Metta | 0.3700 | purchase | |
| 44 | ACC Limited | ACC Limited | 2000 | 123-2 | Metta | 3.2600 | | |
| 45 | ACC Limited | ACC Limited | 2000 | 123-3 | Metta | 2.3700 | | |
| 46 | ACC Limited | ACC Limited | 2000 | 12-3A | Metta | 0.6100 | | |
| 47 | ACC Limited | ACC Limited | 2000 | 12-3b | Metta | 0.6200 | | |
| 48 | ACC Limited | ACC Limited | 2000 | 12-3c | Metta | 0.6200 | | |
| 49 | ACC Limited | ACC Limited | 2000 | 124-1 | Metta | 2.9700 | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 50 | ACC Limited | ACC Limited | 2000 | 124-2A | Metta | 1.3700 | | |
| 51 | ACC Limited | ACC Limited | 2000 | 124-2b | Metta | 1.3700 | | |
| 52 | ACC Limited | ACC Limited | 2000 | 125 | Metta | 3.8500 | | |
| 53 | ACC Limited | ACC Limited | 2000 | 126-1 | Metta | 0.9600 | | |
| 54 | ACC Limited | ACC Limited | 2000 | 126-2 | Metta | 2.6700 | | |
| 55 | ACC Limited | ACC Limited | 2000 | 126-3 | Metta | 0.4000 | | |
| 56 | ACC Limited | ACC Limited | 2000 | 126-4 | Metta | 0.6200 | | |
| 57 | ACC Limited | ACC Limited | 2000 | 127-1 | Metta | 5.9300 | purchase | |
| 58 | ACC Limited | ACC Limited | 2000 | 127-2 | Metta | 0.0500 | purchase | |
| 59 | ACC Limited | ACC Limited | 2000 | 1-2a | Metta | 1.3600 | | |
| 60 | ACC Limited | ACC Limited | 2000 | 1-2b | Metta | 1.3600 | | |
| 61 | ACC Limited | ACC Limited | 2000 | 130-1 | Metta | 0.5900 | | |
| 62 | ACC Limited | ACC Limited | 2000 | 130-2 | Metta | 2.6700 | | |
| 63 | ACC Limited | ACC Limited | 2000 | 130-3 | Metta | 0.4400 | | |
| 64 | ACC Limited | ACC Limited | 2000 | 130-4 | Metta | 5.0900 | | |
| 65 | ACC Limited | ACC Limited | 2000 | 13-1 | Metta | 3.0900 | | |
| 66 | ACC Limited | ACC Limited | 2000 | 131-1 | Metta | 0.3000 | | |
| 67 | ACC Limited | ACC Limited | 2000 | 131-2 | Metta | 3.3600 | | |
| 68 | ACC Limited | ACC Limited | 2000 | 131-3 | Metta | 3.2900 | | |
| 69 | ACC Limited | ACC Limited | 2000 | 132 | Metta | 0.6900 | | |
| 70 | ACC Limited | ACC Limited | 2000 | 13-2 | Metta | 4.7000 | | |
| 71 | ACC Limited | ACC Limited | 2000 | 133-A | Metta | 3.6500 | | |
| 72 | ACC Limited | ACC Limited | 2000 | 133b | Metta | 3.6400 | | |
| 73 | ACC Limited | ACC Limited | 2000 | 134-1A | Metta | 3.8300 | | |
| 74 | ACC Limited | ACC Limited | 2000 | 134-1B | Metta | 3.8300 | | |
| 75 | ACC Limited | ACC Limited | 2000 | 134-2 | Metta | 1.4800 | | |
| 76 | ACC Limited | ACC Limited | 2000 | 134-3 | Metta | 1.7300 | | |
| 77 | ACC Limited | ACC Limited | 2000 | 135 | Metta | 1.7100 | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 78 | ACC Limited | ACC Limited | 2000 | 136 | Metta | 0.7900 | | |
| 79 | ACC Limited | ACC Limited | 2000 | 137-1 | Metta | 1.5800 | | |
| 80 | ACC Limited | ACC Limited | 2000 | 137-2 | Metta | 2.1500 | | |
| 81 | ACC Limited | ACC Limited | 2000 | 137-3 | Metta | 0.8900 | | |
| 82 | ACC Limited | ACC Limited | 2000 | 137-4 | Metta | 0.3500 | | |
| 83 | ACC Limited | ACC Limited | 2000 | 138-1 | Metta | 0.3500 | | |
| 84 | ACC Limited | ACC Limited | 2000 | 138-2 | Metta | 0.5900 | | |
| 85 | ACC Limited | ACC Limited | 2000 | 138-3 | Metta | 4.3200 | | |
| 86 | ACC Limited | ACC Limited | 2000 | 138-4A | Metta | 0.1300 | | |
| 87 | ACC Limited | ACC Limited | 2000 | 138-4b | Metta | 0.1200 | | |
| 88 | ACC Limited | ACC Limited | 2000 | 138-5A | Metta | 0.7100 | | |
| 89 | ACC Limited | ACC Limited | 2000 | 138-5b | Metta | 0.7000 | | |
| 90 | ACC Limited | ACC Limited | 2000 | 138-6A | Metta | 0.0800 | | |
| 91 | ACC Limited | ACC Limited | 2000 | 138-6b | Metta | 0.0700 | | |
| 92 | ACC Limited | ACC Limited | 2000 | 138-7b | Metta | 0.0400 | | |
| 93 | ACC Limited | ACC Limited | 2000 | 138-8 | Metta | 3.7600 | | |
| 94 | ACC Limited | ACC Limited | 2000 | 139-1 | Metta | 1.8500 | | |
| 95 | ACC Limited | ACC Limited | 2000 | 139-2 | Metta | 1.6600 | | |
| 96 | ACC Limited | ACC Limited | 2000 | 139-3 | Metta | 1.2600 | | |
| 97 | ACC Limited | ACC Limited | 2000 | 139-4A | Metta | 0.7200 | | |
| 98 | ACC Limited | ACC Limited | 2000 | 139-4b | Metta | 0.7100 | | |
| 99 | ACC Limited | ACC Limited | 2000 | 139-5A | Metta | 0.4200 | | |
| 100 | ACC Limited | ACC Limited | 2000 | 139-5b | Metta | 0.4200 | | |
| 101 | ACC Limited | ACC Limited | 2000 | 140-1 | Metta | 0.0700 | | |
| 102 | ACC Limited | ACC Limited | 2000 | 140-2 | Metta | 0.2200 | | |
| 103 | ACC Limited | ACC Limited | 2000 | 140-3 | Metta | 2.0300 | | |
| 104 | ACC Limited | ACC Limited | 2000 | 140-4 | Metta | 3.0100 | purchase | |
| 105 | ACC Limited | ACC Limited | 2000 | 141-1 | Metta | 4.2300 | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 106 | ACC Limited | ACC Limited | 2000 | 141-2 | Metta | 4.4700 | | |
| 107 | ACC Limited | ACC Limited | 2000 | 143A | Metta | 3.8400 | | |
| 108 | ACC Limited | ACC Limited | 2000 | 143b | Metta | 1.9200 | | |
| 109 | ACC Limited | ACC Limited | 2000 | 144 | Metta | 5.8800 | | |
| 110 | ACC Limited | ACC Limited | 2000 | 145-1 | Metta | 3.1100 | | |
| 111 | ACC Limited | ACC Limited | 2000 | 145-2A | Metta | 1.9300 | | |
| 112 | ACC Limited | ACC Limited | 2000 | 145-2b | Metta | 0.9100 | | |
| 113 | ACC Limited | ACC Limited | 2000 | 146-1A | Metta | 1.5000 | | |
| 114 | ACC Limited | ACC Limited | 2000 | 146-1B | Metta | 4.1300 | | |
| 115 | ACC Limited | ACC Limited | 2000 | 148 | Metta | 4.4500 | | |
| 116 | ACC Limited | ACC Limited | 2000 | 149 | Metta | 8.8200 | | |
| 117 | ACC Limited | ACC Limited | 2000 | 14A | Metta | 4.4400 | | |
| 118 | ACC Limited | ACC Limited | 2000 | 14b | Metta | 4.4300 | | |
| 119 | ACC Limited | ACC Limited | 2000 | 15-1A | Metta | 0.3500 | | |
| 120 | ACC Limited | ACC Limited | 2000 | 15-1b | Metta | 0.3500 | | |
| 121 | ACC Limited | ACC Limited | 2000 | 15-1C | Metta | 0.3600 | | |
| 122 | ACC Limited | ACC Limited | 2000 | 15-2A | Metta | 0.0200 | | |
| 123 | ACC Limited | ACC Limited | 2000 | 15-2b | Metta | 0.0200 | | |
| 124 | ACC Limited | ACC Limited | 2000 | 153-1 | Metta | 0.5700 | | |
| 125 | ACC Limited | ACC Limited | 2000 | 153-2 | Metta | 8.9700 | | |
| 126 | ACC Limited | ACC Limited | 2000 | 15-3A | Metta | 0.0500 | | |
| 127 | ACC Limited | ACC Limited | 2000 | 15-3b | Metta | 0.0500 | | |
| 128 | ACC Limited | ACC Limited | 2000 | 15-3c | Metta | 0.0500 | | |
| 129 | ACC Limited | ACC Limited | 2000 | 15-4A | Metta | 0.9400 | | |
| 130 | ACC Limited | ACC Limited | 2000 | 15-4b | Metta | 0.9500 | | |
| 131 | ACC Limited | ACC Limited | 2000 | 15-4c | Metta | 0.9500 | | |
| 132 | ACC Limited | ACC Limited | 2000 | 15-5A | Metta | 2.5600 | | |
| 133 | ACC Limited | ACC Limited | 2000 | 15-5b | Metta | 0.7500 | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 134 | ACC Limited | ACC Limited | 2000 | 16-1A | Metta | 1.1300 | | |
| 135 | ACC Limited | ACC Limited | 2000 | 16-1b | Metta | 1.1200 | | |
| 136 | ACC Limited | ACC Limited | 2000 | 16-2 | Metta | 1.2800 | | |
| 137 | ACC Limited | ACC Limited | 2000 | 16-3 | Metta | 3.7100 | | |
| 138 | ACC Limited | ACC Limited | 2000 | 17-1 | Metta | 2.4400 | | |
| 139 | ACC Limited | ACC Limited | 2000 | 17-3 | Metta | 1.0600 | | |
| 140 | ACC Limited | ACC Limited | 2000 | 17-4A | Metta | 0.2400 | | |
| 141 | ACC Limited | ACC Limited | 2000 | 17-4b | Metta | 0.2300 | | |
| 142 | ACC Limited | ACC Limited | 2000 | 17-5A | Metta | 0.5300 | | |
| 143 | ACC Limited | ACC Limited | 2000 | 17-5b | Metta | 0.5300 | | |
| 144 | ACC Limited | ACC Limited | 2000 | 17-7 | Metta | 0.3700 | | |
| 145 | ACC Limited | ACC Limited | 2000 | 18-1A | Metta | 1.0000 | | |
| 146 | ACC Limited | ACC Limited | 2000 | 18-1d | Metta | 1.0000 | Inheritance | |
| 147 | ACC Limited | ACC Limited | 2000 | 18-1B | Metta | 1.2300 | | |
| 148 | ACC Limited | ACC Limited | 2000 | 18-1C | Metta | 1.0000 | | |
| 149 | ACC Limited | ACC Limited | 2000 | 18-3 | Metta | 1.2600 | | |
| 150 | ACC Limited | ACC Limited | 2000 | 18-4 | Metta | 1.6800 | | |
| 151 | ACC Limited | ACC Limited | 2000 | 18-5 | Metta | 1.2800 | | |
| 152 | ACC Limited | ACC Limited | 2000 | 19-1A | Metta | 1.0000 | | |
| 153 | ACC Limited | ACC Limited | 2000 | 19-1b | Metta | 3.2000 | | |
| 154 | ACC Limited | ACC Limited | 2000 | 19-2 | Metta | 3.8800 | | |
| 155 | ACC Limited | ACC Limited | 2000 | 20-1A | Metta | 1.9200 | | |
| 156 | ACC Limited | ACC Limited | 2000 | 20-1b | Metta | 1.9100 | | |
| 157 | ACC Limited | ACC Limited | 2000 | 20-2 | Metta | 1.8300 | | |
| 158 | ACC Limited | ACC Limited | 2000 | 20-3 | Metta | 2.0000 | | |
| 159 | ACC Limited | ACC Limited | 2000 | 21-1A | Metta | 1.8500 | | |
| 160 | ACC Limited | ACC Limited | 2000 | 21-1B | Metta | 1.8600 | | |
| 161 | ACC Limited | ACC Limited | 2000 | 21-2 | Metta | 2.0800 | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 162 | ACC Limited | ACC Limited | 2000 | 21-3 | Metta | 0.2000 | | |
| 163 | ACC Limited | ACC Limited | 2000 | 21-4 | Metta | 1.7800 | | |
| 164 | ACC Limited | ACC Limited | 2000 | 22-1 | Metta | 0.4900 | | |
| 165 | ACC Limited | ACC Limited | 2000 | 22-10 | Metta | 1.0600 | | |
| 166 | ACC Limited | ACC Limited | 2000 | 22-11 | Metta | 1.1900 | | |
| 167 | ACC Limited | ACC Limited | 2000 | 22-12 | Metta | 0.6900 | | |
| 168 | ACC Limited | ACC Limited | 2000 | 22-13 | Metta | 1.1100 | | |
| 169 | ACC Limited | ACC Limited | 2000 | 22-14 | Metta | 0.6700 | | |
| 170 | ACC Limited | ACC Limited | 2000 | 22-15 | Metta | 1.1100 | | |
| 171 | ACC Limited | ACC Limited | 2000 | 22-2 | Metta | 0.4400 | | |
| 172 | ACC Limited | ACC Limited | 2000 | 22-3 | Metta | 0.2500 | | |
| 173 | ACC Limited | ACC Limited | 2000 | 22-4 | Metta | 0.1200 | | |
| 174 | ACC Limited | ACC Limited | 2000 | 22-5 | Metta | 0.0200 | | |
| 175 | ACC Limited | ACC Limited | 2000 | 22-7 | Metta | 0.6900 | | |
| 176 | ACC Limited | ACC Limited | 2000 | 22-8 | Metta | 0.8900 | | |
| 177 | ACC Limited | ACC Limited | 2000 | 22-9 | Metta | 0.9600 | | |
| 178 | ACC Limited | ACC Limited | 2000 | 23-1 | Metta | 5.0900 | | |
| 179 | ACC Limited | ACC Limited | 2000 | 23-2 | Metta | 0.0500 | | |
| 180 | ACC Limited | ACC Limited | 2000 | 23-3 | Metta | 0.1500 | | |
| 181 | ACC Limited | ACC Limited | 2000 | 24-1 | Metta | 2.7400 | | |
| 182 | ACC Limited | ACC Limited | 2000 | 24-2 | Metta | 0.9100 | | |
| 183 | ACC Limited | ACC Limited | 2000 | 24-3 | Metta | 3.9500 | | |
| 184 | ACC Limited | ACC Limited | 2000 | 25 | Metta | 6.3500 | | |
| 185 | ACC Limited | ACC Limited | 2000 | 26-1 | Metta | 3.4100 | | |
| 186 | ACC Limited | ACC Limited | 2000 | 26-2A | Metta | 1.6800 | | |
| 187 | ACC Limited | ACC Limited | 2000 | 26-2b | Metta | 1.6800 | | |
| 188 | ACC Limited | ACC Limited | 2000 | 27-1A | Metta | 0.4450 | purchase | |
| 189 | ACC Limited | ACC Limited | 2000 | 27-1B | Metta | 0.4500 | purchase | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 190 | ACC Limited | ACC Limited | 2000 | 27-2A | Metta | 0.0600 | | |
| 191 | ACC Limited | ACC Limited | 2000 | 27-2b | Metta | 0.0600 | | |
| 192 | ACC Limited | ACC Limited | 2000 | 27-3A | Metta | 4.7200 | | |
| 193 | ACC Limited | ACC Limited | 2000 | 27-3b | Metta | 4.7100 | purchase | |
| 194 | ACC Limited | ACC Limited | 2000 | 29-1 | Metta | 3.3600 | | |
| 195 | ACC Limited | ACC Limited | 2000 | 29-2 | Metta | 5.2600 | | |
| 196 | ACC Limited | ACC Limited | 2000 | 29-3 | Metta | 0.1000 | | |
| 197 | ACC Limited | ACC Limited | 2000 | 29-4 | Metta | 0.3000 | | |
| 198 | ACC Limited | ACC Limited | 2000 | 29-5 | Metta | 0.1200 | | |
| 199 | ACC Limited | ACC Limited | 2000 | 29-6 | Metta | 0.9400 | | |
| 200 | ACC Limited | ACC Limited | 2000 | 2A | Metta | 2.0000 | | |
| 201 | ACC Limited | ACC Limited | 2000 | 2d | Metta | 2.8700 | | |
| 202 | ACC Limited | ACC Limited | 2000 | 2b | Metta | 4.0000 | | |
| 203 | ACC Limited | ACC Limited | 2000 | 2c | Metta | 2.0000 | | |
| 204 | ACC Limited | ACC Limited | 2000 | 30-1 | Metta | 1.5600 | | |
| 205 | ACC Limited | ACC Limited | 2000 | 30-2 | Metta | 1.1400 | | |
| 206 | ACC Limited | ACC Limited | 2000 | 30-3A | Metta | 0.0800 | | |
| 207 | ACC Limited | ACC Limited | 2000 | 30-3b | Metta | 0.0700 | | |
| 208 | ACC Limited | ACC Limited | 2000 | 30-4A | Metta | 1.3800 | | |
| 209 | ACC Limited | ACC Limited | 2000 | 30-4b | Metta | 4.0300 | | |
| 210 | ACC Limited | ACC Limited | 2000 | 30-5 | Metta | 0.2300 | | |
| 211 | ACC Limited | ACC Limited | 2000 | 3-1 | Metta | 1.5600 | | |
| 212 | ACC Limited | ACC Limited | 2000 | 31-1 | Metta | 0.0200 | | |
| 213 | ACC Limited | ACC Limited | 2000 | 31-10 | Metta | 0.5900 | | |
| 214 | ACC Limited | ACC Limited | 2000 | 31-11 | Metta | 1.0900 | | |
| 215 | ACC Limited | ACC Limited | 2000 | 31-2 | Metta | 0.0200 | | |
| 216 | ACC Limited | ACC Limited | 2000 | 31-3 | Metta | 1.2800 | | |
| 217 | ACC Limited | ACC Limited | 2000 | 31-4 | Metta | 1.3600 | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 218 | ACC Limited | ACC Limited | 2000 | 31-5 | Metta | 1.1600 | | |
| 219 | ACC Limited | ACC Limited | 2000 | 31-6 | Metta | 0.4700 | | |
| 220 | ACC Limited | ACC Limited | 2000 | 31-7A | Metta | 0.0200 | purchase | |
| 221 | ACC Limited | ACC Limited | 2000 | 31-7b | Metta | 0.0100 | | |
| 222 | ACC Limited | ACC Limited | 2000 | 31-8A | Metta | 0.0500 | | |
| 223 | ACC Limited | ACC Limited | 2000 | 31-8b | Metta | 0.0500 | | |
| 224 | ACC Limited | ACC Limited | 2000 | 31-8c | Metta | 0.0500 | | |
| 225 | ACC Limited | ACC Limited | 2000 | 31-9 | Metta | 0.0500 | | |
| 226 | ACC Limited | ACC Limited | 2000 | 32-1 | Metta | 2.3500 | | |
| 227 | ACC Limited | ACC Limited | 2000 | 32-2 | Metta | 0.5200 | | |
| 228 | ACC Limited | ACC Limited | 2000 | 32-3 | Metta | 0.2700 | | |
| 229 | ACC Limited | ACC Limited | 2000 | 32-4 | Metta | 0.3700 | | |
| 230 | ACC Limited | ACC Limited | 2000 | 32-5 | Metta | 2.4200 | | |
| 231 | ACC Limited | ACC Limited | 2000 | 3-2A | Metta | 1.4800 | | |
| 232 | ACC Limited | ACC Limited | 2000 | 3-3 | Metta | 5.6100 | | |
| 233 | ACC Limited | ACC Limited | 2000 | 33-1 | Metta | 2.1300 | | |
| 234 | ACC Limited | ACC Limited | 2000 | 33-10 | Metta | 0.4700 | | |
| 235 | ACC Limited | ACC Limited | 2000 | 33-2 | Metta | 0.5700 | | |
| 236 | ACC Limited | ACC Limited | 2000 | 33-3 | Metta | 0.1500 | | |
| 237 | ACC Limited | ACC Limited | 2000 | 33-4 | Metta | 0.2000 | | |
| 238 | ACC Limited | ACC Limited | 2000 | 33-5 | Metta | 1.6300 | | |
| 239 | ACC Limited | ACC Limited | 2000 | 33-6 | Metta | 2.5700 | | |
| 240 | ACC Limited | ACC Limited | 2000 | 33-7 | Metta | 1.2800 | | |
| 241 | ACC Limited | ACC Limited | 2000 | 33-8 | Metta | 0.4000 | | |
| 242 | ACC Limited | ACC Limited | 2000 | 33-9 | Metta | 0.1200 | | |
| 243 | ACC Limited | ACC Limited | 2000 | 34-1 | Metta | 1.8800 | | |
| 244 | ACC Limited | ACC Limited | 2000 | 34-2 | Metta | 1.5100 | | |
| 245 | ACC Limited | ACC Limited | 2000 | 34-3 | Metta | 1.5800 | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 246 | ACC Limited | ACC Limited | 2000 | 34-4 | Metta | 1.1600 | | |
| 247 | ACC Limited | ACC Limited | 2000 | 34-5 | Metta | 1.6600 | | |
| 248 | ACC Limited | ACC Limited | 2000 | 35 | Metta | 3.6300 | | |
| 249 | ACC Limited | ACC Limited | 2000 | 36 | Metta | 6.0000 | | |
| 250 | ACC Limited | ACC Limited | 2000 | 37 | Metta | 5.6100 | | |
| 251 | ACC Limited | ACC Limited | 2000 | 38-1 | Metta | 3.5800 | | |
| 252 | ACC Limited | ACC Limited | 2000 | 38-2 | Metta | 1.3800 | | |
| 253 | ACC Limited | ACC Limited | 2000 | 38-3 | Metta | 1.6600 | | |
| 254 | ACC Limited | ACC Limited | 2000 | 38-4A | Metta | 0.0700 | | |
| 255 | ACC Limited | ACC Limited | 2000 | 38-4b | Metta | 0.0800 | | |
| 256 | ACC Limited | ACC Limited | 2000 | 39 | Metta | 3.3400 | | |
| 257 | ACC Limited | ACC Limited | 2000 | 40-1 | Metta | 2.0800 | | |
| 258 | ACC Limited | ACC Limited | 2000 | 40-2 | Metta | 2.4000 | | |
| 259 | ACC Limited | ACC Limited | 2000 | 4-1 | Metta | 3.2900 | | |
| 260 | ACC Limited | ACC Limited | 2000 | 41-3A | Metta | 1.4200 | | |
| 261 | ACC Limited | ACC Limited | 2000 | 41-3b | Metta | 1.5200 | | |
| 262 | ACC Limited | ACC Limited | 2000 | 41-4 | Metta | 2.0800 | | |
| 263 | ACC Limited | ACC Limited | 2000 | 41-5 | Metta | 1.8800 | | |
| 264 | ACC Limited | ACC Limited | 2000 | 42 | Metta | 3.5800 | | |
| 265 | ACC Limited | ACC Limited | 2000 | 4-2A | Metta | 1.6200 | | |
| 266 | ACC Limited | ACC Limited | 2000 | 4-2b | Metta | 1.6200 | | |
| 267 | ACC Limited | ACC Limited | 2000 | 43 | Metta | 4.1500 | | |
| 268 | ACC Limited | ACC Limited | 2000 | 44-1 | Metta | 3.1100 | | |
| 269 | ACC Limited | ACC Limited | 2000 | 44-2 | Metta | 1.8800 | | |
| 270 | ACC Limited | ACC Limited | 2000 | 46-3A | Metta | 3.9400 | | |
| 271 | ACC Limited | ACC Limited | 2000 | 46-3b | Metta | 1.0000 | | |
| 272 | ACC Limited | ACC Limited | 2000 | 47-1 | Metta | 2.3200 | | |
| 273 | ACC Limited | ACC Limited | 2000 | 47-2 | Metta | 3.4800 | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 274 | ACC Limited | ACC Limited | 2000 | 47-3 | Metta | 2.7700 | | |
| 275 | ACC Limited | ACC Limited | 2000 | 47-4 | Metta | 2.7700 | | |
| 276 | ACC Limited | ACC Limited | 2000 | 48-1 | Metta | 5.9100 | - | |
| 277 | ACC Limited | ACC Limited | 2000 | 48-2 | Metta | 0.3200 | - | |
| 278 | ACC Limited | ACC Limited | 2000 | 48-3 | Metta | 1.8800 | - | |
| 279 | ACC Limited | ACC Limited | 2000 | 49-1 | Metta | 0.8900 | | |
| 280 | ACC Limited | ACC Limited | 2000 | 49-2 | Metta | 2.1300 | | |
| 281 | ACC Limited | ACC Limited | 2000 | 49-3 | Metta | 0.2500 | | |
| 282 | ACC Limited | ACC Limited | 2000 | 49-4 | Metta | 4.7900 | | |
| 283 | ACC Limited | ACC Limited | 2000 | 50-1 | Metta | 0.1700 | | |
| 284 | ACC Limited | ACC Limited | 2000 | 50-2 | Metta | 0.0700 | | |
| 285 | ACC Limited | ACC Limited | 2000 | 50-3 | Metta | 5.3600 | | |
| 286 | ACC Limited | ACC Limited | 2000 | 50-4 | Metta | 4.7400 | | |
| 287 | ACC Limited | ACC Limited | 2000 | 5-1 | Metta | 3.2600 | | |
| 288 | ACC Limited | ACC Limited | 2000 | 51-1 | Metta | 4.3200 | | |
| 289 | ACC Limited | ACC Limited | 2000 | 51-2 | Metta | 0.2000 | | |
| 290 | ACC Limited | ACC Limited | 2000 | 51-3 | Metta | 1.7800 | | |
| 291 | ACC Limited | ACC Limited | 2000 | 5-2 | Metta | 3.0600 | | |
| 292 | ACC Limited | ACC Limited | 2000 | 52-1A | Metta | 5.1000 | | |
| 293 | ACC Limited | ACC Limited | 2000 | 52-1d | Metta | 2.8100 | | |
| 294 | ACC Limited | ACC Limited | 2000 | 52-1B | Metta | 1.2100 | | |
| 295 | ACC Limited | ACC Limited | 2000 | 52-1C | Metta | 1.4100 | | |
| 296 | ACC Limited | ACC Limited | 2000 | 53-1 | Metta | 1.1400 | | |
| 297 | ACC Limited | ACC Limited | 2000 | 53-2 | Metta | 1.0900 | | |
| 298 | ACC Limited | ACC Limited | 2000 | 53-3 | Metta | 1.9800 | | |
| 299 | ACC Limited | ACC Limited | 2000 | 53-4 | Metta | 2.3500 | | |
| 300 | ACC Limited | ACC Limited | 2000 | 53-5 | Metta | 2.3700 | | |
| 301 | ACC Limited | ACC Limited | 2000 | 54-1 | Metta | 4.7000 | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 302 | ACC Limited | ACC Limited | 2000 | 54-2 | Metta | 5.1900 | purchase | |
| 303 | ACC Limited | ACC Limited | 2000 | 55-1 | Metta | 1.6600 | | |
| 304 | ACC Limited | ACC Limited | 2000 | 55-2 | Metta | 1.9800 | | |
| 305 | ACC Limited | ACC Limited | 2000 | 55-3 | Metta | 3.6100 | purchase | |
| 306 | ACC Limited | ACC Limited | 2000 | 56-1 | Metta | 4.0500 | Village Service Inam made FreeHold in 2023 | |
| 307 | ACC Limited | ACC Limited | 2000 | 56-2 | Metta | 3.9500 | Village Service Inam made FreeHold in 2023 | |
| 308 | ACC Limited | ACC Limited | 2000 | 57 | Metta | 6.5000 | | |
| 309 | ACC Limited | ACC Limited | 2000 | 58-1A | Metta | 0.4800 | | |
| 310 | ACC Limited | ACC Limited | 2000 | 58-1B | Metta | 0.4700 | | |
| 311 | ACC Limited | ACC Limited | 2000 | 58-1C | Metta | 0.4800 | | |
| 312 | ACC Limited | ACC Limited | 2000 | 58-2 | Metta | 1.1600 | | |
| 313 | ACC Limited | ACC Limited | 2000 | 58-3 | Metta | 0.3500 | | |
| 314 | ACC Limited | ACC Limited | 2000 | 58-4 | Metta | 4.5000 | | |
| 315 | ACC Limited | ACC Limited | 2000 | 58-5A | Metta | 0.7100 | | |
| 316 | ACC Limited | ACC Limited | 2000 | 58-5B | Metta | 0.7100 | | |
| 317 | ACC Limited | ACC Limited | 2000 | 58-5C | Metta | 0.7100 | | |
| 318 | ACC Limited | ACC Limited | 2000 | 58-6 | Metta | 2.3500 | | |
| 319 | ACC Limited | ACC Limited | 2000 | 59 | Metta | 6.4200 | | |
| 320 | ACC Limited | ACC Limited | 2000 | 60 | Metta | 5.5100 | | |
| 321 | ACC Limited | ACC Limited | 2000 | 61-1 | Metta | 2.9700 | purchase | |
| 322 | ACC Limited | ACC Limited | 2000 | 61-2 | Metta | 2.8700 | purchase | |
| 323 | ACC Limited | ACC Limited | 2000 | 62-1 | Metta | 0.4700 | | |
| 324 | ACC Limited | ACC Limited | 2000 | 62-10 | Metta | 2.6200 | | |
| 325 | ACC Limited | ACC Limited | 2000 | 62-11 | Metta | 1.7300 | | |
| 326 | ACC Limited | ACC Limited | 2000 | 62-2 | Metta | 0.3000 | | |
| 327 | ACC Limited | ACC Limited | 2000 | 62-3 | Metta | 0.1500 | purchase | |
| 328 | ACC Limited | ACC Limited | 2000 | 62-4 | Metta | 0.2000 | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 329 | ACC Limited | ACC Limited | 2000 | 62-5 | Metta | 0.0200 | purchase | |
| 330 | ACC Limited | ACC Limited | 2000 | 62-6 | Metta | 0.2000 | | |
| 331 | ACC Limited | ACC Limited | 2000 | 62-7 | Metta | 2.3000 | | |
| 332 | ACC Limited | ACC Limited | 2000 | 62-8 | houses | 2.1500 | purchase | |
| 333 | ACC Limited | ACC Limited | 2000 | 62-9 | Metta | 1.7500 | purchase | |
| 334 | ACC Limited | ACC Limited | 2000 | 63 | Metta | 4.7400 | | |
| 335 | ACC Limited | ACC Limited | 2000 | 64-1 | Metta | 2.8200 | | |
| 336 | ACC Limited | ACC Limited | 2000 | 64-2 | Metta | 2.7900 | | |
| 337 | ACC Limited | ACC Limited | 2000 | 65-1 | Metta | 3.0400 | | |
| 338 | ACC Limited | ACC Limited | 2000 | 65-2 | Metta | 0.0200 | | |
| 339 | ACC Limited | ACC Limited | 2000 | 66-1 | Metta | 9.0200 | | |
| 340 | ACC Limited | ACC Limited | 2000 | 66-2 | Metta | 0.1500 | | |
| 341 | ACC Limited | ACC Limited | 2000 | 66-3 | Metta | 0.5200 | | |
| 342 | ACC Limited | ACC Limited | 2000 | 67-1 | Metta | 2.7900 | | |
| 343 | ACC Limited | ACC Limited | 2000 | 67-2 | Metta | 2.5500 | | |
| 344 | ACC Limited | ACC Limited | 2000 | 67-3 | Metta | 0.1000 | | |
| 345 | ACC Limited | ACC Limited | 2000 | 67-4 | Metta | 0.4400 | | |
| 346 | ACC Limited | ACC Limited | 2000 | 67-5 | Metta | 0.6400 | | |
| 347 | ACC Limited | ACC Limited | 2000 | 68-1 | Metta | 2.7400 | | |
| 348 | ACC Limited | ACC Limited | 2000 | 68-2 | Metta | 2.4500 | | |
| 349 | ACC Limited | ACC Limited | 2000 | 68-3 | Metta | 2.5000 | | |
| 350 | ACC Limited | ACC Limited | 2000 | 69-1 | Metta | 0.0200 | | |
| 351 | ACC Limited | ACC Limited | 2000 | 69-2 | Metta | 9.6100 | | |
| 352 | ACC Limited | ACC Limited | 2000 | 6a | Metta | 4.3800 | | |
| 353 | ACC Limited | ACC Limited | 2000 | 6b | Metta | 4.2500 | | |
| 354 | ACC Limited | ACC Limited | 2000 | 6c | Metta | 5.2800 | | |
| 355 | ACC Limited | ACC Limited | 2000 | 71-1 | Metta | 2.8700 | | |
| 356 | ACC Limited | ACC Limited | 2000 | 71-2 | Metta | 2.8700 | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 357 | ACC Limited | ACC Limited | 2000 | 71-3 | Metta | 3.6100 | | |
| 358 | ACC Limited | ACC Limited | 2000 | 7-1A | Metta | 1.1200 | | |
| 359 | ACC Limited | ACC Limited | 2000 | 7-1b | Metta | 1.1300 | | |
| 360 | ACC Limited | ACC Limited | 2000 | 7-2 | Metta | 1.0100 | | |
| 361 | ACC Limited | ACC Limited | 2000 | 72-1A | Metta | 1.6000 | | |
| 362 | ACC Limited | ACC Limited | 2000 | 72-1B | Metta | 1.6100 | | |
| 363 | ACC Limited | ACC Limited | 2000 | 72-2A | Metta | 0.0750 | purchase | |
| 364 | ACC Limited | ACC Limited | 2000 | 72-2b | Metta | 0.0750 | purchase | |
| 365 | ACC Limited | ACC Limited | 2000 | 72-3A | Metta | 2.0700 | | |
| 366 | ACC Limited | ACC Limited | 2000 | 72-3b | Metta | 2.0600 | | |
| 367 | ACC Limited | ACC Limited | 2000 | 73-1 | Metta | 1.1600 | | |
| 368 | ACC Limited | ACC Limited | 2000 | 73-2 | Metta | 0.1000 | | |
| 369 | ACC Limited | ACC Limited | 2000 | 73-3 | Metta | 4.2700 | | |
| 370 | ACC Limited | ACC Limited | 2000 | 7-3A | Metta | 0.5800 | | |
| 371 | ACC Limited | ACC Limited | 2000 | 7-3b | Metta | 0.5800 | | |
| 372 | ACC Limited | ACC Limited | 2000 | 74-1 | Metta | 1.9800 | | |
| 373 | ACC Limited | ACC Limited | 2000 | 74-2 | Metta | 3.5100 | | |
| 374 | ACC Limited | ACC Limited | 2000 | 74-3 | Metta | 1.4800 | | |
| 375 | ACC Limited | ACC Limited | 2000 | 7-4A | Metta | 0.0900 | | |
| 376 | ACC Limited | ACC Limited | 2000 | 7-4b | Metta | 0.0900 | | |
| 377 | ACC Limited | ACC Limited | 2000 | 7-4c | Metta | 0.0900 | | |
| 378 | ACC Limited | ACC Limited | 2000 | 75-10 | Metta | 1.2100 | | |
| 379 | ACC Limited | ACC Limited | 2000 | 75-11 | Metta | 2.0000 | | |
| 380 | ACC Limited | ACC Limited | 2000 | 75-12 | Metta | 1.9500 | | |
| 381 | ACC Limited | ACC Limited | 2000 | 75-13 | Metta | 0.8900 | | |
| 382 | ACC Limited | ACC Limited | 2000 | 75-14 | Metta | 1.1900 | | |
| 383 | ACC Limited | ACC Limited | 2000 | 75-1A | Metta | 0.0600 | purchase | |
| 384 | ACC Limited | ACC Limited | 2000 | 75-1B | Metta | 0.0500 | purchase | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 385 | ACC Limited | ACC Limited | 2000 | 75-1C | Metta | 0.0600 | | |
| 386 | ACC Limited | ACC Limited | 2000 | 75-2A | Metta | 0.0600 | | |
| 387 | ACC Limited | ACC Limited | 2000 | 75-2b | Metta | 0.0600 | | |
| 388 | ACC Limited | ACC Limited | 2000 | 75-2C | Metta | 0.0500 | | |
| 389 | ACC Limited | ACC Limited | 2000 | 75-3 | Metta | 0.1200 | | |
| 390 | ACC Limited | ACC Limited | 2000 | 75-4 | Metta | 0.1700 | | |
| 391 | ACC Limited | ACC Limited | 2000 | 75-5 | Metta | 0.1500 | | |
| 392 | ACC Limited | ACC Limited | 2000 | 75-6A | Metta | 0.0500 | | |
| 393 | ACC Limited | ACC Limited | 2000 | 75-6b | Metta | 0.0500 | | |
| 394 | ACC Limited | ACC Limited | 2000 | 75-6c | Metta | 0.0500 | | |
| 395 | ACC Limited | ACC Limited | 2000 | 75-7A | Metta | 0.0200 | | |
| 396 | ACC Limited | ACC Limited | 2000 | 75-7d | Metta | 0.1400 | | |
| 397 | ACC Limited | ACC Limited | 2000 | 75-7b | Metta | 0.0200 | | |
| 398 | ACC Limited | ACC Limited | 2000 | 75-8A | Metta | 0.4000 | | |
| 399 | ACC Limited | ACC Limited | 2000 | 75-8b | Metta | 0.4000 | | |
| 400 | ACC Limited | ACC Limited | 2000 | 75-8c | Metta | 0.4000 | | |
| 401 | ACC Limited | ACC Limited | 2000 | 75-9A | Metta | 0.5000 | | |
| 402 | ACC Limited | ACC Limited | 2000 | 75-9b | Metta | 0.5000 | | |
| 403 | ACC Limited | ACC Limited | 2000 | 75-9C | Metta | 0.5100 | | |
| 404 | ACC Limited | ACC Limited | 2000 | 7-5A | - | 1.7400 | purchase | |
| 405 | ACC Limited | ACC Limited | 2000 | 7-5b | Metta | 1.7400 | | |
| 406 | ACC Limited | ACC Limited | 2000 | 7-6 | Metta | 2.3700 | | |
| 407 | ACC Limited | ACC Limited | 2000 | 76-1A | Metta | 0.0250 | | |
| 408 | ACC Limited | ACC Limited | 2000 | 76-1B | Metta | 0.0250 | | |
| 409 | ACC Limited | ACC Limited | 2000 | 76-3A | Metta | 0.0100 | | |
| 410 | ACC Limited | ACC Limited | 2000 | 76-3b | Metta | 0.0100 | | |
| 411 | ACC Limited | ACC Limited | 2000 | 76-4A | Metta | 1.2800 | | |
| 412 | ACC Limited | ACC Limited | 2000 | 76-4b | Metta | 1.2900 | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 413 | ACC Limited | ACC Limited | 2000 | 77A | Metta | 0.4200 | purchase | |
| 414 | ACC Limited | ACC Limited | 2000 | 7-7a | Metta | 3.0000 | | |
| 415 | ACC Limited | ACC Limited | 2000 | 77d | - | 0.8600 | purchase | |
| 416 | ACC Limited | ACC Limited | 2000 | 77b | Metta | 0.4200 | purchase | |
| 417 | ACC Limited | ACC Limited | 2000 | 7-7b | Metta | 3.0000 | | |
| 418 | ACC Limited | ACC Limited | 2000 | 77c | Metta | 0.8600 | purchase | |
| 419 | ACC Limited | ACC Limited | 2000 | 78-1A | Metta | 3.0600 | | |
| 420 | ACC Limited | ACC Limited | 2000 | 78-1B | Metta | 2.5700 | | |
| 421 | ACC Limited | ACC Limited | 2000 | 78-2 | Metta | 0.4000 | | |
| 422 | ACC Limited | ACC Limited | 2000 | 78-3A | Metta | 0.5400 | | |
| 423 | ACC Limited | ACC Limited | 2000 | 78-3b | Metta | 0.0800 | purchase | |
| 424 | ACC Limited | ACC Limited | 2000 | 78-4 | Metta | 0.5700 | | |
| 425 | ACC Limited | ACC Limited | 2000 | 80-10 | Metta | 0.2700 | | |
| 426 | ACC Limited | ACC Limited | 2000 | 80-11 | Metta | 0.4700 | | |
| 427 | ACC Limited | ACC Limited | 2000 | 80-12A | Metta | 0.3600 | | |
| 428 | ACC Limited | ACC Limited | 2000 | 80-12b | Metta | 0.3600 | | |
| 429 | ACC Limited | ACC Limited | 2000 | 80-13 | Metta | 0.9900 | | |
| 430 | ACC Limited | ACC Limited | 2000 | 80-14A | Metta | 0.6000 | | |
| 431 | ACC Limited | ACC Limited | 2000 | 80-14b | Metta | 0.5900 | | |
| 432 | ACC Limited | ACC Limited | 2000 | 80-1A | - | 0.0200 | | |
| 433 | ACC Limited | ACC Limited | 2000 | 80-1B | Metta | 0.0200 | | |
| 434 | ACC Limited | ACC Limited | 2000 | 80-1c | Metta | 0.0100 | | |
| 435 | ACC Limited | ACC Limited | 2000 | 80-2 | Metta | 0.7700 | | |
| 436 | ACC Limited | ACC Limited | 2000 | 80-3 | Metta | 0.2500 | | |
| 437 | ACC Limited | ACC Limited | 2000 | 80-4 | Metta | 0.2000 | | |
| 438 | ACC Limited | ACC Limited | 2000 | 80-5 | Metta | 1.1100 | | |
| 439 | ACC Limited | ACC Limited | 2000 | 80-6 | Metta | 0.4000 | | |
| 440 | ACC Limited | ACC Limited | 2000 | 80-7E | Metta | 0.0200 | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 441 | ACC Limited | ACC Limited | 2000 | 80-7A | Metta | 0.0200 | | |
| 442 | ACC Limited | ACC Limited | 2000 | 80-7d | Metta | 0.0100 | | |
| 443 | ACC Limited | ACC Limited | 2000 | 8-1 | Metta | 2.5900 | | |
| 444 | ACC Limited | ACC Limited | 2000 | 81-2A | Metta | 0.1200 | | |
| 445 | ACC Limited | ACC Limited | 2000 | 81-2b | Metta | 0.1300 | | |
| 446 | ACC Limited | ACC Limited | 2000 | 81-2C | Metta | 0.1200 | | |
| 447 | ACC Limited | ACC Limited | 2000 | 81-3A | Metta | 0.2500 | | |
| 448 | ACC Limited | ACC Limited | 2000 | 81-3b | Metta | 0.2400 | | |
| 449 | ACC Limited | ACC Limited | 2000 | 81-3C | Metta | 0.2500 | | |
| 450 | ACC Limited | ACC Limited | 2000 | 81-4A | Metta | 0.2600 | | |
| 451 | ACC Limited | ACC Limited | 2000 | 81-4b | Metta | 0.2600 | | |
| 452 | ACC Limited | ACC Limited | 2000 | 81-4C | Metta | 0.2500 | purchase | |
| 453 | ACC Limited | ACC Limited | 2000 | 81-5A | Metta | 0.2700 | | |
| 454 | ACC Limited | ACC Limited | 2000 | 81-5b | Metta | 0.2800 | | |
| 455 | ACC Limited | ACC Limited | 2000 | 81-5C | Metta | 0.2700 | | |
| 456 | ACC Limited | ACC Limited | 2000 | 81-6A | Metta | 0.0900 | | |
| 457 | ACC Limited | ACC Limited | 2000 | 81-6b | Metta | 0.0800 | | |
| 458 | ACC Limited | ACC Limited | 2000 | 81-6C | Metta | 0.0800 | purchase | |
| 459 | ACC Limited | ACC Limited | 2000 | 81-7 | Metta | 0.9400 | | |
| 460 | ACC Limited | ACC Limited | 2000 | 81-8A | Metta | 0.0600 | | |
| 461 | ACC Limited | ACC Limited | 2000 | 81-8b | Metta | 0.0600 | | |
| 462 | ACC Limited | ACC Limited | 2000 | 8-2 | Metta | 2.3500 | | |
| 463 | ACC Limited | ACC Limited | 2000 | 82-1A | Metta | 0.1800 | | |
| 464 | ACC Limited | ACC Limited | 2000 | 82-1B | Metta | 0.1800 | | |
| 465 | ACC Limited | ACC Limited | 2000 | 82-1C | Metta | 0.1800 | | |
| 466 | ACC Limited | ACC Limited | 2000 | 82-3 | Metta | 0.2500 | | |
| 467 | ACC Limited | ACC Limited | 2000 | 82-5 | Metta | 0.0500 | | |
| 468 | ACC Limited | ACC Limited | 2000 | 82-6A | Metta | 0.6000 | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 469 | ACC Limited | ACC Limited | 2000 | 82-6b | Metta | 0.6000 | | |
| 470 | ACC Limited | ACC Limited | 2000 | 82-6C | Metta | 0.6000 | | |
| 471 | ACC Limited | ACC Limited | 2000 | 82-7 | Metta | 0.9400 | | |
| 472 | ACC Limited | ACC Limited | 2000 | 82-8A | Metta | 1.6500 | | |
| 473 | ACC Limited | ACC Limited | 2000 | 82-8B | Metta | 1.0000 | | |
| 474 | ACC Limited | ACC Limited | 2000 | 82-8C | Metta | 0.6900 | | |
| 475 | ACC Limited | ACC Limited | 2000 | 82-9A | Metta | 0.0600 | | |
| 476 | ACC Limited | ACC Limited | 2000 | 82-9b | Metta | 0.0600 | | |
| 477 | ACC Limited | ACC Limited | 2000 | 82-9c | Metta | 0.0500 | | |
| 478 | ACC Limited | ACC Limited | 2000 | 83-1 | Metta | 0.9600 | | |
| 479 | ACC Limited | ACC Limited | 2000 | 83-2 | Metta | 0.0500 | | |
| 480 | ACC Limited | ACC Limited | 2000 | 83-3 | Metta | 0.2000 | purchase | |
| 481 | ACC Limited | ACC Limited | 2000 | 83-4 | Metta | 0.1000 | purchase | |
| 482 | ACC Limited | ACC Limited | 2000 | 83-5 | Metta | 0.3500 | | |
| 483 | ACC Limited | ACC Limited | 2000 | 83-6 | Metta | 0.6700 | | |
| 484 | ACC Limited | ACC Limited | 2000 | 83-7 | Metta | 0.1200 | | |
| 485 | ACC Limited | ACC Limited | 2000 | 84-1 | Metta | 1.2100 | | |
| 486 | ACC Limited | ACC Limited | 2000 | 84-2A1 | Metta | 0.0500 | | |
| 487 | ACC Limited | ACC Limited | 2000 | 84-2b | Metta | 0.0800 | | |
| 488 | ACC Limited | ACC Limited | 2000 | 84-2C | Metta | 0.0700 | | |
| 489 | ACC Limited | ACC Limited | 2000 | 84-3A | Metta | 0.0700 | | |
| 490 | ACC Limited | ACC Limited | 2000 | 84-3d | Metta | 0.1000 | | |
| 491 | ACC Limited | ACC Limited | 2000 | 85 | Metta | 1.2800 | | |
| 492 | ACC Limited | ACC Limited | 2000 | 87 | Metta | 0.5400 | | |
| 493 | ACC Limited | ACC Limited | 2000 | 88-1 | Metta | 0.3000 | | |
| 494 | ACC Limited | ACC Limited | 2000 | 88-2 | Metta | 5.8800 | | |
| 495 | ACC Limited | ACC Limited | 2000 | 89-1A | Metta | 2.0300 | | |
| 496 | ACC Limited | ACC Limited | 2000 | 89-1B | Metta | 2.0200 | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 497 | ACC Limited | ACC Limited | 2000 | 90-1 | Metta | 3.0100 | | |
| 498 | ACC Limited | ACC Limited | 2000 | 90-2 | Metta | 1.0400 | | |
| 499 | ACC Limited | ACC Limited | 2000 | 90-3 | Metta | 1.5800 | | |
| 500 | ACC Limited | ACC Limited | 2000 | 9-1 | Metta | 4.0300 | | |
| 501 | ACC Limited | ACC Limited | 2000 | 92-11c | Metta | 0.0100 | | |
| 502 | ACC Limited | ACC Limited | 2000 | 92-12A2 | - | 0.3100 | purchase | |
| 503 | ACC Limited | ACC Limited | 2000 | 92-15 | Metta | 0.1000 | | |
| 504 | ACC Limited | ACC Limited | 2000 | 92-16 | Metta | 0.0200 | | |
| 505 | ACC Limited | ACC Limited | 2000 | 92-1A1A | Metta | 0.0400 | | |
| 506 | ACC Limited | ACC Limited | 2000 | 92-1A2 | Metta | 0.0700 | | |
| 507 | ACC Limited | ACC Limited | 2000 | 92-11 | Metta | 0.0200 | | |
| 508 | ACC Limited | ACC Limited | 2000 | 92-1K2 | Metta | 0.0200 | | |
| 509 | ACC Limited | ACC Limited | 2000 | 92-1G | Metta | 0.0400 | | |
| 510 | ACC Limited | ACC Limited | 2000 | 92-1B1 | Metta | 0.0100 | | |
| 511 | ACC Limited | ACC Limited | 2000 | 92-1C1 | Metta | 0.0100 | | |
| 512 | ACC Limited | ACC Limited | 2000 | 92-1C3 | Metta | 0.0100 | | |
| 513 | ACC Limited | ACC Limited | 2000 | 92-2 | Metta | 0.5900 | | |
| 514 | ACC Limited | ACC Limited | 2000 | 92-3A | Metta | 0.6800 | | |
| 515 | ACC Limited | ACC Limited | 2000 | 92-3b | Metta | 0.6800 | | |
| 516 | ACC Limited | ACC Limited | 2000 | 92-3C | Metta | 0.6700 | | |
| 517 | ACC Limited | ACC Limited | 2000 | 92-4b | Metta | 0.0800 | | |
| 518 | ACC Limited | ACC Limited | 2000 | 92-5A | Metta | 0.3800 | | |
| 519 | ACC Limited | ACC Limited | 2000 | 92-5d | Metta | 0.3800 | | |
| 520 | ACC Limited | ACC Limited | 2000 | 92-5b | Metta | 0.3800 | | |
| 521 | ACC Limited | ACC Limited | 2000 | 92-6E | Metta | 0.0200 | | |
| 522 | ACC Limited | ACC Limited | 2000 | 92-6A | Metta | 0.0100 | purchase | |
| 523 | ACC Limited | ACC Limited | 2000 | 92-6f | Metta | 0.1000 | | |
| 524 | ACC Limited | ACC Limited | 2000 | 92-6J | Metta | 0.1000 | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 525 | ACC Limited | ACC Limited | 2000 | 92-6C1 | Metta | 0.0100 | | |
| 526 | ACC Limited | ACC Limited | 2000 | 92-6C2 | Metta | 0.0100 | | |
| 527 | ACC Limited | ACC Limited | 2000 | 92-8A | Metta | 0.0300 | | |
| 528 | ACC Limited | ACC Limited | 2000 | 92-9G3 | Metta | 0.0100 | | |
| 529 | ACC Limited | ACC Limited | 2000 | 92-9b2 | Metta | 0.0200 | | |
| 530 | ACC Limited | ACC Limited | 2000 | 92-9C1 | Metta | 0.0100 | | |
| 531 | ACC Limited | ACC Limited | 2000 | 9-2A | Metta | 2.1300 | | |
| 532 | ACC Limited | ACC Limited | 2000 | 9-2b | Metta | 1.5000 | | |
| 533 | ACC Limited | ACC Limited | 2000 | 93-1 | Metta | 0.3500 | | |
| 534 | ACC Limited | ACC Limited | 2000 | 93-10A1 | Metta | 0.0300 | | |
| 535 | ACC Limited | ACC Limited | 2000 | 93-10A3a | Metta | 0.0200 | | |
| 536 | ACC Limited | ACC Limited | 2000 | 93-10E1 | Metta | 0.0100 | | |
| 537 | ACC Limited | ACC Limited | 2000 | 93-10G | Metta | 0.0200 | | |
| 538 | ACC Limited | ACC Limited | 2000 | 93-10I | Metta | 0.0400 | | |
| 539 | ACC Limited | ACC Limited | 2000 | 93-10N1 | Metta | 0.0100 | | |
| 540 | ACC Limited | ACC Limited | 2000 | 93-10o | Metta | 0.0400 | purchase | |
| 541 | ACC Limited | ACC Limited | 2000 | 93-10N2 | Metta | 0.0100 | | |
| 542 | ACC Limited | ACC Limited | 2000 | 93-10N3 | Metta | 0.0100 | | |
| 543 | ACC Limited | ACC Limited | 2000 | 93-12 | Metta | 1.2400 | purchase | |
| 544 | ACC Limited | ACC Limited | 2000 | 93-2 | Metta | 3.7300 | | |
| 545 | ACC Limited | ACC Limited | 2000 | 93-3 | Metta | 0.5700 | | |
| 546 | ACC Limited | ACC Limited | 2000 | 93-4 | Metta | 0.6900 | | |
| 547 | ACC Limited | ACC Limited | 2000 | 93-5 | Metta | 0.0500 | | |
| 548 | ACC Limited | ACC Limited | 2000 | 93-6A | Metta | 0.3400 | | |
| 549 | ACC Limited | ACC Limited | 2000 | 93-6b | Metta | 0.5200 | | |
| 550 | ACC Limited | ACC Limited | 2000 | 93-6C | Metta | 0.4000 | | |
| 551 | ACC Limited | ACC Limited | 2000 | 93-7E | Metta | 0.0300 | | |
| 552 | ACC Limited | ACC Limited | 2000 | 93-7C | Metta | 0.0300 | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 553 | ACC Limited | ACC Limited | 2000 | 93-8 | Metta | 0.2500 | | |
| 554 | ACC Limited | ACC Limited | 2000 | 93-9 | Metta | 1.5300 | | |
| 555 | ACC Limited | ACC Limited | 2000 | 94-1A | Metta | 0.9400 | | |
| 556 | ACC Limited | ACC Limited | 2000 | 94-1d | Metta | 0.4100 | | |
| 557 | ACC Limited | ACC Limited | 2000 | 94-1B | Metta | 0.4100 | | |
| 558 | ACC Limited | ACC Limited | 2000 | 94-2 | Metta | 2.3700 | | |
| 559 | ACC Limited | ACC Limited | 2000 | 98 | Metta | 3.5800 | purchase | |

This revenue record is printed from your land website on 09/10/2024 5:47 pm.

The information contained made available through this web site is for information only and cannot be utilized as certified / authenticated copy for producing in any court or for enforcing any legal claims etc. under the existing relevant Acts / Rules framed by the Government of Andhra Pradesh in this context.

Annexure - 5

GOVERNMENT OF ANDHRA PRADESH
FOREST DEPARTMENT

From
Sri S. Ashok Kumar Yadav,
Forest Range Officer,
MUDDANUR.

To
Sri Sanjay Prasad,,
ACC Limited,
Cement House,
121, Maharshi Karve Road,
Mumbai - 400 020.

Rc.No.105/2016 dt. 11.11.2024

Sir,

Sub : Forest Dept. - ACC Integrated Cement Plant and Limestone Mine (ML at District Kadapa (YSR) State - Andhra Pradesh - Reg. - Certificate for No forest land in the proposed area - Reg.

Ref : (1) DFO, YSR (T) Division, Kadapa Rc.No.3064/2024/ A15 dt. 16.09.2024

(2) Tahsildar, Mylavaram Mandal Ref.No.A/170/2024 dt. 24.10.2024

-oOo-

In obedience to the reference 1st cited, I have addressed a letter to the Tahsildar, Mylavaram for obtaining the revenue records applied by the ACC Cement for establishing the ACC Integrated Cement Plant and Lime Stone Mine (ML Area of 997.08 ha) at Gollapalli village of Mylavaram Mandal.

In this connection the Tahsildar, Mylavaram has supplied the duly signed RSR copies for survey numbers to this office and the Tahsildar, Mylavaram has issued a letter that the survey numbers are classified as Patta Lands. As per the Tahsildar, Mylavaram Mandal supplied RSR copies of the proposed Limestone Mine and plant verified and found that ***there is no Forest area falls in the proposed project area i.e. Lime stone and Plant.***

Yours faithfully,

Encl : As Above

Forest Range Officer, 11.11.24
Muddanur.

Copy submitted to the District Forest Officer, YSR (T) Division, Kadapa for favour of information.

Copy submitted to the Sub Divisional Forest Officer, Proddatur for favour of information.

FOREST RANGE OFFICER,
MUDDANUR. 11.11.24

D:\ACC Cements.doc

| Year | Month | Day | Hour | Temperature (°C) | Relative Humidity (%) | Wind Speed (m/sec) | Wind direction |
|---|---|---|---|---|---|---|---|
| 2024 | 3 | 1 | 0 | 26.17 | 35.77 | 4.27 | 320.00 |
| 2024 | 3 | 1 | 1 | 20.45 | 47.94 | 3.11 | 82.72 |
| 2024 | 3 | 1 | 2 | 25.66 | 57.79 | 0.45 | 78.75 |
| 2024 | 3 | 1 | 3 | 19.19 | 34.73 | 4.12 | 90.79 |
| 2024 | 3 | 1 | 4 | 33.92 | 36.43 | 3.18 | 96.34 |
| 2024 | 3 | 1 | 5 | 34.4 | 57.73 | 4.64 | 85.91 |
| 2024 | 3 | 1 | 6 | 42.66 | 49.35 | 2.28 | 96.99 |
| 2024 | 3 | 1 | 7 | 15.9 | 39.41 | 2.2 | 95.30 |
| 2024 | 3 | 1 | 8 | 33.95 | 39.88 | 0.43 | 80.81 |
| 2024 | 3 | 1 | 9 | 42.96 | 44.36 | 0.15 | 85.22 |
| 2024 | 3 | 1 | 10 | 42.08 | 53.43 | 3.9 | 94.41 |
| 2024 | 3 | 1 | 11 | 24.13 | 47.37 | 4.36 | 84.47 |
| 2024 | 3 | 1 | 12 | 18.81 | 29.84 | 1.63 | 358.26 |
| 2024 | 3 | 1 | 13 | 40.25 | 57.49 | 2.01 | 101.05 |
| 2024 | 3 | 1 | 14 | 13.24 | 40.11 | 0.34 | 80.44 |
| 2024 | 3 | 1 | 15 | 41.94 | 55.94 | 3.67 | 320.00 |
| 2024 | 3 | 1 | 16 | 13.25 | 37.3 | 0.29 | 93.84 |
| 2024 | 3 | 1 | 17 | 27.14 | 49.12 | 3.85 | 99.18 |
| 2024 | 3 | 1 | 18 | 41.04 | 52.9 | 0.17 | 91.00 |
| 2024 | 3 | 1 | 19 | 23.65 | 55.44 | 1.96 | 91.50 |
| 2024 | 3 | 1 | 20 | 33.76 | 44.56 | 1.58 | 91.10 |
| 2024 | 3 | 1 | 21 | 24.68 | 43.26 | 1.45 | 80.88 |
| 2024 | 3 | 1 | 22 | 42.75 | 53.2 | 0.87 | 97.43 |
| 2024 | 3 | 1 | 23 | 41.91 | 43.73 | 0.96 | 86.62 |
| 2024 | 3 | 2 | 0 | 41.24 | 58.48 | 4.54 | 100.41 |
| 2024 | 3 | 2 | 1 | 38.46 | 49.68 | 4.44 | 88.54 |
| 2024 | 3 | 2 | 2 | 15.36 | 35.61 | 0.94 | 85.91 |
| 2024 | 3 | 2 | 3 | 17.65 | 27.79 | 0.18 | 79.90 |
| 2024 | 3 | 2 | 4 | 20.51 | 33.38 | 4.55 | 81.54 |
| 2024 | 3 | 2 | 5 | 24.76 | 39.62 | 0.85 | 320.00 |
| 2024 | 3 | 2 | 6 | 30.49 | 39.21 | 0.36 | 83.71 |
| 2024 | 3 | 2 | 7 | 11.77 | 60.15 | 3.71 | 99.52 |
| 2024 | 3 | 2 | 8 | 41.91 | 54.54 | 3.76 | 56.16 |
| 2024 | 3 | 2 | 9 | 27.72 | 51.9 | 1.04 | 98.49 |
| 2024 | 3 | 2 | 10 | 26.67 | 33.99 | 0.43 | 86.98 |
| 2024 | 3 | 2 | 11 | 15.34 | 47.73 | 3.54 | 83.43 |
| 2024 | 3 | 2 | 12 | 39.83 | 32.41 | 2.67 | 91.85 |
| 2024 | 3 | 2 | 13 | 23.34 | 32.02 | 2.86 | 98.21 |
| 2024 | 3 | 2 | 14 | 29.24 | 53.66 | 3.53 | 90.09 |
| 2024 | 3 | 2 | 15 | 34.29 | 36.76 | 2.06 | 83.91 |
| 2024 | 3 | 2 | 16 | 34.81 | 31.86 | 1.32 | 83.48 |
| 2024 | 3 | 2 | 17 | 42.78 | 38.53 | 1.64 | 181.24 |
| 2024 | 3 | 2 | 18 | 33.12 | 44.23 | 4.55 | 189.20 |
| 2024 | 3 | 2 | 19 | 24.67 | 36.29 | 3.76 | 168.85 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2024 | 3 | 2 | 20 | 19.02 | 40.12 | 3.06 | 169.98 |
| 2024 | 3 | 2 | 21 | 13.47 | 51.13 | 1.71 | 174.65 |
| 2024 | 3 | 2 | 22 | 20.77 | 32.09 | 1.42 | 183.25 |
| 2024 | 3 | 2 | 23 | 30.43 | 41.47 | 2.2 | 179.17 |
| 2024 | 3 | 3 | 0 | 18.44 | 41.87 | 0.82 | 168.79 |
| 2024 | 3 | 3 | 1 | 11.95 | 59.99 | 1.74 | 172.89 |
| 2024 | 3 | 3 | 2 | 32.2 | 52.41 | 1.86 | 180.43 |
| 2024 | 3 | 3 | 3 | 38.21 | 47.58 | 3.83 | 169.10 |
| 2024 | 3 | 3 | 4 | 31.85 | 58.46 | 4.93 | 187.93 |
| 2024 | 3 | 3 | 5 | 28.55 | 60.77 | 2.97 | 190.58 |
| 2024 | 3 | 3 | 6 | 34.27 | 37.8 | 0.51 | 180.03 |
| 2024 | 3 | 3 | 7 | 28.84 | 43.23 | 4.29 | 181.28 |
| 2024 | 3 | 3 | 8 | 13.53 | 27.18 | 4.01 | 170.53 |
| 2024 | 3 | 3 | 9 | 11.58 | 40.22 | 2.61 | 184.70 |
| 2024 | 3 | 3 | 10 | 18.9 | 59.98 | 1.55 | 189.39 |
| 2024 | 3 | 3 | 11 | 42.74 | 35.14 | 3.62 | 174.02 |
| 2024 | 3 | 3 | 12 | 12.4 | 28.99 | 3.67 | 184.29 |
| 2024 | 3 | 3 | 13 | 27.95 | 59.63 | 1.85 | 187.77 |
| 2024 | 3 | 3 | 14 | 31.23 | 47.56 | 1.67 | 182.41 |
| 2024 | 3 | 3 | 15 | 41.89 | 47.34 | 3.31 | 349.12 |
| 2024 | 3 | 3 | 16 | 41.07 | 51.63 | 2.01 | 190.82 |
| 2024 | 3 | 3 | 17 | 25.03 | 55.26 | 4.14 | 182.47 |
| 2024 | 3 | 3 | 18 | 22.03 | 29.6 | 1.19 | 181.10 |
| 2024 | 3 | 3 | 19 | 27.14 | 30.46 | 4.38 | 179.02 |
| 2024 | 3 | 3 | 20 | 25.84 | 27.82 | 1.11 | 186.83 |
| 2024 | 3 | 3 | 21 | 19.8 | 30.41 | 0.54 | 173.11 |
| 2024 | 3 | 3 | 22 | 15.52 | 42.82 | 2.58 | 178.11 |
| 2024 | 3 | 3 | 23 | 27.01 | 40.5 | 1.54 | 320.00 |
| 2024 | 3 | 4 | 0 | 41.12 | 56.92 | 1.61 | 191.23 |
| 2024 | 3 | 4 | 1 | 39.24 | 41.35 | 4.75 | 186.43 |
| 2024 | 3 | 4 | 2 | 13.43 | 57.35 | 0.87 | 183.19 |
| 2024 | 3 | 4 | 3 | 42.22 | 37.33 | 3.29 | 184.00 |
| 2024 | 3 | 4 | 4 | 36.78 | 36.69 | 1.38 | 178.33 |
| 2024 | 3 | 4 | 5 | 28.73 | 43.57 | 4.99 | 182.68 |
| 2024 | 3 | 4 | 6 | 34.88 | 44.44 | 4.16 | 182.23 |
| 2024 | 3 | 4 | 7 | 38.28 | 34.67 | 0.11 | 184.95 |
| 2024 | 3 | 4 | 8 | 29.47 | 48.63 | 2.93 | 179.08 |
| 2024 | 3 | 4 | 9 | 22.77 | 50.71 | 4.71 | 188.49 |
| 2024 | 3 | 4 | 10 | 42.94 | 40.81 | 4.09 | 170.74 |
| 2024 | 3 | 4 | 11 | 22.26 | 46.72 | 4.37 | 177.62 |
| 2024 | 3 | 4 | 12 | 39.63 | 56.57 | 2.75 | 175.78 |
| 2024 | 3 | 4 | 13 | 16.11 | 57.62 | 2.15 | 188.83 |
| 2024 | 3 | 4 | 14 | 19.94 | 38.44 | 0.37 | 348.78 |
| 2024 | 3 | 4 | 15 | 35.34 | 41.92 | 0.85 | 184.96 |
| 2024 | 3 | 4 | 16 | 14.09 | 57.81 | 2.26 | 170.98 |
| 2024 | 3 | 4 | 17 | 36.73 | 31.57 | 0.86 | 181.78 |
| 2024 | 3 | 4 | 18 | 40.44 | 59.95 | 1.21 | 350.57 |

| 2024 | 3 | 4 | 19 | 20.67 | 55.02 | 0.96 | 355.34 |
|---|---|---|---|---|---|---|---|
| 2024 | 3 | 4 | 20 | 33.41 | 45.18 | 0.71 | 353.08 |
| 2024 | 3 | 4 | 21 | 39.9 | 42.76 | 1.47 | 182.10 |
| 2024 | 3 | 4 | 22 | 31.35 | 37.37 | 2.42 | 170.29 |
| 2024 | 3 | 4 | 23 | 41.61 | 40.89 | 1.26 | 179.58 |
| 2024 | 3 | 5 | 0 | 18.24 | 36.36 | 3.29 | 177.20 |
| 2024 | 3 | 5 | 1 | 20.01 | 47.74 | 4.11 | 189.07 |
| 2024 | 3 | 5 | 2 | 42.42 | 36.19 | 4.12 | 97.66 |
| 2024 | 3 | 5 | 3 | 13.64 | 54.84 | 4.95 | 348.69 |
| 2024 | 3 | 5 | 4 | 35.82 | 59.1 | 2.84 | 351.04 |
| 2024 | 3 | 5 | 5 | 21.5 | 29.54 | 3.36 | 351.03 |
| 2024 | 3 | 5 | 6 | 31.56 | 37.45 | 0.97 | 78.79 |
| 2024 | 3 | 5 | 7 | 16.22 | 50.36 | 2.81 | 90.27 |
| 2024 | 3 | 5 | 8 | 14.88 | 38.11 | 4.88 | 353.34 |
| 2024 | 3 | 5 | 9 | 17.69 | 40.77 | 1.66 | 91.57 |
| 2024 | 3 | 5 | 10 | 22.27 | 51.65 | 3.85 | 83.27 |
| 2024 | 3 | 5 | 11 | 13.48 | 39.8 | 0.43 | 350.34 |
| 2024 | 3 | 5 | 12 | 32.77 | 58.67 | 1.72 | 83.26 |
| 2024 | 3 | 5 | 13 | 11.98 | 57.57 | 4.99 | 98.76 |
| 2024 | 3 | 5 | 14 | 36.05 | 44.52 | 4 | 96.45 |
| 2024 | 3 | 5 | 15 | 22.39 | 50.81 | 2.95 | 94.40 |
| 2024 | 3 | 5 | 16 | 18.95 | 31.63 | 0.81 | 83.57 |
| 2024 | 3 | 5 | 17 | 29.73 | 50.06 | 4.86 | 95.45 |
| 2024 | 3 | 5 | 18 | 25.85 | 32.08 | 4.78 | 87.36 |
| 2024 | 3 | 5 | 19 | 28.99 | 51.63 | 1.97 | 92.93 |
| 2024 | 3 | 5 | 20 | 28.36 | 34.83 | 0.92 | 96.62 |
| 2024 | 3 | 5 | 21 | 24.93 | 34.68 | 4.85 | 90.38 |
| 2024 | 3 | 5 | 22 | 23.94 | 45.28 | 1.36 | 99.73 |
| 2024 | 3 | 5 | 23 | 19.64 | 31.83 | 3 | 89.80 |
| 2024 | 3 | 6 | 0 | 26.3 | 34.58 | 2 | 33.26 |
| 2024 | 3 | 6 | 1 | 15.58 | 40.4 | 4.06 | 85.99 |
| 2024 | 3 | 6 | 2 | 17.78 | 49.69 | 1.95 | 92.62 |
| 2024 | 3 | 6 | 3 | 31.79 | 32.62 | 0.65 | 85.03 |
| 2024 | 3 | 6 | 4 | 22.56 | 29.53 | 1.97 | 88.64 |
| 2024 | 3 | 6 | 5 | 32.14 | 47.4 | 4.48 | 102.61 |
| 2024 | 3 | 6 | 6 | 38.01 | 52 | 4.56 | 115.01 |
| 2024 | 3 | 6 | 7 | 26.38 | 51.34 | 0.73 | 264.58 |
| 2024 | 3 | 6 | 8 | 12.93 | 38.69 | 3.96 | 121.08 |
| 2024 | 3 | 6 | 9 | 34.42 | 49.27 | 3.29 | 83.08 |
| 2024 | 3 | 6 | 10 | 18.85 | 59.38 | 2.84 | 265.98 |
| 2024 | 3 | 6 | 11 | 23.19 | 57.92 | 3.77 | 90.02 |
| 2024 | 3 | 6 | 12 | 27.17 | 52.1 | 2.86 | 90.56 |
| 2024 | 3 | 6 | 13 | 27.69 | 46.41 | 3.15 | 279.16 |
| 2024 | 3 | 6 | 14 | 28.19 | 38.04 | 2.02 | 85.15 |
| 2024 | 3 | 6 | 15 | 25.65 | 42.29 | 1.38 | 88.83 |
| 2024 | 3 | 6 | 16 | 20.13 | 31.17 | 3.02 | 79.72 |
| 2024 | 3 | 6 | 17 | 27.78 | 30.51 | 2.31 | 259.15 |

| 2024 | 3 | 6 | 18 | 20.47 | 27.3 | 3.16 | 90.07 |
|---|---|---|---|---|---|---|---|
| 2024 | 3 | 6 | 19 | 18.94 | 30.81 | 1.09 | 84.41 |
| 2024 | 3 | 6 | 20 | 14.12 | 45.38 | 2.14 | 97.23 |
| 2024 | 3 | 6 | 21 | 12.77 | 40.1 | 2.23 | 99.51 |
| 2024 | 3 | 6 | 22 | 42.55 | 35.71 | 2.03 | 91.51 |
| 2024 | 3 | 6 | 23 | 38.75 | 51.46 | 1.09 | 78.76 |
| 2024 | 3 | 7 | 0 | 31.18 | 55.77 | 4.41 | 94.49 |
| 2024 | 3 | 7 | 1 | 20.87 | 50.65 | 0.5 | 82.12 |
| 2024 | 3 | 7 | 2 | 40.06 | 48.93 | 0.52 | 91.58 |
| 2024 | 3 | 7 | 3 | 13.78 | 35.64 | 0.66 | 33.94 |
| 2024 | 3 | 7 | 4 | 23.61 | 49.1 | 1.96 | 86.88 |
| 2024 | 3 | 7 | 5 | 40.61 | 36.4 | 4.55 | 90.30 |
| 2024 | 3 | 7 | 6 | 34.04 | 56.04 | 3.32 | 79.24 |
| 2024 | 3 | 7 | 7 | 38.65 | 55.75 | 0.55 | 97.46 |
| 2024 | 3 | 7 | 8 | 28.79 | 38.52 | 2.93 | 84.73 |
| 2024 | 3 | 7 | 9 | 40.19 | 36.67 | 1.58 | 89.56 |
| 2024 | 3 | 7 | 10 | 26.4 | 43.72 | 1.33 | 81.09 |
| 2024 | 3 | 7 | 11 | 38.18 | 31.4 | 2.09 | 91.35 |
| 2024 | 3 | 7 | 12 | 26.1 | 32.67 | 3.88 | 87.39 |
| 2024 | 3 | 7 | 13 | 38.29 | 60.84 | 1.88 | 92.41 |
| 2024 | 3 | 7 | 14 | 11.48 | 34.51 | 3.6 | 85.45 |
| 2024 | 3 | 7 | 15 | 33.6 | 41.14 | 2.79 | 88.51 |
| 2024 | 3 | 7 | 16 | 30.51 | 32.06 | 2.36 | 320.00 |
| 2024 | 3 | 7 | 17 | 34.5 | 42.53 | 4.17 | 95.65 |
| 2024 | 3 | 7 | 18 | 38.5 | 34.86 | 2.49 | 128.41 |
| 2024 | 3 | 7 | 19 | 33.05 | 27.07 | 1.73 | 142.95 |
| 2024 | 3 | 7 | 20 | 18.94 | 33.16 | 2.21 | 131.24 |
| 2024 | 3 | 7 | 21 | 17.25 | 58.75 | 4.57 | 0.78 |
| 2024 | 3 | 7 | 22 | 17.28 | 35.4 | 0.37 | 141.37 |
| 2024 | 3 | 7 | 23 | 33.34 | 50.37 | 3.63 | 137.94 |
| 2024 | 3 | 8 | 0 | 21.95 | 45.55 | 4.04 | 137.29 |
| 2024 | 3 | 8 | 1 | 18.64 | 51.64 | 4.08 | 135.46 |
| 2024 | 3 | 8 | 2 | 28.01 | 53.31 | 2.25 | 136.13 |
| 2024 | 3 | 8 | 3 | 24.58 | 39.94 | 1.18 | 33.65 |
| 2024 | 3 | 8 | 4 | 31.63 | 56.99 | 1.8 | 133.65 |
| 2024 | 3 | 8 | 5 | 41.45 | 33.36 | 1.94 | 79.27 |
| 2024 | 3 | 8 | 6 | 20.52 | 34.09 | 4.71 | 128.55 |
| 2024 | 3 | 8 | 7 | 38.13 | 53.43 | 3.23 | 143.15 |
| 2024 | 3 | 8 | 8 | 29.71 | 55.69 | 4.43 | 129.75 |
| 2024 | 3 | 8 | 9 | 19.23 | 27.99 | 3.42 | 0.24 |
| 2024 | 3 | 8 | 10 | 34.46 | 46.74 | 1.07 | 144.97 |
| 2024 | 3 | 8 | 11 | 12.95 | 46.95 | 4.56 | 33.65 |
| 2024 | 3 | 8 | 12 | 41.92 | 49.1 | 2.51 | 145.29 |
| 2024 | 3 | 8 | 13 | 14.71 | 28.26 | 3.92 | 236.00 |
| 2024 | 3 | 8 | 14 | 29.78 | 58.7 | 0.38 | 137.71 |
| 2024 | 3 | 8 | 15 | 27.92 | 56.52 | 3.67 | 144.62 |
| 2024 | 3 | 8 | 16 | 25.48 | 28.56 | 2.39 | 0.29 |

| 2024 | 3 | 8 | 17 | 12.6 | 35.9 | 4.81 | 142.21 |
|---|---|---|---|---|---|---|---|
| 2024 | 3 | 8 | 18 | 19.94 | 39.99 | 4.85 | 128.26 |
| 2024 | 3 | 8 | 19 | 29.44 | 46.99 | 3.83 | 143.98 |
| 2024 | 3 | 8 | 20 | 14.64 | 29.62 | 4.31 | 135.23 |
| 2024 | 3 | 8 | 21 | 15.22 | 51.3 | 2.54 | 0.21 |
| 2024 | 3 | 8 | 22 | 26.76 | 51.04 | 2.6 | 95.55 |
| 2024 | 3 | 8 | 23 | 27.97 | 43.78 | 2.77 | 138.96 |
| 2024 | 3 | 9 | 0 | 25.42 | 55.52 | 4.86 | 132.37 |
| 2024 | 3 | 9 | 1 | 11.84 | 47.01 | 0.31 | 236.15 |
| 2024 | 3 | 9 | 2 | 28.21 | 27.01 | 3.24 | 127.39 |
| 2024 | 3 | 9 | 3 | 35.43 | 46.93 | 3.01 | 139.36 |
| 2024 | 3 | 9 | 4 | 26.11 | 33.92 | 3.63 | 135.87 |
| 2024 | 3 | 9 | 5 | 27.21 | 38.16 | 2.77 | 130.08 |
| 2024 | 3 | 9 | 6 | 11.41 | 43.04 | 1.19 | 131.54 |
| 2024 | 3 | 9 | 7 | 40.01 | 41.83 | 3.84 | 127.22 |
| 2024 | 3 | 9 | 8 | 28.64 | 38.21 | 4.15 | 131.81 |
| 2024 | 3 | 9 | 9 | 41.07 | 37.01 | 0.29 | 0.35 |
| 2024 | 3 | 9 | 10 | 14.63 | 55.69 | 3.25 | 142.21 |
| 2024 | 3 | 9 | 11 | 42.11 | 34.7 | 4.02 | 126.48 |
| 2024 | 3 | 9 | 12 | 37.92 | 45.63 | 3.76 | 143.75 |
| 2024 | 3 | 9 | 13 | 12.9 | 53.96 | 3.47 | 135.67 |
| 2024 | 3 | 9 | 14 | 17.82 | 31.21 | 1.94 | 33.52 |
| 2024 | 3 | 9 | 15 | 19.74 | 39.33 | 2.44 | 125.24 |
| 2024 | 3 | 9 | 16 | 34.91 | 59.62 | 4.52 | 0.68 |
| 2024 | 3 | 9 | 17 | 41.14 | 43.71 | 1.08 | 142.34 |
| 2024 | 3 | 9 | 18 | 42.37 | 44.22 | 2.58 | 138.72 |
| 2024 | 3 | 9 | 19 | 41.5 | 45.23 | 0.2 | 132.09 |
| 2024 | 3 | 9 | 20 | 11.49 | 60.14 | 3.03 | 134.05 |
| 2024 | 3 | 9 | 21 | 15.39 | 51.28 | 3.08 | 127.63 |
| 2024 | 3 | 9 | 22 | 31.92 | 60.39 | 3.39 | 143.54 |
| 2024 | 3 | 9 | 23 | 28.8 | 47.9 | 2.12 | 320.00 |
| 2024 | 3 | 10 | 0 | 37.53 | 49.21 | 2.59 | 97.33 |
| 2024 | 3 | 10 | 1 | 28.63 | 27.65 | 1.88 | 277.34 |
| 2024 | 3 | 10 | 2 | 12.3 | 51.78 | 3.45 | 87.90 |
| 2024 | 3 | 10 | 3 | 16.45 | 55.53 | 4.34 | 94.41 |
| 2024 | 3 | 10 | 4 | 18.16 | 60.63 | 4.83 | 276.14 |
| 2024 | 3 | 10 | 5 | 25.82 | 43 | 4.48 | 102.04 |
| 2024 | 3 | 10 | 6 | 41.78 | 51.86 | 4.91 | 84.64 |
| 2024 | 3 | 10 | 7 | 35.19 | 30.63 | 3.38 | 93.07 |
| 2024 | 3 | 10 | 8 | 42.36 | 35.14 | 4.24 | 138.85 |
| 2024 | 3 | 10 | 9 | 21.16 | 34.66 | 3.99 | 97.63 |
| 2024 | 3 | 10 | 10 | 22.1 | 49.2 | 3.21 | 99.32 |
| 2024 | 3 | 10 | 11 | 38.04 | 60.59 | 0.52 | 0.78 |
| 2024 | 3 | 10 | 12 | 35.24 | 37.77 | 2.83 | 349.96 |
| 2024 | 3 | 10 | 13 | 22.89 | 48.88 | 0.52 | 83.52 |
| 2024 | 3 | 10 | 14 | 21.63 | 45.82 | 1.34 | 354.77 |
| 2024 | 3 | 10 | 15 | 19.36 | 44.11 | 4.96 | 135.96 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2024 | 3 | 10 | 16 | 30.88 | 30.18 | 1.16 | 143.82 |
| 2024 | 3 | 10 | 17 | 24.03 | 59.93 | 0.56 | 142.08 |
| 2024 | 3 | 10 | 18 | 22.69 | 53.94 | 3.11 | 82.35 |
| 2024 | 3 | 10 | 19 | 22.8 | 46.62 | 2.62 | 80.43 |
| 2024 | 3 | 10 | 20 | 29.86 | 39.08 | 4.58 | 101.25 |
| 2024 | 3 | 10 | 21 | 22.27 | 54.2 | 1.15 | 269.47 |
| 2024 | 3 | 10 | 22 | 25.05 | 30.36 | 3.5 | 140.57 |
| 2024 | 3 | 10 | 23 | 37.16 | 41.12 | 2.98 | 127.01 |
| 2024 | 3 | 11 | 0 | 22.95 | 46.13 | 1.79 | 144.85 |
| 2024 | 3 | 11 | 1 | 34.19 | 59.9 | 3.09 | 94.88 |
| 2024 | 3 | 11 | 2 | 20.84 | 44.01 | 1.14 | 87.37 |
| 2024 | 3 | 11 | 3 | 16.58 | 52.04 | 3.53 | 79.41 |
| 2024 | 3 | 11 | 4 | 35.69 | 29.54 | 2.28 | 85.81 |
| 2024 | 3 | 11 | 5 | 13.66 | 30.67 | 3.6 | 89.45 |
| 2024 | 3 | 11 | 6 | 29.28 | 38.19 | 0.36 | 88.71 |
| 2024 | 3 | 11 | 7 | 31.03 | 54.93 | 4.46 | 88.89 |
| 2024 | 3 | 11 | 8 | 30.71 | 43.64 | 3.7 | 78.81 |
| 2024 | 3 | 11 | 9 | 31.89 | 56.78 | 3.84 | 350.89 |
| 2024 | 3 | 11 | 10 | 16.44 | 47.06 | 3.38 | 94.77 |
| 2024 | 3 | 11 | 11 | 23.73 | 57.09 | 4.15 | 81.11 |
| 2024 | 3 | 11 | 12 | 32.96 | 30.47 | 4.03 | 94.98 |
| 2024 | 3 | 11 | 13 | 31.31 | 43.68 | 4.13 | 280.83 |
| 2024 | 3 | 11 | 14 | 26.33 | 40.87 | 2.74 | 80.06 |
| 2024 | 3 | 11 | 15 | 33.07 | 49.37 | 0.21 | 87.82 |
| 2024 | 3 | 11 | 16 | 26.85 | 59.32 | 3.29 | 86.09 |
| 2024 | 3 | 11 | 17 | 16.83 | 30.41 | 1.6 | 351.50 |
| 2024 | 3 | 11 | 18 | 26.27 | 56.03 | 1.28 | 359.70 |
| 2024 | 3 | 11 | 19 | 27.04 | 41.78 | 1.93 | 138.80 |
| 2024 | 3 | 11 | 20 | 15.13 | 53.59 | 2.57 | 139.09 |
| 2024 | 3 | 11 | 21 | 17.15 | 33.82 | 3.98 | 143.95 |
| 2024 | 3 | 11 | 22 | 41.01 | 46.53 | 4.56 | 145.29 |
| 2024 | 3 | 11 | 23 | 27.88 | 48.85 | 4.01 | 348.69 |
| 2024 | 3 | 12 | 0 | 34.05 | 50.19 | 4.24 | 82.73 |
| 2024 | 3 | 12 | 1 | 40.29 | 45.88 | 1.21 | 90.25 |
| 2024 | 3 | 12 | 2 | 33.59 | 47.74 | 4.74 | 98.87 |
| 2024 | 3 | 12 | 3 | 41.25 | 51.25 | 1.52 | 269.49 |
| 2024 | 3 | 12 | 4 | 13.41 | 45.92 | 2.9 | 267.85 |
| 2024 | 3 | 12 | 5 | 21.88 | 55.91 | 3.27 | 89.41 |
| 2024 | 3 | 12 | 6 | 40.73 | 37.57 | 0.4 | 98.64 |
| 2024 | 3 | 12 | 7 | 38.22 | 57.99 | 2.5 | 90.80 |
| 2024 | 3 | 12 | 8 | 36.95 | 54.61 | 3.44 | 93.52 |
| 2024 | 3 | 12 | 9 | 36.1 | 56.7 | 0.76 | 79.90 |
| 2024 | 3 | 12 | 10 | 27.78 | 49 | 1.34 | 88.50 |
| 2024 | 3 | 12 | 11 | 31.31 | 41.46 | 2.68 | 82.75 |
| 2024 | 3 | 12 | 12 | 12.39 | 34.71 | 3.84 | 79.78 |
| 2024 | 3 | 12 | 13 | 24.35 | 41.33 | 2.9 | 78.83 |
| 2024 | 3 | 12 | 14 | 39.23 | 31.71 | 1.6 | 82.60 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2024 | 3 | 12 | 15 | 17.24 | 45.93 | 0.84 | 79.86 |
| 2024 | 3 | 12 | 16 | 32.26 | 34.62 | 2.44 | 90.92 |
| 2024 | 3 | 12 | 17 | 42.01 | 43.13 | 4.55 | 81.05 |
| 2024 | 3 | 12 | 18 | 38.31 | 49.69 | 3.11 | 136.43 |
| 2024 | 3 | 12 | 19 | 19.98 | 58.27 | 0.71 | 79.82 |
| 2024 | 3 | 12 | 20 | 35.85 | 49.74 | 2.43 | 90.20 |
| 2024 | 3 | 12 | 21 | 39.19 | 27.98 | 2.3 | 83.41 |
| 2024 | 3 | 12 | 22 | 18.08 | 34.34 | 3.4 | 83.82 |
| 2024 | 3 | 12 | 23 | 36.45 | 55.45 | 1.58 | 100.19 |
| 2024 | 3 | 13 | 0 | 12.93 | 48.25 | 2.24 | 320.00 |
| 2024 | 3 | 13 | 1 | 15.11 | 49.51 | 1.51 | 96.88 |
| 2024 | 3 | 13 | 2 | 29.99 | 28.88 | 2.72 | 124.25 |
| 2024 | 3 | 13 | 3 | 19.31 | 34.78 | 3.58 | 97.02 |
| 2024 | 3 | 13 | 4 | 15.05 | 33.85 | 2.62 | 266.22 |
| 2024 | 3 | 13 | 5 | 30.69 | 39.1 | 4.67 | 277.99 |
| 2024 | 3 | 13 | 6 | 15.59 | 38.95 | 4.61 | 91.11 |
| 2024 | 3 | 13 | 7 | 17.61 | 41.11 | 4.25 | 97.27 |
| 2024 | 3 | 13 | 8 | 34.66 | 34.18 | 4.9 | 277.67 |
| 2024 | 3 | 13 | 9 | 13.74 | 57.32 | 3.74 | 87.84 |
| 2024 | 3 | 13 | 10 | 42.8 | 31.57 | 0.19 | 95.76 |
| 2024 | 3 | 13 | 11 | 32.33 | 38.95 | 1.35 | 79.65 |
| 2024 | 3 | 13 | 12 | 30.04 | 45.59 | 1.06 | 89.27 |
| 2024 | 3 | 13 | 13 | 33.19 | 56.49 | 2.42 | 349.61 |
| 2024 | 3 | 13 | 14 | 13.1 | 31.57 | 1 | 351.43 |
| 2024 | 3 | 13 | 15 | 26.33 | 45.45 | 2.49 | 352.97 |
| 2024 | 3 | 13 | 16 | 28.54 | 36.17 | 4.65 | 356.16 |
| 2024 | 3 | 13 | 17 | 33.3 | 40.58 | 1.75 | 126.26 |
| 2024 | 3 | 13 | 18 | 33.93 | 44.58 | 2.89 | 84.36 |
| 2024 | 3 | 13 | 19 | 12.94 | 33.09 | 1.63 | 94.33 |
| 2024 | 3 | 13 | 20 | 26.77 | 41.35 | 3.43 | 132.67 |
| 2024 | 3 | 13 | 21 | 30.55 | 51 | 4.79 | 82.39 |
| 2024 | 3 | 13 | 22 | 12.57 | 49.06 | 3.43 | 86.36 |
| 2024 | 3 | 13 | 23 | 26.75 | 45.36 | 2.32 | 111.92 |
| 2024 | 3 | 14 | 0 | 22.19 | 58.34 | 1.19 | 264.24 |
| 2024 | 3 | 14 | 1 | 33.76 | 52.37 | 3.21 | 98.42 |
| 2024 | 3 | 14 | 2 | 27.13 | 38.14 | 4.31 | 99.90 |
| 2024 | 3 | 14 | 3 | 36.27 | 59.42 | 1.33 | 262.78 |
| 2024 | 3 | 14 | 4 | 14.55 | 36.1 | 0.42 | 80.02 |
| 2024 | 3 | 14 | 5 | 32.77 | 27.47 | 3.82 | 85.30 |
| 2024 | 3 | 14 | 6 | 40.56 | 48.22 | 4.22 | 90.34 |
| 2024 | 3 | 14 | 7 | 40.41 | 31.86 | 3.28 | 270.72 |
| 2024 | 3 | 14 | 8 | 30.5 | 39.38 | 3.22 | 259.47 |
| 2024 | 3 | 14 | 9 | 15.33 | 27.34 | 2.12 | 98.40 |
| 2024 | 3 | 14 | 10 | 39.2 | 50.42 | 0.47 | 144.59 |
| 2024 | 3 | 14 | 11 | 20.72 | 39.66 | 0.26 | 349.12 |
| 2024 | 3 | 14 | 12 | 12.52 | 38.68 | 4.52 | 348.78 |
| 2024 | 3 | 14 | 13 | 22.41 | 28.84 | 0.79 | 350.34 |

| 2024 | 3 | 14 | 14 | 26.29 | 28.29 | 0.33 | 84.66 |
|---|---|---|---|---|---|---|---|
| 2024 | 3 | 14 | 15 | 13.58 | 55.02 | 4.12 | 83.51 |
| 2024 | 3 | 14 | 16 | 24.37 | 41.05 | 0.5 | 96.61 |
| 2024 | 3 | 14 | 17 | 13.77 | 59.48 | 1.26 | 352.52 |
| 2024 | 3 | 14 | 18 | 37.71 | 55.2 | 1.13 | 128.59 |
| 2024 | 3 | 14 | 19 | 39.63 | 39.48 | 1.13 | 89.98 |
| 2024 | 3 | 14 | 20 | 14.27 | 35.15 | 0.27 | 79.44 |
| 2024 | 3 | 14 | 21 | 23.53 | 52.39 | 0.29 | 98.41 |
| 2024 | 3 | 14 | 22 | 24.6 | 54.37 | 4.48 | 85.98 |
| 2024 | 3 | 14 | 23 | 21.97 | 33.47 | 2.36 | 135.44 |
| 2024 | 3 | 15 | 0 | 30.79 | 49.82 | 3.81 | 126.70 |
| 2024 | 3 | 15 | 1 | 28.54 | 43.71 | 1.62 | 79.39 |
| 2024 | 3 | 15 | 2 | 32.44 | 58.05 | 4.03 | 89.60 |
| 2024 | 3 | 15 | 3 | 38.41 | 52.83 | 0.31 | 79.45 |
| 2024 | 3 | 15 | 4 | 21.34 | 31.67 | 3.06 | 96.19 |
| 2024 | 3 | 15 | 5 | 29.03 | 58.55 | 4.27 | 90.36 |
| 2024 | 3 | 15 | 6 | 14.36 | 31.43 | 2.63 | 97.44 |
| 2024 | 3 | 15 | 7 | 21.37 | 39.42 | 1.03 | 96.44 |
| 2024 | 3 | 15 | 8 | 27.83 | 42.63 | 0.23 | 91.56 |
| 2024 | 3 | 15 | 9 | 29.05 | 41.02 | 3.85 | 91.17 |
| 2024 | 3 | 15 | 10 | 40.82 | 53.1 | 2.05 | 93.91 |
| 2024 | 3 | 15 | 11 | 41.51 | 34.91 | 2.93 | 89.54 |
| 2024 | 3 | 15 | 12 | 27.97 | 58.61 | 3.72 | 82.11 |
| 2024 | 3 | 15 | 13 | 21.85 | 55.79 | 0.68 | 101.07 |
| 2024 | 3 | 15 | 14 | 33.45 | 54.41 | 4.3 | 82.58 |
| 2024 | 3 | 15 | 15 | 41.86 | 44.76 | 2.85 | 97.61 |
| 2024 | 3 | 15 | 16 | 35.49 | 48.24 | 1.12 | 91.35 |
| 2024 | 3 | 15 | 17 | 35.12 | 38.68 | 2.31 | 348.45 |
| 2024 | 3 | 15 | 18 | 32.76 | 41.55 | 1.26 | 352.22 |
| 2024 | 3 | 15 | 19 | 18.05 | 36.51 | 1.71 | 352.53 |
| 2024 | 3 | 15 | 20 | 28.05 | 50.28 | 4.25 | 349.17 |
| 2024 | 3 | 15 | 21 | 14.95 | 31.25 | 2.2 | 86.79 |
| 2024 | 3 | 15 | 22 | 11.87 | 54.08 | 3.92 | 81.09 |
| 2024 | 3 | 15 | 23 | 14.82 | 27.89 | 1.58 | 89.22 |
| 2024 | 3 | 16 | 0 | 37.11 | 41.92 | 0.51 | 95.23 |
| 2024 | 3 | 16 | 1 | 17.7 | 59.5 | 4.54 | 98.30 |
| 2024 | 3 | 16 | 2 | 37.29 | 53.71 | 2.7 | 95.43 |
| 2024 | 3 | 16 | 3 | 33.33 | 35.86 | 4.99 | 90.76 |
| 2024 | 3 | 16 | 4 | 16.72 | 59.38 | 2.25 | 101.00 |
| 2024 | 3 | 16 | 5 | 21.7 | 31.85 | 3.56 | 92.20 |
| 2024 | 3 | 16 | 6 | 40.48 | 28.12 | 4.97 | 87.35 |
| 2024 | 3 | 16 | 7 | 36.06 | 55.26 | 4.08 | 320.00 |
| 2024 | 3 | 16 | 8 | 14.88 | 41.57 | 2.57 | 320.00 |
| 2024 | 3 | 16 | 9 | 29.11 | 43.78 | 2.06 | 320.00 |
| 2024 | 3 | 16 | 10 | 30.67 | 52.91 | 0.64 | 320.00 |
| 2024 | 3 | 16 | 11 | 16.13 | 29.02 | 0.44 | 320.00 |
| 2024 | 3 | 16 | 12 | 12.39 | 32.52 | 0.71 | 320.00 |

| 2024 | 3 | 16 | 13 | 24.79 | 39.54 | 0.91 | 320.00 |
|---|---|---|---|---|---|---|---|
| 2024 | 3 | 16 | 14 | 22.63 | 45.07 | 3.05 | 320.00 |
| 2024 | 3 | 16 | 15 | 41.56 | 52.08 | 4.09 | 320.00 |
| 2024 | 3 | 16 | 16 | 31.48 | 29.99 | 4.86 | 320.00 |
| 2024 | 3 | 16 | 17 | 29.42 | 49.39 | 1.31 | 320.00 |
| 2024 | 3 | 16 | 18 | 13.75 | 51.17 | 3.19 | 320.00 |
| 2024 | 3 | 16 | 19 | 13.74 | 50.44 | 2.36 | 320.00 |
| 2024 | 3 | 16 | 20 | 22.42 | 34.89 | 3.83 | 95.22 |
| 2024 | 3 | 16 | 21 | 27.83 | 56.71 | 0.52 | 93.88 |
| 2024 | 3 | 16 | 22 | 28.67 | 37.09 | 3.1 | 99.26 |
| 2024 | 3 | 16 | 23 | 16.46 | 42.15 | 4.56 | 92.86 |
| 2024 | 3 | 17 | 0 | 21.22 | 52.49 | 3.26 | 131.65 |
| 2024 | 3 | 17 | 1 | 32.47 | 53 | 3.44 | 349.12 |
| 2024 | 3 | 17 | 2 | 32.98 | 60.78 | 2.45 | 348.78 |
| 2024 | 3 | 17 | 3 | 14.45 | 31.08 | 2.16 | 135.88 |
| 2024 | 3 | 17 | 4 | 24.45 | 45.48 | 1.5 | 349.12 |
| 2024 | 3 | 17 | 5 | 29.89 | 27.75 | 4.62 | 348.78 |
| 2024 | 3 | 17 | 6 | 22.84 | 44.2 | 0.81 | 350.34 |
| 2024 | 3 | 17 | 7 | 40.83 | 30.34 | 1.28 | 79.47 |
| 2024 | 3 | 17 | 8 | 36.51 | 28.47 | 4.97 | 92.49 |
| 2024 | 3 | 17 | 9 | 27.46 | 53.92 | 2.88 | 90.96 |
| 2024 | 3 | 17 | 10 | 33.98 | 36.47 | 1.7 | 84.22 |
| 2024 | 3 | 17 | 11 | 13.97 | 57.13 | 3.68 | 85.74 |
| 2024 | 3 | 17 | 12 | 22.25 | 53.48 | 1.86 | 85.75 |
| 2024 | 3 | 17 | 13 | 40.81 | 45.47 | 0.68 | 84.79 |
| 2024 | 3 | 17 | 14 | 30.01 | 56.26 | 2.33 | 349.07 |
| 2024 | 3 | 17 | 15 | 34.16 | 44.06 | 1.73 | 353.19 |
| 2024 | 3 | 17 | 16 | 26.46 | 45.17 | 1.43 | 357.03 |
| 2024 | 3 | 17 | 17 | 36.65 | 44.59 | 1.38 | 141.72 |
| 2024 | 3 | 17 | 18 | 40.86 | 44.4 | 2.22 | 140.35 |
| 2024 | 3 | 17 | 19 | 40.77 | 52.75 | 0.6 | 136.85 |
| 2024 | 3 | 17 | 20 | 38.94 | 29.24 | 3.68 | 33.54 |
| 2024 | 3 | 17 | 21 | 14.63 | 43.68 | 0.51 | 140.43 |
| 2024 | 3 | 17 | 22 | 19.84 | 50.46 | 3.02 | 131.30 |
| 2024 | 3 | 17 | 23 | 16.5 | 36.46 | 4.88 | 132.57 |
| 2024 | 3 | 18 | 0 | 19.3 | 40.36 | 4.57 | 143.36 |
| 2024 | 3 | 18 | 1 | 21.22 | 56.29 | 3.48 | 133.67 |
| 2024 | 3 | 18 | 2 | 36.75 | 35.3 | 1.16 | 129.42 |
| 2024 | 3 | 18 | 3 | 36.71 | 52.27 | 2.79 | 213.81 |
| 2024 | 3 | 18 | 4 | 31.44 | 27.89 | 1.99 | 141.80 |
| 2024 | 3 | 18 | 5 | 26.7 | 57.83 | 3.09 | 78.27 |
| 2024 | 3 | 18 | 6 | 37.67 | 48.7 | 2.45 | 135.15 |
| 2024 | 3 | 18 | 7 | 40.58 | 42.42 | 0.72 | 144.45 |
| 2024 | 3 | 18 | 8 | 15.18 | 58.49 | 0.71 | 124.03 |
| 2024 | 3 | 18 | 9 | 21.57 | 28.18 | 0.34 | 130.23 |
| 2024 | 3 | 18 | 10 | 24.65 | 60.95 | 3.45 | 138.28 |
| 2024 | 3 | 18 | 11 | 25.77 | 56.99 | 2.96 | 124.33 |

| 2024 | 3 | 18 | 12 | 13.67 | 36.69 | 3.52 | 143.99 |
|---|---|---|---|---|---|---|---|
| 2024 | 3 | 18 | 13 | 41.93 | 36.76 | 3.64 | 139.93 |
| 2024 | 3 | 18 | 14 | 21.73 | 42.39 | 1.71 | 140.27 |
| 2024 | 3 | 18 | 15 | 23.05 | 59.99 | 0.92 | 131.49 |
| 2024 | 3 | 18 | 16 | 34.93 | 52 | 1.26 | 141.76 |
| 2024 | 3 | 18 | 17 | 11.47 | 39.53 | 3.84 | 138.31 |
| 2024 | 3 | 18 | 18 | 27.31 | 59.39 | 4.07 | 130.86 |
| 2024 | 3 | 18 | 19 | 16.92 | 48.71 | 2.81 | 134.50 |
| 2024 | 3 | 18 | 20 | 17.88 | 45.67 | 3.47 | 124.60 |
| 2024 | 3 | 18 | 21 | 16.37 | 40.25 | 4.57 | 128.91 |
| 2024 | 3 | 18 | 22 | 24.3 | 52.9 | 4.96 | 131.45 |
| 2024 | 3 | 18 | 23 | 25.1 | 41.57 | 3.48 | 131.47 |
| 2024 | 3 | 19 | 0 | 30.03 | 60.67 | 3.53 | 145.24 |
| 2024 | 3 | 19 | 1 | 18.99 | 35.97 | 1.59 | 132.46 |
| 2024 | 3 | 19 | 2 | 32.65 | 33.18 | 2.95 | 134.19 |
| 2024 | 3 | 19 | 3 | 29.11 | 39.45 | 0.16 | 129.44 |
| 2024 | 3 | 19 | 4 | 13.13 | 55.71 | 0.14 | 136.10 |
| 2024 | 3 | 19 | 5 | 21.79 | 50.09 | 4.05 | 82.42 |
| 2024 | 3 | 19 | 6 | 31.7 | 34.63 | 2.61 | 94.91 |
| 2024 | 3 | 19 | 7 | 13.21 | 55.69 | 3.27 | 110.95 |
| 2024 | 3 | 19 | 8 | 19.13 | 40.7 | 0.98 | 104.65 |
| 2024 | 3 | 19 | 9 | 34.42 | 37.46 | 0.46 | 102.53 |
| 2024 | 3 | 19 | 10 | 27.16 | 38.61 | 0.86 | 143.21 |
| 2024 | 3 | 19 | 11 | 38.18 | 31.05 | 3.74 | 139.11 |
| 2024 | 3 | 19 | 12 | 15.2 | 33.95 | 1.98 | 142.31 |
| 2024 | 3 | 19 | 13 | 42.4 | 56.35 | 4.25 | 139.04 |
| 2024 | 3 | 19 | 14 | 41.35 | 32.99 | 4.82 | 141.89 |
| 2024 | 3 | 19 | 15 | 39.59 | 43.03 | 4.4 | 144.14 |
| 2024 | 3 | 19 | 16 | 16.21 | 31.45 | 0.46 | 350.03 |
| 2024 | 3 | 19 | 17 | 35.07 | 28.86 | 4.68 | 353.70 |
| 2024 | 3 | 19 | 18 | 38.81 | 50.26 | 4.39 | 357.81 |
| 2024 | 3 | 19 | 19 | 19.92 | 59.63 | 2.35 | 125.27 |
| 2024 | 3 | 19 | 20 | 30.44 | 38.24 | 2.56 | 133.62 |
| 2024 | 3 | 19 | 21 | 28.09 | 49.04 | 0.45 | 128.92 |
| 2024 | 3 | 19 | 22 | 21.68 | 53 | 4.27 | 139.98 |
| 2024 | 3 | 19 | 23 | 14.13 | 27.13 | 0.91 | 133.29 |
| 2024 | 3 | 20 | 0 | 36.35 | 60.15 | 2.55 | 140.96 |
| 2024 | 3 | 20 | 1 | 18.27 | 36.44 | 2.81 | 144.69 |
| 2024 | 3 | 20 | 2 | 39.32 | 45.62 | 1.52 | 95.11 |
| 2024 | 3 | 20 | 3 | 24.6 | 48.53 | 4.14 | 115.66 |
| 2024 | 3 | 20 | 4 | 14.47 | 39.37 | 0.49 | 269.74 |
| 2024 | 3 | 20 | 5 | 21.69 | 56.75 | 1.21 | 125.62 |
| 2024 | 3 | 20 | 6 | 40.49 | 60.35 | 0.81 | 143.95 |
| 2024 | 3 | 20 | 7 | 12.52 | 43.89 | 1.7 | 125.09 |
| 2024 | 3 | 20 | 8 | 17.65 | 34.83 | 0.4 | 259.57 |
| 2024 | 3 | 20 | 9 | 30.44 | 41.91 | 1.8 | 140.49 |
| 2024 | 3 | 20 | 10 | 13.43 | 53.97 | 3.84 | 134.97 |

| 2024 | 3 | 20 | 11 | 23.32 | 44.23 | 3.29 | 142.70 |
|---|---|---|---|---|---|---|---|
| 2024 | 3 | 20 | 12 | 22.35 | 37.05 | 4.32 | 140.01 |
| 2024 | 3 | 20 | 13 | 37.05 | 54.96 | 0.71 | 136.87 |
| 2024 | 3 | 20 | 14 | 18.22 | 37.23 | 1.81 | 137.22 |
| 2024 | 3 | 20 | 15 | 35.61 | 38.3 | 3.58 | 139.50 |
| 2024 | 3 | 20 | 16 | 25.85 | 33.5 | 1.38 | 135.21 |
| 2024 | 3 | 20 | 17 | 42.43 | 34.68 | 3.43 | 138.45 |
| 2024 | 3 | 20 | 18 | 34.61 | 51.09 | 1.19 | 358.65 |
| 2024 | 3 | 20 | 19 | 34.38 | 44.67 | 2.4 | 131.09 |
| 2024 | 3 | 20 | 20 | 23.35 | 60.44 | 3.13 | 236.07 |
| 2024 | 3 | 20 | 21 | 18.79 | 40.95 | 1.31 | 131.05 |
| 2024 | 3 | 20 | 22 | 25.5 | 60.59 | 2.28 | 138.66 |
| 2024 | 3 | 20 | 23 | 26.93 | 58.82 | 2.02 | 129.82 |
| 2024 | 3 | 21 | 0 | 40.12 | 34.28 | 3.01 | 130.79 |
| 2024 | 3 | 21 | 1 | 18.7 | 53.44 | 1.37 | 278.08 |
| 2024 | 3 | 21 | 2 | 41.94 | 32.82 | 0.19 | 278.00 |
| 2024 | 3 | 21 | 3 | 39.56 | 28.84 | 1.9 | 261.16 |
| 2024 | 3 | 21 | 4 | 36.88 | 56.85 | 0.58 | 266.07 |
| 2024 | 3 | 21 | 5 | 20.45 | 52.35 | 4.65 | 127.95 |
| 2024 | 3 | 21 | 6 | 24.07 | 45.91 | 2.07 | 127.72 |
| 2024 | 3 | 21 | 7 | 23.92 | 33.68 | 2.44 | 135.17 |
| 2024 | 3 | 21 | 8 | 28.17 | 32.57 | 1.54 | 135.07 |
| 2024 | 3 | 21 | 9 | 14.17 | 31.91 | 2.27 | 141.35 |
| 2024 | 3 | 21 | 10 | 12.89 | 49.33 | 4.52 | 133.44 |
| 2024 | 3 | 21 | 11 | 35.18 | 33.05 | 2.39 | 124.72 |
| 2024 | 3 | 21 | 12 | 34.62 | 55.17 | 3.01 | 126.78 |
| 2024 | 3 | 21 | 13 | 17.93 | 53.98 | 3.11 | 138.77 |
| 2024 | 3 | 21 | 14 | 21.79 | 30.12 | 4.46 | 133.61 |
| 2024 | 3 | 21 | 15 | 23.32 | 41.68 | 0.25 | 142.30 |
| 2024 | 3 | 21 | 16 | 38.18 | 36.14 | 1.13 | 128.30 |
| 2024 | 3 | 21 | 17 | 24.73 | 42.3 | 4.8 | 130.39 |
| 2024 | 3 | 21 | 18 | 42.32 | 47.93 | 1.12 | 128.42 |
| 2024 | 3 | 21 | 19 | 35.07 | 47.88 | 2.52 | 132.72 |
| 2024 | 3 | 21 | 20 | 13.42 | 28.52 | 4.18 | 128.74 |
| 2024 | 3 | 21 | 21 | 29.8 | 40.71 | 4.51 | 126.11 |
| 2024 | 3 | 21 | 22 | 12.55 | 59.57 | 4.16 | 144.75 |
| 2024 | 3 | 21 | 23 | 39.4 | 31.32 | 0.23 | 144.10 |
| 2024 | 3 | 22 | 0 | 31.46 | 55.85 | 0.32 | 136.73 |
| 2024 | 3 | 22 | 1 | 37.6 | 47.57 | 2.63 | 126.24 |
| 2024 | 3 | 22 | 2 | 42.95 | 35.67 | 0.88 | 131.36 |
| 2024 | 3 | 22 | 3 | 13.54 | 54.76 | 1.46 | 140.66 |
| 2024 | 3 | 22 | 4 | 35.26 | 31.6 | 1.91 | 33.29 |
| 2024 | 3 | 22 | 5 | 23.27 | 48.96 | 2.26 | 263.12 |
| 2024 | 3 | 22 | 6 | 23 | 56.97 | 0.62 | 279.67 |
| 2024 | 3 | 22 | 7 | 29.96 | 52.44 | 1.6 | 270.14 |
| 2024 | 3 | 22 | 8 | 22.65 | 44.58 | 0.44 | 260.99 |
| 2024 | 3 | 22 | 9 | 42.02 | 42.94 | 0.53 | 143.46 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2024 | 3 | 22 | 10 | 30.67 | 39.42 | 2.04 | 141.92 |
| 2024 | 3 | 22 | 11 | 23.97 | 33.05 | 1.11 | 127.98 |
| 2024 | 3 | 22 | 12 | 32.62 | 44.89 | 2.26 | 129.14 |
| 2024 | 3 | 22 | 13 | 42.26 | 33.19 | 2.8 | 130.01 |
| 2024 | 3 | 22 | 14 | 11.85 | 44.3 | 4.31 | 140.29 |
| 2024 | 3 | 22 | 15 | 36.53 | 49.3 | 3.98 | 143.53 |
| 2024 | 3 | 22 | 16 | 30.97 | 29.67 | 1.19 | 127.92 |
| 2024 | 3 | 22 | 17 | 39.02 | 59.94 | 2.73 | 145.95 |
| 2024 | 3 | 22 | 18 | 16.34 | 39.42 | 3.41 | 357.56 |
| 2024 | 3 | 22 | 19 | 25.99 | 51.74 | 0.27 | 129.25 |
| 2024 | 3 | 22 | 20 | 13.65 | 53.95 | 0.11 | 142.49 |
| 2024 | 3 | 22 | 21 | 34.84 | 42.22 | 4.78 | 144.96 |
| 2024 | 3 | 22 | 22 | 41.55 | 35.17 | 0.68 | 144.60 |
| 2024 | 3 | 22 | 23 | 29.58 | 48.76 | 1.69 | 136.99 |
| 2024 | 3 | 23 | 0 | 17.47 | 37.61 | 0.41 | 124.13 |
| 2024 | 3 | 23 | 1 | 23.29 | 38.31 | 1.21 | 126.24 |
| 2024 | 3 | 23 | 2 | 21.9 | 32.72 | 3.2 | 145.57 |
| 2024 | 3 | 23 | 3 | 14.56 | 38.52 | 3.35 | 129.73 |
| 2024 | 3 | 23 | 4 | 24.33 | 39.65 | 2.83 | 143.22 |
| 2024 | 3 | 23 | 5 | 32.23 | 27.06 | 1.33 | 131.26 |
| 2024 | 3 | 23 | 6 | 34.12 | 60.41 | 3.14 | 83.71 |
| 2024 | 3 | 23 | 7 | 36.92 | 54.8 | 1.95 | 114.27 |
| 2024 | 3 | 23 | 8 | 34 | 57.42 | 3.26 | 144.75 |
| 2024 | 3 | 23 | 9 | 33.37 | 33.12 | 2.35 | 139.10 |
| 2024 | 3 | 23 | 10 | 14.11 | 39.34 | 4.4 | 136.25 |
| 2024 | 3 | 23 | 11 | 24.44 | 42.77 | 1.35 | 136.24 |
| 2024 | 3 | 23 | 12 | 40.04 | 54.86 | 3.74 | 144.34 |
| 2024 | 3 | 23 | 13 | 28.25 | 44.08 | 1.78 | 125.73 |
| 2024 | 3 | 23 | 14 | 37.83 | 35.56 | 0.4 | 132.77 |
| 2024 | 3 | 23 | 15 | 15.73 | 31.53 | 1.86 | 132.04 |
| 2024 | 3 | 23 | 16 | 40.56 | 27.21 | 3.79 | 129.06 |
| 2024 | 3 | 23 | 17 | 11.62 | 44.69 | 0.23 | 132.81 |
| 2024 | 3 | 23 | 18 | 25.79 | 59.87 | 0.66 | 33.01 |
| 2024 | 3 | 23 | 19 | 42.29 | 41.17 | 0.77 | 91.05 |
| 2024 | 3 | 23 | 20 | 39.22 | 52.5 | 4.36 | 104.94 |
| 2024 | 3 | 23 | 21 | 14.58 | 33.63 | 1.89 | 122.02 |
| 2024 | 3 | 23 | 22 | 34.54 | 58.51 | 4.5 | 261.56 |
| 2024 | 3 | 23 | 23 | 42.84 | 44.67 | 2.54 | 145.84 |
| 2024 | 3 | 24 | 0 | 35.45 | 59.7 | 2.84 | 135.74 |
| 2024 | 3 | 24 | 1 | 24.24 | 40.06 | 4.55 | 128.62 |
| 2024 | 3 | 24 | 2 | 13.59 | 42.07 | 2.13 | 139.53 |
| 2024 | 3 | 24 | 3 | 29.53 | 47.89 | 1.54 | 131.33 |
| 2024 | 3 | 24 | 4 | 22.39 | 60.58 | 2.46 | 141.70 |
| 2024 | 3 | 24 | 5 | 17.44 | 29.9 | 2.32 | 33.58 |
| 2024 | 3 | 24 | 6 | 20.06 | 36.57 | 0.92 | 262.35 |
| 2024 | 3 | 24 | 7 | 23.28 | 27.48 | 0.51 | 272.07 |
| 2024 | 3 | 24 | 8 | 26.85 | 32.81 | 1.48 | 258.92 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2024 | 3 | 24 | 9 | 18.1 | 55.76 | 0.5 | 271.17 |
| 2024 | 3 | 24 | 10 | 27.89 | 60.62 | 3.43 | 126.40 |
| 2024 | 3 | 24 | 11 | 35.49 | 48.38 | 2.08 | 138.13 |
| 2024 | 3 | 24 | 12 | 34.29 | 43.7 | 0.64 | 130.35 |
| 2024 | 3 | 24 | 13 | 21.15 | 30.44 | 4.82 | 143.97 |
| 2024 | 3 | 24 | 14 | 20.08 | 31.76 | 2.44 | 141.99 |
| 2024 | 3 | 24 | 15 | 12.11 | 47.34 | 1.59 | 128.24 |
| 2024 | 3 | 24 | 16 | 39.77 | 47.23 | 2.63 | 145.79 |
| 2024 | 3 | 24 | 17 | 19.39 | 45.31 | 1 | 144.63 |
| 2024 | 3 | 24 | 18 | 12.81 | 35.07 | 0.12 | 142.46 |
| 2024 | 3 | 24 | 19 | 15.55 | 56.34 | 0.18 | 352.35 |
| 2024 | 3 | 24 | 20 | 41.61 | 31.62 | 4.61 | 353.79 |
| 2024 | 3 | 24 | 21 | 39.01 | 47.72 | 3.36 | 351.84 |
| 2024 | 3 | 24 | 22 | 17.29 | 33.07 | 4.49 | 350.91 |
| 2024 | 3 | 24 | 23 | 14.8 | 57.65 | 3.35 | 348.79 |
| 2024 | 3 | 25 | 0 | 17.23 | 30.92 | 1.75 | 125.57 |
| 2024 | 3 | 25 | 1 | 41.18 | 27.81 | 2.73 | 142.69 |
| 2024 | 3 | 25 | 2 | 38.61 | 45.37 | 2.95 | 145.00 |
| 2024 | 3 | 25 | 3 | 39.49 | 46.62 | 4.83 | 143.74 |
| 2024 | 3 | 25 | 4 | 29.09 | 30.54 | 2.47 | 130.17 |
| 2024 | 3 | 25 | 5 | 21.19 | 44.09 | 3.76 | 264.13 |
| 2024 | 3 | 25 | 6 | 17.65 | 54.82 | 4.75 | 262.20 |
| 2024 | 3 | 25 | 7 | 15.75 | 58.82 | 2.28 | 264.53 |
| 2024 | 3 | 25 | 8 | 20.98 | 58.06 | 3.08 | 278.59 |
| 2024 | 3 | 25 | 9 | 42.89 | 51.53 | 2.6 | 280.66 |
| 2024 | 3 | 25 | 10 | 34.01 | 31.56 | 2.25 | 131.00 |
| 2024 | 3 | 25 | 11 | 32.07 | 49.77 | 0.44 | 126.80 |
| 2024 | 3 | 25 | 12 | 42.97 | 37.71 | 1.5 | 139.16 |
| 2024 | 3 | 25 | 13 | 15.57 | 46.99 | 1.27 | 143.46 |
| 2024 | 3 | 25 | 14 | 21.69 | 36.57 | 3.96 | 126.38 |
| 2024 | 3 | 25 | 15 | 13.93 | 43.17 | 4.82 | 141.57 |
| 2024 | 3 | 25 | 16 | 37.99 | 52.35 | 0.64 | 127.57 |
| 2024 | 3 | 25 | 17 | 12.74 | 30.47 | 1.06 | 124.10 |
| 2024 | 3 | 25 | 18 | 26.52 | 54.38 | 4.3 | 131.86 |
| 2024 | 3 | 25 | 19 | 25.36 | 50.39 | 1.2 | 145.65 |
| 2024 | 3 | 25 | 20 | 13.47 | 58.38 | 3.89 | 353.88 |
| 2024 | 3 | 25 | 21 | 13.65 | 35.76 | 4.3 | 355.91 |
| 2024 | 3 | 25 | 22 | 21.58 | 36.92 | 2.39 | 353.30 |
| 2024 | 3 | 25 | 23 | 24.82 | 54.75 | 3.85 | 99.06 |
| 2024 | 3 | 26 | 0 | 36.43 | 36.33 | 4.4 | 93.12 |
| 2024 | 3 | 26 | 1 | 12.68 | 45.32 | 3.42 | 80.92 |
| 2024 | 3 | 26 | 2 | 31.9 | 28.81 | 1.83 | 80.86 |
| 2024 | 3 | 26 | 3 | 26.87 | 29.75 | 4.55 | 86.70 |
| 2024 | 3 | 26 | 4 | 17.69 | 39.61 | 1.39 | 98.06 |
| 2024 | 3 | 26 | 5 | 28.09 | 28.98 | 4.83 | 93.72 |
| 2024 | 3 | 26 | 6 | 42.44 | 36.84 | 2.46 | 92.49 |
| 2024 | 3 | 26 | 7 | 14.46 | 37.91 | 0.32 | 87.38 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2024 | 3 | 26 | 8 | 29.2 | 49.61 | 1.34 | 100.52 |
| 2024 | 3 | 26 | 9 | 28.24 | 54.71 | 3.52 | 98.00 |
| 2024 | 3 | 26 | 10 | 23.99 | 51.03 | 0.67 | 97.82 |
| 2024 | 3 | 26 | 11 | 27.35 | 40.39 | 1.55 | 94.07 |
| 2024 | 3 | 26 | 12 | 30.62 | 29.85 | 4.47 | 88.75 |
| 2024 | 3 | 26 | 13 | 18.11 | 46.86 | 1.81 | 94.04 |
| 2024 | 3 | 26 | 14 | 31.63 | 35.6 | 3.72 | 90.32 |
| 2024 | 3 | 26 | 15 | 18.91 | 42.15 | 1.41 | 92.68 |
| 2024 | 3 | 26 | 16 | 38.41 | 44.63 | 4.05 | 87.35 |
| 2024 | 3 | 26 | 17 | 39.47 | 60.66 | 1.5 | 85.08 |
| 2024 | 3 | 26 | 18 | 18.49 | 27.7 | 4.44 | 351.15 |
| 2024 | 3 | 26 | 19 | 38.99 | 57.17 | 1.69 | 358.97 |
| 2024 | 3 | 26 | 20 | 26.95 | 44.79 | 4.46 | 144.44 |
| 2024 | 3 | 26 | 21 | 22.7 | 42.84 | 1.48 | 356.28 |
| 2024 | 3 | 26 | 22 | 40.27 | 28.07 | 4.64 | 5.13 |
| 2024 | 3 | 26 | 23 | 27.82 | 60.59 | 0.97 | 3.91 |
| 2024 | 3 | 27 | 0 | 14.66 | 34.98 | 4.81 | 10.24 |
| 2024 | 3 | 27 | 1 | 13.97 | 50.89 | 4.33 | 7.36 |
| 2024 | 3 | 27 | 2 | 29.56 | 36.87 | 3 | 8.63 |
| 2024 | 3 | 27 | 3 | 33.72 | 35.71 | 1.19 | 10.14 |
| 2024 | 3 | 27 | 4 | 29.09 | 51.11 | 1.93 | 10.77 |
| 2024 | 3 | 27 | 5 | 24.99 | 36.22 | 4.67 | 2.17 |
| 2024 | 3 | 27 | 6 | 42.2 | 52.52 | 1.79 | 1.72 |
| 2024 | 3 | 27 | 7 | 11.51 | 47.62 | 0.23 | 2.91 |
| 2024 | 3 | 27 | 8 | 22.54 | 53.46 | 2.19 | 266.02 |
| 2024 | 3 | 27 | 9 | 22.04 | 27.35 | 2.36 | 4.64 |
| 2024 | 3 | 27 | 10 | 13.59 | 46.9 | 2.1 | 1.32 |
| 2024 | 3 | 27 | 11 | 32.66 | 57.01 | 3.43 | 10.11 |
| 2024 | 3 | 27 | 12 | 12.36 | 28.43 | 2.57 | 4.42 |
| 2024 | 3 | 27 | 13 | 26.76 | 37.92 | 3.02 | 8.17 |
| 2024 | 3 | 27 | 14 | 33.53 | 33.6 | 3.65 | 10.90 |
| 2024 | 3 | 27 | 15 | 29.96 | 53.93 | 2.41 | 1.73 |
| 2024 | 3 | 27 | 16 | 17.72 | 39.76 | 3.62 | 1.53 |
| 2024 | 3 | 27 | 17 | 38.73 | 46.07 | 3.31 | 141.46 |
| 2024 | 3 | 27 | 18 | 12.49 | 44.2 | 3.17 | 6.77 |
| 2024 | 3 | 27 | 19 | 41.66 | 42.82 | 0.45 | 143.37 |
| 2024 | 3 | 27 | 20 | 31.77 | 31.6 | 2.83 | 135.31 |
| 2024 | 3 | 27 | 21 | 39 | 59.5 | 4.54 | 2.19 |
| 2024 | 3 | 27 | 22 | 28.81 | 31.15 | 2.33 | 1.88 |
| 2024 | 3 | 27 | 23 | 17.88 | 58.2 | 2.03 | 100.61 |
| 2024 | 3 | 28 | 0 | 27.82 | 47.06 | 0.87 | 275.88 |
| 2024 | 3 | 28 | 1 | 36.81 | 46.4 | 3.25 | 7.43 |
| 2024 | 3 | 28 | 2 | 38.31 | 43.71 | 2.64 | 10.02 |
| 2024 | 3 | 28 | 3 | 16.16 | 37.81 | 4.23 | 2.64 |
| 2024 | 3 | 28 | 4 | 23.14 | 35.91 | 1.06 | 2.35 |
| 2024 | 3 | 28 | 5 | 21.67 | 43.29 | 4.76 | 9.99 |
| 2024 | 3 | 28 | 6 | 22.93 | 41.46 | 0.37 | 2.36 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2024 | 3 | 28 | 7 | 23.27 | 28.35 | 0.22 | 10.97 |
| 2024 | 3 | 28 | 8 | 38.06 | 27.56 | 2.17 | 268.11 |
| 2024 | 3 | 28 | 9 | 12.59 | 53.15 | 3.9 | 277.71 |
| 2024 | 3 | 28 | 10 | 12.07 | 53.49 | 4.42 | 10.25 |
| 2024 | 3 | 28 | 11 | 41.98 | 50.23 | 2.91 | 5.45 |
| 2024 | 3 | 28 | 12 | 33.99 | 60.76 | 2.36 | 4.57 |
| 2024 | 3 | 28 | 13 | 31.03 | 58.19 | 2.06 | 10.50 |
| 2024 | 3 | 28 | 14 | 38.93 | 51.77 | 4.16 | 10.57 |
| 2024 | 3 | 28 | 15 | 18.58 | 33.83 | 0.11 | 5.82 |
| 2024 | 3 | 28 | 16 | 42.81 | 28.76 | 0.94 | 6.41 |
| 2024 | 3 | 28 | 17 | 38.46 | 27.24 | 2.13 | 10.55 |
| 2024 | 3 | 28 | 18 | 31.28 | 53.16 | 4.57 | 1.11 |
| 2024 | 3 | 28 | 19 | 32.69 | 31.49 | 2.32 | 8.64 |
| 2024 | 3 | 28 | 20 | 30.85 | 60.51 | 1.85 | 4.76 |
| 2024 | 3 | 28 | 21 | 32.73 | 29.59 | 4.6 | 3.94 |
| 2024 | 3 | 28 | 22 | 20.87 | 29.74 | 3.74 | 4.70 |
| 2024 | 3 | 28 | 23 | 19.8 | 52.48 | 3.72 | 276.12 |
| 2024 | 3 | 29 | 0 | 38.42 | 30.99 | 4.44 | 272.41 |
| 2024 | 3 | 29 | 1 | 30.38 | 58.38 | 3.55 | 268.39 |
| 2024 | 3 | 29 | 2 | 31.35 | 49.6 | 2.99 | 271.27 |
| 2024 | 3 | 29 | 3 | 26.11 | 35.38 | 3.66 | 272.78 |
| 2024 | 3 | 29 | 4 | 21.88 | 56.93 | 2.81 | 279.84 |
| 2024 | 3 | 29 | 5 | 26.78 | 50.4 | 3.78 | 280.77 |
| 2024 | 3 | 29 | 6 | 19.14 | 47.86 | 4.5 | 262.64 |
| 2024 | 3 | 29 | 7 | 28.78 | 53.2 | 4.16 | 264.88 |
| 2024 | 3 | 29 | 8 | 19.27 | 54.82 | 2.65 | 261.30 |
| 2024 | 3 | 29 | 9 | 11.64 | 51.88 | 0.53 | 261.15 |
| 2024 | 3 | 29 | 10 | 25.33 | 48.35 | 3.68 | 259.19 |
| 2024 | 3 | 29 | 11 | 27.97 | 60.23 | 1.95 | 280.19 |
| 2024 | 3 | 29 | 12 | 40.63 | 33.74 | 4.61 | 271.99 |
| 2024 | 3 | 29 | 13 | 28.2 | 46.14 | 3.2 | 277.15 |
| 2024 | 3 | 29 | 14 | 28.81 | 59.8 | 2.37 | 268.44 |
| 2024 | 3 | 29 | 15 | 12.19 | 45.85 | 3.62 | 270.08 |
| 2024 | 3 | 29 | 16 | 16.79 | 33.29 | 4.14 | 264.41 |
| 2024 | 3 | 29 | 17 | 28.25 | 56.21 | 3.86 | 27.45 |
| 2024 | 3 | 29 | 18 | 23.93 | 46.76 | 1.67 | 24.67 |
| 2024 | 3 | 29 | 19 | 27.01 | 51.6 | 1.13 | 355.93 |
| 2024 | 3 | 29 | 20 | 25.76 | 53.18 | 2.66 | 25.37 |
| 2024 | 3 | 29 | 21 | 13.11 | 34.72 | 3.92 | 29.30 |
| 2024 | 3 | 29 | 22 | 36.16 | 53.36 | 3.45 | 271.47 |
| 2024 | 3 | 29 | 23 | 25.81 | 41.56 | 1.43 | 280.55 |
| 2024 | 3 | 30 | 0 | 15.19 | 27.37 | 1.92 | 278.03 |
| 2024 | 3 | 30 | 1 | 31.05 | 29.41 | 4.86 | 277.34 |
| 2024 | 3 | 30 | 2 | 32.67 | 46.48 | 1.59 | 277.53 |
| 2024 | 3 | 30 | 3 | 32.49 | 31.88 | 2.03 | 270.40 |
| 2024 | 3 | 30 | 4 | 17.91 | 48.74 | 2.2 | 278.84 |
| 2024 | 3 | 30 | 5 | 11.64 | 28.91 | 3.46 | 276.75 |

| 2024 | 3 | 30 | 6 | 26.4 | 43.74 | 3.61 | 270.06 |
|---|---|---|---|---|---|---|---|
| 2024 | 3 | 30 | 7 | 40.7 | 56.97 | 1.7 | 266.23 |
| 2024 | 3 | 30 | 8 | 15.37 | 41.49 | 4.16 | 280.97 |
| 2024 | 3 | 30 | 9 | 40.83 | 37.45 | 0.46 | 260.26 |
| 2024 | 3 | 30 | 10 | 20.95 | 31.64 | 4.39 | 278.53 |
| 2024 | 3 | 30 | 11 | 35.47 | 36.31 | 1.1 | 93.45 |
| 2024 | 3 | 30 | 12 | 22 | 50.11 | 2.67 | 271.32 |
| 2024 | 3 | 30 | 13 | 14.03 | 35.85 | 2.29 | 303.53 |
| 2024 | 3 | 30 | 14 | 34.32 | 47.65 | 4.95 | 281.22 |
| 2024 | 3 | 30 | 15 | 14.81 | 44.5 | 1.43 | 271.49 |
| 2024 | 3 | 30 | 16 | 21.79 | 30 | 2.32 | 279.20 |
| 2024 | 3 | 30 | 17 | 13.76 | 37.98 | 3.16 | 271.80 |
| 2024 | 3 | 30 | 18 | 20.03 | 43.85 | 2.13 | 279.62 |
| 2024 | 3 | 30 | 19 | 18.91 | 44.73 | 3.54 | 260.30 |
| 2024 | 3 | 30 | 20 | 38.31 | 47.59 | 1.14 | 273.81 |
| 2024 | 3 | 30 | 21 | 33.53 | 32.76 | 0.61 | 260.41 |
| 2024 | 3 | 30 | 22 | 40.75 | 52.32 | 1.67 | 261.54 |
| 2024 | 3 | 30 | 23 | 14.89 | 40.81 | 2.69 | 274.32 |
| 2024 | 3 | 31 | 0 | 11.7 | 49.04 | 2.52 | 277.08 |
| 2024 | 3 | 31 | 1 | 20.25 | 54.28 | 2.07 | 278.11 |
| 2024 | 3 | 31 | 2 | 12.89 | 53.76 | 0.12 | 94.09 |
| 2024 | 3 | 31 | 3 | 35.93 | 38.94 | 1.9 | 266.49 |
| 2024 | 3 | 31 | 4 | 34.48 | 39.37 | 1.59 | 267.87 |
| 2024 | 3 | 31 | 5 | 41.58 | 36.52 | 2 | 279.79 |
| 2024 | 3 | 31 | 6 | 25.76 | 45.38 | 2.84 | 281.20 |
| 2024 | 3 | 31 | 7 | 17.26 | 57.95 | 4.84 | 276.33 |
| 2024 | 3 | 31 | 8 | 15.37 | 27.86 | 0.27 | 264.17 |
| 2024 | 3 | 31 | 9 | 15.45 | 30.03 | 2.35 | 265.98 |
| 2024 | 3 | 31 | 10 | 25.51 | 43.25 | 0.96 | 274.32 |
| 2024 | 3 | 31 | 11 | 19.51 | 46.26 | 4.54 | 270.81 |
| 2024 | 3 | 31 | 12 | 16.74 | 28.42 | 1.04 | 86.73 |
| 2024 | 3 | 31 | 13 | 41.51 | 43.71 | 0.42 | 80.12 |
| 2024 | 3 | 31 | 14 | 38.08 | 29.2 | 2.36 | 86.41 |
| 2024 | 3 | 31 | 15 | 13.85 | 49.97 | 2.02 | 277.51 |
| 2024 | 3 | 31 | 16 | 20.33 | 46.21 | 2.62 | 272.17 |
| 2024 | 3 | 31 | 17 | 30.01 | 46.94 | 3.15 | 263.72 |
| 2024 | 3 | 31 | 18 | 22.49 | 29.13 | 2.5 | 274.27 |
| 2024 | 3 | 31 | 19 | 23.29 | 43.23 | 0.37 | 265.91 |
| 2024 | 3 | 31 | 20 | 29.87 | 32.36 | 4.78 | 268.07 |
| 2024 | 3 | 31 | 21 | 30.16 | 42.97 | 0.5 | 265.48 |
| 2024 | 3 | 31 | 22 | 22.54 | 58.49 | 4.14 | 270.52 |
| 2024 | 3 | 31 | 23 | 42.26 | 34.05 | 1.59 | 271.14 |
| 2024 | 4 | 1 | 0 | 44.61 | 49.68 | 0.47 | 271.44 |
| 2024 | 4 | 1 | 1 | 43.23 | 51.31 | 0.1 | 280.63 |
| 2024 | 4 | 1 | 2 | 22.59 | 48.65 | 2.24 | 272.37 |
| 2024 | 4 | 1 | 3 | 41.27 | 38.52 | 1.65 | 275.54 |
| 2024 | 4 | 1 | 4 | 44.01 | 30.12 | 2.12 | 94.89 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2024 | 4 | 1 | 5 | 40.87 | 33.37 | 1.98 | 269.49 |
| 2024 | 4 | 1 | 6 | 25.58 | 36.35 | 1.74 | 271.54 |
| 2024 | 4 | 1 | 7 | 28.39 | 48.25 | 3.29 | 263.13 |
| 2024 | 4 | 1 | 8 | 23.58 | 52.63 | 3.52 | 266.90 |
| 2024 | 4 | 1 | 9 | 20.39 | 32.27 | 0.85 | 303.14 |
| 2024 | 4 | 1 | 10 | 29.88 | 40.13 | 2.59 | 274.43 |
| 2024 | 4 | 1 | 11 | 42.96 | 35.96 | 2.03 | 271.24 |
| 2024 | 4 | 1 | 12 | 33.79 | 42.19 | 1.02 | 260.95 |
| 2024 | 4 | 1 | 13 | 21.8 | 46.73 | 2.43 | 270.37 |
| 2024 | 4 | 1 | 14 | 40.47 | 51.4 | 0.88 | 264.93 |
| 2024 | 4 | 1 | 15 | 29.66 | 57.37 | 1.29 | 280.72 |
| 2024 | 4 | 1 | 16 | 21.09 | 38.73 | 0.98 | 259.62 |
| 2024 | 4 | 1 | 17 | 34.95 | 50.87 | 3.86 | 263.89 |
| 2024 | 4 | 1 | 18 | 32.69 | 57.07 | 1.67 | 267.32 |
| 2024 | 4 | 1 | 19 | 25.36 | 37.59 | 0.44 | 261.73 |
| 2024 | 4 | 1 | 20 | 32.89 | 29.73 | 2.81 | 354.50 |
| 2024 | 4 | 1 | 21 | 22.38 | 53.59 | 3.54 | 138.78 |
| 2024 | 4 | 1 | 22 | 30.16 | 31.11 | 0.25 | 141.03 |
| 2024 | 4 | 1 | 23 | 42.86 | 35.25 | 3.24 | 263.24 |
| 2024 | 4 | 2 | 0 | 19.49 | 57.3 | 1.92 | 281.03 |
| 2024 | 4 | 2 | 1 | 18.77 | 29.8 | 2.9 | 276.04 |
| 2024 | 4 | 2 | 2 | 24.27 | 32.1 | 1.42 | 266.67 |
| 2024 | 4 | 2 | 3 | 35.6 | 45.19 | 0.68 | 280.91 |
| 2024 | 4 | 2 | 4 | 22.46 | 35.89 | 2.77 | 271.53 |
| 2024 | 4 | 2 | 5 | 26.54 | 55.37 | 3.93 | 135.08 |
| 2024 | 4 | 2 | 6 | 35.55 | 52.87 | 3.03 | 261.07 |
| 2024 | 4 | 2 | 7 | 35.59 | 33.24 | 2.84 | 259.59 |
| 2024 | 4 | 2 | 8 | 40.91 | 31.37 | 3.68 | 303.70 |
| 2024 | 4 | 2 | 9 | 29.81 | 46.22 | 1.52 | 259.29 |
| 2024 | 4 | 2 | 10 | 29.83 | 43.9 | 2.93 | 265.20 |
| 2024 | 4 | 2 | 11 | 35.91 | 53.64 | 1.75 | 274.32 |
| 2024 | 4 | 2 | 12 | 33.16 | 35.29 | 1.56 | 273.72 |
| 2024 | 4 | 2 | 13 | 27.33 | 33.21 | 1.22 | 270.05 |
| 2024 | 4 | 2 | 14 | 30.27 | 35.54 | 2.94 | 266.68 |
| 2024 | 4 | 2 | 15 | 42.12 | 53.25 | 1.16 | 278.21 |
| 2024 | 4 | 2 | 16 | 34.2 | 53.18 | 2.31 | 277.06 |
| 2024 | 4 | 2 | 17 | 46.54 | 34.36 | 2.33 | 277.15 |
| 2024 | 4 | 2 | 18 | 30.42 | 30.2 | 3.76 | 262.57 |
| 2024 | 4 | 2 | 19 | 46.31 | 55.39 | 2.51 | 270.98 |
| 2024 | 4 | 2 | 20 | 20.98 | 46.65 | 3.59 | 268.01 |
| 2024 | 4 | 2 | 21 | 34.72 | 41.91 | 2.38 | 272.18 |
| 2024 | 4 | 2 | 22 | 20.08 | 39.46 | 1.99 | 262.11 |
| 2024 | 4 | 2 | 23 | 18.5 | 29.73 | 1.14 | 277.82 |
| 2024 | 4 | 3 | 0 | 46.3 | 47.23 | 1.18 | 262.31 |
| 2024 | 4 | 3 | 1 | 32.82 | 40.64 | 1.23 | 80.44 |
| 2024 | 4 | 3 | 2 | 46.04 | 53.02 | 2.68 | 92.12 |
| 2024 | 4 | 3 | 3 | 42.5 | 39.58 | 0.78 | 106.73 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2024 | 4 | 3 | 4 | 30.51 | 40.28 | 1.48 | 122.23 |
| 2024 | 4 | 3 | 5 | 28.05 | 30.7 | 3.8 | 262.70 |
| 2024 | 4 | 3 | 6 | 21.25 | 38.38 | 0.33 | 280.05 |
| 2024 | 4 | 3 | 7 | 19 | 41.27 | 2.06 | 273.33 |
| 2024 | 4 | 3 | 8 | 40.57 | 35.95 | 2.64 | 279.06 |
| 2024 | 4 | 3 | 9 | 30.71 | 44.95 | 1.35 | 261.47 |
| 2024 | 4 | 3 | 10 | 20.89 | 54.44 | 3.69 | 260.26 |
| 2024 | 4 | 3 | 11 | 24.51 | 45.75 | 3.89 | 281.06 |
| 2024 | 4 | 3 | 12 | 34.86 | 56.59 | 2.51 | 266.73 |
| 2024 | 4 | 3 | 13 | 23.77 | 55.97 | 2.77 | 280.70 |
| 2024 | 4 | 3 | 14 | 19.55 | 52.64 | 2.24 | 81.16 |
| 2024 | 4 | 3 | 15 | 20.89 | 48.89 | 0.62 | 99.67 |
| 2024 | 4 | 3 | 16 | 44.65 | 57.01 | 2.43 | 269.79 |
| 2024 | 4 | 3 | 17 | 19.51 | 46.84 | 1.65 | 265.04 |
| 2024 | 4 | 3 | 18 | 36.24 | 41.61 | 0.15 | 268.88 |
| 2024 | 4 | 3 | 19 | 31.94 | 57.15 | 0.14 | 260.40 |
| 2024 | 4 | 3 | 20 | 26.98 | 29.03 | 0.21 | 269.17 |
| 2024 | 4 | 3 | 21 | 45.28 | 47.07 | 2.2 | 261.44 |
| 2024 | 4 | 3 | 22 | 28.04 | 55.3 | 1.05 | 276.40 |
| 2024 | 4 | 3 | 23 | 28.34 | 51.13 | 0.67 | 84.84 |
| 2024 | 4 | 4 | 0 | 41.79 | 47.66 | 2.96 | 99.12 |
| 2024 | 4 | 4 | 1 | 28.12 | 46.88 | 1.95 | 89.68 |
| 2024 | 4 | 4 | 2 | 26.36 | 41.64 | 2.08 | 97.63 |
| 2024 | 4 | 4 | 3 | 41.53 | 58.28 | 2.26 | 84.53 |
| 2024 | 4 | 4 | 4 | 24.5 | 57.39 | 3.96 | 88.23 |
| 2024 | 4 | 4 | 5 | 42.72 | 33.83 | 3.28 | 100.62 |
| 2024 | 4 | 4 | 6 | 27.41 | 49.3 | 1.75 | 96.80 |
| 2024 | 4 | 4 | 7 | 40.86 | 43.91 | 0.27 | 95.47 |
| 2024 | 4 | 4 | 8 | 43.13 | 38.7 | 0.76 | 82.63 |
| 2024 | 4 | 4 | 9 | 45.08 | 55.99 | 0.65 | 98.46 |
| 2024 | 4 | 4 | 10 | 20.53 | 54.15 | 0.6 | 82.35 |
| 2024 | 4 | 4 | 11 | 18.62 | 47.4 | 1.58 | 82.10 |
| 2024 | 4 | 4 | 12 | 39.99 | 29.53 | 3.84 | 85.60 |
| 2024 | 4 | 4 | 13 | 39.47 | 42.29 | 3.4 | 85.68 |
| 2024 | 4 | 4 | 14 | 34.48 | 32.05 | 3.94 | 81.24 |
| 2024 | 4 | 4 | 15 | 19.6 | 49.96 | 1.85 | 84.73 |
| 2024 | 4 | 4 | 16 | 34.2 | 44.33 | 2.66 | 83.91 |
| 2024 | 4 | 4 | 17 | 45.69 | 38.39 | 2.28 | 97.34 |
| 2024 | 4 | 4 | 18 | 34.28 | 48.99 | 3.85 | 93.93 |
| 2024 | 4 | 4 | 19 | 33.79 | 29.44 | 2.27 | 94.83 |
| 2024 | 4 | 4 | 20 | 45.59 | 54.48 | 2.68 | 93.14 |
| 2024 | 4 | 4 | 21 | 24.1 | 54.2 | 0.32 | 85.14 |
| 2024 | 4 | 4 | 22 | 41.58 | 52.06 | 1.31 | 87.49 |
| 2024 | 4 | 4 | 23 | 43.06 | 35.14 | 2.62 | 100.44 |
| 2024 | 4 | 5 | 0 | 40.34 | 54.56 | 0.75 | 100.96 |
| 2024 | 4 | 5 | 1 | 46.41 | 44.61 | 3.38 | 79.94 |
| 2024 | 4 | 5 | 2 | 22.35 | 41.51 | 2.41 | 85.32 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2024 | 4 | 5 | 3 | 31.05 | 46.05 | 0.9 | 100.47 |
| 2024 | 4 | 5 | 4 | 22.66 | 53.16 | 0.78 | 259.85 |
| 2024 | 4 | 5 | 5 | 27.02 | 35.12 | 3.08 | 266.80 |
| 2024 | 4 | 5 | 6 | 20.51 | 48.11 | 0.94 | 90.45 |
| 2024 | 4 | 5 | 7 | 28.94 | 51.8 | 1.15 | 99.13 |
| 2024 | 4 | 5 | 8 | 45.5 | 43.24 | 3.34 | 145.93 |
| 2024 | 4 | 5 | 9 | 38.6 | 43.32 | 2.26 | 127.17 |
| 2024 | 4 | 5 | 10 | 33.02 | 40.95 | 2.94 | 349.99 |
| 2024 | 4 | 5 | 11 | 37.65 | 41.74 | 3.75 | 57.45 |
| 2024 | 4 | 5 | 12 | 32.81 | 30.76 | 1.09 | 57.98 |
| 2024 | 4 | 5 | 13 | 42.42 | 46.12 | 2.17 | 61.24 |
| 2024 | 4 | 5 | 14 | 42.68 | 33.42 | 2.43 | 303.18 |
| 2024 | 4 | 5 | 15 | 36.15 | 42.48 | 1.03 | 71.24 |
| 2024 | 4 | 5 | 16 | 38.14 | 37.61 | 2.85 | 62.34 |
| 2024 | 4 | 5 | 17 | 42.27 | 31.84 | 2.63 | 274.88 |
| 2024 | 4 | 5 | 18 | 45.21 | 56.84 | 0.67 | 125.09 |
| 2024 | 4 | 5 | 19 | 40.32 | 37.04 | 0.64 | 269.37 |
| 2024 | 4 | 5 | 20 | 41.64 | 50.74 | 2.1 | 79.00 |
| 2024 | 4 | 5 | 21 | 36.3 | 57.57 | 2.97 | 88.92 |
| 2024 | 4 | 5 | 22 | 29.89 | 51.67 | 3.79 | 100.05 |
| 2024 | 4 | 5 | 23 | 31.15 | 31.37 | 1.48 | 112.83 |
| 2024 | 4 | 6 | 0 | 31.9 | 54.91 | 3.29 | 279.27 |
| 2024 | 4 | 6 | 1 | 30.22 | 50.8 | 2.85 | 270.80 |
| 2024 | 4 | 6 | 2 | 21.37 | 31.53 | 3.61 | 276.49 |
| 2024 | 4 | 6 | 3 | 29.94 | 32.63 | 3.89 | 277.62 |
| 2024 | 4 | 6 | 4 | 31.55 | 39.73 | 1.53 | 281.16 |
| 2024 | 4 | 6 | 5 | 25.88 | 43 | 2.7 | 271.76 |
| 2024 | 4 | 6 | 6 | 22.73 | 53.22 | 3.62 | 261.88 |
| 2024 | 4 | 6 | 7 | 25.44 | 45.5 | 1.06 | 271.93 |
| 2024 | 4 | 6 | 8 | 19.1 | 34.92 | 2.53 | 57.45 |
| 2024 | 4 | 6 | 9 | 46.01 | 34.41 | 1.44 | 57.98 |
| 2024 | 4 | 6 | 10 | 28.82 | 33.79 | 1.58 | 61.24 |
| 2024 | 4 | 6 | 11 | 29.96 | 37.48 | 2.32 | 71.24 |
| 2024 | 4 | 6 | 12 | 27.34 | 38.96 | 2.45 | 62.34 |
| 2024 | 4 | 6 | 13 | 19.79 | 67.9 | 3.77 | 278.63 |
| 2024 | 4 | 6 | 14 | 32.87 | 31.36 | 0.26 | 277.94 |
| 2024 | 4 | 6 | 15 | 27.41 | 57.28 | 0.72 | 273.00 |
| 2024 | 4 | 6 | 16 | 32.52 | 36.05 | 0.12 | 127.14 |
| 2024 | 4 | 6 | 17 | 28.59 | 34.32 | 1.42 | 143.75 |
| 2024 | 4 | 6 | 18 | 42.69 | 49.1 | 1.35 | 264.32 |
| 2024 | 4 | 6 | 19 | 33.28 | 36.97 | 2.32 | 275.36 |
| 2024 | 4 | 6 | 20 | 19.76 | 34.54 | 2.66 | 126.28 |
| 2024 | 4 | 6 | 21 | 38.53 | 45.18 | 0.7 | 79.39 |
| 2024 | 4 | 6 | 22 | 27.07 | 48.93 | 3.64 | 85.04 |
| 2024 | 4 | 6 | 23 | 45.33 | 49.52 | 3.46 | 91.63 |
| 2024 | 4 | 7 | 0 | 33.27 | 50.1 | 3.3 | 101.51 |
| 2024 | 4 | 7 | 1 | 19.63 | 48.9 | 2.17 | 115.04 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2024 | 4 | 7 | 2 | 32.72 | 37.43 | 1.38 | 124.61 |
| 2024 | 4 | 7 | 3 | 24.01 | 40.38 | 0.26 | 129.52 |
| 2024 | 4 | 7 | 4 | 36.16 | 42.73 | 1.63 | 132.66 |
| 2024 | 4 | 7 | 5 | 24.43 | 50.81 | 1.7 | 135.22 |
| 2024 | 4 | 7 | 6 | 43.75 | 56.53 | 1.29 | 138.67 |
| 2024 | 4 | 7 | 7 | 37.13 | 36.16 | 2.71 | 139.26 |
| 2024 | 4 | 7 | 8 | 40.06 | 55.63 | 3.03 | 131.54 |
| 2024 | 4 | 7 | 9 | 24.38 | 48.61 | 1.63 | 123.57 |
| 2024 | 4 | 7 | 10 | 25.52 | 53.9 | 2.83 | 93.70 |
| 2024 | 4 | 7 | 11 | 35.03 | 53.76 | 2.1 | 143.05 |
| 2024 | 4 | 7 | 12 | 32.27 | 41.49 | 3.91 | 142.92 |
| 2024 | 4 | 7 | 13 | 27.11 | 53.76 | 1.73 | 124.17 |
| 2024 | 4 | 7 | 14 | 41.53 | 32.76 | 1.26 | 125.97 |
| 2024 | 4 | 7 | 15 | 41.97 | 46.82 | 2.63 | 145.39 |
| 2024 | 4 | 7 | 16 | 33.41 | 58.2 | 2.07 | 141.38 |
| 2024 | 4 | 7 | 17 | 25.7 | 42.97 | 1.61 | 133.45 |
| 2024 | 4 | 7 | 18 | 35.81 | 58.52 | 0.49 | 143.90 |
| 2024 | 4 | 7 | 19 | 22.49 | 54.09 | 2.53 | 133.87 |
| 2024 | 4 | 7 | 20 | 38.79 | 57.73 | 2.73 | 143.15 |
| 2024 | 4 | 7 | 21 | 21.49 | 48.34 | 1.37 | 134.80 |
| 2024 | 4 | 7 | 22 | 43.23 | 46.53 | 1.9 | 131.69 |
| 2024 | 4 | 7 | 23 | 39.15 | 41.41 | 3.12 | 80.07 |
| 2024 | 4 | 8 | 0 | 43.25 | 46.91 | 3.1 | 90.00 |
| 2024 | 4 | 8 | 1 | 25.72 | 37.26 | 0.94 | 103.59 |
| 2024 | 4 | 8 | 2 | 28.98 | 37.68 | 1.75 | 120.09 |
| 2024 | 4 | 8 | 3 | 19.52 | 51.99 | 2.61 | 136.28 |
| 2024 | 4 | 8 | 4 | 45.69 | 43.87 | 1.08 | 128.56 |
| 2024 | 4 | 8 | 5 | 27.04 | 41.44 | 3.8 | 124.51 |
| 2024 | 4 | 8 | 6 | 36.21 | 38.91 | 0.3 | 127.17 |
| 2024 | 4 | 8 | 7 | 45.31 | 42.78 | 1.36 | 124.29 |
| 2024 | 4 | 8 | 8 | 35.18 | 43.08 | 1.77 | 129.22 |
| 2024 | 4 | 8 | 9 | 24.56 | 39.34 | 2.97 | 139.35 |
| 2024 | 4 | 8 | 10 | 41.73 | 55.54 | 0.14 | 140.91 |
| 2024 | 4 | 8 | 11 | 22.62 | 54.58 | 0.29 | 95.35 |
| 2024 | 4 | 8 | 12 | 39.52 | 40.25 | 3.01 | 88.80 |
| 2024 | 4 | 8 | 13 | 19.43 | 44.34 | 0.37 | 135.92 |
| 2024 | 4 | 8 | 14 | 39.37 | 45.61 | 3.93 | 132.77 |
| 2024 | 4 | 8 | 15 | 32.42 | 33.72 | 0.18 | 128.97 |
| 2024 | 4 | 8 | 16 | 39.4 | 39.99 | 1.49 | 127.57 |
| 2024 | 4 | 8 | 17 | 26.19 | 53.89 | 3.16 | 144.58 |
| 2024 | 4 | 8 | 18 | 21.69 | 54.43 | 3.71 | 145.73 |
| 2024 | 4 | 8 | 19 | 45.27 | 42.01 | 0.42 | 129.09 |
| 2024 | 4 | 8 | 20 | 33.04 | 54.04 | 3.77 | 138.47 |
| 2024 | 4 | 8 | 21 | 29.21 | 46.67 | 2.19 | 140.06 |
| 2024 | 4 | 8 | 22 | 28.52 | 37.52 | 1.72 | 141.97 |
| 2024 | 4 | 8 | 23 | 35.5 | 32.14 | 2.95 | 126.65 |
| 2024 | 4 | 9 | 0 | 19.73 | 42.31 | 1.14 | 124.02 |

| 2024 | 4 | 9 | 1 | 30.24 | 34.63 | 3.2 | 143.75 |
|---|---|---|---|---|---|---|---|
| 2024 | 4 | 9 | 2 | 32.45 | 46.51 | 0.45 | 145.77 |
| 2024 | 4 | 9 | 3 | 46.33 | 48.9 | 1.99 | 124.63 |
| 2024 | 4 | 9 | 4 | 22.01 | 47.13 | 1.2 | 144.53 |
| 2024 | 4 | 9 | 5 | 31.68 | 44.36 | 1.15 | 130.34 |
| 2024 | 4 | 9 | 6 | 24.61 | 55.15 | 1.57 | 130.63 |
| 2024 | 4 | 9 | 7 | 30.54 | 39.07 | 3.22 | 134.44 |
| 2024 | 4 | 9 | 8 | 22.85 | 44.45 | 1.33 | 85.19 |
| 2024 | 4 | 9 | 9 | 42.88 | 41.4 | 2.74 | 137.46 |
| 2024 | 4 | 9 | 10 | 30.34 | 45.93 | 0.2 | 142.09 |
| 2024 | 4 | 9 | 11 | 24.8 | 49.58 | 3.37 | 84.14 |
| 2024 | 4 | 9 | 12 | 19.34 | 36.93 | 1.55 | 91.81 |
| 2024 | 4 | 9 | 13 | 35.08 | 36.05 | 0.48 | 99.59 |
| 2024 | 4 | 9 | 14 | 18.84 | 55.53 | 1.49 | 80.84 |
| 2024 | 4 | 9 | 15 | 29.32 | 39.86 | 0.11 | 84.05 |
| 2024 | 4 | 9 | 16 | 26.15 | 39.91 | 2.7 | 92.33 |
| 2024 | 4 | 9 | 17 | 31.83 | 47.95 | 3.14 | 95.86 |
| 2024 | 4 | 9 | 18 | 19.06 | 40.19 | 3.93 | 84.65 |
| 2024 | 4 | 9 | 19 | 32.81 | 47.2 | 0.36 | 142.55 |
| 2024 | 4 | 9 | 20 | 42.15 | 32.08 | 2.95 | 144.22 |
| 2024 | 4 | 9 | 21 | 19.41 | 52.17 | 0.32 | 125.01 |
| 2024 | 4 | 9 | 22 | 38.4 | 48.45 | 1.11 | 126.46 |
| 2024 | 4 | 9 | 23 | 20.1 | 54.49 | 2.81 | 81.09 |
| 2024 | 4 | 10 | 0 | 28.31 | 53.02 | 2.77 | 97.07 |
| 2024 | 4 | 10 | 1 | 38.34 | 32.92 | 3.68 | 89.72 |
| 2024 | 4 | 10 | 2 | 25.49 | 31.23 | 1.58 | 90.82 |
| 2024 | 4 | 10 | 3 | 39 | 34.59 | 2.44 | 93.57 |
| 2024 | 4 | 10 | 4 | 38.73 | 57.5 | 2.26 | 87.31 |
| 2024 | 4 | 10 | 5 | 23.6 | 35.82 | 1.42 | 81.15 |
| 2024 | 4 | 10 | 6 | 21.72 | 47.92 | 0.17 | 86.33 |
| 2024 | 4 | 10 | 7 | 26.46 | 57.38 | 0.95 | 86.72 |
| 2024 | 4 | 10 | 8 | 38.91 | 33.28 | 2.48 | 81.13 |
| 2024 | 4 | 10 | 9 | 44.05 | 49.55 | 1.14 | 127.68 |
| 2024 | 4 | 10 | 10 | 21.67 | 54.99 | 2.95 | 135.93 |
| 2024 | 4 | 10 | 11 | 45.61 | 42.96 | 1.28 | 144.96 |
| 2024 | 4 | 10 | 12 | 39.41 | 43.99 | 3.37 | 141.85 |
| 2024 | 4 | 10 | 13 | 25.28 | 53.5 | 1.86 | 143.52 |
| 2024 | 4 | 10 | 14 | 25.53 | 47.84 | 0.66 | 139.58 |
| 2024 | 4 | 10 | 15 | 19.9 | 32.91 | 0.84 | 141.67 |
| 2024 | 4 | 10 | 16 | 46.19 | 30.72 | 1.87 | 144.90 |
| 2024 | 4 | 10 | 17 | 32.63 | 51.34 | 2.51 | 141.51 |
| 2024 | 4 | 10 | 18 | 35.51 | 35.21 | 0.15 | 139.45 |
| 2024 | 4 | 10 | 19 | 23.72 | 56.65 | 0.6 | 132.67 |
| 2024 | 4 | 10 | 20 | 38.2 | 42.61 | 0.2 | 141.04 |
| 2024 | 4 | 10 | 21 | 44.73 | 42.15 | 3.87 | 123.85 |
| 2024 | 4 | 10 | 22 | 46.37 | 33.17 | 0.97 | 142.42 |
| 2024 | 4 | 10 | 23 | 37.86 | 42.28 | 1.97 | 138.88 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2024 | 4 | 11 | 0 | 45.78 | 46.3 | 1.2 | 130.46 |
| 2024 | 4 | 11 | 1 | 18.68 | 31.52 | 3.39 | 132.67 |
| 2024 | 4 | 11 | 2 | 27.78 | 43.43 | 0.25 | 143.08 |
| 2024 | 4 | 11 | 3 | 30.5 | 30.72 | 1.93 | 128.19 |
| 2024 | 4 | 11 | 4 | 35.15 | 36.01 | 3.93 | 126.42 |
| 2024 | 4 | 11 | 5 | 33.38 | 55.54 | 3.65 | 133.46 |
| 2024 | 4 | 11 | 6 | 31.51 | 46.98 | 0.16 | 126.57 |
| 2024 | 4 | 11 | 7 | 21 | 61.2 | 2.01 | 137.42 |
| 2024 | 4 | 11 | 8 | 34.41 | 30.22 | 0.58 | 133.42 |
| 2024 | 4 | 11 | 9 | 23.17 | 35.07 | 3.76 | 137.42 |
| 2024 | 4 | 11 | 10 | 20.33 | 50.07 | 2.93 | 140.42 |
| 2024 | 4 | 11 | 11 | 18.97 | 31.88 | 2.69 | 143.83 |
| 2024 | 4 | 11 | 12 | 22.92 | 32.12 | 1.96 | 138.63 |
| 2024 | 4 | 11 | 13 | 28.85 | 57.02 | 2.19 | 126.58 |
| 2024 | 4 | 11 | 14 | 26.07 | 49.05 | 1.22 | 140.12 |
| 2024 | 4 | 11 | 15 | 19.72 | 38.73 | 0.76 | 139.24 |
| 2024 | 4 | 11 | 16 | 21.71 | 55.61 | 2.36 | 131.50 |
| 2024 | 4 | 11 | 17 | 41.52 | 33.56 | 3.89 | 142.99 |
| 2024 | 4 | 11 | 18 | 32.18 | 42.31 | 3.36 | 142.42 |
| 2024 | 4 | 11 | 19 | 33.99 | 31.78 | 3.41 | 214.00 |
| 2024 | 4 | 11 | 20 | 40.38 | 37.46 | 3.42 | 142.49 |
| 2024 | 4 | 11 | 21 | 31.86 | 58.73 | 1.51 | 128.31 |
| 2024 | 4 | 11 | 22 | 18.62 | 34.03 | 0.19 | 141.63 |
| 2024 | 4 | 11 | 23 | 25.17 | 39.38 | 2.75 | 128.42 |
| 2024 | 4 | 12 | 0 | 22.61 | 39.68 | 1.2 | 124.37 |
| 2024 | 4 | 12 | 1 | 31.82 | 53.9 | 0.9 | 137.18 |
| 2024 | 4 | 12 | 2 | 21.53 | 56.24 | 0.8 | 141.98 |
| 2024 | 4 | 12 | 3 | 28.3 | 34.08 | 1.5 | 144.39 |
| 2024 | 4 | 12 | 4 | 32.65 | 47.83 | 2.66 | 130.82 |
| 2024 | 4 | 12 | 5 | 44.03 | 50.21 | 2.73 | 56.24 |
| 2024 | 4 | 12 | 6 | 25.19 | 40.08 | 2.51 | 98.91 |
| 2024 | 4 | 12 | 7 | 22.99 | 30.19 | 1.8 | 97.09 |
| 2024 | 4 | 12 | 8 | 31.29 | 46.87 | 1.32 | 123.90 |
| 2024 | 4 | 12 | 9 | 31.72 | 54.42 | 3.63 | 348.09 |
| 2024 | 4 | 12 | 10 | 37.24 | 53.09 | 3.21 | 351.69 |
| 2024 | 4 | 12 | 11 | 40.87 | 41.19 | 1.33 | 145.50 |
| 2024 | 4 | 12 | 12 | 45.64 | 54.42 | 0.55 | 139.20 |
| 2024 | 4 | 12 | 13 | 33.57 | 54.39 | 3.8 | 139.94 |
| 2024 | 4 | 12 | 14 | 36.05 | 56.76 | 2.94 | 126.02 |
| 2024 | 4 | 12 | 15 | 20.66 | 50.04 | 3.79 | 127.56 |
| 2024 | 4 | 12 | 16 | 35.08 | 46.01 | 1.35 | 128.74 |
| 2024 | 4 | 12 | 17 | 24.58 | 44.06 | 0.58 | 123.98 |
| 2024 | 4 | 12 | 18 | 37.97 | 42.66 | 2.44 | 145.94 |
| 2024 | 4 | 12 | 19 | 31.43 | 53.74 | 0.68 | 128.32 |
| 2024 | 4 | 12 | 20 | 30.03 | 37.87 | 0.35 | 143.73 |
| 2024 | 4 | 12 | 21 | 29.78 | 53.01 | 0.44 | 137.19 |
| 2024 | 4 | 12 | 22 | 19.76 | 42.98 | 0.58 | 133.10 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2024 | 4 | 12 | 23 | 33.4 | 58.54 | 3.72 | 352.26 |
| 2024 | 4 | 13 | 0 | 23.82 | 45.96 | 3.87 | 359.14 |
| 2024 | 4 | 13 | 1 | 31.01 | 38.92 | 3.1 | 0.91 |
| 2024 | 4 | 13 | 2 | 39.84 | 41.35 | 0.11 | 352.99 |
| 2024 | 4 | 13 | 3 | 20.87 | 51.59 | 1.68 | 124.59 |
| 2024 | 4 | 13 | 4 | 39.85 | 48.64 | 2.14 | 125.57 |
| 2024 | 4 | 13 | 5 | 26.77 | 44.11 | 3.98 | 143.34 |
| 2024 | 4 | 13 | 6 | 45.3 | 29.65 | 4 | 142.82 |
| 2024 | 4 | 13 | 7 | 20.33 | 45.26 | 1.29 | 142.28 |
| 2024 | 4 | 13 | 8 | 25.04 | 48.67 | 1.54 | 135.66 |
| 2024 | 4 | 13 | 9 | 31.59 | 49.81 | 1.7 | 137.50 |
| 2024 | 4 | 13 | 10 | 21.59 | 41.38 | 0.83 | 125.11 |
| 2024 | 4 | 13 | 11 | 23.45 | 43.65 | 1.52 | 143.56 |
| 2024 | 4 | 13 | 12 | 40.47 | 43.96 | 2.15 | 129.32 |
| 2024 | 4 | 13 | 13 | 27.51 | 50.82 | 1.42 | 135.87 |
| 2024 | 4 | 13 | 14 | 24.89 | 35.69 | 3.55 | 143.14 |
| 2024 | 4 | 13 | 15 | 24.53 | 57.05 | 2.59 | 139.21 |
| 2024 | 4 | 13 | 16 | 26.96 | 30.58 | 0.56 | 131.99 |
| 2024 | 4 | 13 | 17 | 30.37 | 36.31 | 0.55 | 145.57 |
| 2024 | 4 | 13 | 18 | 24.09 | 53.67 | 3.28 | 128.12 |
| 2024 | 4 | 13 | 19 | 41.74 | 32.95 | 1.08 | 135.04 |
| 2024 | 4 | 13 | 20 | 32.91 | 47.01 | 2.18 | 133.94 |
| 2024 | 4 | 13 | 21 | 35.57 | 35.94 | 3.94 | 139.51 |
| 2024 | 4 | 13 | 22 | 38.62 | 50.94 | 1.6 | 142.98 |
| 2024 | 4 | 13 | 23 | 33.86 | 53.25 | 1.85 | 127.29 |
| 2024 | 4 | 14 | 0 | 27.99 | 30.05 | 2 | 136.07 |
| 2024 | 4 | 14 | 1 | 43.99 | 32.87 | 1.43 | 135.53 |
| 2024 | 4 | 14 | 2 | 43.91 | 53 | 1.18 | 133.06 |
| 2024 | 4 | 14 | 3 | 19.75 | 56.68 | 2.71 | 130.86 |
| 2024 | 4 | 14 | 4 | 32.9 | 35.27 | 3.34 | 136.44 |
| 2024 | 4 | 14 | 5 | 36.84 | 44.41 | 3.24 | 144.46 |
| 2024 | 4 | 14 | 6 | 44.3 | 51.8 | 2.32 | 131.43 |
| 2024 | 4 | 14 | 7 | 22.35 | 41.64 | 1.97 | 143.80 |
| 2024 | 4 | 14 | 8 | 27.71 | 41.96 | 0.17 | 133.79 |
| 2024 | 4 | 14 | 9 | 44.28 | 29.33 | 0.24 | 137.03 |
| 2024 | 4 | 14 | 10 | 41.41 | 41.46 | 3.92 | 128.79 |
| 2024 | 4 | 14 | 11 | 32.43 | 39.72 | 3.57 | 127.92 |
| 2024 | 4 | 14 | 12 | 33.79 | 55.59 | 3.91 | 138.15 |
| 2024 | 4 | 14 | 13 | 26.74 | 29 | 0.69 | 131.58 |
| 2024 | 4 | 14 | 14 | 32.67 | 35.8 | 3.61 | 133.91 |
| 2024 | 4 | 14 | 15 | 25.69 | 46.02 | 1.49 | 127.87 |
| 2024 | 4 | 14 | 16 | 26.71 | 35.36 | 0.48 | 144.73 |
| 2024 | 4 | 14 | 17 | 40.09 | 49.54 | 1.3 | 142.92 |
| 2024 | 4 | 14 | 18 | 31.07 | 39.66 | 0.6 | 139.76 |
| 2024 | 4 | 14 | 19 | 35.78 | 57.58 | 0.9 | 142.41 |
| 2024 | 4 | 14 | 20 | 42.2 | 30.44 | 3.86 | 85.08 |
| 2024 | 4 | 14 | 21 | 20.48 | 33.15 | 2.94 | 131.84 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2024 | 4 | 14 | 22 | 38.52 | 46.12 | 2.7 | 130.75 |
| 2024 | 4 | 14 | 23 | 45.11 | 42.63 | 2.57 | 136.52 |
| 2024 | 4 | 15 | 0 | 30.19 | 42.54 | 2.11 | 145.75 |
| 2024 | 4 | 15 | 1 | 37.09 | 44.74 | 1.23 | 303.75 |
| 2024 | 4 | 15 | 2 | 31.85 | 41.64 | 2.44 | 264.50 |
| 2024 | 4 | 15 | 3 | 38.33 | 52.73 | 0.87 | 259.96 |
| 2024 | 4 | 15 | 4 | 36.98 | 37.33 | 1.19 | 260.48 |
| 2024 | 4 | 15 | 5 | 29.57 | 47.03 | 2.76 | 260.70 |
| 2024 | 4 | 15 | 6 | 25.17 | 55.5 | 3.8 | 80.48 |
| 2024 | 4 | 15 | 7 | 20 | 31.61 | 3.31 | 79.90 |
| 2024 | 4 | 15 | 8 | 40.53 | 30.96 | 0.72 | 259.14 |
| 2024 | 4 | 15 | 9 | 19.15 | 32.39 | 1.41 | 261.97 |
| 2024 | 4 | 15 | 10 | 20.26 | 42.3 | 1.68 | 57.45 |
| 2024 | 4 | 15 | 11 | 37.47 | 57.18 | 1.68 | 57.98 |
| 2024 | 4 | 15 | 12 | 38.87 | 43.65 | 2.06 | 61.24 |
| 2024 | 4 | 15 | 13 | 34.13 | 47.86 | 1.82 | 71.24 |
| 2024 | 4 | 15 | 14 | 38.29 | 55.58 | 1.8 | 62.34 |
| 2024 | 4 | 15 | 15 | 27.46 | 52.81 | 3.43 | 137.95 |
| 2024 | 4 | 15 | 16 | 23.88 | 58.73 | 0.42 | 132.66 |
| 2024 | 4 | 15 | 17 | 26.59 | 58.24 | 0.14 | 141.13 |
| 2024 | 4 | 15 | 18 | 24.73 | 42.14 | 0.15 | 132.00 |
| 2024 | 4 | 15 | 19 | 20.14 | 57.75 | 2.02 | 143.64 |
| 2024 | 4 | 15 | 20 | 29.44 | 48.12 | 0.56 | 126.81 |
| 2024 | 4 | 15 | 21 | 26.79 | 54.66 | 1.79 | 127.69 |
| 2024 | 4 | 15 | 22 | 37.52 | 29.92 | 0.41 | 124.69 |
| 2024 | 4 | 15 | 23 | 23.42 | 53.35 | 0.72 | 142.38 |
| 2024 | 4 | 16 | 0 | 24.04 | 29.98 | 0.95 | 139.01 |
| 2024 | 4 | 16 | 1 | 39.68 | 36.66 | 3.68 | 127.45 |
| 2024 | 4 | 16 | 2 | 43.47 | 41.88 | 2.22 | 133.13 |
| 2024 | 4 | 16 | 3 | 37.87 | 42.25 | 3.9 | 135.36 |
| 2024 | 4 | 16 | 4 | 32.48 | 56.13 | 1.02 | 129.48 |
| 2024 | 4 | 16 | 5 | 38.08 | 57.03 | 3.31 | 144.44 |
| 2024 | 4 | 16 | 6 | 36.8 | 40.05 | 0.39 | 130.63 |
| 2024 | 4 | 16 | 7 | 31.18 | 53.11 | 2.47 | 125.92 |
| 2024 | 4 | 16 | 8 | 38.74 | 46.88 | 1.61 | 130.45 |
| 2024 | 4 | 16 | 9 | 35.74 | 51.07 | 0.97 | 128.47 |
| 2024 | 4 | 16 | 10 | 35.31 | 55.7 | 3.18 | 126.33 |
| 2024 | 4 | 16 | 11 | 31.66 | 55.89 | 3.16 | 142.82 |
| 2024 | 4 | 16 | 12 | 27.76 | 39.03 | 2.61 | 126.94 |
| 2024 | 4 | 16 | 13 | 22.88 | 29.03 | 1.31 | 129.12 |
| 2024 | 4 | 16 | 14 | 43.51 | 41.11 | 2.37 | 133.22 |
| 2024 | 4 | 16 | 15 | 26.56 | 51.67 | 1.39 | 146.01 |
| 2024 | 4 | 16 | 16 | 41.61 | 45.8 | 1.25 | 135.58 |
| 2024 | 4 | 16 | 17 | 29.93 | 31.86 | 0.86 | 130.55 |
| 2024 | 4 | 16 | 18 | 34.15 | 33.3 | 2.64 | 126.60 |
| 2024 | 4 | 16 | 19 | 20.57 | 42.75 | 0.19 | 125.69 |
| 2024 | 4 | 16 | 20 | 18.82 | 54.37 | 1.24 | 135.63 |

| 2024 | 4 | 16 | 21 | 46.28 | 57.56 | 0.69 | 128.64 |
|---|---|---|---|---|---|---|---|
| 2024 | 4 | 16 | 22 | 46.04 | 37.12 | 2.32 | 124.63 |
| 2024 | 4 | 16 | 23 | 45.56 | 58.78 | 3.51 | 127.48 |
| 2024 | 4 | 17 | 0 | 32.28 | 32.93 | 3.9 | 56.19 |
| 2024 | 4 | 17 | 1 | 29.35 | 50.57 | 3.51 | 83.89 |
| 2024 | 4 | 17 | 2 | 33.86 | 39.97 | 3.72 | 94.08 |
| 2024 | 4 | 17 | 3 | 41.74 | 36.04 | 0.53 | 91.60 |
| 2024 | 4 | 17 | 4 | 29.35 | 32.98 | 1.07 | 96.63 |
| 2024 | 4 | 17 | 5 | 23.43 | 48.3 | 2.94 | 95.95 |
| 2024 | 4 | 17 | 6 | 29.35 | 38.6 | 2.13 | 33.96 |
| 2024 | 4 | 17 | 7 | 27.71 | 41 | 1.46 | 95.08 |
| 2024 | 4 | 17 | 8 | 45.22 | 50.88 | 3.3 | 264.49 |
| 2024 | 4 | 17 | 9 | 37.92 | 48.26 | 0.5 | 265.73 |
| 2024 | 4 | 17 | 10 | 30.37 | 29.75 | 1.31 | 266.03 |
| 2024 | 4 | 17 | 11 | 41.69 | 39.31 | 2.93 | 267.97 |
| 2024 | 4 | 17 | 12 | 28.23 | 34.51 | 1.1 | 270.86 |
| 2024 | 4 | 17 | 13 | 44.3 | 58.24 | 0.49 | 274.12 |
| 2024 | 4 | 17 | 14 | 35.95 | 45.94 | 1 | 277.94 |
| 2024 | 4 | 17 | 15 | 25.05 | 54.93 | 2.4 | 139.25 |
| 2024 | 4 | 17 | 16 | 45.91 | 31.2 | 0.8 | 145.24 |
| 2024 | 4 | 17 | 17 | 42.24 | 31.51 | 2.5 | 144.45 |
| 2024 | 4 | 17 | 18 | 23.96 | 51.36 | 2.72 | 136.17 |
| 2024 | 4 | 17 | 19 | 20.23 | 38.49 | 3.96 | 132.65 |
| 2024 | 4 | 17 | 20 | 45.12 | 55.46 | 0.29 | 141.22 |
| 2024 | 4 | 17 | 21 | 18.64 | 57.62 | 1.65 | 278.75 |
| 2024 | 4 | 17 | 22 | 44.21 | 40.97 | 1.52 | 135.32 |
| 2024 | 4 | 17 | 23 | 21.3 | 37.44 | 2.9 | 131.26 |
| 2024 | 4 | 18 | 0 | 24.37 | 52.93 | 2.21 | 127.58 |
| 2024 | 4 | 18 | 1 | 42.9 | 56.16 | 1.69 | 128.61 |
| 2024 | 4 | 18 | 2 | 36.68 | 40.33 | 0.44 | 96.09 |
| 2024 | 4 | 18 | 3 | 43.71 | 50.32 | 3.82 | 92.64 |
| 2024 | 4 | 18 | 4 | 32.63 | 40.21 | 3.57 | 85.23 |
| 2024 | 4 | 18 | 5 | 26.48 | 38.07 | 1.95 | 95.91 |
| 2024 | 4 | 18 | 6 | 35.53 | 44.91 | 0.66 | 264.41 |
| 2024 | 4 | 18 | 7 | 29.83 | 45.06 | 1.51 | 266.49 |
| 2024 | 4 | 18 | 8 | 40.76 | 52.95 | 3.39 | 142.41 |
| 2024 | 4 | 18 | 9 | 23.45 | 54.27 | 0.84 | 127.46 |
| 2024 | 4 | 18 | 10 | 26.77 | 39.52 | 0.82 | 136.71 |
| 2024 | 4 | 18 | 11 | 27.26 | 30.1 | 3.51 | 132.09 |
| 2024 | 4 | 18 | 12 | 39.69 | 51.01 | 3.65 | 145.78 |
| 2024 | 4 | 18 | 13 | 21.59 | 34.04 | 3.43 | 145.51 |
| 2024 | 4 | 18 | 14 | 31.35 | 57.49 | 2.67 | 125.93 |
| 2024 | 4 | 18 | 15 | 37.18 | 53.7 | 3.3 | 144.97 |
| 2024 | 4 | 18 | 16 | 25.26 | 53.02 | 2.93 | 144.50 |
| 2024 | 4 | 18 | 17 | 31.1 | 32.45 | 1.36 | 143.66 |
| 2024 | 4 | 18 | 18 | 21.03 | 55.71 | 2.83 | 143.44 |
| 2024 | 4 | 18 | 19 | 42.78 | 42.78 | 1.85 | 124.70 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2024 | 4 | 18 | 20 | 43.96 | 55.24 | 1.12 | 140.90 |
| 2024 | 4 | 18 | 21 | 27.76 | 41.21 | 3.68 | 136.34 |
| 2024 | 4 | 18 | 22 | 43.3 | 49.35 | 1.16 | 144.45 |
| 2024 | 4 | 18 | 23 | 27.13 | 42.17 | 3.87 | 140.29 |
| 2024 | 4 | 19 | 0 | 42.86 | 36.1 | 2.38 | 131.86 |
| 2024 | 4 | 19 | 1 | 46.44 | 42.24 | 3.09 | 132.71 |
| 2024 | 4 | 19 | 2 | 32.17 | 51.46 | 2.18 | 143.91 |
| 2024 | 4 | 19 | 3 | 28.3 | 49.05 | 1.3 | 146.25 |
| 2024 | 4 | 19 | 4 | 30.66 | 48.91 | 3.83 | 136.20 |
| 2024 | 4 | 19 | 5 | 43.02 | 32.57 | 0.55 | 129.90 |
| 2024 | 4 | 19 | 6 | 25.9 | 44.11 | 3.58 | 139.90 |
| 2024 | 4 | 19 | 7 | 45.28 | 49.28 | 0.76 | 129.87 |
| 2024 | 4 | 19 | 8 | 18.52 | 48.55 | 0.74 | 138.39 |
| 2024 | 4 | 19 | 9 | 19.34 | 55.38 | 3.87 | 124.74 |
| 2024 | 4 | 19 | 10 | 22.19 | 36.87 | 2.36 | 145.94 |
| 2024 | 4 | 19 | 11 | 29.24 | 57.69 | 1.82 | 127.65 |
| 2024 | 4 | 19 | 12 | 23.11 | 36.94 | 2.36 | 133.23 |
| 2024 | 4 | 19 | 13 | 36.71 | 58.75 | 1.92 | 138.41 |
| 2024 | 4 | 19 | 14 | 39.1 | 41.49 | 3.09 | 127.29 |
| 2024 | 4 | 19 | 15 | 30.95 | 39 | 1.75 | 135.67 |
| 2024 | 4 | 19 | 16 | 19.02 | 50.81 | 2.28 | 142.91 |
| 2024 | 4 | 19 | 17 | 25.61 | 40.86 | 3.08 | 125.31 |
| 2024 | 4 | 19 | 18 | 43.47 | 50.4 | 1.67 | 357.46 |
| 2024 | 4 | 19 | 19 | 43.32 | 33.14 | 3.09 | 133.41 |
| 2024 | 4 | 19 | 20 | 35.86 | 46.62 | 1.22 | 128.73 |
| 2024 | 4 | 19 | 21 | 21.2 | 46.76 | 3.96 | 140.47 |
| 2024 | 4 | 19 | 22 | 40.26 | 36.16 | 2.07 | 141.77 |
| 2024 | 4 | 19 | 23 | 29.59 | 35.58 | 1.31 | 135.76 |
| 2024 | 4 | 20 | 0 | 44.26 | 35.14 | 0.9 | 137.49 |
| 2024 | 4 | 20 | 1 | 43.71 | 46.14 | 0.58 | 268.03 |
| 2024 | 4 | 20 | 2 | 24.61 | 44.7 | 1.16 | 273.04 |
| 2024 | 4 | 20 | 3 | 28.74 | 38.49 | 0.81 | 129.00 |
| 2024 | 4 | 20 | 4 | 27.39 | 57.39 | 3.77 | 126.37 |
| 2024 | 4 | 20 | 5 | 34.53 | 54.83 | 3.96 | 145.96 |
| 2024 | 4 | 20 | 6 | 29.18 | 56.16 | 1.29 | 127.54 |
| 2024 | 4 | 20 | 7 | 43.66 | 52.21 | 0.7 | 142.34 |
| 2024 | 4 | 20 | 8 | 34.14 | 41.31 | 2.61 | 133.89 |
| 2024 | 4 | 20 | 9 | 22.11 | 54.87 | 3.73 | 128.19 |
| 2024 | 4 | 20 | 10 | 25.95 | 29.03 | 0.38 | 137.97 |
| 2024 | 4 | 20 | 11 | 32.48 | 58.39 | 1.05 | 124.80 |
| 2024 | 4 | 20 | 12 | 26.33 | 51.02 | 1.19 | 126.31 |
| 2024 | 4 | 20 | 13 | 33.63 | 35.98 | 2.27 | 137.07 |
| 2024 | 4 | 20 | 14 | 33.23 | 33.5 | 2.15 | 143.64 |
| 2024 | 4 | 20 | 15 | 27.23 | 50.77 | 3.36 | 145.86 |
| 2024 | 4 | 20 | 16 | 24.48 | 45.28 | 3.08 | 130.68 |
| 2024 | 4 | 20 | 17 | 26.71 | 53.06 | 3.46 | 133.97 |
| 2024 | 4 | 20 | 18 | 36.43 | 36.65 | 3.7 | 129.33 |

| 2024 | 4 | 20 | 19 | 26.69 | 45.41 | 0.86 | 348.57 |
|---|---|---|---|---|---|---|---|
| 2024 | 4 | 20 | 20 | 42.82 | 47.43 | 2.99 | 140.18 |
| 2024 | 4 | 20 | 21 | 34.84 | 36.66 | 0.53 | 126.63 |
| 2024 | 4 | 20 | 22 | 27.54 | 30.23 | 3.72 | 127.94 |
| 2024 | 4 | 20 | 23 | 44.73 | 31.49 | 0.96 | 137.93 |
| 2024 | 4 | 21 | 0 | 21.38 | 38.3 | 3.08 | 142.24 |
| 2024 | 4 | 21 | 1 | 29.34 | 34.86 | 1.37 | 84.19 |
| 2024 | 4 | 21 | 2 | 26.4 | 48.81 | 1.35 | 92.41 |
| 2024 | 4 | 21 | 3 | 37.55 | 31.54 | 3.71 | 96.74 |
| 2024 | 4 | 21 | 4 | 29.25 | 58.55 | 2.25 | 98.90 |
| 2024 | 4 | 21 | 5 | 45.4 | 30.23 | 3.26 | 100.24 |
| 2024 | 4 | 21 | 6 | 42.01 | 58.12 | 0.76 | 101.95 |
| 2024 | 4 | 21 | 7 | 19.03 | 49.77 | 0.89 | 101.76 |
| 2024 | 4 | 21 | 8 | 37.54 | 48.34 | 2.18 | 98.00 |
| 2024 | 4 | 21 | 9 | 29.59 | 41.56 | 3.69 | 93.39 |
| 2024 | 4 | 21 | 10 | 21.98 | 45.75 | 0.18 | 90.42 |
| 2024 | 4 | 21 | 11 | 34.24 | 32.71 | 0.51 | 94.80 |
| 2024 | 4 | 21 | 12 | 20.55 | 35.28 | 0.16 | 109.78 |
| 2024 | 4 | 21 | 13 | 34.69 | 38.58 | 3.01 | 138.02 |
| 2024 | 4 | 21 | 14 | 24.94 | 51.01 | 3.7 | 275.95 |
| 2024 | 4 | 21 | 15 | 34.57 | 58.5 | 3.34 | 136.16 |
| 2024 | 4 | 21 | 16 | 27.9 | 31.43 | 2.95 | 129.89 |
| 2024 | 4 | 21 | 17 | 36.67 | 31.3 | 2.34 | 141.19 |
| 2024 | 4 | 21 | 18 | 27.61 | 29.37 | 0.12 | 133.19 |
| 2024 | 4 | 21 | 19 | 26.58 | 33.11 | 1.28 | 134.60 |
| 2024 | 4 | 21 | 20 | 18.57 | 56.37 | 0.68 | 129.77 |
| 2024 | 4 | 21 | 21 | 44.59 | 41.95 | 0.33 | 143.87 |
| 2024 | 4 | 21 | 22 | 29.64 | 40.24 | 1.57 | 132.60 |
| 2024 | 4 | 21 | 23 | 25.32 | 33.82 | 0.97 | 142.21 |
| 2024 | 4 | 22 | 0 | 34.76 | 49.76 | 3.77 | 348.99 |
| 2024 | 4 | 22 | 1 | 27.81 | 53.02 | 2.69 | 353.18 |
| 2024 | 4 | 22 | 2 | 21.83 | 49.41 | 3.09 | 131.93 |
| 2024 | 4 | 22 | 3 | 35.24 | 34.78 | 1.37 | 124.20 |
| 2024 | 4 | 22 | 4 | 19.14 | 32.31 | 0.21 | 98.24 |
| 2024 | 4 | 22 | 5 | 37.18 | 32.06 | 1.31 | 136.31 |
| 2024 | 4 | 22 | 6 | 19.73 | 46.08 | 0.99 | 126.62 |
| 2024 | 4 | 22 | 7 | 43.73 | 31.68 | 3.97 | 132.75 |
| 2024 | 4 | 22 | 8 | 39.61 | 53.18 | 0.51 | 136.12 |
| 2024 | 4 | 22 | 9 | 33.51 | 52.4 | 0.61 | 133.11 |
| 2024 | 4 | 22 | 10 | 43.34 | 57.01 | 0.69 | 138.53 |
| 2024 | 4 | 22 | 11 | 42.36 | 30.49 | 1.67 | 99.56 |
| 2024 | 4 | 22 | 12 | 39.07 | 57.34 | 3.95 | 88.31 |
| 2024 | 4 | 22 | 13 | 29.76 | 48.16 | 1.44 | 81.82 |
| 2024 | 4 | 22 | 14 | 23.94 | 37.28 | 1.41 | 269.24 |
| 2024 | 4 | 22 | 15 | 35.64 | 47.32 | 2.44 | 137.57 |
| 2024 | 4 | 22 | 16 | 35.3 | 34.44 | 3.69 | 129.34 |
| 2024 | 4 | 22 | 17 | 28.11 | 53.45 | 3.6 | 124.86 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2024 | 4 | 22 | 18 | 19.25 | 39.61 | 3.53 | 132.61 |
| 2024 | 4 | 22 | 19 | 43.93 | 41.34 | 1.44 | 353.22 |
| 2024 | 4 | 22 | 20 | 45.44 | 47.48 | 0.42 | 125.01 |
| 2024 | 4 | 22 | 21 | 45.02 | 37.73 | 3.78 | 142.37 |
| 2024 | 4 | 22 | 22 | 24 | 53.3 | 1.62 | 145.57 |
| 2024 | 4 | 22 | 23 | 23.58 | 32.91 | 3.14 | 143.71 |
| 2024 | 4 | 23 | 0 | 37.27 | 35.51 | 1.55 | 125.99 |
| 2024 | 4 | 23 | 1 | 41.44 | 51.17 | 0.12 | 134.13 |
| 2024 | 4 | 23 | 2 | 25.24 | 51.5 | 0.73 | 83.70 |
| 2024 | 4 | 23 | 3 | 22.44 | 43.3 | 2.25 | 110.52 |
| 2024 | 4 | 23 | 4 | 39.19 | 51.84 | 1.26 | 132.14 |
| 2024 | 4 | 23 | 5 | 37.25 | 41.47 | 3.96 | 140.55 |
| 2024 | 4 | 23 | 6 | 44.61 | 52.29 | 3.96 | 135.14 |
| 2024 | 4 | 23 | 7 | 37.21 | 31.49 | 3.24 | 131.04 |
| 2024 | 4 | 23 | 8 | 24.64 | 47.94 | 3.78 | 143.76 |
| 2024 | 4 | 23 | 9 | 25.32 | 47.95 | 3.52 | 133.39 |
| 2024 | 4 | 23 | 10 | 23.68 | 47.29 | 3.65 | 145.09 |
| 2024 | 4 | 23 | 11 | 29.37 | 33.34 | 1.92 | 125.20 |
| 2024 | 4 | 23 | 12 | 36.5 | 55.32 | 3.35 | 130.33 |
| 2024 | 4 | 23 | 13 | 24.34 | 55.18 | 2.29 | 80.72 |
| 2024 | 4 | 23 | 14 | 38.57 | 39.19 | 0.65 | 91.73 |
| 2024 | 4 | 23 | 15 | 40.79 | 58.74 | 0.28 | 262.30 |
| 2024 | 4 | 23 | 16 | 19.92 | 31.46 | 3.01 | 266.99 |
| 2024 | 4 | 23 | 17 | 28.92 | 53.33 | 2.85 | 268.55 |
| 2024 | 4 | 23 | 18 | 45.83 | 48.31 | 2.88 | 266.15 |
| 2024 | 4 | 23 | 19 | 33.62 | 38.96 | 2.94 | 263.17 |
| 2024 | 4 | 23 | 20 | 45.02 | 33.49 | 3.81 | 260.91 |
| 2024 | 4 | 23 | 21 | 28.35 | 58.69 | 2.96 | 260.94 |
| 2024 | 4 | 23 | 22 | 20.39 | 34.56 | 0.17 | 263.61 |
| 2024 | 4 | 23 | 23 | 28.15 | 39.72 | 2.87 | 269.45 |
| 2024 | 4 | 24 | 0 | 46.04 | 58.18 | 2.99 | 276.72 |
| 2024 | 4 | 24 | 1 | 35.81 | 33.95 | 2.75 | 143.88 |
| 2024 | 4 | 24 | 2 | 27.35 | 54.36 | 2.42 | 139.97 |
| 2024 | 4 | 24 | 3 | 39.35 | 37.34 | 2.83 | 131.49 |
| 2024 | 4 | 24 | 4 | 34.79 | 55.27 | 2.46 | 143.20 |
| 2024 | 4 | 24 | 5 | 42.37 | 42.52 | 2.71 | 128.29 |
| 2024 | 4 | 24 | 6 | 43.24 | 51.31 | 3.28 | 139.80 |
| 2024 | 4 | 24 | 7 | 30.74 | 39.32 | 3.12 | 138.97 |
| 2024 | 4 | 24 | 8 | 41.7 | 47.73 | 3.95 | 139.95 |
| 2024 | 4 | 24 | 9 | 22.35 | 48.17 | 0.97 | 136.12 |
| 2024 | 4 | 24 | 10 | 39.81 | 42.7 | 2.92 | 132.10 |
| 2024 | 4 | 24 | 11 | 40.28 | 31.4 | 1.87 | 135.86 |
| 2024 | 4 | 24 | 12 | 37.37 | 41.56 | 1.78 | 142.61 |
| 2024 | 4 | 24 | 13 | 25.34 | 48.95 | 2.64 | 140.88 |
| 2024 | 4 | 24 | 14 | 30.87 | 50.42 | 2.33 | 137.34 |
| 2024 | 4 | 24 | 15 | 34.93 | 44.72 | 0.22 | 137.83 |
| 2024 | 4 | 24 | 16 | 32.97 | 41.84 | 3.27 | 130.12 |

| 2024 | 4 | 24 | 17 | 37.15 | 30.35 | 2.56 | 131.22 |
|---|---|---|---|---|---|---|---|
| 2024 | 4 | 24 | 18 | 40.01 | 53.23 | 2.93 | 139.95 |
| 2024 | 4 | 24 | 19 | 23.92 | 55.93 | 1.62 | 142.34 |
| 2024 | 4 | 24 | 20 | 44.82 | 33.55 | 1.39 | 139.48 |
| 2024 | 4 | 24 | 21 | 20.43 | 51.67 | 1.99 | 134.31 |
| 2024 | 4 | 24 | 22 | 25.43 | 37.48 | 0.3 | 129.73 |
| 2024 | 4 | 24 | 23 | 24.56 | 46.59 | 2.75 | 141.66 |
| 2024 | 4 | 25 | 0 | 30.85 | 56 | 2.79 | 132.27 |
| 2024 | 4 | 25 | 1 | 42.82 | 30.82 | 0.42 | 124.94 |
| 2024 | 4 | 25 | 2 | 46.07 | 33.15 | 3.07 | 143.43 |
| 2024 | 4 | 25 | 3 | 21.03 | 46.39 | 1.12 | 144.71 |
| 2024 | 4 | 25 | 4 | 26.8 | 50.61 | 2.45 | 124.84 |
| 2024 | 4 | 25 | 5 | 20.38 | 47.1 | 2.93 | 124.68 |
| 2024 | 4 | 25 | 6 | 43.04 | 31.79 | 2.39 | 139.23 |
| 2024 | 4 | 25 | 7 | 42.26 | 53.41 | 2.21 | 145.47 |
| 2024 | 4 | 25 | 8 | 27.1 | 30.35 | 2.96 | 143.34 |
| 2024 | 4 | 25 | 9 | 38.29 | 41.85 | 0.71 | 133.91 |
| 2024 | 4 | 25 | 10 | 30.81 | 37.57 | 3.67 | 280.82 |
| 2024 | 4 | 25 | 11 | 37.24 | 57.98 | 2.04 | 131.41 |
| 2024 | 4 | 25 | 12 | 35.45 | 52.52 | 2.45 | 134.69 |
| 2024 | 4 | 25 | 13 | 40.36 | 48.15 | 0.23 | 136.54 |
| 2024 | 4 | 25 | 14 | 22.21 | 55.3 | 0.3 | 124.50 |
| 2024 | 4 | 25 | 15 | 23.97 | 54.97 | 0.15 | 128.35 |
| 2024 | 4 | 25 | 16 | 18.6 | 45.02 | 2.24 | 134.79 |
| 2024 | 4 | 25 | 17 | 21.46 | 37.25 | 1.82 | 128.46 |
| 2024 | 4 | 25 | 18 | 40.88 | 31.15 | 2.64 | 126.36 |
| 2024 | 4 | 25 | 19 | 43.66 | 34.54 | 1.9 | 143.00 |
| 2024 | 4 | 25 | 20 | 29.72 | 37.74 | 2.21 | 139.60 |
| 2024 | 4 | 25 | 21 | 36.53 | 53.6 | 0.55 | 130.43 |
| 2024 | 4 | 25 | 22 | 38.41 | 46.97 | 3.81 | 124.14 |
| 2024 | 4 | 25 | 23 | 25.97 | 52.65 | 1.9 | 134.89 |
| 2024 | 4 | 26 | 0 | 24.21 | 53.37 | 0.12 | 143.73 |
| 2024 | 4 | 26 | 1 | 31.04 | 38.12 | 0.31 | 141.19 |
| 2024 | 4 | 26 | 2 | 22.46 | 57.43 | 0.35 | 127.35 |
| 2024 | 4 | 26 | 3 | 29.32 | 37.97 | 3.06 | 144.09 |
| 2024 | 4 | 26 | 4 | 20.39 | 43.33 | 3.63 | 139.37 |
| 2024 | 4 | 26 | 5 | 21.39 | 51.14 | 3.26 | 138.94 |
| 2024 | 4 | 26 | 6 | 38.28 | 43.6 | 0.95 | 125.63 |
| 2024 | 4 | 26 | 7 | 18.64 | 40.08 | 2.83 | 140.96 |
| 2024 | 4 | 26 | 8 | 39.45 | 46.47 | 2.8 | 137.24 |
| 2024 | 4 | 26 | 9 | 23.87 | 31.95 | 2.65 | 131.94 |
| 2024 | 4 | 26 | 10 | 37.94 | 52.83 | 1.33 | 124.68 |
| 2024 | 4 | 26 | 11 | 39.62 | 32.19 | 3.33 | 135.07 |
| 2024 | 4 | 26 | 12 | 19.05 | 50.03 | 2.03 | 137.92 |
| 2024 | 4 | 26 | 13 | 23.16 | 50.86 | 3.83 | 136.47 |
| 2024 | 4 | 26 | 14 | 19.62 | 34.94 | 1.8 | 138.46 |
| 2024 | 4 | 26 | 15 | 28.64 | 56.25 | 3.39 | 136.26 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2024 | 4 | 26 | 16 | 19.34 | 39.65 | 3.2 | 140.71 |
| 2024 | 4 | 26 | 17 | 21.21 | 52.24 | 3.42 | 130.64 |
| 2024 | 4 | 26 | 18 | 27.21 | 58.82 | 1.15 | 128.42 |
| 2024 | 4 | 26 | 19 | 40.54 | 38.64 | 1.75 | 270.86 |
| 2024 | 4 | 26 | 20 | 34.94 | 49.45 | 3.27 | 266.81 |
| 2024 | 4 | 26 | 21 | 29.95 | 47.14 | 3.36 | 261.71 |
| 2024 | 4 | 26 | 22 | 28.19 | 32.6 | 2.8 | 259.05 |
| 2024 | 4 | 26 | 23 | 43.62 | 36.34 | 3.12 | 99.61 |
| 2024 | 4 | 27 | 0 | 18.86 | 53.63 | 3.54 | 258.88 |
| 2024 | 4 | 27 | 1 | 24.04 | 54.93 | 2.69 | 260.70 |
| 2024 | 4 | 27 | 2 | 39.72 | 48.94 | 1.54 | 264.18 |
| 2024 | 4 | 27 | 3 | 24.25 | 54.65 | 2.86 | 268.11 |
| 2024 | 4 | 27 | 4 | 27.54 | 55.89 | 2.04 | 269.58 |
| 2024 | 4 | 27 | 5 | 40.16 | 53.09 | 2.28 | 268.63 |
| 2024 | 4 | 27 | 6 | 24.64 | 31.1 | 2.28 | 264.88 |
| 2024 | 4 | 27 | 7 | 42.47 | 47.64 | 1.45 | 96.40 |
| 2024 | 4 | 27 | 8 | 18.8 | 52.55 | 1.1 | 265.25 |
| 2024 | 4 | 27 | 9 | 41.75 | 50.22 | 2.53 | 261.87 |
| 2024 | 4 | 27 | 10 | 31.47 | 52.37 | 2.6 | 262.42 |
| 2024 | 4 | 27 | 11 | 41.9 | 36.82 | 1.74 | 269.69 |
| 2024 | 4 | 27 | 12 | 27.2 | 39.16 | 1.47 | 279.76 |
| 2024 | 4 | 27 | 13 | 37.09 | 46.14 | 1.51 | 144.28 |
| 2024 | 4 | 27 | 14 | 26.22 | 50.86 | 2.64 | 303.13 |
| 2024 | 4 | 27 | 15 | 41.88 | 58.26 | 1.08 | 139.10 |
| 2024 | 4 | 27 | 16 | 45.96 | 49.08 | 3.45 | 132.00 |
| 2024 | 4 | 27 | 17 | 21.33 | 37.46 | 3.45 | 134.65 |
| 2024 | 4 | 27 | 18 | 21.85 | 45.21 | 0.2 | 135.06 |
| 2024 | 4 | 27 | 19 | 21.7 | 58.62 | 1.81 | 266.78 |
| 2024 | 4 | 27 | 20 | 27 | 47.32 | 1.62 | 142.07 |
| 2024 | 4 | 27 | 21 | 43.17 | 48.84 | 1.75 | 141.03 |
| 2024 | 4 | 27 | 22 | 38.31 | 39.83 | 2.42 | 128.84 |
| 2024 | 4 | 27 | 23 | 45.89 | 46.58 | 2.05 | 143.19 |
| 2024 | 4 | 28 | 0 | 34.33 | 45.58 | 2.6 | 140.74 |
| 2024 | 4 | 28 | 1 | 35.41 | 32.82 | 3.8 | 83.50 |
| 2024 | 4 | 28 | 2 | 41.87 | 52.54 | 0.41 | 33.86 |
| 2024 | 4 | 28 | 3 | 36.37 | 50.67 | 0.49 | 84.98 |
| 2024 | 4 | 28 | 4 | 30.83 | 38.9 | 1.23 | 266.41 |
| 2024 | 4 | 28 | 5 | 41.37 | 31.39 | 3.99 | 274.02 |
| 2024 | 4 | 28 | 6 | 34.04 | 51.33 | 0.22 | 128.27 |
| 2024 | 4 | 28 | 7 | 38.58 | 34.26 | 2.3 | 141.58 |
| 2024 | 4 | 28 | 8 | 24.99 | 37.64 | 2.58 | 137.35 |
| 2024 | 4 | 28 | 9 | 25.12 | 35.69 | 1.31 | 138.28 |
| 2024 | 4 | 28 | 10 | 26.7 | 45.47 | 0.24 | 135.97 |
| 2024 | 4 | 28 | 11 | 45.55 | 29.88 | 0.49 | 143.86 |
| 2024 | 4 | 28 | 12 | 35.74 | 41.86 | 2.14 | 125.51 |
| 2024 | 4 | 28 | 13 | 40.75 | 39.27 | 2.94 | 139.07 |
| 2024 | 4 | 28 | 14 | 19.86 | 29.69 | 3.44 | 134.84 |

| 2024 | 4 | 28 | 15 | 40.24 | 43.4 | 1.92 | 136.52 |
|---|---|---|---|---|---|---|---|
| 2024 | 4 | 28 | 16 | 27.68 | 50.45 | 3.59 | 137.36 |
| 2024 | 4 | 28 | 17 | 36.37 | 42.54 | 1.14 | 143.74 |
| 2024 | 4 | 28 | 18 | 43.99 | 57.39 | 1.6 | 139.10 |
| 2024 | 4 | 28 | 19 | 23.19 | 32.96 | 3.51 | 140.63 |
| 2024 | 4 | 28 | 20 | 43.12 | 55.29 | 0.62 | 141.93 |
| 2024 | 4 | 28 | 21 | 39.26 | 43.77 | 3.48 | 104.85 |
| 2024 | 4 | 28 | 22 | 36.08 | 58.55 | 3.65 | 142.85 |
| 2024 | 4 | 28 | 23 | 26.27 | 57.63 | 0.37 | 136.42 |
| 2024 | 4 | 29 | 0 | 29.29 | 32.61 | 2.48 | 124.25 |
| 2024 | 4 | 29 | 1 | 40.03 | 58.01 | 3.32 | 124.85 |
| 2024 | 4 | 29 | 2 | 26.72 | 29.3 | 1.62 | 132.94 |
| 2024 | 4 | 29 | 3 | 27.26 | 51.19 | 2.2 | 141.47 |
| 2024 | 4 | 29 | 4 | 40.52 | 55.54 | 2.13 | 86.80 |
| 2024 | 4 | 29 | 5 | 25.44 | 29.63 | 0.59 | 94.77 |
| 2024 | 4 | 29 | 6 | 30.67 | 55.02 | 2.23 | 87.48 |
| 2024 | 4 | 29 | 7 | 45.59 | 44.96 | 3.12 | 97.02 |
| 2024 | 4 | 29 | 8 | 21.06 | 43.74 | 0.76 | 136.18 |
| 2024 | 4 | 29 | 9 | 31.37 | 33.23 | 3.67 | 142.42 |
| 2024 | 4 | 29 | 10 | 39.96 | 52.26 | 1.08 | 136.10 |
| 2024 | 4 | 29 | 11 | 40.95 | 36.65 | 0.41 | 303.04 |
| 2024 | 4 | 29 | 12 | 31.53 | 49.08 | 2.85 | 131.20 |
| 2024 | 4 | 29 | 13 | 36.3 | 55.77 | 0.69 | 126.82 |
| 2024 | 4 | 29 | 14 | 21.95 | 32.29 | 1.01 | 133.61 |
| 2024 | 4 | 29 | 15 | 30.14 | 46.35 | 2.33 | 146.09 |
| 2024 | 4 | 29 | 16 | 27.93 | 53.8 | 3.5 | 144.61 |
| 2024 | 4 | 29 | 17 | 28.33 | 44.1 | 1.95 | 138.99 |
| 2024 | 4 | 29 | 18 | 24.34 | 47.18 | 1.25 | 127.36 |
| 2024 | 4 | 29 | 19 | 31.86 | 43.41 | 3.18 | 133.66 |
| 2024 | 4 | 29 | 20 | 40.75 | 56.29 | 1.76 | 135.45 |
| 2024 | 4 | 29 | 21 | 25.55 | 41.11 | 2.78 | 279.93 |
| 2024 | 4 | 29 | 22 | 25.22 | 30.79 | 3.33 | 276.60 |
| 2024 | 4 | 29 | 23 | 27.45 | 38.38 | 1.82 | 274.89 |
| 2024 | 4 | 30 | 0 | 39.04 | 49.13 | 2.21 | 274.53 |
| 2024 | 4 | 30 | 1 | 39.38 | 36.35 | 1.59 | 274.34 |
| 2024 | 4 | 30 | 2 | 26.73 | 46.61 | 3.15 | 276.15 |
| 2024 | 4 | 30 | 3 | 25.46 | 48.73 | 3.48 | 279.01 |
| 2024 | 4 | 30 | 4 | 42.43 | 40.71 | 3.67 | 132.38 |
| 2024 | 4 | 30 | 5 | 30.77 | 33.9 | 1.57 | 128.98 |
| 2024 | 4 | 30 | 6 | 34.02 | 30.54 | 1.28 | 137.89 |
| 2024 | 4 | 30 | 7 | 35.58 | 42.29 | 1.25 | 142.06 |
| 2024 | 4 | 30 | 8 | 45.97 | 42.76 | 0.91 | 145.44 |
| 2024 | 4 | 30 | 9 | 34.06 | 43.64 | 1.28 | 135.12 |
| 2024 | 4 | 30 | 10 | 28.01 | 54.76 | 1.89 | 277.45 |
| 2024 | 4 | 30 | 11 | 28.23 | 45.74 | 1.74 | 269.04 |
| 2024 | 4 | 30 | 12 | 18.78 | 33.02 | 2.95 | 260.98 |
| 2024 | 4 | 30 | 13 | 22.23 | 36.76 | 0.77 | 80.80 |

| 2024 | 4 | 30 | 14 | 41.27 | 49.44 | 1.34 | 87.71 |
|---|---|---|---|---|---|---|---|
| 2024 | 4 | 30 | 15 | 40.34 | 33.56 | 1.4 | 87.30 |
| 2024 | 4 | 30 | 16 | 45.52 | 48.01 | 3.05 | 89.01 |
| 2024 | 4 | 30 | 17 | 26.71 | 44.12 | 1.66 | 95.33 |
| 2024 | 4 | 30 | 18 | 23.63 | 31.04 | 2.16 | 81.61 |
| 2024 | 4 | 30 | 19 | 19.72 | 55.63 | 2.7 | 83.43 |
| 2024 | 4 | 30 | 20 | 33.71 | 52.68 | 0.81 | 89.98 |
| 2024 | 4 | 30 | 21 | 39.79 | 39.39 | 0.89 | 88.30 |
| 2024 | 4 | 30 | 22 | 40.94 | 46.1 | 0.32 | 99.08 |
| 2024 | 4 | 30 | 23 | 42.61 | 36.64 | 3.93 | 95.85 |
| 2024 | 5 | 1 | 0 | 27.2 | 43.52 | 0.06 | 92.32 |
| 2024 | 5 | 1 | 1 | 32 | 57.16 | 0.08 | 79.66 |
| 2024 | 5 | 1 | 2 | 39.08 | 45.15 | 0.11 | 259.71 |
| 2024 | 5 | 1 | 3 | 42.34 | 48.85 | 1.2 | 269.53 |
| 2024 | 5 | 1 | 4 | 34.45 | 37.08 | 1.3 | 278.93 |
| 2024 | 5 | 1 | 5 | 33.47 | 56.69 | 0.26 | 140.14 |
| 2024 | 5 | 1 | 6 | 33.55 | 43.81 | 1.5 | 143.01 |
| 2024 | 5 | 1 | 7 | 18.34 | 35.55 | 0.37 | 144.18 |
| 2024 | 5 | 1 | 8 | 21.03 | 32.77 | 0.17 | 144.51 |
| 2024 | 5 | 1 | 9 | 36.74 | 53.05 | 0.18 | 140.32 |
| 2024 | 5 | 1 | 10 | 43.07 | 42.32 | 0.37 | 138.53 |
| 2024 | 5 | 1 | 11 | 45.58 | 47.83 | 0.13 | 133.86 |
| 2024 | 5 | 1 | 12 | 37.53 | 49.16 | 0.15 | 139.59 |
| 2024 | 5 | 1 | 13 | 42.16 | 34.68 | 0.31 | 139.23 |
| 2024 | 5 | 1 | 14 | 42.87 | 36.07 | 0.1 | 136.86 |
| 2024 | 5 | 1 | 15 | 17.38 | 58.26 | 0.15 | 144.94 |
| 2024 | 5 | 1 | 16 | 39.82 | 46.63 | 0.23 | 145.05 |
| 2024 | 5 | 1 | 17 | 35.25 | 58.05 | 0.19 | 123.69 |
| 2024 | 5 | 1 | 18 | 19.5 | 49.21 | 0.19 | 131.22 |
| 2024 | 5 | 1 | 19 | 28.73 | 40.95 | 0.02 | 135.69 |
| 2024 | 5 | 1 | 20 | 29.08 | 43.32 | 0.14 | 139.67 |
| 2024 | 5 | 1 | 21 | 46.62 | 55.97 | 0.13 | 143.71 |
| 2024 | 5 | 1 | 22 | 46.82 | 50.96 | 0.29 | 145.56 |
| 2024 | 5 | 1 | 23 | 46.06 | 53.85 | 0.1 | 141.82 |
| 2024 | 5 | 2 | 0 | 45.97 | 47.98 | 0.18 | 136.75 |
| 2024 | 5 | 2 | 1 | 40.62 | 47.24 | 0.26 | 91.57 |
| 2024 | 5 | 2 | 2 | 17.38 | 33.75 | 0.24 | 130.83 |
| 2024 | 5 | 2 | 3 | 34.38 | 48.19 | 0.04 | 140.43 |
| 2024 | 5 | 2 | 4 | 41.49 | 43.7 | 0.11 | 213.78 |
| 2024 | 5 | 2 | 5 | 43.78 | 43.86 | 0.15 | 142.35 |
| 2024 | 5 | 2 | 6 | 21.15 | 55.25 | 0.27 | 128.31 |
| 2024 | 5 | 2 | 7 | 37.81 | 43.04 | 0.35 | 146.07 |
| 2024 | 5 | 2 | 8 | 39.59 | 44.61 | 0.23 | 135.64 |
| 2024 | 5 | 2 | 9 | 33.63 | 53.14 | 0.03 | 127.51 |
| 2024 | 5 | 2 | 10 | 28.92 | 56.5 | 0.29 | 303.72 |
| 2024 | 5 | 2 | 11 | 27.41 | 45.26 | 0.05 | 125.51 |
| 2024 | 5 | 2 | 12 | 38.62 | 36.84 | 0.17 | 128.07 |

| 2024 | 5 | 2 | 13 | 38.56 | 45.33 | 0.35 | 141.84 |
|---|---|---|---|---|---|---|---|
| 2024 | 5 | 2 | 14 | 24.79 | 35.49 | 0.27 | 134.06 |
| 2024 | 5 | 2 | 15 | 45.3 | 56.86 | 0.05 | 134.65 |
| 2024 | 5 | 2 | 16 | 41.36 | 52.26 | 0.31 | 303.31 |
| 2024 | 5 | 2 | 17 | 38.35 | 44.73 | 0.09 | 303.60 |
| 2024 | 5 | 2 | 18 | 23.81 | 57.55 | 0.29 | 141.01 |
| 2024 | 5 | 2 | 19 | 35.59 | 39.46 | 0.15 | 273.79 |
| 2024 | 5 | 2 | 20 | 41.12 | 58.04 | 0.16 | 88.18 |
| 2024 | 5 | 2 | 21 | 23.49 | 53.83 | 0.03 | 79.62 |
| 2024 | 5 | 2 | 22 | 37.22 | 36.87 | 0.33 | 91.56 |
| 2024 | 5 | 2 | 23 | 23.09 | 48.88 | 0.34 | 85.61 |
| 2024 | 5 | 3 | 0 | 31.58 | 39.07 | 0.05 | 36.47 |
| 2024 | 5 | 3 | 1 | 38.38 | 55.75 | 0.06 | 259.09 |
| 2024 | 5 | 3 | 2 | 43.24 | 44.72 | 0.37 | 267.35 |
| 2024 | 5 | 3 | 3 | 22.17 | 47.74 | 0.26 | 277.68 |
| 2024 | 5 | 3 | 4 | 25.53 | 42.81 | 0.21 | 130.56 |
| 2024 | 5 | 3 | 5 | 39.88 | 38.63 | 0.01 | 145.80 |
| 2024 | 5 | 3 | 6 | 21.5 | 55.58 | 0.28 | 128.74 |
| 2024 | 5 | 3 | 7 | 44.12 | 42.1 | 0.29 | 126.67 |
| 2024 | 5 | 3 | 8 | 19.27 | 51.85 | 0.3 | 140.83 |
| 2024 | 5 | 3 | 9 | 20.08 | 33.84 | 0.28 | 140.35 |
| 2024 | 5 | 3 | 10 | 17.41 | 45.54 | 0.35 | 136.94 |
| 2024 | 5 | 3 | 11 | 33.18 | 46.97 | 0.17 | 125.08 |
| 2024 | 5 | 3 | 12 | 21.9 | 50.84 | 0.37 | 137.92 |
| 2024 | 5 | 3 | 13 | 23.15 | 38.29 | 0.1 | 137.29 |
| 2024 | 5 | 3 | 14 | 21.7 | 36.98 | 0.05 | 143.38 |
| 2024 | 5 | 3 | 15 | 36.13 | 43.7 | 0.15 | 145.00 |
| 2024 | 5 | 3 | 16 | 41.46 | 41.48 | 0.22 | 133.11 |
| 2024 | 5 | 3 | 17 | 19.07 | 41.99 | 0.16 | 140.46 |
| 2024 | 5 | 3 | 18 | 33.67 | 32.6 | 0.02 | 134.38 |
| 2024 | 5 | 3 | 19 | 23.61 | 40.3 | 0.14 | 333.03 |
| 2024 | 5 | 3 | 20 | 28.03 | 54.81 | 0.01 | 339.44 |
| 2024 | 5 | 3 | 21 | 47.44 | 49.96 | 0.04 | 344.13 |
| 2024 | 5 | 3 | 22 | 21.3 | 54.46 | 0.17 | 343.37 |
| 2024 | 5 | 3 | 23 | 37.17 | 32.31 | 0.08 | 336.45 |
| 2024 | 5 | 4 | 0 | 34.12 | 58.04 | 0.23 | 326.46 |
| 2024 | 5 | 4 | 1 | 17.5 | 48.73 | 0.05 | 138.85 |
| 2024 | 5 | 4 | 2 | 21.99 | 55.19 | 0.22 | 134.97 |
| 2024 | 5 | 4 | 3 | 39.14 | 49.16 | 0.36 | 142.35 |
| 2024 | 5 | 4 | 4 | 35.05 | 50.77 | 0.09 | 143.95 |
| 2024 | 5 | 4 | 5 | 32.12 | 34.24 | 0.11 | 303.32 |
| 2024 | 5 | 4 | 6 | 24 | 50.65 | 0.1 | 303.31 |
| 2024 | 5 | 4 | 7 | 30.87 | 50.79 | 0.21 | 128.69 |
| 2024 | 5 | 4 | 8 | 36.26 | 32.5 | 0.13 | 124.39 |
| 2024 | 5 | 4 | 9 | 25.48 | 34.51 | 0.35 | 130.69 |
| 2024 | 5 | 4 | 10 | 18.26 | 55.7 | 0.14 | 141.62 |
| 2024 | 5 | 4 | 11 | 40.18 | 49.64 | 0.36 | 127.74 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2024 | 5 | 4 | 12 | 43.68 | 45 | 0.12 | 139.48 |
| 2024 | 5 | 4 | 13 | 43.25 | 37.11 | 0.02 | 279.50 |
| 2024 | 5 | 4 | 14 | 46.51 | 45.1 | 0.06 | 277.22 |
| 2024 | 5 | 4 | 15 | 29.56 | 51.14 | 0.28 | 276.11 |
| 2024 | 5 | 4 | 16 | 43.43 | 31.4 | 0.19 | 275.09 |
| 2024 | 5 | 4 | 17 | 38.83 | 43.35 | 0.04 | 274.75 |
| 2024 | 5 | 4 | 18 | 34.66 | 38.94 | 0.39 | 277.54 |
| 2024 | 5 | 4 | 19 | 30.56 | 56.86 | 0.33 | 279.68 |
| 2024 | 5 | 4 | 20 | 26.93 | 32.66 | 0.39 | 303.06 |
| 2024 | 5 | 4 | 21 | 47.62 | 33.26 | 0.26 | 303.13 |
| 2024 | 5 | 4 | 22 | 19.93 | 56.76 | 0.06 | 127.04 |
| 2024 | 5 | 4 | 23 | 25.84 | 53.57 | 0.06 | 137.08 |
| 2024 | 5 | 5 | 0 | 36.87 | 43.57 | 0.33 | 127.12 |
| 2024 | 5 | 5 | 1 | 29.63 | 46.77 | 0.33 | 143.69 |
| 2024 | 5 | 5 | 2 | 17.6 | 41.06 | 0.38 | 140.71 |
| 2024 | 5 | 5 | 3 | 45.48 | 48.91 | 0.04 | 124.87 |
| 2024 | 5 | 5 | 4 | 42.29 | 33.36 | 0.27 | 144.84 |
| 2024 | 5 | 5 | 5 | 39.22 | 54.24 | 0.16 | 135.14 |
| 2024 | 5 | 5 | 6 | 30.42 | 42.93 | 0.17 | 130.35 |
| 2024 | 5 | 5 | 7 | 21.41 | 54.83 | 0.19 | 137.98 |
| 2024 | 5 | 5 | 8 | 35.43 | 46.42 | 0.01 | 144.71 |
| 2024 | 5 | 5 | 9 | 32.23 | 46.92 | 0.28 | 143.13 |
| 2024 | 5 | 5 | 10 | 45.8 | 54.92 | 0.22 | 143.13 |
| 2024 | 5 | 5 | 11 | 34.12 | 34.09 | 0.21 | 133.94 |
| 2024 | 5 | 5 | 12 | 26.22 | 49.79 | 0.36 | 329.92 |
| 2024 | 5 | 5 | 13 | 21.07 | 37.79 | 0.24 | 336.01 |
| 2024 | 5 | 5 | 14 | 47.93 | 33.05 | 0.17 | 339.66 |
| 2024 | 5 | 5 | 15 | 37.02 | 35.31 | 0.26 | 342.05 |
| 2024 | 5 | 5 | 16 | 23.33 | 31.85 | 0.23 | 345.99 |
| 2024 | 5 | 5 | 17 | 17.76 | 53.24 | 0.07 | 353.64 |
| 2024 | 5 | 5 | 18 | 31.88 | 46.77 | 0.07 | 131.24 |
| 2024 | 5 | 5 | 19 | 42.82 | 34.45 | 0.31 | 142.15 |
| 2024 | 5 | 5 | 20 | 26.82 | 45.71 | 0.24 | 33.35 |
| 2024 | 5 | 5 | 21 | 20.13 | 49.03 | 0.04 | 130.11 |
| 2024 | 5 | 5 | 22 | 18.1 | 40.41 | 0.07 | 136.12 |
| 2024 | 5 | 5 | 23 | 35.88 | 58.85 | 0.03 | 125.81 |
| 2024 | 5 | 6 | 0 | 46.78 | 32.67 | 0.03 | 129.69 |
| 2024 | 5 | 6 | 1 | 43.44 | 57.45 | 0.35 | 84.92 |
| 2024 | 5 | 6 | 2 | 33.88 | 56.71 | 0.26 | 97.81 |
| 2024 | 5 | 6 | 3 | 39.16 | 42.07 | 0.12 | 108.76 |
| 2024 | 5 | 6 | 4 | 40.55 | 32.06 | 0.23 | 117.91 |
| 2024 | 5 | 6 | 5 | 30.75 | 53.82 | 0.01 | 125.54 |
| 2024 | 5 | 6 | 6 | 19.47 | 48.98 | 0.38 | 131.34 |
| 2024 | 5 | 6 | 7 | 25.24 | 47.86 | 0.12 | 130.64 |
| 2024 | 5 | 6 | 8 | 20.26 | 36.21 | 0.23 | 117.26 |
| 2024 | 5 | 6 | 9 | 34.53 | 56.27 | 0.23 | 84.25 |
| 2024 | 5 | 6 | 10 | 25.13 | 55.8 | 0.35 | 137.80 |

| 2024 | 5 | 6 | 11 | 41.94 | 45.14 | 0.05 | 144.58 |
|---|---|---|---|---|---|---|---|
| 2024 | 5 | 6 | 12 | 34.22 | 44.75 | 0.24 | 138.31 |
| 2024 | 5 | 6 | 13 | 41.26 | 38.84 | 0.35 | 135.90 |
| 2024 | 5 | 6 | 14 | 42.72 | 53.36 | 0.11 | 132.59 |
| 2024 | 5 | 6 | 15 | 37.46 | 42.42 | 0.03 | 140.29 |
| 2024 | 5 | 6 | 16 | 18.44 | 42.21 | 0.25 | 186.91 |
| 2024 | 5 | 6 | 17 | 20.02 | 35.09 | 0.05 | 157.49 |
| 2024 | 5 | 6 | 18 | 37.15 | 40.61 | 2.7 | 143.42 |
| 2024 | 5 | 6 | 19 | 32.13 | 41.48 | 0.04 | 141.80 |
| 2024 | 5 | 6 | 20 | 41.85 | 38.1 | 0.11 | 142.54 |
| 2024 | 5 | 6 | 21 | 42.94 | 49.69 | 0.21 | 145.99 |
| 2024 | 5 | 6 | 22 | 22.93 | 57.83 | 0.37 | 168.88 |
| 2024 | 5 | 6 | 23 | 31.2 | 46.64 | 0.28 | 157.46 |
| 2024 | 5 | 7 | 0 | 27.1 | 37.02 | 0.03 | 150.24 |
| 2024 | 5 | 7 | 1 | 42.92 | 53.95 | 0 | 86.00 |
| 2024 | 5 | 7 | 2 | 44.06 | 40.97 | 0.06 | 92.96 |
| 2024 | 5 | 7 | 3 | 31.4 | 31.27 | 0.21 | 99.87 |
| 2024 | 5 | 7 | 4 | 24.44 | 32.73 | 0.02 | 109.45 |
| 2024 | 5 | 7 | 5 | 41.04 | 46.73 | 0.21 | 123.49 |
| 2024 | 5 | 7 | 6 | 47.77 | 31.05 | 0.35 | 142.21 |
| 2024 | 5 | 7 | 7 | 29.85 | 53.49 | 0.14 | 171.23 |
| 2024 | 5 | 7 | 8 | 36.92 | 39.18 | 0.05 | 142.70 |
| 2024 | 5 | 7 | 9 | 25.25 | 38.96 | 0.09 | 87.95 |
| 2024 | 5 | 7 | 10 | 39.67 | 56.46 | 0.06 | 222.02 |
| 2024 | 5 | 7 | 11 | 21.8 | 44.5 | 0.24 | 350.07 |
| 2024 | 5 | 7 | 12 | 20.83 | 45.14 | 0.18 | 345.51 |
| 2024 | 5 | 7 | 13 | 27.51 | 53.89 | 0.38 | 344.34 |
| 2024 | 5 | 7 | 14 | 41.75 | 39.02 | 0.19 | 347.47 |
| 2024 | 5 | 7 | 15 | 29 | 57.79 | 0.19 | 351.64 |
| 2024 | 5 | 7 | 16 | 34.21 | 33.7 | 0.32 | 354.67 |
| 2024 | 5 | 7 | 17 | 45.02 | 55.08 | 0.32 | 359.47 |
| 2024 | 5 | 7 | 18 | 27.23 | 34.62 | 0.14 | 52.86 |
| 2024 | 5 | 7 | 19 | 31.48 | 57.94 | 0.1 | 219.24 |
| 2024 | 5 | 7 | 20 | 37.14 | 36.54 | 0.14 | 171.05 |
| 2024 | 5 | 7 | 21 | 27.5 | 49.55 | 0.24 | 82.48 |
| 2024 | 5 | 7 | 22 | 45.92 | 47.99 | 0.14 | 107.33 |
| 2024 | 5 | 7 | 23 | 38.14 | 33.23 | 0.09 | 125.77 |
| 2024 | 5 | 8 | 0 | 44.14 | 40.26 | 0.16 | 138.19 |
| 2024 | 5 | 8 | 1 | 28.92 | 47.51 | 0.28 | 168.59 |
| 2024 | 5 | 8 | 2 | 35.23 | 34.71 | 0.34 | 153.54 |
| 2024 | 5 | 8 | 3 | 36.97 | 40.07 | 0.3 | 45.59 |
| 2024 | 5 | 8 | 4 | 21.37 | 40.29 | 0.03 | 173.37 |
| 2024 | 5 | 8 | 5 | 27.58 | 33.19 | 0.16 | 190.30 |
| 2024 | 5 | 8 | 6 | 28.21 | 50.21 | 0.19 | 189.81 |
| 2024 | 5 | 8 | 7 | 39.13 | 45.04 | 0.08 | 160.87 |
| 2024 | 5 | 8 | 8 | 30.22 | 41.56 | 0.2 | 45.37 |
| 2024 | 5 | 8 | 9 | 21.41 | 31.02 | 0.01 | 140.20 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2024 | 5 | 8 | 10 | 19.03 | 48.51 | 0.18 | 272.27 |
| 2024 | 5 | 8 | 11 | 36.21 | 56.57 | 0.29 | 146.45 |
| 2024 | 5 | 8 | 12 | 20.77 | 44.26 | 0.17 | 45.40 |
| 2024 | 5 | 8 | 13 | 42.38 | 45.87 | 0.15 | 36.37 |
| 2024 | 5 | 8 | 14 | 28.37 | 43.7 | 0.11 | 329.72 |
| 2024 | 5 | 8 | 15 | 21.22 | 40.58 | 0.18 | 336.15 |
| 2024 | 5 | 8 | 16 | 36.21 | 56.12 | 0.18 | 342.77 |
| 2024 | 5 | 8 | 17 | 33.31 | 37.1 | 0.07 | 353.33 |
| 2024 | 5 | 8 | 18 | 20.06 | 53.02 | 0.31 | 47.68 |
| 2024 | 5 | 8 | 19 | 21.33 | 52.93 | 0.17 | 33.44 |
| 2024 | 5 | 8 | 20 | 25.37 | 53.93 | 0.32 | 219.36 |
| 2024 | 5 | 8 | 21 | 32.84 | 49.91 | 0.08 | 233.92 |
| 2024 | 5 | 8 | 22 | 29.5 | 31.91 | 0.13 | 37.36 |
| 2024 | 5 | 8 | 23 | 18.55 | 54.04 | 0.08 | 163.70 |
| 2024 | 5 | 9 | 0 | 21.2 | 51.94 | 0.37 | 79.16 |
| 2024 | 5 | 9 | 1 | 43.75 | 52.27 | 0.34 | 87.92 |
| 2024 | 5 | 9 | 2 | 18.54 | 41.76 | 0.27 | 98.54 |
| 2024 | 5 | 9 | 3 | 25.92 | 57.56 | 0.15 | 109.79 |
| 2024 | 5 | 9 | 4 | 19.03 | 31.36 | 0.26 | 119.08 |
| 2024 | 5 | 9 | 5 | 33.85 | 34.52 | 0.28 | 125.84 |
| 2024 | 5 | 9 | 6 | 18.52 | 46.98 | 5.6 | 130.09 |
| 2024 | 5 | 9 | 7 | 28.56 | 56.54 | 5.5 | 125.36 |
| 2024 | 5 | 9 | 8 | 37.67 | 39.53 | 0.2 | 89.78 |
| 2024 | 5 | 9 | 9 | 47.08 | 36.69 | 0.09 | 149.51 |
| 2024 | 5 | 9 | 10 | 21.71 | 57.45 | 0.07 | 217.85 |
| 2024 | 5 | 9 | 11 | 18.4 | 47.98 | 0.19 | 234.15 |
| 2024 | 5 | 9 | 12 | 45.22 | 47.44 | 0.31 | 233.45 |
| 2024 | 5 | 9 | 13 | 18.67 | 41.61 | 0.14 | 45.78 |
| 2024 | 5 | 9 | 14 | 30.03 | 48.09 | 0.1 | 51.49 |
| 2024 | 5 | 9 | 15 | 29.68 | 40.23 | 0.29 | 38.65 |
| 2024 | 5 | 9 | 16 | 41.27 | 45.09 | 0.14 | 51.65 |
| 2024 | 5 | 9 | 17 | 43.19 | 52.33 | 6 | 51.01 |
| 2024 | 5 | 9 | 18 | 41.68 | 50.07 | 0.32 | 234.74 |
| 2024 | 5 | 9 | 19 | 46.69 | 47.5 | 0.3 | 216.44 |
| 2024 | 5 | 9 | 20 | 26.8 | 34.26 | 0.14 | 187.02 |
| 2024 | 5 | 9 | 21 | 43.73 | 32.18 | 0.24 | 166.74 |
| 2024 | 5 | 9 | 22 | 28.6 | 48.29 | 0.33 | 78.52 |
| 2024 | 5 | 9 | 23 | 19.49 | 37.8 | 0.08 | 86.44 |
| 2024 | 5 | 10 | 0 | 39.41 | 36.49 | 0.3 | 90.66 |
| 2024 | 5 | 10 | 1 | 33.38 | 46.86 | 0.33 | 93.05 |
| 2024 | 5 | 10 | 2 | 44.56 | 42.39 | 5.4 | 94.43 |
| 2024 | 5 | 10 | 3 | 36.25 | 47.8 | 0.2 | 95.60 |
| 2024 | 5 | 10 | 4 | 34.84 | 49.27 | 0.33 | 95.71 |
| 2024 | 5 | 10 | 5 | 38.85 | 46.87 | 0.13 | 94.64 |
| 2024 | 5 | 10 | 6 | 38.28 | 31.31 | 0.16 | 94.46 |
| 2024 | 5 | 10 | 7 | 22.7 | 57.68 | 2.97 | 86.54 |
| 2024 | 5 | 10 | 8 | 30.5 | 39.11 | 0.07 | 80.31 |

| 2024 | 5 | 10 | 9 | 31.54 | 43.13 | 0.13 | 35.49 |
|---|---|---|---|---|---|---|---|
| 2024 | 5 | 10 | 10 | 29.7 | 32.02 | 0.27 | 214.62 |
| 2024 | 5 | 10 | 11 | 41.03 | 55.12 | 0.18 | 225.43 |
| 2024 | 5 | 10 | 12 | 36.12 | 41.44 | 0.07 | 175.11 |
| 2024 | 5 | 10 | 13 | 38.53 | 56.52 | 0.1 | 146.67 |
| 2024 | 5 | 10 | 14 | 22.22 | 58.29 | 0.06 | 181.95 |
| 2024 | 5 | 10 | 15 | 33.42 | 44.02 | 0.16 | 55.65 |
| 2024 | 5 | 10 | 16 | 47.33 | 46.57 | 0.16 | 41.60 |
| 2024 | 5 | 10 | 17 | 20.79 | 44.52 | 0.19 | 175.35 |
| 2024 | 5 | 10 | 18 | 44.37 | 57.05 | 0.35 | 234.03 |
| 2024 | 5 | 10 | 19 | 37.52 | 40.87 | 0.27 | 228.68 |
| 2024 | 5 | 10 | 20 | 43.49 | 43.78 | 0.21 | 219.58 |
| 2024 | 5 | 10 | 21 | 20.07 | 49.69 | 0.16 | 235.12 |
| 2024 | 5 | 10 | 22 | 40.12 | 31.35 | 0.13 | 158.48 |
| 2024 | 5 | 10 | 23 | 48.11 | 50.21 | 0.15 | 168.19 |
| 2024 | 5 | 11 | 0 | 33.36 | 40.13 | 5.6 | 181.14 |
| 2024 | 5 | 11 | 1 | 20.12 | 45.15 | 0.04 | 79.79 |
| 2024 | 5 | 11 | 2 | 24.83 | 49.78 | 0.18 | 84.97 |
| 2024 | 5 | 11 | 3 | 36.1 | 31.94 | 0.24 | 92.09 |
| 2024 | 5 | 11 | 4 | 33.06 | 45.51 | 0.06 | 103.45 |
| 2024 | 5 | 11 | 5 | 33.35 | 36.74 | 0.22 | 120.66 |
| 2024 | 5 | 11 | 6 | 26.7 | 41.82 | 0.03 | 139.07 |
| 2024 | 5 | 11 | 7 | 42.87 | 35.07 | 0.32 | 138.54 |
| 2024 | 5 | 11 | 8 | 41.03 | 33.36 | 0.25 | 132.40 |
| 2024 | 5 | 11 | 9 | 32.66 | 41.78 | 0.05 | 98.63 |
| 2024 | 5 | 11 | 10 | 31.35 | 37.37 | 0.27 | 234.48 |
| 2024 | 5 | 11 | 11 | 17.35 | 44.89 | 0.38 | 303.24 |
| 2024 | 5 | 11 | 12 | 35.13 | 45.25 | 0.01 | 233.45 |
| 2024 | 5 | 11 | 13 | 39.24 | 56.93 | 0.12 | 356.99 |
| 2024 | 5 | 11 | 14 | 19.49 | 44.24 | 0.05 | 354.86 |
| 2024 | 5 | 11 | 15 | 26.16 | 36.22 | 0.12 | 355.44 |
| 2024 | 5 | 11 | 16 | 27.72 | 40.41 | 0.08 | 357.56 |
| 2024 | 5 | 11 | 17 | 29.96 | 55.39 | 0.2 | 229.74 |
| 2024 | 5 | 11 | 18 | 38.83 | 54.14 | 0.06 | 185.72 |
| 2024 | 5 | 11 | 19 | 18.38 | 54 | 0.34 | 183.41 |
| 2024 | 5 | 11 | 20 | 44.64 | 46.3 | 0.04 | 215.04 |
| 2024 | 5 | 11 | 21 | 28.41 | 40.56 | 0.06 | 169.01 |
| 2024 | 5 | 11 | 22 | 20.44 | 35.52 | 0.38 | 80.42 |
| 2024 | 5 | 11 | 23 | 25.37 | 58.15 | 0.39 | 89.64 |
| 2024 | 5 | 12 | 0 | 20.07 | 36.59 | 0.09 | 94.62 |
| 2024 | 5 | 12 | 1 | 47.86 | 53.79 | 0.14 | 98.00 |
| 2024 | 5 | 12 | 2 | 41.91 | 55.7 | 0.37 | 105.63 |
| 2024 | 5 | 12 | 3 | 34.84 | 50.35 | 0.12 | 116.80 |
| 2024 | 5 | 12 | 4 | 22.86 | 47.41 | 0.34 | 126.90 |
| 2024 | 5 | 12 | 5 | 33.87 | 43.32 | 0.23 | 135.83 |
| 2024 | 5 | 12 | 6 | 22.74 | 56.3 | 0.06 | 144.05 |
| 2024 | 5 | 12 | 7 | 41.23 | 58.32 | 0.37 | 36.24 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2024 | 5 | 12 | 8 | 31.3 | 38.73 | 0.19 | 180.70 |
| 2024 | 5 | 12 | 9 | 22.68 | 36.53 | 0.18 | 160.89 |
| 2024 | 5 | 12 | 10 | 30.93 | 56.55 | 0.19 | 180.74 |
| 2024 | 5 | 12 | 11 | 23.05 | 49.88 | 0.26 | 41.80 |
| 2024 | 5 | 12 | 12 | 19.16 | 32.72 | 0.08 | 275.62 |
| 2024 | 5 | 12 | 13 | 20.8 | 56.67 | 0.04 | 337.87 |
| 2024 | 5 | 12 | 14 | 46.95 | 45.99 | 0 | 346.66 |
| 2024 | 5 | 12 | 15 | 19.17 | 45.95 | 0.26 | 350.83 |
| 2024 | 5 | 12 | 16 | 31.1 | 51.52 | 0.38 | 356.30 |
| 2024 | 5 | 12 | 17 | 45.07 | 44.46 | 0.21 | 215.67 |
| 2024 | 5 | 12 | 18 | 33.14 | 43.72 | 0.18 | 53.83 |
| 2024 | 5 | 12 | 19 | 39.61 | 55.92 | 0.06 | 225.05 |
| 2024 | 5 | 12 | 20 | 40.68 | 32.75 | 0.31 | 215.15 |
| 2024 | 5 | 12 | 21 | 23.64 | 52.27 | 0.01 | 43.75 |
| 2024 | 5 | 12 | 22 | 33.29 | 48.34 | 0.14 | 150.24 |
| 2024 | 5 | 12 | 23 | 18.07 | 48.64 | 0.01 | 90.00 |
| 2024 | 5 | 13 | 0 | 46.22 | 31.5 | 0.15 | 106.88 |
| 2024 | 5 | 13 | 1 | 46.97 | 54.89 | 0.04 | 123.31 |
| 2024 | 5 | 13 | 2 | 27.2 | 32.44 | 0.26 | 137.32 |
| 2024 | 5 | 13 | 3 | 42.95 | 34.99 | 0.33 | 178.30 |
| 2024 | 5 | 13 | 4 | 36.28 | 44.49 | 0.18 | 146.74 |
| 2024 | 5 | 13 | 5 | 17.63 | 34.83 | 0.31 | 210.99 |
| 2024 | 5 | 13 | 6 | 33.68 | 44.52 | 0.05 | 303.10 |
| 2024 | 5 | 13 | 7 | 21.32 | 52.03 | 0.33 | 203.81 |
| 2024 | 5 | 13 | 8 | 17.2 | 51.69 | 0.32 | 159.06 |
| 2024 | 5 | 13 | 9 | 45.17 | 50.17 | 0.17 | 154.75 |
| 2024 | 5 | 13 | 10 | 17.26 | 51.15 | 0.27 | 138.09 |
| 2024 | 5 | 13 | 11 | 24.92 | 43.99 | 0.07 | 48.24 |
| 2024 | 5 | 13 | 12 | 35.19 | 50.22 | 0.26 | 37.73 |
| 2024 | 5 | 13 | 13 | 26.96 | 36.75 | 0.1 | 271.02 |
| 2024 | 5 | 13 | 14 | 43.82 | 31.82 | 0.22 | 176.45 |
| 2024 | 5 | 13 | 15 | 45.31 | 34.32 | 0.08 | 181.27 |
| 2024 | 5 | 13 | 16 | 42.88 | 52.96 | 0.05 | 152.38 |
| 2024 | 5 | 13 | 17 | 23.39 | 44.02 | 0.22 | 326.53 |
| 2024 | 5 | 13 | 18 | 36.01 | 42.54 | 0.15 | 335.98 |
| 2024 | 5 | 13 | 19 | 30.09 | 52.25 | 0.13 | 344.54 |
| 2024 | 5 | 13 | 20 | 18.16 | 48.96 | 0.15 | 343.42 |
| 2024 | 5 | 13 | 21 | 35.63 | 56.58 | 0.27 | 206.60 |
| 2024 | 5 | 13 | 22 | 42.94 | 49.25 | 0.31 | 280.34 |
| 2024 | 5 | 13 | 23 | 17.46 | 52.05 | 0.19 | 276.45 |
| 2024 | 5 | 14 | 0 | 22.19 | 39.57 | 0.27 | 184.10 |
| 2024 | 5 | 14 | 1 | 47.72 | 43.79 | 0.29 | 208.91 |
| 2024 | 5 | 14 | 2 | 18.18 | 57.26 | 0.39 | 203.60 |
| 2024 | 5 | 14 | 3 | 36.27 | 50.88 | 0.16 | 194.02 |
| 2024 | 5 | 14 | 4 | 22.68 | 33.95 | 0.21 | 271.54 |
| 2024 | 5 | 14 | 5 | 40.82 | 38.02 | 3.4 | 258.81 |
| 2024 | 5 | 14 | 6 | 24.76 | 57.39 | 0.12 | 47.15 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2024 | 5 | 14 | 7 | 39.44 | 34.97 | 0.08 | 40.63 |
| 2024 | 5 | 14 | 8 | 25.98 | 32.77 | 0.02 | 156.72 |
| 2024 | 5 | 14 | 9 | 27.04 | 38.2 | 0.29 | 148.33 |
| 2024 | 5 | 14 | 10 | 40.56 | 45.76 | 0 | 158.89 |
| 2024 | 5 | 14 | 11 | 36.05 | 48.89 | 0.18 | 199.34 |
| 2024 | 5 | 14 | 12 | 38.01 | 57.34 | 0.36 | 165.58 |
| 2024 | 5 | 14 | 13 | 45.8 | 56.76 | 0.04 | 157.40 |
| 2024 | 5 | 14 | 14 | 26.28 | 44.9 | 0.24 | 164.62 |
| 2024 | 5 | 14 | 15 | 46.22 | 32.68 | 0.14 | 179.20 |
| 2024 | 5 | 14 | 16 | 17.92 | 50.61 | 0.34 | 184.10 |
| 2024 | 5 | 14 | 17 | 24.18 | 39.28 | 0.2 | 174.00 |
| 2024 | 5 | 14 | 18 | 45.88 | 33.91 | 4.1 | 200.45 |
| 2024 | 5 | 14 | 19 | 22.98 | 31.15 | 1.2 | 202.79 |
| 2024 | 5 | 14 | 20 | 20.49 | 36.74 | 0.29 | 191.16 |
| 2024 | 5 | 14 | 21 | 27.41 | 57.62 | 0.38 | 277.26 |
| 2024 | 5 | 14 | 22 | 32.26 | 56.03 | 0.36 | 275.72 |
| 2024 | 5 | 14 | 23 | 19.83 | 33.86 | 0.17 | 279.82 |
| 2024 | 5 | 15 | 0 | 37.97 | 38.58 | 0.31 | 188.31 |
| 2024 | 5 | 15 | 1 | 37.82 | 54.95 | 0.29 | 160.34 |
| 2024 | 5 | 15 | 2 | 32.92 | 57.37 | 0.14 | 208.39 |
| 2024 | 5 | 15 | 3 | 36.05 | 37.01 | 0.37 | 185.40 |
| 2024 | 5 | 15 | 4 | 25.97 | 51.79 | 0 | 279.95 |
| 2024 | 5 | 15 | 5 | 32.56 | 44.29 | 0.39 | 274.22 |
| 2024 | 5 | 15 | 6 | 30.5 | 37.59 | 0.03 | 268.01 |
| 2024 | 5 | 15 | 7 | 36.71 | 57.65 | 0.22 | 278.47 |
| 2024 | 5 | 15 | 8 | 38.28 | 50.19 | 0.34 | 178.80 |
| 2024 | 5 | 15 | 9 | 39.15 | 50.9 | 0.18 | 160.04 |
| 2024 | 5 | 15 | 10 | 23.98 | 35.4 | 0.03 | 198.94 |
| 2024 | 5 | 15 | 11 | 41.22 | 52.23 | 0.2 | 189.98 |
| 2024 | 5 | 15 | 12 | 30.03 | 50.8 | 0.38 | 175.78 |
| 2024 | 5 | 15 | 13 | 19.15 | 55.69 | 0.17 | 279.30 |
| 2024 | 5 | 15 | 14 | 21.6 | 58.17 | 0.04 | 271.39 |
| 2024 | 5 | 15 | 15 | 35.82 | 36.75 | 0.32 | 263.67 |
| 2024 | 5 | 15 | 16 | 22.11 | 41.4 | 0.32 | 48.57 |
| 2024 | 5 | 15 | 17 | 42.28 | 33.13 | 0.27 | 45.07 |
| 2024 | 5 | 15 | 18 | 18.41 | 41.33 | 0.29 | 39.60 |
| 2024 | 5 | 15 | 19 | 37.97 | 57.66 | 0.34 | 47.45 |
| 2024 | 5 | 15 | 20 | 30.43 | 39.06 | 0.12 | 44.45 |
| 2024 | 5 | 15 | 21 | 37.7 | 34.48 | 0.09 | 35.65 |
| 2024 | 5 | 15 | 22 | 29.13 | 40.66 | 0.25 | 43.36 |
| 2024 | 5 | 15 | 23 | 25.16 | 48.6 | 0.29 | 51.70 |
| 2024 | 5 | 16 | 0 | 22.24 | 44.36 | 0.17 | 259.16 |
| 2024 | 5 | 16 | 1 | 30.26 | 38.12 | 0.23 | 274.09 |
| 2024 | 5 | 16 | 2 | 37.81 | 55.55 | 0.03 | 190.13 |
| 2024 | 5 | 16 | 3 | 37.85 | 34.78 | 0.05 | 183.90 |
| 2024 | 5 | 16 | 4 | 41.13 | 53.7 | 0.19 | 183.02 |
| 2024 | 5 | 16 | 5 | 32.61 | 35.2 | 0.31 | 275.61 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2024 | 5 | 16 | 6 | 32.87 | 41.03 | 0.26 | 42.01 |
| 2024 | 5 | 16 | 7 | 34.15 | 49.39 | 0.39 | 259.80 |
| 2024 | 5 | 16 | 8 | 19.23 | 54.13 | 0.28 | 261.29 |
| 2024 | 5 | 16 | 9 | 24.38 | 50.15 | 0.31 | 260.51 |
| 2024 | 5 | 16 | 10 | 39.95 | 36.27 | 0.15 | 259.96 |
| 2024 | 5 | 16 | 11 | 19.38 | 42.43 | 0.29 | 260.52 |
| 2024 | 5 | 16 | 12 | 47.38 | 38.53 | 0.06 | 261.55 |
| 2024 | 5 | 16 | 13 | 42.23 | 52.27 | 0.34 | 263.01 |
| 2024 | 5 | 16 | 14 | 42.44 | 47.69 | 0.07 | 264.84 |
| 2024 | 5 | 16 | 15 | 26.31 | 41.17 | 0.25 | 267.38 |
| 2024 | 5 | 16 | 16 | 40.78 | 50.33 | 0.32 | 270.50 |
| 2024 | 5 | 16 | 17 | 24.86 | 40.57 | 0.24 | 274.23 |
| 2024 | 5 | 16 | 18 | 35.42 | 34.09 | 0.09 | 280.60 |
| 2024 | 5 | 16 | 19 | 27.51 | 41.13 | 0.22 | 173.40 |
| 2024 | 5 | 16 | 20 | 29.6 | 33.65 | 0.16 | 212.91 |
| 2024 | 5 | 16 | 21 | 38.08 | 43.07 | 0.24 | 194.49 |
| 2024 | 5 | 16 | 22 | 18.25 | 46.08 | 0.07 | 187.36 |
| 2024 | 5 | 16 | 23 | 24.74 | 36.19 | 0.3 | 206.72 |
| 2024 | 5 | 17 | 0 | 33.23 | 31.59 | 0.12 | 276.80 |
| 2024 | 5 | 17 | 1 | 40.99 | 51.64 | 0.21 | 272.31 |
| 2024 | 5 | 17 | 2 | 23.55 | 45.11 | 0.35 | 268.28 |
| 2024 | 5 | 17 | 3 | 21.56 | 39.2 | 0.06 | 264.86 |
| 2024 | 5 | 17 | 4 | 33.79 | 52.51 | 0.39 | 265.29 |
| 2024 | 5 | 17 | 5 | 44.13 | 54.26 | 0.08 | 263.86 |
| 2024 | 5 | 17 | 6 | 17.18 | 44.83 | 0.07 | 262.26 |
| 2024 | 5 | 17 | 7 | 44.34 | 56.13 | 0.32 | 265.61 |
| 2024 | 5 | 17 | 8 | 34.61 | 48.75 | 0.16 | 274.91 |
| 2024 | 5 | 17 | 9 | 33.94 | 44.97 | 0.26 | 280.36 |
| 2024 | 5 | 17 | 10 | 32.87 | 56.53 | 0.02 | 156.46 |
| 2024 | 5 | 17 | 11 | 28.06 | 37.28 | 0.04 | 188.59 |
| 2024 | 5 | 17 | 12 | 34.72 | 32.12 | 0.12 | 280.01 |
| 2024 | 5 | 17 | 13 | 18.61 | 53.48 | 0.09 | 277.52 |
| 2024 | 5 | 17 | 14 | 45.16 | 44.32 | 0.12 | 277.02 |
| 2024 | 5 | 17 | 15 | 20.32 | 50.52 | 0.13 | 278.51 |
| 2024 | 5 | 17 | 16 | 47.77 | 36.38 | 0.38 | 151.49 |
| 2024 | 5 | 17 | 17 | 25.94 | 57.21 | 0.38 | 205.58 |
| 2024 | 5 | 17 | 18 | 21.18 | 33.4 | 0.12 | 185.94 |
| 2024 | 5 | 17 | 19 | 30.02 | 44.62 | 0.18 | 149.54 |
| 2024 | 5 | 17 | 20 | 20.1 | 58.69 | 0.29 | 162.69 |
| 2024 | 5 | 17 | 21 | 37.8 | 48.03 | 0.06 | 169.12 |
| 2024 | 5 | 17 | 22 | 19.64 | 44.27 | 0.29 | 195.31 |
| 2024 | 5 | 17 | 23 | 41.5 | 56.73 | 0.11 | 181.92 |
| 2024 | 5 | 18 | 0 | 39.22 | 43.56 | 0.19 | 152.01 |
| 2024 | 5 | 18 | 1 | 47.09 | 51.98 | 0.39 | 180.30 |
| 2024 | 5 | 18 | 2 | 37.24 | 44.94 | 0.25 | 183.98 |
| 2024 | 5 | 18 | 3 | 44.54 | 39.47 | 0.15 | 197.01 |
| 2024 | 5 | 18 | 4 | 39.39 | 39.46 | 0.37 | 179.67 |

| 2024 | 5 | 18 | 5 | 37.63 | 35.46 | 0.04 | 204.46 |
|---|---|---|---|---|---|---|---|
| 2024 | 5 | 18 | 6 | 24.12 | 47.67 | 0.23 | 156.93 |
| 2024 | 5 | 18 | 7 | 17.78 | 32.11 | 0.15 | 152.73 |
| 2024 | 5 | 18 | 8 | 22.62 | 42.28 | 0.14 | 278.00 |
| 2024 | 5 | 18 | 9 | 18.57 | 32.01 | 0.06 | 272.45 |
| 2024 | 5 | 18 | 10 | 33.47 | 35.18 | 0.35 | 270.50 |
| 2024 | 5 | 18 | 11 | 42.14 | 42.89 | 0.16 | 270.49 |
| 2024 | 5 | 18 | 12 | 38.6 | 32.4 | 0.21 | 270.32 |
| 2024 | 5 | 18 | 13 | 23.17 | 36.19 | 0.14 | 266.84 |
| 2024 | 5 | 18 | 14 | 37.79 | 39.35 | 0.05 | 261.72 |
| 2024 | 5 | 18 | 15 | 19.82 | 51.55 | 0.38 | 48.20 |
| 2024 | 5 | 18 | 16 | 25.64 | 31.79 | 0.01 | 51.38 |
| 2024 | 5 | 18 | 17 | 20.06 | 54.31 | 0.05 | 134.64 |
| 2024 | 5 | 18 | 18 | 38.17 | 58.25 | 0.36 | 129.62 |
| 2024 | 5 | 18 | 19 | 19.94 | 37.98 | 0.2 | 173.94 |
| 2024 | 5 | 18 | 20 | 42.69 | 46.01 | 0.23 | 212.45 |
| 2024 | 5 | 18 | 21 | 35.24 | 36.38 | 0.24 | 196.76 |
| 2024 | 5 | 18 | 22 | 27.76 | 46.18 | 0.2 | 320.12 |
| 2024 | 5 | 18 | 23 | 36.37 | 36.74 | 0.02 | 322.53 |
| 2024 | 5 | 19 | 0 | 37.44 | 31.16 | 0.38 | 322.87 |
| 2024 | 5 | 19 | 1 | 43.02 | 46.53 | 0.33 | 322.35 |
| 2024 | 5 | 19 | 2 | 38.97 | 54.42 | 0.31 | 318.41 |
| 2024 | 5 | 19 | 3 | 29.35 | 36.38 | 0.06 | 308.46 |
| 2024 | 5 | 19 | 4 | 31.14 | 46.19 | 0.13 | 324.34 |
| 2024 | 5 | 19 | 5 | 33.57 | 57.47 | 0.23 | 145.52 |
| 2024 | 5 | 19 | 6 | 40.55 | 33.75 | 0.05 | 141.49 |
| 2024 | 5 | 19 | 7 | 26.06 | 46.48 | 0.13 | 127.17 |
| 2024 | 5 | 19 | 8 | 35.47 | 51.99 | 0.32 | 132.90 |
| 2024 | 5 | 19 | 9 | 42.56 | 40.71 | 0.04 | 133.96 |
| 2024 | 5 | 19 | 10 | 43.39 | 57.58 | 0.26 | 39.19 |
| 2024 | 5 | 19 | 11 | 28.9 | 43 | 0.18 | 38.95 |
| 2024 | 5 | 19 | 12 | 47.7 | 51.21 | 0.29 | 271.67 |
| 2024 | 5 | 19 | 13 | 25.47 | 49.7 | 0.08 | 320.12 |
| 2024 | 5 | 19 | 14 | 26.6 | 44.79 | 0.08 | 322.53 |
| 2024 | 5 | 19 | 15 | 20.68 | 36.31 | 0.3 | 322.87 |
| 2024 | 5 | 19 | 16 | 24.39 | 32.1 | 0.25 | 322.35 |
| 2024 | 5 | 19 | 17 | 26.26 | 53.7 | 0.3 | 318.41 |
| 2024 | 5 | 19 | 18 | 19.51 | 50.83 | 0.22 | 308.46 |
| 2024 | 5 | 19 | 19 | 47.51 | 53.92 | 0.24 | 324.34 |
| 2024 | 5 | 19 | 20 | 17.64 | 46.73 | 0.08 | 213.65 |
| 2024 | 5 | 19 | 21 | 23.78 | 37.42 | 0.11 | 171.86 |
| 2024 | 5 | 19 | 22 | 23.2 | 58.45 | 0.19 | 211.74 |
| 2024 | 5 | 19 | 23 | 44.06 | 42.9 | 0.03 | 320.12 |
| 2024 | 5 | 20 | 0 | 27.8 | 43.73 | 0.04 | 322.53 |
| 2024 | 5 | 20 | 1 | 18.42 | 53.01 | 0.24 | 322.87 |
| 2024 | 5 | 20 | 2 | 37.32 | 55.17 | 0.19 | 322.35 |
| 2024 | 5 | 20 | 3 | 29.13 | 39.81 | 0.1 | 213.43 |

| 2024 | 5 | 20 | 4 | 18.57 | 40.38 | 0.32 | 144.83 |
|---|---|---|---|---|---|---|---|
| 2024 | 5 | 20 | 5 | 17.14 | 43.18 | 0.11 | 143.65 |
| 2024 | 5 | 20 | 6 | 31.14 | 57.11 | 0.31 | 139.06 |
| 2024 | 5 | 20 | 7 | 38.11 | 49.68 | 0.02 | 46.61 |
| 2024 | 5 | 20 | 8 | 22.66 | 36.23 | 0.2 | 47.46 |
| 2024 | 5 | 20 | 9 | 19.59 | 31.88 | 0.08 | 265.32 |
| 2024 | 5 | 20 | 10 | 35.55 | 35.79 | 0.24 | 269.75 |
| 2024 | 5 | 20 | 11 | 38 | 40.27 | 0.09 | 272.05 |
| 2024 | 5 | 20 | 12 | 25.45 | 43.8 | 0.3 | 274.10 |
| 2024 | 5 | 20 | 13 | 26.1 | 41.82 | 0.18 | 276.93 |
| 2024 | 5 | 20 | 14 | 37.56 | 40.77 | 0.28 | 279.20 |
| 2024 | 5 | 20 | 15 | 42.75 | 55.37 | 0.09 | 280.04 |
| 2024 | 5 | 20 | 16 | 45.28 | 38.46 | 0.25 | 279.09 |
| 2024 | 5 | 20 | 17 | 19.82 | 54.43 | 0.3 | 274.51 |
| 2024 | 5 | 20 | 18 | 18.8 | 55.3 | 0.17 | 36.67 |
| 2024 | 5 | 20 | 19 | 19.24 | 42.82 | 0.36 | 43.92 |
| 2024 | 5 | 20 | 20 | 26.05 | 37.8 | 0.15 | 123.99 |
| 2024 | 5 | 20 | 21 | 41.35 | 48.13 | 0.28 | 126.33 |
| 2024 | 5 | 20 | 22 | 46.72 | 58.51 | 0.25 | 140.67 |
| 2024 | 5 | 20 | 23 | 19.13 | 44.4 | 0.01 | 126.16 |
| 2024 | 5 | 21 | 0 | 30.88 | 43.6 | 2.3 | 54.14 |
| 2024 | 5 | 21 | 1 | 26.77 | 45.9 | 0.25 | 34.74 |
| 2024 | 5 | 21 | 2 | 22.64 | 51.15 | 0.06 | 52.49 |
| 2024 | 5 | 21 | 3 | 33.79 | 53.3 | 0.12 | 49.94 |
| 2024 | 5 | 21 | 4 | 20.12 | 37.82 | 0.06 | 39.22 |
| 2024 | 5 | 21 | 5 | 20.99 | 43.31 | 0.24 | 41.15 |
| 2024 | 5 | 21 | 6 | 21.84 | 43.4 | 0.12 | 258.99 |
| 2024 | 5 | 21 | 7 | 28.68 | 56.38 | 0.05 | 270.95 |
| 2024 | 5 | 21 | 8 | 38.57 | 43.14 | 0.34 | 279.00 |
| 2024 | 5 | 21 | 9 | 30.15 | 35.91 | 0.21 | 282.26 |
| 2024 | 5 | 21 | 10 | 33.87 | 40.66 | 0.31 | 11.97 |
| 2024 | 5 | 21 | 11 | 43.98 | 46.56 | 0.35 | 13.47 |
| 2024 | 5 | 21 | 12 | 38.14 | 36.86 | 0.29 | 15.87 |
| 2024 | 5 | 21 | 13 | 36.72 | 51.87 | 0.21 | 23.50 |
| 2024 | 5 | 21 | 14 | 38.44 | 55.3 | 0.34 | 275.90 |
| 2024 | 5 | 21 | 15 | 42.53 | 44.69 | 0.15 | 28.98 |
| 2024 | 5 | 21 | 16 | 44.78 | 44.21 | 0.06 | 22.47 |
| 2024 | 5 | 21 | 17 | 17.76 | 43.56 | 0.32 | 45.46 |
| 2024 | 5 | 21 | 18 | 26.77 | 36.41 | 2.5 | 251.93 |
| 2024 | 5 | 21 | 19 | 39.39 | 41 | 0.06 | 248.41 |
| 2024 | 5 | 21 | 20 | 29.52 | 54.15 | 2.6 | 250.64 |
| 2024 | 5 | 21 | 21 | 40.21 | 47.14 | 0.01 | 256.26 |
| 2024 | 5 | 21 | 22 | 18.84 | 54.21 | 0.01 | 259.99 |
| 2024 | 5 | 21 | 23 | 39.06 | 42.5 | 0.3 | 260.68 |
| 2024 | 5 | 22 | 0 | 41.6 | 35.58 | 0.28 | 261.18 |
| 2024 | 5 | 22 | 1 | 18.07 | 36.8 | 0.33 | 262.01 |
| 2024 | 5 | 22 | 2 | 42.93 | 41.92 | 0.03 | 263.65 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2024 | 5 | 22 | 3 | 23.73 | 51.61 | 0.36 | 265.34 |
| 2024 | 5 | 22 | 4 | 24.69 | 34.75 | 0.18 | 261.19 |
| 2024 | 5 | 22 | 5 | 37.99 | 47.62 | 0.28 | 256.57 |
| 2024 | 5 | 22 | 6 | 21.07 | 51.59 | 0.09 | 263.86 |
| 2024 | 5 | 22 | 7 | 44.74 | 45.82 | 0.12 | 273.23 |
| 2024 | 5 | 22 | 8 | 35.11 | 39.62 | 0.14 | 274.98 |
| 2024 | 5 | 22 | 9 | 24.01 | 54.11 | 0.25 | 273.94 |
| 2024 | 5 | 22 | 10 | 22.04 | 52.39 | 0.13 | 272.10 |
| 2024 | 5 | 22 | 11 | 47.36 | 45.08 | 0.27 | 270.25 |
| 2024 | 5 | 22 | 12 | 21.76 | 42.74 | 0.36 | 270.15 |
| 2024 | 5 | 22 | 13 | 33.89 | 42.17 | 0.07 | 271.60 |
| 2024 | 5 | 22 | 14 | 24.97 | 44.23 | 0.17 | 274.62 |
| 2024 | 5 | 22 | 15 | 19.37 | 34.92 | 0.06 | 278.75 |
| 2024 | 5 | 22 | 16 | 19.06 | 34.84 | 0.34 | 283.36 |
| 2024 | 5 | 22 | 17 | 27.6 | 34.19 | 0.3 | 288.65 |
| 2024 | 5 | 22 | 18 | 17.13 | 35.78 | 0.32 | 294.52 |
| 2024 | 5 | 22 | 19 | 19.49 | 36.52 | 0.07 | 299.57 |
| 2024 | 5 | 22 | 20 | 37.74 | 57.32 | 0.15 | 297.71 |
| 2024 | 5 | 22 | 21 | 47.05 | 57.98 | 0.07 | 288.90 |
| 2024 | 5 | 22 | 22 | 26.12 | 36.95 | 0.22 | 279.27 |
| 2024 | 5 | 22 | 23 | 46.09 | 51.14 | 0.38 | 274.36 |
| 2024 | 5 | 23 | 0 | 40.29 | 31.5 | 0.25 | 274.37 |
| 2024 | 5 | 23 | 1 | 29.55 | 31.72 | 0 | 274.23 |
| 2024 | 5 | 23 | 2 | 47.97 | 46.54 | 0.34 | 271.50 |
| 2024 | 5 | 23 | 3 | 34.54 | 45.68 | 0.16 | 263.72 |
| 2024 | 5 | 23 | 4 | 37.38 | 44.45 | 0.2 | 254.66 |
| 2024 | 5 | 23 | 5 | 36.73 | 36.89 | 0.08 | 251.48 |
| 2024 | 5 | 23 | 6 | 45.52 | 33.99 | 0.05 | 256.15 |
| 2024 | 5 | 23 | 7 | 24.32 | 48.92 | 0.12 | 262.77 |
| 2024 | 5 | 23 | 8 | 42.32 | 46.58 | 0.13 | 270.75 |
| 2024 | 5 | 23 | 9 | 18.98 | 49.96 | 0.12 | 277.47 |
| 2024 | 5 | 23 | 10 | 34.91 | 58.28 | 0.15 | 279.78 |
| 2024 | 5 | 23 | 11 | 33.79 | 38.62 | 0.1 | 276.47 |
| 2024 | 5 | 23 | 12 | 20.19 | 52.39 | 0.04 | 270.19 |
| 2024 | 5 | 23 | 13 | 28.96 | 47.64 | 0.19 | 264.13 |
| 2024 | 5 | 23 | 14 | 47.51 | 48.84 | 0.15 | 259.94 |
| 2024 | 5 | 23 | 15 | 17.95 | 38.03 | 0.34 | 259.69 |
| 2024 | 5 | 23 | 16 | 20.66 | 50.4 | 0.02 | 260.30 |
| 2024 | 5 | 23 | 17 | 23.38 | 47.2 | 0.16 | 259.95 |
| 2024 | 5 | 23 | 18 | 28.3 | 38.45 | 0.05 | 251.68 |
| 2024 | 5 | 23 | 19 | 46.99 | 44.94 | 0.31 | 318.41 |
| 2024 | 5 | 23 | 20 | 33.98 | 55.22 | 0.31 | 144.33 |
| 2024 | 5 | 23 | 21 | 29.67 | 46.56 | 0.23 | 138.39 |
| 2024 | 5 | 23 | 22 | 37.46 | 51.75 | 0.07 | 308.46 |
| 2024 | 5 | 23 | 23 | 24.46 | 51.67 | 0.3 | 324.34 |
| 2024 | 5 | 24 | 0 | 26.24 | 44.43 | 0.1 | 314.71 |
| 2024 | 5 | 24 | 1 | 44.04 | 39.34 | 0.07 | 239.17 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2024 | 5 | 24 | 2 | 46.98 | 49.17 | 0.39 | 274.90 |
| 2024 | 5 | 24 | 3 | 26.77 | 44.5 | 0.15 | 314.33 |
| 2024 | 5 | 24 | 4 | 37.43 | 35.49 | 0.08 | 222.81 |
| 2024 | 5 | 24 | 5 | 41.51 | 48.53 | 0.35 | 321.99 |
| 2024 | 5 | 24 | 6 | 17.23 | 45.63 | 0.33 | 215.23 |
| 2024 | 5 | 24 | 7 | 38.89 | 40.12 | 0.02 | 312.14 |
| 2024 | 5 | 24 | 8 | 33.32 | 42.39 | 0.16 | 324.56 |
| 2024 | 5 | 24 | 9 | 41.59 | 37.77 | 0.34 | 219.05 |
| 2024 | 5 | 24 | 10 | 19.96 | 56.77 | 0.34 | 315.32 |
| 2024 | 5 | 24 | 11 | 19.61 | 38.45 | 0.33 | 319.87 |
| 2024 | 5 | 24 | 12 | 29.58 | 37.32 | 0.37 | 328.92 |
| 2024 | 5 | 24 | 13 | 40.82 | 51.08 | 0.01 | 339.39 |
| 2024 | 5 | 24 | 14 | 38.81 | 58.58 | 0.36 | 352.24 |
| 2024 | 5 | 24 | 15 | 41.34 | 33.69 | 0.29 | 216.88 |
| 2024 | 5 | 24 | 16 | 26.9 | 33.34 | 0.16 | 314.92 |
| 2024 | 5 | 24 | 17 | 20.15 | 42.79 | 0.05 | 231.15 |
| 2024 | 5 | 24 | 18 | 28.3 | 50.97 | 0.25 | 306.33 |
| 2024 | 5 | 24 | 19 | 35.27 | 41.49 | 0.34 | 321.83 |
| 2024 | 5 | 24 | 20 | 28.77 | 58.49 | 0.01 | 309.89 |
| 2024 | 5 | 24 | 21 | 25.1 | 38.36 | 0.1 | 316.19 |
| 2024 | 5 | 24 | 22 | 20.03 | 41.83 | 0.13 | 80.91 |
| 2024 | 5 | 24 | 23 | 22.8 | 37.71 | 0.19 | 84.37 |
| 2024 | 5 | 25 | 0 | 34.68 | 51.09 | 0.15 | 89.57 |
| 2024 | 5 | 25 | 1 | 31.04 | 48.53 | 0.12 | 97.56 |
| 2024 | 5 | 25 | 2 | 20.01 | 52.45 | 0.25 | 112.10 |
| 2024 | 5 | 25 | 3 | 17.13 | 40.88 | 0.16 | 129.18 |
| 2024 | 5 | 25 | 4 | 28.27 | 50.15 | 0.26 | 142.58 |
| 2024 | 5 | 25 | 5 | 30.78 | 43.95 | 0.1 | 307.31 |
| 2024 | 5 | 25 | 6 | 25.77 | 36.29 | 0.04 | 313.92 |
| 2024 | 5 | 25 | 7 | 24.79 | 34.82 | 0.36 | 325.07 |
| 2024 | 5 | 25 | 8 | 17.73 | 35.08 | 0.3 | 318.37 |
| 2024 | 5 | 25 | 9 | 21.52 | 53.24 | 0.03 | 314.89 |
| 2024 | 5 | 25 | 10 | 43.18 | 46.02 | 0.01 | 129.80 |
| 2024 | 5 | 25 | 11 | 27.19 | 52.24 | 0.32 | 258.92 |
| 2024 | 5 | 25 | 12 | 37.22 | 52.49 | 0.31 | 278.79 |
| 2024 | 5 | 25 | 13 | 40.41 | 52.77 | 0.24 | 290.58 |
| 2024 | 5 | 25 | 14 | 36.46 | 53.74 | 0.24 | 297.22 |
| 2024 | 5 | 25 | 15 | 20 | 53.43 | 0.34 | 301.34 |
| 2024 | 5 | 25 | 16 | 38.05 | 56 | 0.05 | 305.04 |
| 2024 | 5 | 25 | 17 | 45.66 | 39.07 | 0.2 | 312.44 |
| 2024 | 5 | 25 | 18 | 27.21 | 40.53 | 0.01 | 327.08 |
| 2024 | 5 | 25 | 19 | 30.68 | 54.43 | 0.38 | 346.02 |
| 2024 | 5 | 25 | 20 | 31.65 | 46.64 | 0.36 | 234.93 |
| 2024 | 5 | 25 | 21 | 24.57 | 44.27 | 0.26 | 232.74 |
| 2024 | 5 | 25 | 22 | 36.07 | 56.48 | 0.15 | 316.97 |
| 2024 | 5 | 25 | 23 | 44.28 | 58.46 | 0.26 | 79.47 |
| 2024 | 5 | 26 | 0 | 21.15 | 33.8 | 0.29 | 98.97 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2024 | 5 | 26 | 1 | 33.86 | 48.68 | 0.27 | 129.76 |
| 2024 | 5 | 26 | 2 | 43.8 | 46.69 | 0.13 | 303.87 |
| 2024 | 5 | 26 | 3 | 19.21 | 41.12 | 0.03 | 313.38 |
| 2024 | 5 | 26 | 4 | 27.05 | 46.17 | 0.29 | 303.69 |
| 2024 | 5 | 26 | 5 | 18.87 | 46.6 | 0.18 | 136.91 |
| 2024 | 5 | 26 | 6 | 30.02 | 54.25 | 0.25 | 128.60 |
| 2024 | 5 | 26 | 7 | 24.07 | 31.65 | 0.2 | 254.19 |
| 2024 | 5 | 26 | 8 | 40.8 | 44.06 | 0.02 | 271.74 |
| 2024 | 5 | 26 | 9 | 39.03 | 44.05 | 0.25 | 292.28 |
| 2024 | 5 | 26 | 10 | 39.18 | 49.66 | 0.38 | 310.09 |
| 2024 | 5 | 26 | 11 | 25.53 | 40.17 | 0.25 | 319.62 |
| 2024 | 5 | 26 | 12 | 44.44 | 54.35 | 0.31 | 322.11 |
| 2024 | 5 | 26 | 13 | 19.5 | 52.12 | 0.26 | 322.12 |
| 2024 | 5 | 26 | 14 | 44.68 | 56.59 | 0.06 | 321.12 |
| 2024 | 5 | 26 | 15 | 42.45 | 35.3 | 0.02 | 319.45 |
| 2024 | 5 | 26 | 16 | 48.14 | 34.84 | 0.11 | 317.76 |
| 2024 | 5 | 26 | 17 | 20.7 | 32.31 | 0.31 | 319.49 |
| 2024 | 5 | 26 | 18 | 21.1 | 31.28 | 0.22 | 331.31 |
| 2024 | 5 | 26 | 19 | 43.33 | 51.7 | 0.3 | 335.62 |
| 2024 | 5 | 26 | 20 | 38.23 | 37.67 | 0.37 | 324.19 |
| 2024 | 5 | 26 | 21 | 24.25 | 55.91 | 0 | 288.85 |
| 2024 | 5 | 26 | 22 | 35.48 | 54.99 | 0.09 | 262.27 |
| 2024 | 5 | 26 | 23 | 42.71 | 57.6 | 0.1 | 259.85 |
| 2024 | 5 | 27 | 0 | 33.56 | 57.51 | 0.28 | 266.78 |
| 2024 | 5 | 27 | 1 | 32.6 | 33.06 | 0.34 | 277.23 |
| 2024 | 5 | 27 | 2 | 44.7 | 52.81 | 0.14 | 284.56 |
| 2024 | 5 | 27 | 3 | 38.67 | 39.22 | 0.19 | 289.39 |
| 2024 | 5 | 27 | 4 | 24.13 | 50.99 | 0.1 | 289.18 |
| 2024 | 5 | 27 | 5 | 46.73 | 54.27 | 0.34 | 280.08 |
| 2024 | 5 | 27 | 6 | 19.57 | 47.49 | 0.07 | 269.87 |
| 2024 | 5 | 27 | 7 | 23.58 | 33.5 | 0.08 | 270.63 |
| 2024 | 5 | 27 | 8 | 27.63 | 37.51 | 0.06 | 275.59 |
| 2024 | 5 | 27 | 9 | 31.02 | 52.51 | 0.33 | 282.79 |
| 2024 | 5 | 27 | 10 | 44.85 | 34.96 | 0.17 | 290.51 |
| 2024 | 5 | 27 | 11 | 31.56 | 34.89 | 0.2 | 297.91 |
| 2024 | 5 | 27 | 12 | 41.92 | 42.21 | 0.04 | 304.25 |
| 2024 | 5 | 27 | 13 | 34.68 | 42.98 | 0.23 | 310.11 |
| 2024 | 5 | 27 | 14 | 20.33 | 47.91 | 0.16 | 314.16 |
| 2024 | 5 | 27 | 15 | 26.15 | 32.11 | 0.06 | 310.36 |
| 2024 | 5 | 27 | 16 | 17.94 | 54.84 | 0.27 | 297.84 |
| 2024 | 5 | 27 | 17 | 25.17 | 57 | 0.01 | 287.94 |
| 2024 | 5 | 27 | 18 | 43.33 | 54.45 | 0.31 | 279.57 |
| 2024 | 5 | 27 | 19 | 47.05 | 50.98 | 0.3 | 246.70 |
| 2024 | 5 | 27 | 20 | 34.63 | 52.1 | 0.12 | 133.29 |
| 2024 | 5 | 27 | 21 | 43.44 | 49.52 | 0.08 | 140.64 |
| 2024 | 5 | 27 | 22 | 37.24 | 46.49 | 0.02 | 241.71 |
| 2024 | 5 | 27 | 23 | 19.02 | 35.72 | 0.31 | 258.86 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2024 | 5 | 28 | 0 | 28.59 | 55.3 | 0.37 | 270.85 |
| 2024 | 5 | 28 | 1 | 42.96 | 45.77 | 0.27 | 271.78 |
| 2024 | 5 | 28 | 2 | 46.86 | 47.34 | 0.27 | 266.95 |
| 2024 | 5 | 28 | 3 | 37.94 | 32.74 | 0.15 | 259.64 |
| 2024 | 5 | 28 | 4 | 43.67 | 54.7 | 0.01 | 252.03 |
| 2024 | 5 | 28 | 5 | 37.41 | 44.74 | 0.17 | 249.01 |
| 2024 | 5 | 28 | 6 | 42.37 | 46.18 | 0.04 | 258.38 |
| 2024 | 5 | 28 | 7 | 26.46 | 55.41 | 0.18 | 267.66 |
| 2024 | 5 | 28 | 8 | 26.53 | 44.74 | 0.34 | 272.94 |
| 2024 | 5 | 28 | 9 | 28.57 | 52.39 | 0.37 | 277.10 |
| 2024 | 5 | 28 | 10 | 32.23 | 51.59 | 0.18 | 280.02 |
| 2024 | 5 | 28 | 11 | 47.73 | 45.69 | 0.15 | 281.91 |
| 2024 | 5 | 28 | 12 | 29.21 | 44.56 | 0.36 | 282.99 |
| 2024 | 5 | 28 | 13 | 43.34 | 50.09 | 0.08 | 283.78 |
| 2024 | 5 | 28 | 14 | 30.72 | 54.31 | 0.13 | 283.47 |
| 2024 | 5 | 28 | 15 | 42.6 | 58.87 | 0.33 | 281.00 |
| 2024 | 5 | 28 | 16 | 28.24 | 52.34 | 0.22 | 277.92 |
| 2024 | 5 | 28 | 17 | 42.39 | 55.9 | 2.3 | 273.48 |
| 2024 | 5 | 28 | 18 | 17.19 | 58.5 | 2.5 | 11.97 |
| 2024 | 5 | 28 | 19 | 30.56 | 55.47 | 2.6 | 256.59 |
| 2024 | 5 | 28 | 20 | 33.52 | 45.69 | 0.07 | 250.38 |
| 2024 | 5 | 28 | 21 | 32.95 | 47.74 | 0.28 | 249.62 |
| 2024 | 5 | 28 | 22 | 18.56 | 40.16 | 0.24 | 251.92 |
| 2024 | 5 | 28 | 23 | 17.31 | 52.22 | 0.12 | 255.85 |
| 2024 | 5 | 29 | 0 | 17.38 | 41.38 | 0.18 | 13.47 |
| 2024 | 5 | 29 | 1 | 40.11 | 48.22 | 0.07 | 15.87 |
| 2024 | 5 | 29 | 2 | 26.22 | 54.32 | 0.21 | 23.50 |
| 2024 | 5 | 29 | 3 | 38.26 | 39.87 | 0.37 | 259.20 |
| 2024 | 5 | 29 | 4 | 45.08 | 35.7 | 0.08 | 259.03 |
| 2024 | 5 | 29 | 5 | 46.21 | 35.02 | 0.25 | 259.16 |
| 2024 | 5 | 29 | 6 | 35.89 | 45.62 | 0.24 | 266.38 |
| 2024 | 5 | 29 | 7 | 32.62 | 40.07 | 0.33 | 274.15 |
| 2024 | 5 | 29 | 8 | 43.7 | 50.91 | 0.05 | 276.05 |
| 2024 | 5 | 29 | 9 | 18.33 | 57.96 | 0.35 | 275.41 |
| 2024 | 5 | 29 | 10 | 35.39 | 42.76 | 0.3 | 275.48 |
| 2024 | 5 | 29 | 11 | 39.76 | 40.77 | 5.1 | 277.13 |
| 2024 | 5 | 29 | 12 | 22.34 | 46.39 | 0.12 | 279.89 |
| 2024 | 5 | 29 | 13 | 40.21 | 50.96 | 4.9 | 283.11 |
| 2024 | 5 | 29 | 14 | 47.14 | 45.4 | 0.2 | 287.51 |
| 2024 | 5 | 29 | 15 | 34.63 | 53.37 | 0.08 | 291.35 |
| 2024 | 5 | 29 | 16 | 26.52 | 43.47 | 0.05 | 294.15 |
| 2024 | 5 | 29 | 17 | 34.14 | 43.98 | 0.15 | 294.57 |
| 2024 | 5 | 29 | 18 | 44.76 | 44.16 | 0.11 | 290.90 |
| 2024 | 5 | 29 | 19 | 27.11 | 47.66 | 0.35 | 280.41 |
| 2024 | 5 | 29 | 20 | 21.98 | 41.52 | 0.12 | 264.14 |
| 2024 | 5 | 29 | 21 | 46 | 49.02 | 5.3 | 254.15 |
| 2024 | 5 | 29 | 22 | 33.27 | 43.35 | 0.09 | 253.05 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2024 | 5 | 29 | 23 | 40.96 | 57.25 | 0.01 | 256.26 |
| 2024 | 5 | 30 | 0 | 18.71 | 53.09 | 0.34 | 260.97 |
| 2024 | 5 | 30 | 1 | 33.43 | 31.32 | 0.02 | 268.73 |
| 2024 | 5 | 30 | 2 | 46.62 | 34.74 | 5.1 | 276.35 |
| 2024 | 5 | 30 | 3 | 42.64 | 47.55 | 0.09 | 280.56 |
| 2024 | 5 | 30 | 4 | 40.93 | 41.7 | 0.26 | 280.62 |
| 2024 | 5 | 30 | 5 | 39.54 | 53.09 | 0.2 | 276.82 |
| 2024 | 5 | 30 | 6 | 17.57 | 41.41 | 0.11 | 282.47 |
| 2024 | 5 | 30 | 7 | 46.37 | 32.3 | 0.24 | 288.65 |
| 2024 | 5 | 30 | 8 | 45.61 | 38.14 | 0.06 | 291.94 |
| 2024 | 5 | 30 | 9 | 20.1 | 57.63 | 0.12 | 300.67 |
| 2024 | 5 | 30 | 10 | 33.81 | 39.51 | 0.23 | 308.66 |
| 2024 | 5 | 30 | 11 | 43.08 | 51.11 | 0.18 | 312.48 |
| 2024 | 5 | 30 | 12 | 31.04 | 41.24 | 2.3 | 312.88 |
| 2024 | 5 | 30 | 13 | 18.05 | 56.3 | 0.03 | 312.87 |
| 2024 | 5 | 30 | 14 | 22.86 | 48.04 | 0.15 | 312.69 |
| 2024 | 5 | 30 | 15 | 36.76 | 37.15 | 0.16 | 312.98 |
| 2024 | 5 | 30 | 16 | 25.95 | 48.13 | 0.18 | 313.50 |
| 2024 | 5 | 30 | 17 | 46.67 | 52.38 | 0.26 | 314.42 |
| 2024 | 5 | 30 | 18 | 44.7 | 36.49 | 0.31 | 316.00 |
| 2024 | 5 | 30 | 19 | 33.52 | 56.82 | 0.29 | 298.91 |
| 2024 | 5 | 30 | 20 | 36.43 | 48.56 | 0.24 | 144.73 |
| 2024 | 5 | 30 | 21 | 24.79 | 33.22 | 0.29 | 314.68 |
| 2024 | 5 | 30 | 22 | 28.32 | 42.58 | 0.34 | 213.41 |
| 2024 | 5 | 30 | 23 | 38.28 | 33.78 | 0.04 | 137.51 |
| 2024 | 5 | 31 | 0 | 41.08 | 46.78 | 0.02 | 254.78 |
| 2024 | 5 | 31 | 1 | 35.71 | 56.77 | 0.19 | 270.86 |
| 2024 | 5 | 31 | 2 | 28.84 | 57.97 | 0.24 | 284.19 |
| 2024 | 5 | 31 | 3 | 37.04 | 51.65 | 0.15 | 288.53 |
| 2024 | 5 | 31 | 4 | 29.68 | 32.32 | 0.11 | 288.43 |
| 2024 | 5 | 31 | 5 | 37.16 | 48.1 | 0.18 | 289.54 |
| 2024 | 5 | 31 | 6 | 43.37 | 38.33 | 0.19 | 291.56 |
| 2024 | 5 | 31 | 7 | 41.6 | 51.56 | 0.17 | 301.56 |
| 2024 | 5 | 31 | 8 | 44.46 | 47.03 | 0.29 | 314.31 |
| 2024 | 5 | 31 | 9 | 27.94 | 41.94 | 0.1 | 325.56 |
| 2024 | 5 | 31 | 10 | 21.44 | 35.02 | 0.32 | 331.63 |
| 2024 | 5 | 31 | 11 | 34.24 | 40.05 | 0.09 | 334.40 |
| 2024 | 5 | 31 | 12 | 46.94 | 36.25 | 0.12 | 335.77 |
| 2024 | 5 | 31 | 13 | 32.04 | 46.59 | 0.07 | 336.16 |
| 2024 | 5 | 31 | 14 | 44.82 | 47.77 | 0.09 | 336.12 |
| 2024 | 5 | 31 | 15 | 45.9 | 34.9 | 0.08 | 335.63 |
| 2024 | 5 | 31 | 16 | 42.41 | 48.1 | 0.27 | 334.60 |
| 2024 | 5 | 31 | 17 | 35.46 | 55.95 | 0.08 | 334.82 |
| 2024 | 5 | 31 | 18 | 41.4 | 35.08 | 0.35 | 343.68 |
| 2024 | 5 | 31 | 19 | 45.84 | 55.07 | 0.2 | 351.24 |
| 2024 | 5 | 31 | 20 | 22.48 | 33.31 | 0.09 | 355.60 |
| 2024 | 5 | 31 | 21 | 17.24 | 41.7 | 0.37 | 354.32 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2024 | 5 | 31 | 22 | 31.09 | 47.92 | 0.34 | 348.86 |
| 2024 | 5 | 31 | 23 | 37.4 | 42.88 | 0.25 | 344.16 |

## AMBIENT AIR QUALITY MONITORING

Location- 1: Project Site (Unit: µg/m3)

| Date of Monitoring | Clock Hours | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 00-08 | | 08-16 | | 16-24 | | 24 Hours | 24 Hours | 24 Hours |
| | $SO_2$ | $NO_2$ | $SO_2$ | $NO_2$ | $SO_2$ | $NO_2$ | $PM_{10}$ | $PM_{2.5}$ | CO |
| 01.03.2024 | 5.0 | 10.5 | 5.9 | 12.3 | 5.4 | 10.9 | 38.8 | 22.0 | BDL |
| 02.03.2024 | 5.1 | 9.8 | 5.8 | 11.5 | 5.7 | 10.5 | 46.8 | 25.2 | BDL |
| 08.03.2024 | 4.9 | 10.7 | 6.2 | 12.0 | 5.7 | 9.9 | 43.3 | 22.9 | BDL |
| 09.03.2024 | 4.5 | 9.9 | 6.3 | 11.8 | 5.6 | 10.2 | 47.0 | 20.8 | BDL |
| 15.03.2024 | 5.0 | 10.2 | 6.1 | 11.7 | 5.7 | 10.6 | 41.2 | 25.7 | BDL |
| 16.03.2024 | 4.6 | 10.1 | 5.9 | 11.2 | 5.5 | 10.8 | 49.9 | 26.7 | BDL |
| 22.03.2024 | 4.8 | 10.3 | 6.0 | 12.1 | 4.4 | 10.3 | 41.1 | 21.7 | BDL |
| 23.03.2024 | 4.6 | 10.8 | 6.5 | 11.9 | 5.2 | 10.2 | 40.2 | 21.2 | BDL |
| 29.03.2024 | 4.5 | 10.7 | 6.6 | 12.1 | 5.5 | 10.9 | 39.7 | 22.2 | BDL |
| 30.03.2024 | 5.0 | 9.6 | 5.9 | 11.5 | 5.7 | 10.6 | 38.1 | 24.7 | BDL |
| 05.04.2024 | 4.7 | 10.1 | 5.8 | 12.3 | 5.0 | 10.4 | 38.1 | 22.8 | BDL |
| 06.04.2024 | 4.6 | 10.2 | 6.8 | 11.8 | 4.4 | 9.9 | 50.2 | 23.3 | BDL |
| 12.04.2024 | 4.8 | 10.3 | 6.0 | 11.3 | 5.4 | 10.9 | 49.2 | 24.6 | BDL |
| 13.04.2024 | 5.2 | 10.8 | 6.5 | 12.0 | 4.8 | 10.6 | 47.3 | 22.9 | BDL |
| 19.04.2024 | 4.6 | 10.0 | 5.8 | 12.1 | 4.9 | 10.3 | 48.5 | 26.4 | BDL |
| 20.04.2024 | 5.3 | 10.5 | 6.8 | 11.5 | 5.5 | 10.5 | 47.2 | 25.4 | BDL |
| 26.04.2024 | 5.2 | 10.2 | 6.2 | 11.8 | 5.7 | 10.3 | 40.5 | 28.0 | BDL |
| 27.04.2024 | 5.0 | 10.6 | 5.8 | 11.6 | 5.4 | 10.8 | 43.2 | 22.1 | BDL |
| 03.05.2024 | 4.8 | 9.6 | 6.2 | 12.0 | 5.7 | 9.9 | 38.6 | 26.2 | BDL |
| 04.05.2024 | 4.9 | 10.4 | 6.1 | 12.3 | 5.1 | 10.6 | 49.4 | 25.1 | BDL |
| 10.05.2024 | 5.2 | 9.8 | 6.8 | 11.5 | 5.5 | 10.8 | 49.3 | 25.4 | BDL |
| 11.05.2024 | 4.8 | 10.2 | 6.7 | 11.8 | 5.7 | 10.2 | 49.7 | 24.6 | BDL |
| 17.05.2024 | 4.3 | 9.5 | 5.8 | 12.1 | 4.9 | 10.3 | 36.4 | 21.2 | BDL |
| 18.05.2024 | 4.5 | 9.8 | 5.9 | 12.3 | 5.6 | 10.9 | 43.6 | 27.8 | BDL |
| 24.05.2024 | 4.8 | 9.8 | 6.5 | 11.2 | 5.5 | 10.2 | 42.9 | 27.0 | BDL |
| 25.05.2024 | 4.4 | 10.8 | 6.2 | 12.3 | 5.7 | 9.8 | 41.4 | 25.1 | BDL |

| | $SO_2$ | $NO_2$ | $PM_{10}$ | $PM_{2.5}$ | CO |
|---|---|---|---|---|---|
| Max. | 6.8 | 12.3 | 50.2 | 28.0 | BDL |
| Min. | 4.3 | 9.5 | 36.4 | 20.8 | BDL |
| 98%tile | 6.8 | 12.3 | 50.1 | 27.9 | BDL |

## AMBIENT AIR QUALITY MONITORING

Location- 2: Mine Site (Unit: µg/m3)

| Date of Monitoring | Clock Hours | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 00-08 | | 08-16 | | 16-24 | | 24 Hours | 24 Hours | 24 Hours |
| | $SO_2$ | $NO_2$ | $SO_2$ | $NO_2$ | $SO_2$ | $NO_2$ | $PM_{10}$ | $PM_{2.5}$ | CO |
| 01.03.2024 | 4.9 | 9.0 | 6.3 | 11.0 | 5.3 | 10.4 | 51.2 | 23.3 | BDL |
| 02.03.2024 | 5.0 | 9.1 | 6.5 | 10.8 | 5.6 | 10.5 | 45.8 | 25.3 | BDL |
| 08.03.2024 | 5.1 | 9.4 | 6.6 | 10.6 | 5.6 | 10.2 | 42.1 | 21.1 | BDL |
| 09.03.2024 | 5.4 | 9.1 | 6.0 | 11.0 | 5.8 | 10.5 | 38.7 | 25.7 | BDL |
| 15.03.2024 | 5.5 | 9.5 | 6.6 | 11.0 | 6.2 | 9.8 | 49.8 | 23.4 | BDL |
| 16.03.2024 | 5.1 | 9.8 | 6.1 | 10.4 | 5.9 | 10.4 | 45.1 | 21.9 | BDL |
| 22.03.2024 | 4.7 | 9.7 | 5.9 | 11.0 | 4.8 | 9.7 | 44.8 | 27.8 | BDL |
| 23.03.2024 | 5.4 | 9.5 | 6.6 | 10.5 | 6.3 | 9.6 | 38.3 | 23.3 | BDL |
| 29.03.2024 | 5.0 | 9.6 | 6.5 | 10.2 | 5.4 | 10.5 | 50.4 | 25.5 | BDL |
| 30.03.2024 | 5.1 | 9.2 | 6.1 | 10.5 | 6.2 | 10.2 | 51.9 | 27.4 | BDL |
| 05.04.2024 | 4.6 | 9.0 | 5.8 | 10.6 | 4.9 | 9.8 | 50.3 | 26.5 | BDL |
| 06.04.2024 | 5.3 | 9.5 | 5.9 | 11.0 | 5.9 | 10.1 | 39.2 | 23.4 | BDL |
| 12.04.2024 | 4.7 | 9.1 | 6.1 | 10.8 | 5.3 | 10.3 | 43.0 | 24.9 | BDL |
| 13.04.2024 | 5.2 | 9.6 | 6.6 | 11.0 | 6.2 | 9.9 | 47.9 | 24.5 | BDL |
| 19.04.2024 | 4.5 | 8.9 | 5.7 | 10.8 | 4.8 | 9.7 | 47.4 | 23.1 | BDL |
| 20.04.2024 | 5.2 | 9.8 | 5.7 | 10.4 | 5.4 | 10.4 | 40.6 | 21.3 | BDL |
| 26.04.2024 | 5.5 | 9.1 | 6.2 | 11.0 | 6.1 | 10.1 | 38.0 | 24.4 | BDL |
| 27.04.2024 | 4.9 | 8.9 | 6.3 | 10.4 | 5.3 | 9.8 | 46.0 | 22.6 | BDL |
| 03.05.2024 | 5.4 | 9.2 | 6.6 | 11.0 | 5.9 | 9.6 | 51.4 | 23.0 | BDL |
| 04.05.2024 | 4.2 | 9.8 | 6.0 | 10.5 | 5.0 | 10.0 | 44.6 | 25.0 | BDL |
| 10.05.2024 | 5.4 | 9.5 | 6.2 | 11.0 | 6.3 | 10.1 | 51.4 | 23.1 | BDL |
| 11.05.2024 | 5.1 | 9.5 | 6.6 | 10.9 | 5.6 | 10.9 | 47.8 | 25.8 | BDL |
| 17.05.2024 | 4.5 | 9.4 | 5.7 | 11.0 | 4.8 | 9.7 | 41.7 | 27.3 | BDL |
| 18.05.2024 | 4.6 | 9.1 | 6.4 | 10.8 | 5.9 | 9.6 | 50.6 | 22.4 | BDL |
| 24.05.2024 | 4.3 | 9.6 | 5.9 | 10.2 | 6.0 | 9.5 | 39.0 | 25.6 | BDL |
| 25.05.2024 | 5.5 | 9.5 | 6.2 | 11.0 | 6.1 | 9.7 | 44.5 | 20.1 | BDL |

| | $SO_2$ | $NO_2$ | $PM_{10}$ | $PM_{2.5}$ | CO |
|---|---|---|---|---|---|
| Max. | 6.6 | 11.0 | 51.9 | 27.8 | BDL |
| Min. | 4.2 | 8.9 | 38.0 | 20.1 | BDL |
| 98%tile | 6.6 | 11.0 | 51.7 | 27.6 | BDL |



501

## AMBIENT AIR QUALITY MONITORING

Location - 3: Near Village Chinna Venthrula (Unit: µg/m3)

| Date of Monitoring | Clock | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 00-08 | | 08-16 | | 16-24 | | 24 Hours | 24 Hours | 24 Hours |
| | $SO_2$ | $NO_2$ | $SO_2$ | $NO_2$ | $SO_2$ | $NO_2$ | $PM_{10}$ | $PM_{2.5}$ | CO |
| 01.03.2024 | 6.6 | 12.4 | 8.0 | 14.8 | 7.0 | 12.8 | 50.4 | 34.0 | BDL |
| 02.03.2024 | 6.7 | 12.5 | 8.2 | 15.0 | 7.3 | 13.1 | 48.4 | 34.9 | BDL |
| 08.03.2024 | 6.5 | 12.8 | 8.3 | 15.2 | 7.3 | 13.3 | 52.2 | 24.7 | BDL |
| 09.03.2024 | 6.1 | 13.3 | 7.8 | 16.0 | 7.5 | 13.7 | 55.1 | 29.9 | BDL |
| 15.03.2024 | 6.0 | 13.6 | 8.1 | 16.3 | 7.9 | 14.3 | 56.9 | 29.4 | BDL |
| 16.03.2024 | 6.5 | 13.7 | 7.5 | 16.6 | 7.6 | 14.0 | 48.4 | 33.7 | BDL |
| 22.03.2024 | 6.4 | 12.1 | 7.6 | 14.3 | 6.4 | 12.1 | 59.2 | 24.9 | BDL |
| 23.03.2024 | 6.5 | 14.3 | 8.6 | 17.5 | 8.0 | 14.7 | 49.8 | 30.3 | BDL |
| 29.03.2024 | 6.5 | 12.5 | 8.2 | 15.0 | 7.1 | 12.9 | 52.5 | 33.2 | BDL |
| 30.03.2024 | 6.3 | 14.2 | 8.6 | 17.3 | 7.9 | 14.6 | 51.2 | 34.5 | BDL |
| 05.04.2024 | 6.3 | 11.9 | 7.5 | 14.2 | 6.6 | 12.2 | 51.5 | 33.0 | BDL |
| 06.04.2024 | 6.5 | 13.2 | 8.5 | 15.8 | 7.6 | 13.8 | 58.5 | 34.7 | BDL |
| 12.04. 2024 | 6.4 | 12.1 | 7.6 | 14.3 | 7.0 | 12.7 | 50.3 | 33.2 | BDL |
| 13.04. 2024 | 5.9 | 13.7 | 8.6 | 16.6 | 7.9 | 14.3 | 54.0 | 28.8 | BDL |
| 19.04. 2024 | 6.2 | 11.3 | 7.4 | 13.9 | 6.5 | 12.1 | 50.9 | 27.4 | BDL |
| 20.04. 2024 | 6.6 | 13.0 | 8.6 | 15.5 | 7.1 | 13.2 | 52.5 | 30.1 | BDL |
| 26.04. 2024 | 6.5 | 14.3 | 8.5 | 17.5 | 7.8 | 14.5 | 50.6 | 30.7 | BDL |
| 27.04. 2024 | 6.6 | 12.4 | 8.0 | 14.8 | 7.0 | 12.8 | 49.9 | 28.7 | BDL |
| 03.05. 2024 | 6.0 | 13.3 | 8.6 | 16.0 | 7.6 | 13.8 | 51.2 | 26.4 | BDL |
| 04.05. 2024 | 6.5 | 12.2 | 7.7 | 14.5 | 6.7 | 12.4 | 48.8 | 28.2 | BDL |
| 10.05. 2024 | 6.7 | 14.5 | 8.6 | 17.9 | 8.1 | 14.9 | 48.8 | 32.8 | BDL |
| 11.05. 2024 | 6.0 | 12.8 | 8.3 | 15.2 | 7.3 | 13.3 | 50.4 | 30.0 | BDL |
| 17.05. 2024 | 6.2 | 11.8 | 7.4 | 13.9 | 6.5 | 12.1 | 53.9 | 31.2 | BDL |
| 18.05. 2024 | 6.5 | 13.7 | 8.1 | 16.6 | 7.6 | 14.0 | 56.5 | 29.7 | BDL |
| 24.05. 2024 | 6.2 | 13.9 | 8.6 | 17.0 | 7.7 | 14.2 | 51.7 | 25.4 | BDL |
| 25.05. 2024 | 6.5 | 14.2 | 8.2 | 17.3 | 7.8 | 14.5 | 48.2 | 30.1 | BDL |

| | $SO_2$ | $NO_2$ | $PM_{10}$ | $PM_{2.5}$ | CO |
|---|---|---|---|---|---|
| Max. | 8.6 | 17.9 | 59.2 | 34.9 | BDL |
| Min. | 5.9 | 11.3 | 48.2 | 24.7 | BDL |
| 98%tile | 8.6 | 17.5 | 58.9 | 34.8 | BDL |



502

## AMBIENT AIR QUALITY MONITORING

Location - 4: Village Vaddirala (Unit: µg/m3)

| Date of Monitoring | Clock Hours | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 00-08 | | 08-16 | | 16-24 | | 24 Hours | 24 Hours | 24 Hours |
| | $SO_2$ | $NO_2$ | $SO_2$ | $NO_2$ | $SO_2$ | $NO_2$ | $PM_{10}$ | $PM_{2.5}$ | CO |
| 01.03. 2024 | 8.7 | 16.8 | 10.1 | 19.2 | 9.1 | 17.2 | 59.0 | 36.5 | BDL |
| 02.03. 2024 | 8.8 | 16.9 | 10.3 | 19.4 | 9.4 | 17.5 | 71.3 | 31.5 | BDL |
| 08.03. 2024 | 8.9 | 16.5 | 10.4 | 19.6 | 9.4 | 17.7 | 64.8 | 34.5 | BDL |
| 09.03. 2024 | 9.2 | 16.2 | 10.9 | 20.3 | 9.6 | 18.1 | 70.5 | 36.8 | BDL |
| 15.03. 2024 | 9.3 | 15.9 | 11.1 | 20.1 | 10.0 | 18.7 | 69.7 | 33.6 | BDL |
| 16.03. 2024 | 9.4 | 16.1 | 11.3 | 20.3 | 9.7 | 18.4 | 67.8 | 32.4 | BDL |
| 22.03.2024 | 8.5 | 16.5 | 9.8 | 18.7 | 8.5 | 16.5 | 62.7 | 35.6 | BDL |
| 23.03.2024 | 9.6 | 16.1 | 11.7 | 20.3 | 10.1 | 19.1 | 65.3 | 35.5 | BDL |
| 29.03.2024 | 8.8 | 16.9 | 10.3 | 19.4 | 9.2 | 17.3 | 69.3 | 31.6 | BDL |
| 30.03. 2024 | 9.6 | 16.5 | 11.7 | 20.3 | 10.0 | 19.0 | 59.0 | 33.5 | BDL |
| 05.04.2024 | 8.4 | 16.3 | 9.6 | 18.6 | 8.7 | 16.6 | 69.3 | 30.9 | BDL |
| 06.04.2024 | 9.1 | 16.6 | 10.8 | 20.2 | 9.7 | 18.2 | 64.8 | 34.8 | BDL |
| 12.04.2024 | 8.5 | 16.5 | 9.7 | 18.7 | 9.1 | 17.1 | 69.0 | 38.5 | BDL |
| 13.04. 2024 | 9.4 | 16.4 | 11.3 | 20.3 | 10.0 | 18.7 | 64.9 | 33.5 | BDL |
| 19.04.2024 | 8.3 | 16.2 | 10.2 | 18.3 | 8.6 | 16.5 | 63.8 | 32.1 | BDL |
| 20.04.2024 | 9.0 | 16.0 | 10.7 | 19.9 | 9.2 | 17.6 | 71.0 | 32.6 | BDL |
| 26.04.2024 | 9.7 | 16.5 | 11.7 | 20.3 | 9.9 | 18.9 | 70.5 | 35.8 | BDL |
| 27.04.2024 | 8.7 | 16.5 | 10.1 | 19.2 | 9.1 | 17.2 | 69.8 | 37.8 | BDL |
| 03.05.2024 | 9.2 | 16.4 | 10.9 | 18.5 | 9.7 | 18.2 | 63.3 | 35.1 | BDL |
| 04.05.2024 | 8.6 | 16.3 | 10.2 | 18.9 | 8.8 | 16.8 | 65.2 | 34.7 | BDL |
| 10.05.2024 | 9.6 | 16.5 | 11.7 | 20.1 | 10.2 | 19.3 | 59.7 | 30.8 | BDL |
| 11.05.2024 | 8.9 | 15.8 | 10.4 | 19.6 | 9.4 | 17.7 | 62.9 | 35.1 | BDL |
| 17.05. 2024 | 8.0 | 15.7 | 10.2 | 18.3 | 8.6 | 16.5 | 67.5 | 34.1 | BDL |
| 18.05.2024 | 9.4 | 15.8 | 11.3 | 20.3 | 9.7 | 18.4 | 60.8 | 39.2 | BDL |
| 24.05.2024 | 9.5 | 16.3 | 11.5 | 20.1 | 9.8 | 18.6 | 61.0 | 36.8 | BDL |
| 25.05.2024 | 9.6 | 16.4 | 11.7 | 18.5 | 9.9 | 18.9 | 68.0 | 34.9 | BDL |

| | $SO_2$ | $NO_2$ | $PM_{10}$ | $PM_{2.5}$ | CO |
|---|---|---|---|---|---|
| Max. | 11.7 | 20.3 | 71.3 | 39.2 | BDL |
| Min. | 8 | 15.7 | 59.0 | 30.8 | BDL |
| 98%tile | 11.7 | 20.3 | 71.2 | 38.8 | BDL |



503

## AMBIENT AIR QUALITY MONITORING

Location- 5: Village Bestavemula (Unit: µg/m3)

| Date of Monitoring | Clock Hours | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 00-08 | | 08-16 | | 16-24 | | 24 Hours | 24 Hours | 24 Hours |
| | $SO_2$ | $NO_2$ | $SO_2$ | $NO_2$ | $SO_2$ | $NO_2$ | $PM_{10}$ | $PM_{2.5}$ | CO |
| 01.03.2024 | 6.1 | 11.4 | 7.5 | 13.8 | 6.5 | 11.8 | 51.3 | 31.0 | BDL |
| 02.03.2024 | 6.2 | 11.5 | 6.6 | 14.0 | 6.8 | 12.1 | 54.3 | 29.4 | BDL |
| 08.03.2024 | 6.3 | 11.8 | 7.1 | 14.2 | 6.8 | 12.3 | 50.4 | 26.8 | BDL |
| 09.03.2024 | 6.5 | 12.3 | 7.5 | 15.0 | 7.0 | 12.7 | 58.3 | 31.4 | BDL |
| 15.03.2024 | 6.2 | 12.6 | 7.2 | 15.3 | 6.3 | 13.3 | 49.6 | 26.2 | BDL |
| 16.03.2024 | 5.6 | 12.7 | 6.6 | 15.6 | 7.1 | 13.0 | 53.2 | 28.1 | BDL |
| 22.03.2024 | 5.9 | 11.1 | 7.1 | 13.3 | 5.9 | 11.1 | 58.1 | 24.4 | BDL |
| 23.03.2024 | 6.5 | 13.3 | 7.5 | 16.5 | 6.7 | 13.7 | 52.5 | 31.0 | BDL |
| 29.03.2024 | 6.2 | 11.5 | 6.9 | 14.0 | 6.6 | 11.9 | 56.4 | 33.0 | BDL |
| 30.03.2024 | 5.5 | 13.2 | 7.4 | 16.3 | 6.2 | 13.6 | 57.5 | 32.0 | BDL |
| 05.04.2024 | 5.8 | 10.9 | 7.0 | 13.2 | 6.1 | 11.2 | 47.0 | 27.2 | BDL |
| 06.04.2024 | 6.5 | 12.2 | 7.5 | 14.8 | 7.1 | 12.8 | 52.6 | 32.0 | BDL |
| 12.04.2024 | 5.9 | 11.1 | 7.1 | 13.3 | 6.5 | 11.7 | 57.5 | 27.6 | BDL |
| 13.04.2024 | 6.5 | 12.7 | 7.4 | 15.6 | 6.2 | 13.3 | 50.4 | 30.9 | BDL |
| 19.04.2024 | 5.4 | 10.3 | 6.9 | 12.9 | 6.0 | 11.1 | 57.1 | 31.7 | BDL |
| 20.04.2024 | 6.4 | 12.0 | 6.2 | 14.5 | 6.6 | 12.2 | 49.4 | 33.3 | BDL |
| 26.04.2024 | 6.2 | 13.3 | 7.5 | 16.5 | 7.1 | 13.5 | 56.9 | 31.7 | BDL |
| 27.04.2024 | 6.1 | 11.4 | 6.8 | 13.8 | 6.5 | 11.8 | 55.6 | 28.2 | BDL |
| 03.05.2024 | 6.5 | 12.3 | 7.5 | 15.0 | 7.1 | 12.8 | 48.7 | 24.5 | BDL |
| 04.05.2024 | 6.0 | 11.2 | 7.2 | 13.5 | 6.2 | 11.4 | 55.1 | 27.0 | BDL |
| 10.05.2024 | 6.5 | 13.5 | 7.5 | 17.8 | 6.1 | 13.9 | 46.8 | 27.7 | BDL |
| 11.05.2024 | 6.3 | 11.8 | 7.1 | 14.2 | 6.8 | 12.3 | 48.0 | 26.7 | BDL |
| 17.05.2024 | 5.7 | 10.8 | 6.9 | 12.9 | 6.0 | 11.1 | 57.6 | 26.1 | BDL |
| 18.05.2024 | 5.5 | 12.7 | 7.4 | 15.6 | 6.4 | 13.0 | 53.3 | 27.2 | BDL |
| 24.05.2024 | 6.5 | 12.9 | 7.5 | 16.0 | 6.2 | 13.2 | 52.6 | 25.6 | BDL |
| 25.05.2024 | 5.8 | 13.2 | 7.1 | 16.3 | 6.1 | 13.5 | 52.1 | 27.1 | BDL |

| | **$SO_2$** | **$NO_2$** | **$PM_{10}$** | **$PM_{2.5}$** | **CO** |
|---|---|---|---|---|---|
| Max. | 7.5 | 17.8 | 58.3 | 33.3 | BDL |
| Min. | 5.4 | 10.3 | 46.8 | 24.4 | BDL |
| 98%tile | 7.5 | 16.5 | 58.2 | 33.2 | BDL |

## AMBIENT AIR QUALITY MONITORING

Location -6: Village T.Kammavaripalli (Unit: µg/m3)

| Date of Monitoring | Clock Hours | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 00-08 | | 08-16 | | 16-24 | | 24 Hours | 24 Hours | 24 Hours |
| | $SO_2$ | $NO_2$ | $SO_2$ | $NO_2$ | $SO_2$ | $NO_2$ | $PM_{10}$ | $PM_{2.5}$ | CO |
| 01.03.2024 | 5.3 | 10.8 | 7.0 | 13.2 | 5.7 | 11.2 | 42.4 | 25.4 | BDL |
| 02.03.2024 | 5.4 | 10.9 | 6.1 | 13.4 | 6.0 | 11.5 | 50.1 | 27.2 | BDL |
| 08.03.2024 | 5.5 | 11.2 | 7.0 | 13.6 | 6.0 | 11.7 | 53.4 | 28.8 | BDL |
| 09.03.2024 | 4.7 | 11.7 | 6.2 | 14.4 | 6.2 | 12.1 | 42.8 | 29.0 | BDL |
| 15.03.2024 | 5.5 | 12.0 | 7.0 | 14.7 | 6.6 | 12.7 | 56.4 | 32.9 | BDL |
| 16.03.2024 | 4.8 | 12.1 | 6.5 | 15.0 | 6.3 | 12.4 | 42.9 | 25.3 | BDL |
| 22.03.2024 | 5.1 | 10.5 | 6.3 | 12.7 | 5.1 | 10.5 | 44.3 | 31.5 | BDL |
| 23.03.2024 | 5.4 | 12.7 | 7.0 | 15.9 | 6.7 | 13.1 | 51.4 | 27.2 | BDL |
| 29.03.2024 | 4.9 | 10.9 | 6.9 | 13.4 | 5.8 | 11.3 | 49.6 | 24.0 | BDL |
| 30.03.2024 | 5.5 | 12.6 | 7.0 | 15.7 | 6.6 | 13.0 | 47.0 | 25.0 | BDL |
| 05.04.2024 | 5.0 | 10.3 | 6.2 | 12.6 | 5.3 | 10.6 | 43.9 | 27.8 | BDL |
| 06.04.2024 | 5.5 | 11.6 | 7.0 | 14.2 | 6.3 | 12.2 | 46.9 | 31.4 | BDL |
| 12.04.2024 | 5.1 | 10.5 | 6.3 | 12.7 | 5.7 | 11.1 | 45.0 | 29.0 | BDL |
| 13.04.2024 | 5.2 | 12.1 | 7.0 | 15.0 | 6.6 | 12.7 | 42.0 | 32.2 | BDL |
| 19.04.2024 | 4.9 | 9.7 | 6.1 | 12.3 | 5.2 | 10.5 | 51.5 | 32.9 | BDL |
| 20.04.2024 | 5.5 | 11.4 | 6.8 | 13.9 | 5.8 | 11.6 | 52.2 | 28.4 | BDL |
| 26.04.2024 | 4.7 | 12.7 | 7.0 | 15.9 | 6.5 | 12.9 | 52.0 | 27.0 | BDL |
| 27.04.2024 | 5.3 | 10.8 | 6.7 | 13.2 | 5.7 | 11.2 | 42.0 | 27.3 | BDL |
| 03.05.2024 | 5.1 | 11.7 | 6.9 | 14.4 | 6.3 | 12.2 | 47.7 | 32.0 | BDL |
| 04.05.2024 | 5.2 | 10.6 | 6.4 | 12.9 | 5.4 | 10.8 | 49.8 | 30.0 | BDL |
| 10.05.2024 | 5.4 | 12.9 | 7.0 | 16.5 | 6.8 | 13.3 | 45.2 | 28.9 | BDL |
| 11.05.2024 | 5.5 | 11.2 | 7.0 | 13.6 | 6.0 | 11.7 | 42.8 | 27.1 | BDL |
| 17.05.2024 | 4.6 | 10.2 | 6.1 | 12.3 | 5.2 | 10.5 | 45.3 | 29.8 | BDL |
| 18.05.2024 | 5.4 | 12.1 | 7.0 | 15.0 | 6.3 | 12.4 | 48.4 | 24.6 | BDL |
| 24.05.2024 | 5.3 | 12.3 | 6.5 | 15.4 | 6.4 | 12.6 | 47.2 | 28.8 | BDL |
| 25.05.2024 | 5.2 | 12.6 | 7.0 | 15.7 | 6.5 | 12.9 | 52.9 | 30.4 | BDL |

| | $SO_2$ | $NO_2$ | $PM_{10}$ | $PM_{2.5}$ | CO |
|---|---|---|---|---|---|
| Max. | 7 | 16.5 | 56.4 | 32.9 | BDL |
| Min. | 4.6 | 9.7 | 42.0 | 24.0 | BDL |
| 98%tile | 7.0 | 15.9 | 54.9 | 32.9 | BDL |

## AMBIENT AIR QUALITY MONITORING

Location -7: Village G.Uppalapadu (Unit: µg/m3)

| Date of Monitoring | Clock Hours | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 00-08 | | 08-16 | | 16-24 | | 24 Hours | 24 Hours | 24 Hours |
| | $SO_2$ | $NO_2$ | $SO_2$ | $NO_2$ | $SO_2$ | $NO_2$ | $PM_{10}$ | $PM_{2.5}$ | CO |
| 01.03.2024 | 6.1 | 15.2 | 8.0 | 17.6 | 7.0 | 15.6 | 60.1 | 31.6 | BDL |
| 02.03.2024 | 6.0 | 15.3 | 7.4 | 17.8 | 7.3 | 15.9 | 60.5 | 35.1 | BDL |
| 08.03.2024 | 6.3 | 15.6 | 7.8 | 18.0 | 7.3 | 16.1 | 62.5 | 32.7 | BDL |
| 09.03.2024 | 6.5 | 16.1 | 8.0 | 17.5 | 7.5 | 16.5 | 56.6 | 34.2 | BDL |
| 15.03.2024 | 6.6 | 16.4 | 7.1 | 18.0 | 7.9 | 17.1 | 62.1 | 32.9 | BDL |
| 16.03.2024 | 6.8 | 16.5 | 8.0 | 17.8 | 7.6 | 16.8 | 55.1 | 31.8 | BDL |
| 22.03.2024 | 6.4 | 14.9 | 7.6 | 17.1 | 6.4 | 14.9 | 61.6 | 32.2 | BDL |
| 23.03.2024 | 5.9 | 17.1 | 7.0 | 18.0 | 7.4 | 17.5 | 54.8 | 36.1 | BDL |
| 29.03.2024 | 6.7 | 15.3 | 7.6 | 17.8 | 7.1 | 15.7 | 65.7 | 32.8 | BDL |
| 30.03.2024 | 6.4 | 17.0 | 8.0 | 17.6 | 7.9 | 17.4 | 60.2 | 29.5 | BDL |
| 05.04.2024 | 6.3 | 14.7 | 7.5 | 17.0 | 6.6 | 15.0 | 64.7 | 32.8 | BDL |
| 06.04.2024 | 6.5 | 16.0 | 8.0 | 18.0 | 7.6 | 16.6 | 57.5 | 31.1 | BDL |
| 12.04.2024 | 6.1 | 14.9 | 7.6 | 17.1 | 7.0 | 15.5 | 55.7 | 33.8 | BDL |
| 13.04.2024 | 6.3 | 16.5 | 8.0 | 18.0 | 7.9 | 17.1 | 59.4 | 33.2 | BDL |
| 19.04.2024 | 6.2 | 14.1 | 7.4 | 16.7 | 6.5 | 14.9 | 67.6 | 36.3 | BDL |
| 20.04.2024 | 6.5 | 15.8 | 8.0 | 17.4 | 7.1 | 16.0 | 66.8 | 35.6 | BDL |
| 26.04.2024 | 6.1 | 17.1 | 7.4 | 18.0 | 7.8 | 17.3 | 61.2 | 33.6 | BDL |
| 27.04.2024 | 6.5 | 15.2 | 8.0 | 17.6 | 7.0 | 15.6 | 57.0 | 29.9 | BDL |
| 03.05.2024 | 6.1 | 16.1 | 7.4 | 17.9 | 7.6 | 16.6 | 61.3 | 36.7 | BDL |
| 04.05.2024 | 6.5 | 15.0 | 7.7 | 17.3 | 6.7 | 15.2 | 67.4 | 36.9 | BDL |
| 10.05.2024 | 6.3 | 17.3 | 8.0 | 18.0 | 7.4 | 17.7 | 54.7 | 35.7 | BDL |
| 11.05.2024 | 6.5 | 15.6 | 7.5 | 17.6 | 7.3 | 16.1 | 57.0 | 35.8 | BDL |
| 17.05.2024 | 5.9 | 14.6 | 7.4 | 16.7 | 6.5 | 14.9 | 60.2 | 30.0 | BDL |
| 18.05.2024 | 6.1 | 16.5 | 7.1 | 17.5 | 7.6 | 16.8 | 63.5 | 34.0 | BDL |
| 24.05.20124 | 6.6 | 16.7 | 7.7 | 18.0 | 7.7 | 17.0 | 63.2 | 29.5 | BDL |
| 25.05.2024 | 6.2 | 17.0 | 8.0 | 17.9 | 7.8 | 17.3 | 60.3 | 31.9 | BDL |

| | $SO_2$ | $NO_2$ | $PM_{10}$ | $PM_{2.5}$ | CO |
|---|---|---|---|---|---|
| Max. | 8 | 18.0 | 67.6 | 36.9 | BDL |
| Min. | 5.9 | 14.1 | 54.7 | 29.5 | BDL |
| 98%tile | 8.0 | 18.0 | 67.5 | 36.8 | BDL |

**Location- 8: Village Madhavapuram** **(Unit µg/m³)**

| DATE OF MONITORING | CLOCK HOURS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 00 – 08 | | 08 – 16 | | 16 – 24 | | 24 HOURS $PM_{10}$ | 24 HOURS $PM_{2.5}$ | CO |
| | $SO_2$ | NO2 | $SO_2$ | NO2 | $SO_2$ | NO2 | | | |
| 03.03.2024 | 5.6 | 11.0 | 7.0 | 13.4 | 6.0 | 11.4 | 44.1 | 27.2 | BDL |
| 04.03.2024 | 5.5 | 11.1 | 6.9 | 13.6 | 6.3 | 11.7 | 48.5 | 25.4 | BDL |
| 10.03.2024 | 5.8 | 11.4 | 6.8 | 13.8 | 6.3 | 11.9 | 50.9 | 27.8 | BDL |
| 11.03.2024 | 6.1 | 11.9 | 7.0 | 14.6 | 6.5 | 12.3 | 47.5 | 31.6 | BDL |
| 17.03.2024 | 6.2 | 12.2 | 6.5 | 14.9 | 6.3 | 12.9 | 54.0 | 27.0 | BDL |
| 18.03.2024 | 6.3 | 12.3 | 7.0 | 15.2 | 6.6 | 12.6 | 48.8 | 32.7 | BDL |
| 24.03.2024 | 5.4 | 10.7 | 6.6 | 12.9 | 5.4 | 10.7 | 46.4 | 32.9 | BDL |
| 25.03.2024 | 6.6 | 12.9 | 7.0 | 15.6 | 6.5 | 13.3 | 47.7 | 29.0 | BDL |
| 31.03.2024 | 5.7 | 11.1 | 7.0 | 13.6 | 6.1 | 11.5 | 54.0 | 31.6 | BDL |
| 01.04.2024 | 6.5 | 12.8 | 7.0 | 15.2 | 6.5 | 13.2 | 44.4 | 31.1 | BDL |
| 07.04.2024 | 5.3 | 10.5 | 6.5 | 12.8 | 5.6 | 10.8 | 51.9 | 33.5 | BDL |
| 08.04.2024 | 6.0 | 11.8 | 7.0 | 14.4 | 6.6 | 12.4 | 51.8 | 32.0 | BDL |
| 14.04.2024 | 5.4 | 10.7 | 6.7 | 12.9 | 6.0 | 11.3 | 51.4 | 30.7 | BDL |
| 15.04.2024 | 6.3 | 12.3 | 7.0 | 15.2 | 6.3 | 12.9 | 50.7 | 25.8 | BDL |
| 21.04.2024 | 4.9 | 10.4 | 6.7 | 12.5 | 5.5 | 10.7 | 47.3 | 25.2 | BDL |
| 22.04.2024 | 5.5 | 11.6 | 6.8 | 14.1 | 6.1 | 11.8 | 46.2 | 31.8 | BDL |
| 28.04.2024 | 5.4 | 12.9 | 7.0 | 15.6 | 6.8 | 13.1 | 48.5 | 30.1 | BDL |
| 29.04.2024 | 5.6 | 11.0 | 7.0 | 13.4 | 6.0 | 11.4 | 51.2 | 31.7 | BDL |
| 05.05.2024 | 6.1 | 11.9 | 7.0 | 14.6 | 6.6 | 12.4 | 51.4 | 26.7 | BDL |
| 06.05.2024 | 5.5 | 10.8 | 6.7 | 13.1 | 5.7 | 11.0 | 44.5 | 28.9 | BDL |
| 12.05.2024 | 6.5 | 13.1 | 6.9 | 15.6 | 6.8 | 13.5 | 55.0 | 24.0 | BDL |
| 13.05.2024 | 5.8 | 11.4 | 7.0 | 13.8 | 6.3 | 11.9 | 53.3 | 25.5 | BDL |
| 19.05.2024 | 5.2 | 9.9 | 6.7 | 12.5 | 5.5 | 10.7 | 51.2 | 28.4 | BDL |
| 20.05.2024 | 6.3 | 12.3 | 6.6 | 15.2 | 6.6 | 12.6 | 48.2 | 29.4 | BDL |
| 26.05.2024 | 6.4 | 12.5 | 6.8 | 15.6 | 6.7 | 12.8 | 48.3 | 25.7 | BDL |
| 27.05.2024 | 6.5 | 12.8 | 7.0 | 14.5 | 6.8 | 13.1 | 53.2 | 33.1 | BDL |

## AMBIENT AIR QUALITY MONITORING

| | $SO_2$ | $NO_2$ | $PM_{10}$ | $PM_{2.5}$ | CO |
|---|---|---|---|---|---|
| **Max.** | 7 | 15.6 | 55.0 | 33.5 | BDL |
| **Min.** | 4.9 | 9.9 | 44.1 | 24.0 | BDL |
| **98%tile** | 7.0 | 15.6 | 54.5 | 33.3 | BDL |

**Location - 9: Village Erragudi** **(Unit µg/m³)**

| DATE OF MONITORING | CLOCK HOURS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 00 – 08 | | 08 – 16 | | 16 – 24 | | 24 HOURS $PM_{10}$ | 24 HOURS $PM_{2.5}$ | CO |
| | $SO_2$ | NO2 | $SO_2$ | NO2 | $SO_2$ | NO2 | | | |
| **03.03.2024** | 6.7 | 12.3 | 8.1 | 14.7 | 7.1 | 12.7 | 59.1 | 34.5 | BDL |
| **04.03.2024** | 6.8 | 12.4 | 8.3 | 14.9 | 7.4 | 13.0 | 58.8 | 34.1 | BDL |
| **10.03.2024** | 6.9 | 12.7 | 8.4 | 15.1 | 7.4 | 13.2 | 52.7 | 31.5 | BDL |
| **11.03.2024** | 7.2 | 13.2 | 8.9 | 15.9 | 7.6 | 13.6 | 58.5 | 32.3 | BDL |
| **17.03.2024** | 7.3 | 13.5 | 9.0 | 16.2 | 8.0 | 14.2 | 56.7 | 35.4 | BDL |
| **18.03.2024** | 7.4 | 13.6 | 8.8 | 16.5 | 7.7 | 13.9 | 51.4 | 30.3 | BDL |
| **24.03.2024** | 6.5 | 12.0 | 7.7 | 14.2 | 6.5 | 12.0 | 52.0 | 28.3 | BDL |
| **25.03.2024** | 7.7 | 14.2 | 9.0 | 16.6 | 8.1 | 14.6 | 54.5 | 30.9 | BDL |
| **31.03.2024** | 6.8 | 12.4 | 8.3 | 14.9 | 7.2 | 12.8 | 52.5 | 35.2 | BDL |
| **01.04.2024** | 7.6 | 14.1 | 8.2 | 16.5 | 8.0 | 14.5 | 54.5 | 34.2 | BDL |
| **07.04.2024** | 6.4 | 11.8 | 7.6 | 14.1 | 6.7 | 12.1 | 60.3 | 28.9 | BDL |
| **08.04.2024** | 7.1 | 13.1 | 8.8 | 15.7 | 7.7 | 13.7 | 51.9 | 29.2 | BDL |
| **14.04.2024** | 6.5 | 12.0 | 7.7 | 14.2 | 7.1 | 12.6 | 62.0 | 34.8 | BDL |
| **15.04.2024** | 7.4 | 13.6 | 9.0 | 16.5 | 8.0 | 14.2 | 57.6 | 29.1 | BDL |
| **21.04.2024** | 6.0 | 11.2 | 7.5 | 13.8 | 6.6 | 12.0 | 51.8 | 33.0 | BDL |
| **22.04.2024** | 7.0 | 12.9 | 8.7 | 15.4 | 7.2 | 13.1 | 55.3 | 33.6 | BDL |
| **28.04.2024** | 7.7 | 14.2 | 8.8 | 16.6 | 7.9 | 14.4 | 52.3 | 32.3 | BDL |
| **29.04.2024** | 6.7 | 12.3 | 8.1 | 14.7 | 7.1 | 12.7 | 51.3 | 33.9 | BDL |
| **05.05.2024** | 7.2 | 13.2 | 8.9 | 15.9 | 7.7 | 13.7 | 54.7 | 28.2 | BDL |
| **06.05.2024** | 6.6 | 12.1 | 7.8 | 14.4 | 6.8 | 12.3 | 57.4 | 30.1 | BDL |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **12.05.2024** | 7.8 | 14.4 | 9.0 | 16.4 | 8.2 | 14.8 | 54.9 | 29.0 | BDL |
| **13.05.2024** | 6.9 | 12.7 | 8.4 | 15.1 | 7.4 | 13.2 | 50.8 | 27.6 | BDL |
| **19.05.2024** | 6.3 | 11.7 | 7.5 | 13.8 | 6.6 | 12.0 | 53.7 | 32.8 | BDL |
| **20.05.2024** | 7.4 | 13.6 | 8.8 | 16.5 | 7.7 | 13.9 | 57.0 | 33.0 | BDL |
| **26.05.2024** | 7.5 | 13.8 | 8.1 | 16.1 | 7.8 | 14.1 | 49.0 | 33.2 | BDL |
| **27.05.2024** | 7.6 | 14.1 | 8.5 | 16.6 | 7.9 | 14.4 | 49.9 | 30.1 | BDL |

| | **$SO_2$** | **$NO_2$** | **$PM_{10}$** | **$PM_{2.5}$** | **CO** |
|---|---|---|---|---|---|
| **Max.** | 9 | 16.6 | 62.0 | 35.4 | BDL |
| **Min.** | 6 | 11.2 | 49.0 | 27.6 | BDL |
| **98%tile** | 9.0 | 16.6 | 61.2 | 35.3 | BDL |

## AMBIENT AIR QUALITY MONITORING

**Location- 10: Village Talamanchipatnam** **(Unit µg/m³)**

| DATE OF MONITORING | CLOCK HOURS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 00 – 08 | | 08 – 16 | | 16 – 24 | | 24 HOURS $PM_{10}$ | 24 HOURS $PM_{2.5}$ | CO |
| | $SO_2$ | NO2 | $SO_2$ | NO2 | $SO_2$ | NO2 | | | |
| 03.03.2024 | 5.7 | 10.9 | 7.1 | 13.3 | 6.1 | 11.3 | 53.1 | 31.2 | BDL |
| 04.03.2024 | 5.8 | 11.0 | 7.3 | 13.5 | 6.4 | 11.6 | 51.1 | 29.9 | BDL |
| 10.03.2024 | 5.9 | 11.3 | 7.4 | 13.7 | 6.4 | 11.8 | 51.7 | 27.4 | BDL |
| 11.03.2024 | 6.2 | 11.8 | 7.6 | 14.5 | 6.6 | 12.2 | 49.0 | 26.0 | BDL |
| 17.03.2024 | 6.3 | 12.1 | 7.2 | 14.8 | 7.0 | 12.8 | 58.3 | 31.3 | BDL |
| 18.03.2024 | 6.4 | 12.2 | 7.7 | 15.1 | 6.7 | 12.5 | 48.3 | 31.0 | BDL |
| 24.03.2024 | 5.5 | 10.6 | 6.7 | 12.8 | 5.5 | 10.6 | 53.4 | 26.5 | BDL |
| 25.03.2024 | 6.5 | 12.8 | 7.7 | 15.4 | 7.1 | 13.2 | 49.7 | 27.3 | BDL |
| 31.03.2024 | 5.8 | 11.0 | 7.3 | 13.5 | 6.2 | 11.4 | 54.4 | 29.5 | BDL |
| 01.04.2024 | 6.4 | 12.7 | 7.2 | 15.8 | 7.0 | 13.1 | 53.4 | 30.5 | BDL |
| 07.04.2024 | 5.4 | 10.4 | 6.6 | 12.7 | 5.7 | 10.7 | 57.2 | 29.0 | BDL |
| 08.04.2024 | 6.1 | 11.7 | 7.7 | 14.3 | 6.7 | 12.3 | 58.0 | 30.6 | BDL |
| 14.04.2024 | 5.5 | 10.6 | 6.7 | 12.8 | 6.1 | 11.2 | 49.3 | 26.7 | BDL |
| 15.04.2024 | 6.4 | 12.2 | 7.7 | 15.1 | 7.0 | 12.8 | 53.9 | 29.3 | BDL |
| 21.04.2024 | 5.0 | 10.3 | 6.5 | 12.4 | 5.6 | 10.6 | 48.3 | 29.6 | BDL |
| 22.04.2024 | 6.0 | 11.5 | 7.7 | 14.0 | 6.2 | 11.7 | 53.0 | 28.3 | BDL |
| 28.04.2024 | 6.5 | 12.8 | 7.4 | 15.9 | 6.9 | 13.0 | 46.7 | 25.9 | BDL |
| 29.04.2024 | 5.7 | 10.9 | 7.1 | 13.3 | 6.1 | 11.3 | 51.6 | 26.3 | BDL |
| 05.05.2024 | 6.2 | 11.8 | 7.2 | 14.5 | 6.7 | 12.3 | 57.9 | 27.4 | BDL |
| 06.05.2024 | 5.6 | 10.7 | 6.8 | 13.0 | 5.8 | 10.9 | 53.8 | 28.5 | BDL |
| 12.05.2024 | 6.4 | 13.0 | 7.7 | 15.9 | 7.2 | 13.4 | 50.9 | 29.5 | BDL |
| 13.05.2024 | 5.9 | 11.3 | 7.4 | 13.7 | 6.4 | 11.8 | 49.9 | 29.9 | BDL |
| 19.05.2024 | 5.3 | 9.8 | 6.5 | 12.4 | 5.6 | 10.6 | 58.9 | 26.6 | BDL |
| 20.05.2024 | 6.4 | 12.2 | 7.7 | 15.1 | 6.7 | 12.5 | 51.5 | 29.3 | BDL |
| 26.05.2024 | 6.5 | 12.4 | 7.4 | 15.5 | 6.8 | 12.7 | 53.4 | 26.6 | BDL |
| 27.05.2024 | 6.2 | 12.7 | 7.1 | 15.8 | 6.9 | 13.0 | 46.2 | 31.2 | BDL |

AMBIENT AIR QUALITY MONITORING

| | $SO_2$ | $NO_2$ | $PM_{10}$ | $PM_{2.5}$ | CO |
|---|---|---|---|---|---|
| **Max.** | 7.7 | 15.9 | 58.9 | 31.3 | BDL |
| **Min.** | 5 | 9.8 | 46.2 | 25.9 | BDL |
| **98%tile** | 7.7 | 15.8 | 58.6 | 31.3 | BDL |



511

## AMBIENT AIR QUALITY MONITORING

**Location- 11: Village Peddaventurla** **(Unit µg/m³)**

| DATE OF MONITORING | CLOCK HOURS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 00 – 08 | | 08 – 16 | | 16 – 24 | | 24 HOURS $PM_{10}$ | 24 HOURS $PM_{2.5}$ | CO |
| | $SO_2$ | NO2 | $SO_2$ | NO2 | $SO_2$ | NO2 | | | |
| 05.03.2024 | 6.9 | 14.5 | 8.3 | 16.9 | 7.3 | 14.9 | 67.0 | 35.3 | BDL |
| 06.03.2024 | 7.0 | 14.6 | 8.5 | 17.1 | 7.6 | 15.2 | 60.0 | 33.1 | BDL |
| 12.03.2024 | 7.1 | 14.9 | 8.6 | 17.3 | 7.6 | 15.4 | 60.2 | 33.7 | BDL |
| 13.03.2024 | 7.4 | 15.4 | 9.0 | 18.0 | 7.8 | 15.8 | 63.3 | 35.6 | BDL |
| 19.03.2024 | 7.5 | 15.7 | 8.2 | 17.4 | 8.2 | 16.4 | 66.5 | 36.3 | BDL |
| 20.03.2024 | 7.2 | 15.8 | 8.4 | 16.5 | 7.9 | 16.1 | 59.5 | 34.6 | BDL |
| 26.03.2024 | 6.7 | 14.2 | 7.9 | 16.4 | 6.7 | 14.2 | 62.6 | 35.2 | BDL |
| 27.03.2024 | 7.1 | 16.4 | 9.0 | 18.0 | 8.3 | 16.8 | 55.8 | 34.9 | BDL |
| 02.04.2024 | 7.0 | 14.6 | 8.5 | 17.1 | 7.4 | 15.0 | 67.8 | 35.0 | BDL |
| 03.04.2024 | 7.5 | 16.3 | 9.0 | 16.3 | 8.2 | 16.7 | 65.2 | 32.6 | BDL |
| 09.04.2024 | 6.6 | 14.0 | 7.8 | 16.3 | 6.9 | 14.3 | 60.4 | 36.5 | BDL |
| 10.04.2024 | 7.3 | 15.3 | 9.0 | 17.9 | 7.9 | 15.9 | 59.6 | 30.0 | BDL |
| 16.04.2024 | 6.7 | 14.2 | 7.9 | 16.4 | 7.3 | 14.8 | 68.0 | 35.2 | BDL |
| 17.04.2024 | 7.5 | 15.8 | 9.0 | 18.0 | 8.2 | 16.4 | 59.3 | 31.6 | BDL |
| 23.04.2024 | 6.2 | 13.9 | 7.7 | 16.0 | 6.8 | 14.2 | 63.9 | 33.0 | BDL |
| 24.04.2024 | 7.1 | 15.1 | 8.9 | 17.6 | 7.4 | 15.3 | 68.1 | 35.0 | BDL |
| 30.04.2024 | 6.4 | 16.4 | 8.8 | 17.8 | 8.1 | 16.6 | 63.7 | 32.8 | BDL |
| 01.05.2024 | 6.9 | 14.5 | 8.3 | 16.9 | 7.3 | 14.9 | 57.9 | 31.6 | BDL |
| 07.05.2024 | 7.4 | 15.4 | 9.0 | 18.0 | 7.9 | 15.9 | 67.4 | 32.2 | BDL |
| 08.05.2024 | 6.8 | 14.3 | 8.0 | 16.6 | 7.0 | 14.5 | 67.3 | 30.5 | BDL |
| 14.05.2024 | 7.5 | 16.5 | 8.6 | 18.0 | 8.4 | 17.0 | 57.4 | 32.7 | BDL |
| 15.05.2024 | 7.1 | 14.9 | 8.6 | 17.3 | 7.6 | 15.4 | 68.0 | 32.1 | BDL |
| 21.05.2024 | 6.5 | 13.4 | 7.7 | 16.0 | 6.8 | 14.2 | 61.2 | 36.4 | BDL |
| 22.05.2024 | 6.8 | 15.8 | 9.0 | 18.0 | 7.9 | 16.1 | 60.4 | 30.4 | BDL |
| 28.05.2024 | 7.1 | 16.0 | 8.5 | 16.2 | 8.0 | 16.3 | 62.6 | 34.2 | BDL |
| 29.05.2024 | 7.4 | 15.5 | 9.0 | 17.5 | 8.1 | 16.6 | 67.9 | 33.1 | BDL |

AMBIENT AIR QUALITY MONITORING

| | $SO_2$ | $NO_2$ | $PM_{10}$ | $PM_{2.5}$ | CO |
|---|---|---|---|---|---|
| **Max.** | 9 | 18.0 | 68.1 | 36.5 | BDL |
| **Min.** | 6.2 | 13.4 | 55.8 | 30.0 | BDL |
| **98%tile** | 9.0 | 18.0 | 68.1 | 36.5 | BDL |

## AMBIENT AIR QUALITY MONITORING

**Location- 12: Village Perusomula** **(Unit µg/m³)**

| DATE OF MONITORING | CLOCK HOURS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 00 – 08 | | 08 – 16 | | 16 – 24 | | 24 HOURS $PM_{10}$ | 24 HOURS $PM_{2.5}$ | CO |
| | $SO_2$ | $NO_2$ | $SO_2$ | $NO_2$ | $SO_2$ | $NO_2$ | | | |
| **03.03.2024** | 9.0 | 19.0 | 10.4 | 21.4 | 9.4 | 19.4 | 63.9 | 39.2 | 0.6 |
| **04.03.2024** | 9.1 | 19.1 | 10.6 | 21.6 | 9.7 | 19.7 | 76.5 | 36.9 | 0.7 |
| **10.03.2024** | 9.2 | 19.4 | 10.7 | 21.8 | 9.7 | 19.9 | 65.3 | 36.6 | 0.7 |
| **11.03.2024** | 9.5 | 19.9 | 11.2 | 21.5 | 9.9 | 20.3 | 71.2 | 36.1 | 0.6 |
| **17.03.2024** | 9.1 | 20.2 | 11.1 | 20.5 | 10.3 | 20.9 | 75.1 | 41.8 | 0.6 |
| **18.03.2024** | 8.5 | 20.3 | 10.9 | 22.2 | 10.0 | 20.6 | 71.3 | 38.3 | 0.6 |
| **24.03.2024** | 8.8 | 18.7 | 10.0 | 20.9 | 8.8 | 18.7 | 74.2 | 40.5 | 0.6 |
| **25.03.2024** | 9.5 | 20.1 | 11.2 | 22.2 | 10.4 | 21.3 | 73.8 | 38.3 | 0.6 |
| **31.03.2024** | 9.1 | 19.1 | 10.6 | 21.6 | 9.5 | 19.5 | 67.1 | 39.3 | 0.6 |
| **01.04.2024** | 8.9 | 20.2 | 11.1 | 22.2 | 10.3 | 21.2 | 64.8 | 38.3 | 0.6 |
| **07.04.2024** | 8.7 | 18.5 | 9.9 | 20.8 | 9.0 | 18.8 | 71.7 | 40.0 | 0.6 |
| **08.04.2024** | 9.4 | 19.8 | 11.1 | 22.1 | 10.0 | 20.4 | 75.3 | 36.9 | 0.6 |
| **14.04.2024** | 8.8 | 18.7 | 10.0 | 20.9 | 9.4 | 19.3 | 64.9 | 39.7 | 0.6 |
| **15.04.2024** | 9.5 | 20.3 | 11.0 | 20.6 | 10.3 | 20.9 | 66.1 | 40.4 | 0.6 |
| **21.04.2024** | 8.3 | 17.9 | 9.8 | 20.5 | 8.9 | 18.7 | 70.2 | 41.8 | 0.7 |
| **22.04.2024** | 9.3 | 19.6 | 11.0 | 22.1 | 9.5 | 19.8 | 74.5 | 38.6 | 0.6 |
| **28.04.2024** | 9.5 | 20.5 | 10.9 | 20.8 | 10.2 | 21.1 | 62.9 | 34.8 | 0.6 |
| **29.04.2024** | 9.0 | 19.0 | 10.4 | 21.4 | 9.4 | 19.4 | 68.2 | 39.9 | 0.6 |
| **05.05.2024** | 9.5 | 19.9 | 11.2 | 21.9 | 10.0 | 20.4 | 76.4 | 41.3 | 0.6 |
| **06.05.2024** | 8.9 | 18.8 | 10.1 | 21.1 | 9.1 | 19.0 | 62.5 | 36.1 | 0.6 |
| **12.05.2024** | 9.1 | 20.5 | 11.2 | 22.2 | 10.5 | 21.5 | 70.9 | 38.2 | 0.7 |
| **13.05.2024** | 9.2 | 19.4 | 10.7 | 21.8 | 9.7 | 19.9 | 67.5 | 37.6 | 0.6 |
| **19.05.2024** | 8.6 | 18.4 | 9.8 | 20.5 | 8.9 | 18.7 | 70.8 | 38.8 | 0.6 |
| **20.05.2024** | 9.1 | 20.3 | 10.6 | 22.2 | 10.0 | 20.6 | 73.5 | 37.7 | 0.6 |
| **26.05.2024** | 9.3 | 20.5 | 11.2 | 22.1 | 10.1 | 20.8 | 65.4 | 38.2 | 0.6 |
| **27.05.2024** | 9.5 | 19.5 | 10.8 | 19.8 | 10.2 | 21.1 | 74.6 | 40.6 | 0.6 |

| | $SO_2$ | $NO_2$ | $PM_{10}$ | $PM_{2.5}$ | CO |
|---|---|---|---|---|---|
| **Max.** | 11.2 | 22.2 | 76.5 | 41.8 | 0.67 |
| **Min.** | 8.3 | 17.9 | 62.5 | 34.8 | 0.56 |
| **98%tile** | 11.2 | 22.2 | 76.4 | 41.8 | 0.67 |

## AMBIENT AIR QUALITY MONITORING

**Location- 13 : Village Nakkavanipalle** **(Unit µg/m³)**

| DATE OF MONITORING | CLOCK HOURS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 00 – 08 | | 08 – 16 | | 16 – 24 | | 24 HOURS $PM_{10}$ | 24 HOURS $PM_{2.5}$ | CO |
| | $SO_2$ | NO2 | $SO_2$ | NO2 | $SO_2$ | NO2 | | | |
| 03.03.2024 | 4.8 | 10.0 | 6.2 | 12.4 | 5.2 | 10.4 | 52.2 | 32.6 | BDL |
| 04.03.2024 | 4.9 | 10.1 | 6.4 | 12.6 | 5.5 | 10.7 | 54.8 | 26.2 | BDL |
| 10.03.2024 | 5.0 | 10.4 | 6.5 | 12.8 | 5.5 | 10.9 | 58.0 | 27.4 | BDL |
| 11.03.2024 | 5.3 | 10.9 | 7.0 | 13.6 | 5.7 | 11.3 | 47.7 | 32.5 | BDL |
| 17.03.2024 | 5.4 | 11.2 | 7.2 | 13.9 | 6.1 | 11.9 | 54.0 | 32.7 | BDL |
| 18.03.2024 | 5.5 | 11.3 | 7.4 | 14.2 | 5.8 | 11.6 | 56.1 | 26.6 | BDL |
| 24.03.2024 | 4.6 | 9.7 | 5.8 | 11.9 | 4.6 | 9.7 | 51.7 | 30.4 | BDL |
| 25.03.2024 | 5.8 | 11.9 | 7.6 | 14.8 | 6.2 | 12.3 | 57.8 | 33.2 | BDL |
| 31.03.2024 | 4.9 | 10.1 | 6.4 | 12.6 | 5.3 | 10.5 | 56.3 | 28.8 | BDL |
| 01.04.2024 | 5.7 | 11.8 | 7.6 | 14.6 | 6.1 | 12.2 | 51.1 | 25.1 | BDL |
| 07.04.2024 | 4.5 | 9.5 | 5.7 | 11.8 | 4.8 | 9.8 | 50.1 | 32.2 | BDL |
| 08.04.2024 | 5.2 | 10.8 | 6.9 | 13.4 | 5.8 | 11.4 | 57.6 | 28.1 | BDL |
| 14.04.2024 | 4.6 | 9.7 | 5.8 | 11.9 | 5.2 | 10.3 | 50.6 | 25.1 | BDL |
| 15.04.2024 | 5.5 | 11.3 | 7.4 | 14.2 | 6.1 | 11.9 | 49.6 | 26.8 | BDL |
| 21.04.2024 | 4.4 | 8.9 | 5.6 | 11.5 | 4.7 | 9.7 | 51.1 | 33.1 | BDL |
| 22.04.2024 | 5.1 | 10.6 | 6.8 | 13.1 | 5.3 | 10.8 | 49.3 | 25.9 | BDL |
| 28.04.2024 | 5.8 | 11.9 | 7.5 | 14.5 | 6.0 | 12.1 | 51.0 | 25.6 | BDL |
| 29.04.2024 | 4.8 | 10.0 | 6.2 | 12.4 | 5.2 | 10.4 | 51.7 | 28.3 | BDL |
| 05.05.2024 | 5.3 | 10.9 | 7.0 | 13.6 | 5.8 | 11.4 | 56.6 | 33.1 | BDL |
| 06.05.2024 | 4.7 | 9.8 | 5.9 | 12.1 | 4.9 | 10.0 | 60.0 | 27.0 | BDL |
| 12.05.2024 | 5.9 | 12.1 | 7.5 | 14.8 | 6.3 | 12.5 | 51.8 | 30.2 | BDL |
| 13.05.2024 | 5.0 | 10.4 | 6.5 | 12.8 | 5.5 | 10.9 | 53.1 | 32.2 | BDL |
| 19.05.2024 | 4.1 | 9.4 | 5.6 | 11.5 | 4.7 | 9.7 | 49.6 | 26.0 | BDL |
| 20.05.2024 | 5.5 | 11.3 | 7.4 | 14.2 | 5.8 | 11.6 | 58.7 | 26.1 | BDL |
| 26.05.2024 | 5.6 | 11.5 | 7.6 | 14.6 | 5.9 | 11.8 | 60.2 | 32.6 | BDL |
| 27.05.2024 | 5.7 | 11.8 | 7.4 | 14.5 | 6.0 | 12.1 | 49.2 | 26.1 | BDL |

AMBIENT AIR QUALITY MONITORING

| | $SO_2$ | $NO_2$ | $PM_{10}$ | $PM_{2.5}$ | CO |
|---|---|---|---|---|---|
| **Max.** | 7.6 | 14.8 | 60.2 | 33.2 | BDL |
| **Min.** | 4.1 | 8.9 | 47.7 | 25.1 | BDL |
| **98%tile** | 7.6 | 14.7 | 60.1 | 33.2 | BDL |



517

*Annexure - 8*

# HYDROGEOLOGICAL REPORT

## PROPOSED 5.0 MTPA INTEGRATED CEMENT CLINKERISATION PLANT, 8.0 MTPA CEMENT GRINDING UNIT, 100 MW CAPTIVE POWER PLANT WITH KADAPA LIMESTONE MINE (AREA-997.08 HA)
## AT
## GOLLAPALLE, VILLAGE OF MYLAVARAM MANDAL, KADAPA (YSR) DISTRICT, ANDHRA PRADESH

**ASSESSMENT BLOCK: MYLAVARAM**
**CATEGORY: SAFE**


**PROJECT PROPONENT**

ACC LIMITED

ADANI CORPORATE HOUSE,

SHANTIGRAM, SG HIGHWAY,

AHMEDABAD, GUJARAT 382 421

MOBILE NO. +91 792 555 8623

**NABET ACCREDITED CONSULTANT**

J.M. ENVIRONET PVT. LTD.

(NABET CERTIFICATE NO. NABET/GWCO/IA/GW018)

EMMAR DIGITAL GREENS, TOWER – B, UNIT NO. 1517, GOLF COURSE EXT. ROAD, SECTOR – 61, GURUGRAM (HARYANA)

Email: jmenviron@hotmail.com

# Table of Contents

1. SALIENT FEATURES OF THE PROPOSAL ..... 1
2. ABOUT THE PROJECT ..... 2
2.1 LANDUSE / LAND COVER OF THE SURROUNDING AREA ..... 6
2.2. DEM / TOPOGRAPHY ..... 8
2.3 GEOMORPHOLOGY AND DRAINAGE ..... 10
2.4 DETAILS OF WETLANDS/ MAJOR WATER BODIES ..... 13
3 HYDROGEOLOGY ..... 14
3.1 GEOLOGICAL SETUP ..... 14
3.2 HYDROGEOLOGICAL SETUP ..... 17
3.3.1. Aquifer characteristics ..... 17
3.3.2. Ground water flow and aquifer interaction with surface water bodies ..... 17
3.3.3 Depth to Water level ..... 21
3.3.4 Long term water level data analysis ..... 27
3.3.5 Ground water quality ..... 32
3.3.6 Water Quality of Nearby water body ..... 40
4 DETAILS OF PROPOSED / EXISTING TUBEWELLS/ BOREWELLS ..... 40
5. PROPOSED DEWATERING PLANS IN CASE OF INFRASTRUCTURE DEWATERING PROJECTS ..... 41
6 IMPACT ASSESSMENT ..... 41
6.1 IMPACT ON THE GROUND WATER REGIME ..... 41
6.2 IMPACT ON SURFACE WATER SOURCE ..... 45
6.3 IMPACT ON WATER QUALITY ..... 45
6.4 MITIGATION MEASURES ..... 45
7 WATER BALANCE, RECYCLE AND REUSE ..... 46
8 SALINE WATER DISPOSAL STRATEGIES ..... 50
9 ANY OTHER DETAILS PERTAINING TO THE PROJECT ..... 51
10 SUMMARY AND CONCLUSION ..... 51
11 BIBILIOGRAPHY ..... 52
12 ACCREDITATION CERTIFICATE ..... 53

# List of Figures

Figure 1:Location Map of the Study Area ..... 3
Figure 2:Environment Setting Map of the Study Area ..... 4
Figure 3: Google map of the Study Area ..... 5
Figure 4:LULC Map of the Study Area ..... 7
Figure 5: Digital Elevation Map of Study Area. ..... 9
Figure 6: Geomorphology Map of the Study Area ..... 11

Figure 7:Drainage Map of the Study Area ..... 12
Figure 8:Ramsar Site Map of India showing Wetlands ..... 13
Figure 9: Geology Map of the Study Area ..... 16
Figure 10:Hydrogeology Map (Pre-monsoon, May-2024) of the Study Area ..... 18
Figure 11:Water Table Contour Map Pre-Monsoon May-2024 Season of the Area ..... 19
Figure 12:Water Table Contour Map Post Monsoon Season (November-2023) of the Study Area ..... 20
Figure 13:Monitoring Location Map of the Study Area ..... 23
Figure 14:Depth to Water Level map pre-Monsoon (May-2024) Season ..... 24
Figure 15:Depth to Water Level Post Monsoon Season (November-2023) of the Study Area ..... 25
Figure 16:Seasonal Fluctuation Map of the Study Area ..... 26
Figure 17:Water level Fluctuation Graph in last 10 years (Nossam Station) ..... 28
Figure 18:Decadal Map Post Monsoon Season of Kadapa District ..... 29
Figure 19 Decadal (m/year) Map Pre-Monsoon Season (May-2024) of the Study area ..... 30
Figure 20:Decadal(m/year) Map Post Monsoon Season (November-2023) of the Study Area ..... 31
Figure 21:Chloride Map of the Study Area ..... 36
Figure 22: Electrical Conductivity Map of the Study Area ..... 37
Figure 23: Nitrate Map of the Study Area ..... 38
Figure 24:Fluoride Map of the Study Area ..... 39
Figure 25:Water Balance Diagram ..... 47
Figure 26 Schematic Diagram for Sewage Treatment Plant ..... 49
Figure 27 Schematic Diagram for Reverse Osmosis. ..... 50

# List of Table

Table 1:LULC Classification ..... 6
Table 2:Aquifer Property (Hard Rock) in the Study Area ..... 17
Table 3:Details of Ground Water in and around Buffer Zone ..... 22
Table 4:Details of Nossam Station ..... 27
Table 5:Ground Water Sampling Result ..... 33
Table 6:Details of Ground Water Abstraction Structure ..... 40
Table 7: Details of Groundwater resources Available in the study area calculated based on GEC 2015 ..... 44
Table 8:Break up of Water Requirement ..... 47
Table 9 Expected Waste Water Characteristics of STP ..... 49

# 1. SALIENT FEATURES OF THE PROPOSAL

| S. No. | Particulars | Information |
|---|---|---|
| 1. | Fresh or Renewal | Fresh |
| 2. | Existing or New/ Proposed | New Project |
| 3. | If Renewal, date of validity of existing/ last NOC | Not Applicable |
| 4. | CTE Issue Date | New Project |
| 5. | Name of Project with Address | Proposed 5.0 MTPA Integrated Cement Clinkerisation Plant, 8.0 MTPA Cement Grinding Unit, 100 MW Captive Power Plant with Kadapa Limestone Mine (Area-997.08 Ha) at Gollapalle, Village of Mylavaram Mandal, Kadapa (YSR) District, Andhra Pradesh |
| 6. | State | Andhra Pradesh |
| 7. | District | Kadapa (YSR) |
| 8. | Block/ Taluka | Mylavaram Mandal |
| 9. | Category of Block/ Taluka (as per prevailing GWRE) | Safe |
| 10. | Quantum of GW (KLD) | 2922 KLD |
| 11. | Quantum of GW (m3/Year) | 9,64,260 m3/year |
| 12. | Alluvium/ non-alluvium | Non- alluvium |
| 13. | Consultant Details with Name of Authorized Signatory (If Institution) | Deepa Taneja<br>J M Enivronet Pvt. Ltd. |
| 14. | In case report is prepared jointly by accredited institute and individual consultant, name details of chapters prepared by the individual consultant | NA |
| 15. | Accreditation Certificate No. and Date/ Validity (In case jointly as per Point No. 14, No. and validity of both institution and individual are to be given) | Accreditation Certificate No.: QCI/NABET/ENV/GWCO/ACO/21/51 dated 23.09.2021<br>Date/ Validity: 08.09.2026 |

## 2. ABOUT THE PROJECT

Proposed 5.0 MTPA Integrated Cement Clinkerisation Plant, 8.0 MTPA Cement Grinding Unit, 100 MW Captive Power Plant with Kadapa Limestone Mine (Area – 997.08 Ha) at Gollapalle, Village of Mylavaram Mandal, Kadapa (YSR) District, Andhra Pradesh is a Greenfield project which falls under Category 'A' projects as per the EIA Notification, 2006 and as amended thereof; Project or Activity '3(b)' Cement Plants --- in which the plant of proposed capacity will be installed by M/s. ACC Limited. And M/s. ACC Limited also has proposed Kadapa limestone mine of area 997.08 Ha at Dhannawada, Chinna Venturla, Vaddarala, Bestavemula, Gollapalle, G. Uppalapadu Villages of Mylavaram Mandal, Kadapa (YSR) District which is located just above the proposed plant site.

Scope of Work

- Conducting of Field investigation related to Water levels and Aquifer disposition
- Groundwater level monitoring
- Groundwater quality monitoring
- Surface Water quality
- Preparation of Hydrogeological Report on ground water conditions in both core and buffer zones

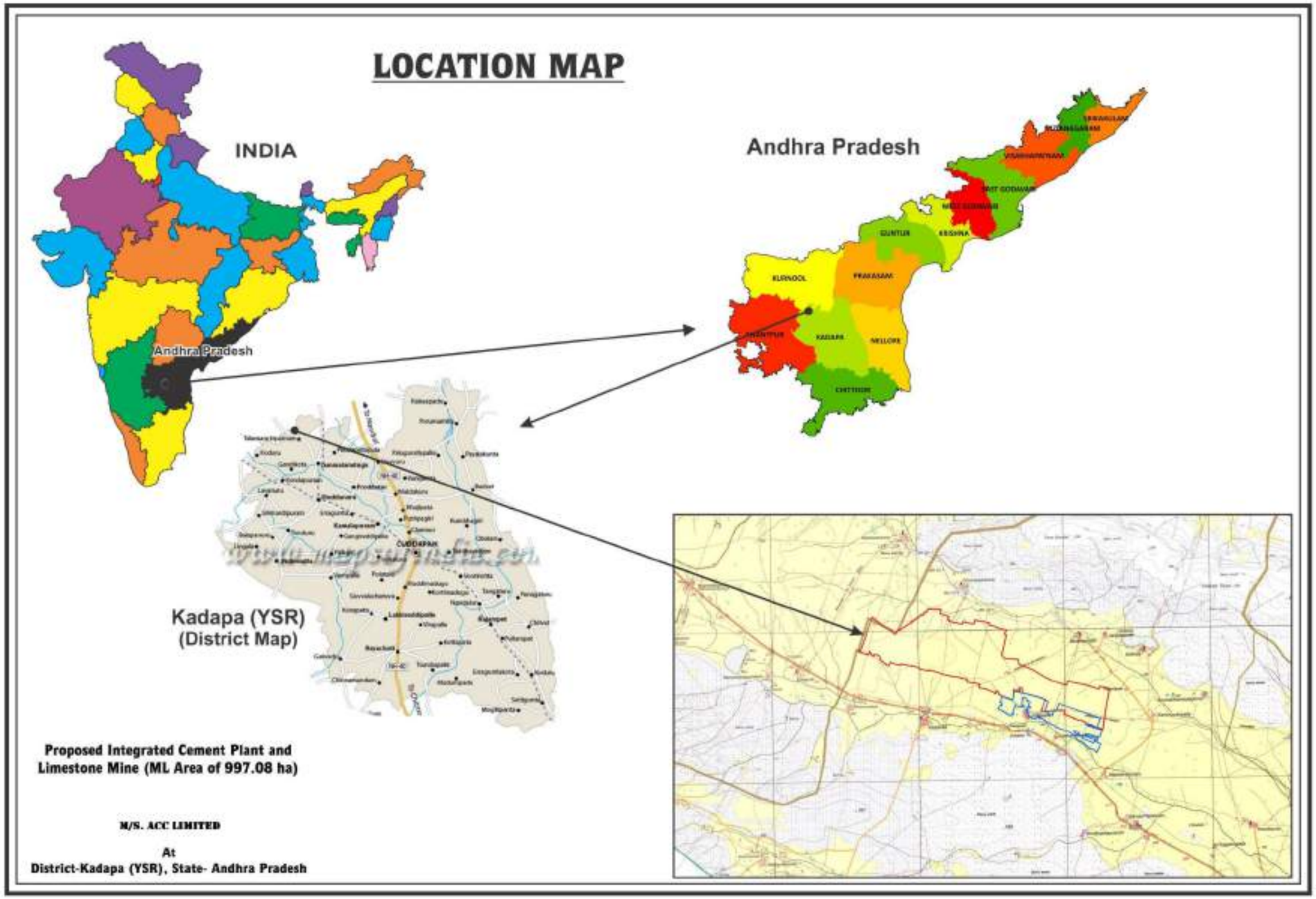



*Figure 1:Location Map of the Study Area*

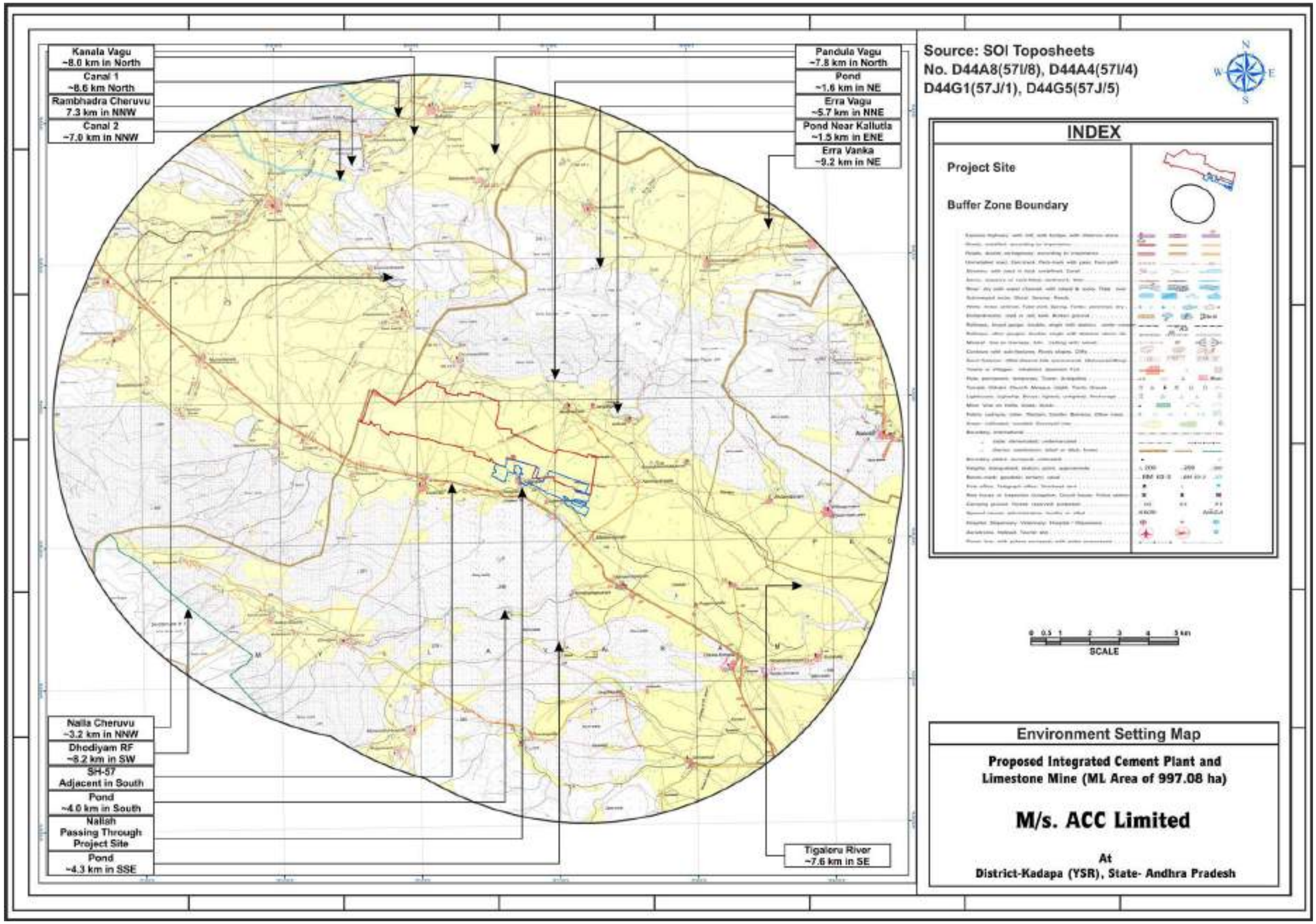



*Figure 2:Environment Setting Map of the Study Area*

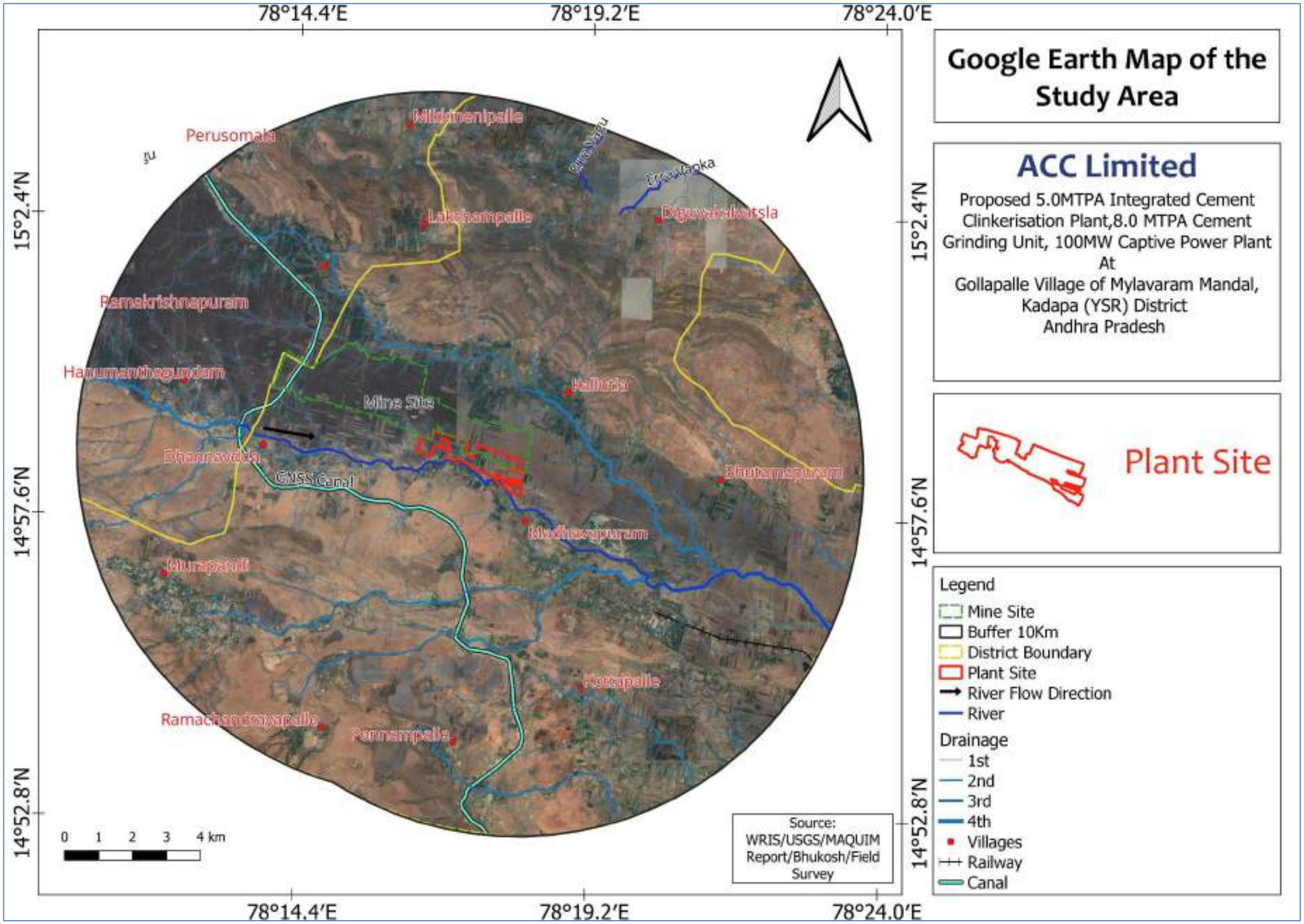



*Figure 3: Google map of the Study Area*

## 2.1 LANDUSE / LAND COVER OF THE SURROUNDING AREA

The land use classification of the project area is primarily dominated by Open Scrub/Stony Waste, covering 21,976.79 hectares, which constitutes 50.52% of the total land. Agriculture Land is the second most prevalent category, occupying 16,336.20 hectares and accounting for 37.55% of the total area. Vegetation and Plantation areas span 3,432.70 hectares, forming 7.89% of the land. Surface Water Bodies are present in 511.16 hectares, representing 1.18% of the total site. The area under Solar Panels covers 379.68 hectares, making up 0.87% of the land. Road infrastructure is spread over 366.22 hectares, contributing 0.84% to the total area. Settlements occupy 310.49 hectares, forming 0.71% of the land use, while Mine Quarries cover 123.62 hectares, accounting for 0.28% of the area. Lastly, the Industrial Area is relatively small, occupying 63.36 hectares and making up 0.15% of the total land.

And in the proposed Limestone mine area most of the area is covered by Open scrub/stony waster which is almost about 45.58%, followed by agricultural land of about 39.83% and minor area is covered by Plantation, Forest, surface water bodies, settlements and etc.

*Table 1:LULC Classification*

| S. No. | Class Name | Area (Ha) | Area % |
|---|---|---|---|
| 1. | Open Scrub/Stony Waste | 21976.79 | 50.52 |
| 2. | Agriculture Land | 16336.2 | 37.55 |
| 3. | Vegetation/Plantation | 3432.7 | 7.89 |
| 4. | Surface Water Bodies | 511.16 | 1.18 |
| 5. | Solar Panel | 379.68 | 0.87 |
| 6. | Road | 366.22 | 0.84 |
| 7. | Settlement | 310.49 | 0.71 |
| 8. | Mine Quarry | 123.62 | 0.28 |
| 9. | Industry | 63.36 | 0.15 |
| **Total** | | **43500.22** | **100.00** |

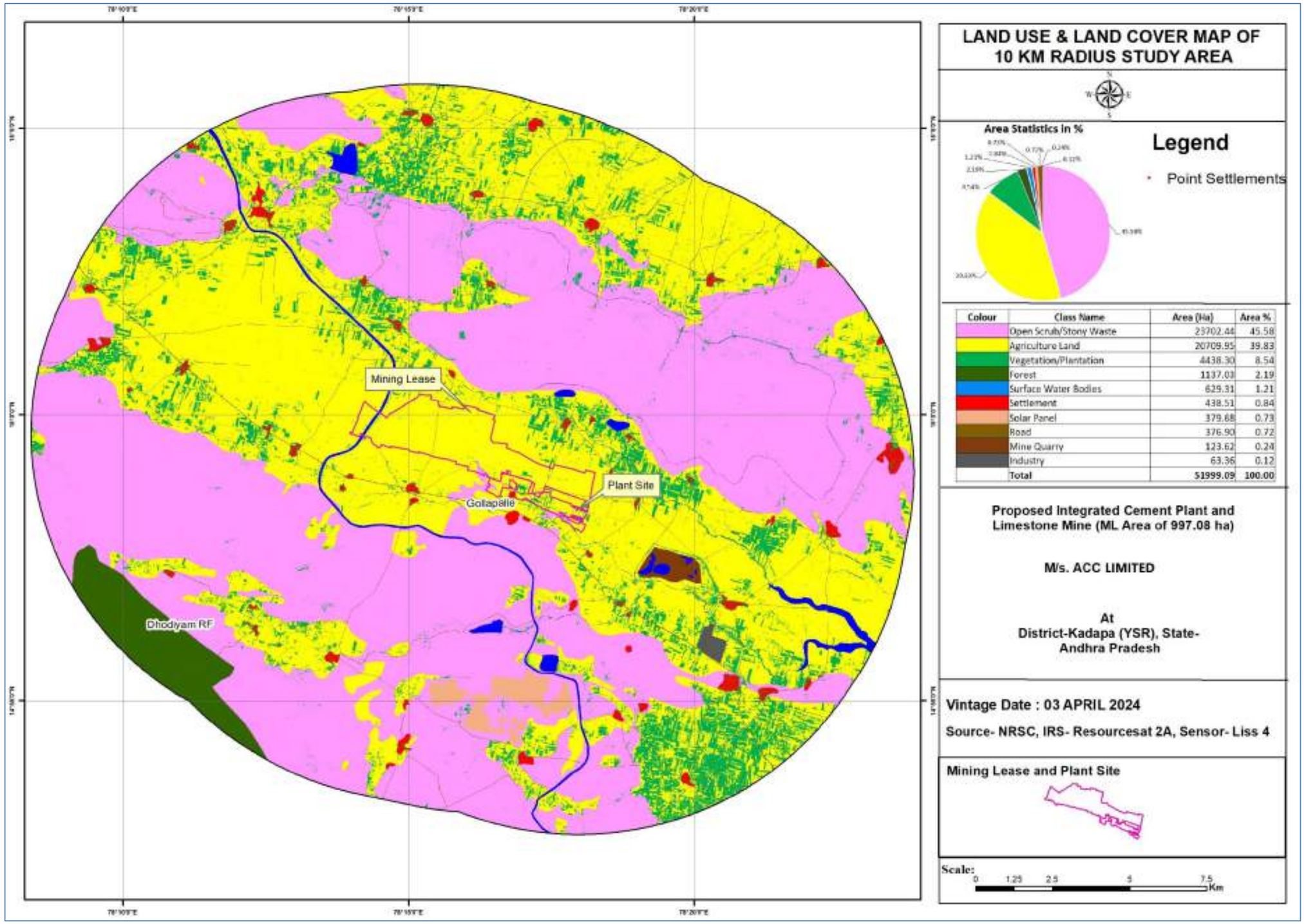



*Figure 4:LULC Map of the Study Area*

## 2.2. DEM / TOPOGRAPHY

The elevation of the study area ranges from 171 to 466 m amsl which indicates that it is Gently undulating topography. The digital elevation map is prepared by data taken from USGS SRTM. Similarly, the study area considered for the Kadapa limestone mine, the elevations are ranging from 176 to 430 m asml with gently undulating topography.

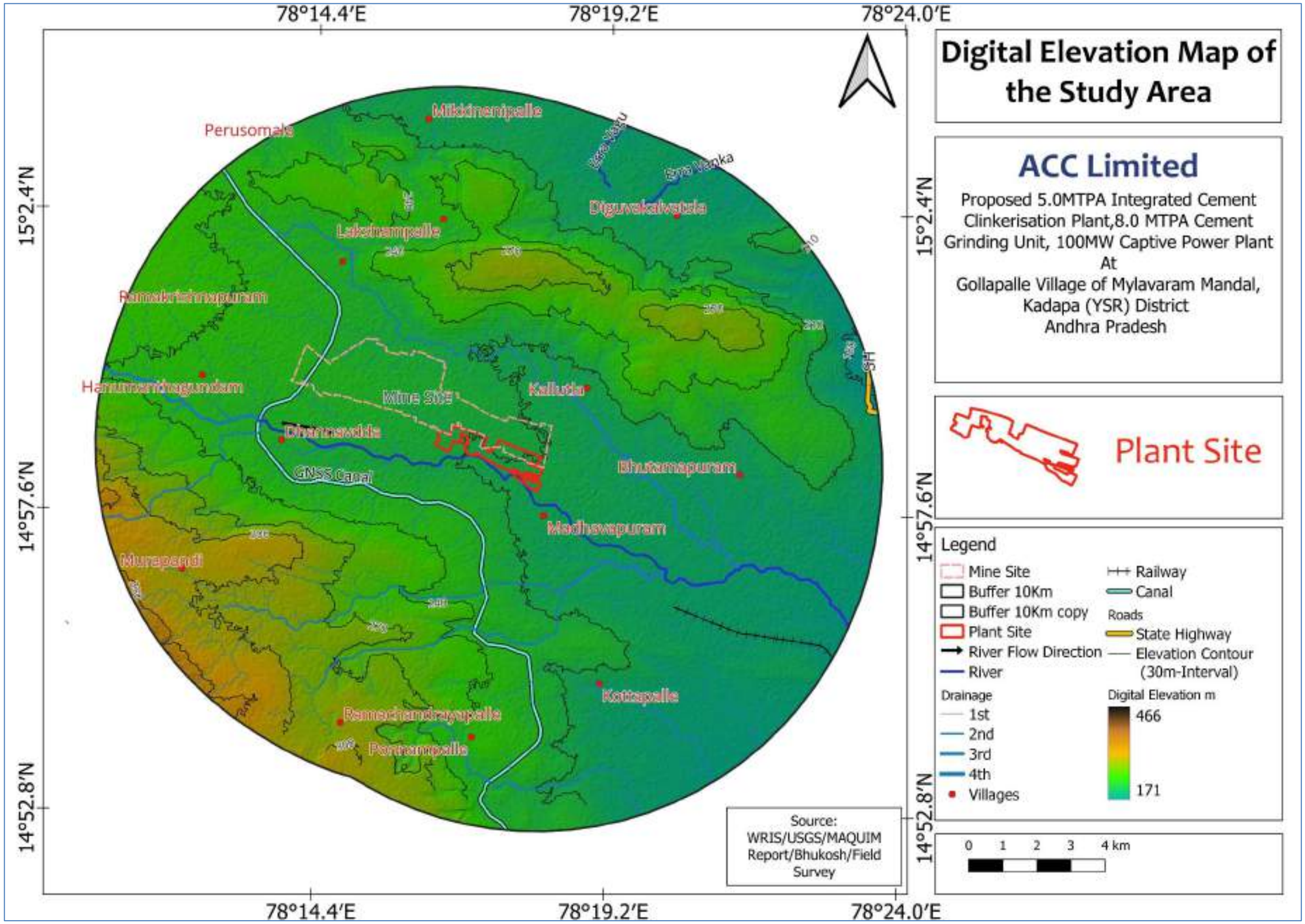



*Figure 5: Digital Elevation Map of Study Area.*

## 2.3 GEOMORPHOLOGY AND DRAINAGE

Kadapa district, located in the southern part of the Indian state of Andhra Pradesh, exhibits diverse geomorphological features owing to its location between the Eastern Ghats and the Deccan Plateau.

**Eastern Ghats:** The eastern part of the district is characterized by the presence of the Eastern Ghats Mountain range. This region is marked by rugged terrain, steep slopes, and deep valleys. The Nallamala Hills, a part of the Eastern Ghats, run through the northeastern portion of the district.

**Plateaus:** Much of the district is situated on the Deccan Plateau, which is a relatively flat and elevated region. These plateaus are often dissected by rivers and streams, resulting in undulating topography.

**River Valleys:** The district is traversed by several rivers, including the Pennar, Chitravathi, and Papagni rivers. These rivers have carved out valleys and plains across the landscape, contributing to the agricultural productivity of the region.

**Alluvial Plains:** The river valleys and their tributaries have created extensive alluvial plains in certain areas, particularly along the banks of major rivers. These fertile plains support agriculture and are densely populated.

**Residual Hills:** In addition to the Nallamala Hills, Kadapa district also features smaller residual hills and rocky outcrops scattered throughout its landscape. These hills often provide scenic vistas and serve as habitats for diverse flora and fauna.

The upper watershed of the Penner includes Kadapa district, central and eastern Anantapur district, the southern part of Kurnool district, northwestern Chittoor district. The main tributaries of the Penner are the Jayamangali, Kunderu and Sagileru from the north, and the Chitrabvati, Papaghni and Cheyyeru from the south. The Penner then flows east through a gap in the Eastern Ghats enters in to the plains of Coastal Andhra, where it empties into the Bay of Bengal 15 km east of Nellore at a place called Ootukuru. Where few streams of first order originate near the northern and southern border of the project area. The catchment areas of these streams originating inside the project area is small and these streams carry limited surface runoff during the rains. GNSS canal (Galeru Nagari Sujala Sravanthi) is passing through the western side of the project area. Northern and southern sides of the project area are bounded by two nalas (Vagu), Pala Vagu (northern side) and Rallavanka Vagu (southern side). The upstream catchment areas of both Vagu (nala) are disturbed by huge height of dumps of deep excavated GNSS canal.

Although there is a well-defined drainage system having Trellis drainage pattern in the buffer zone, a major part of drainage has been harnessed by constructing irrigation projects, tanks and anicuts.

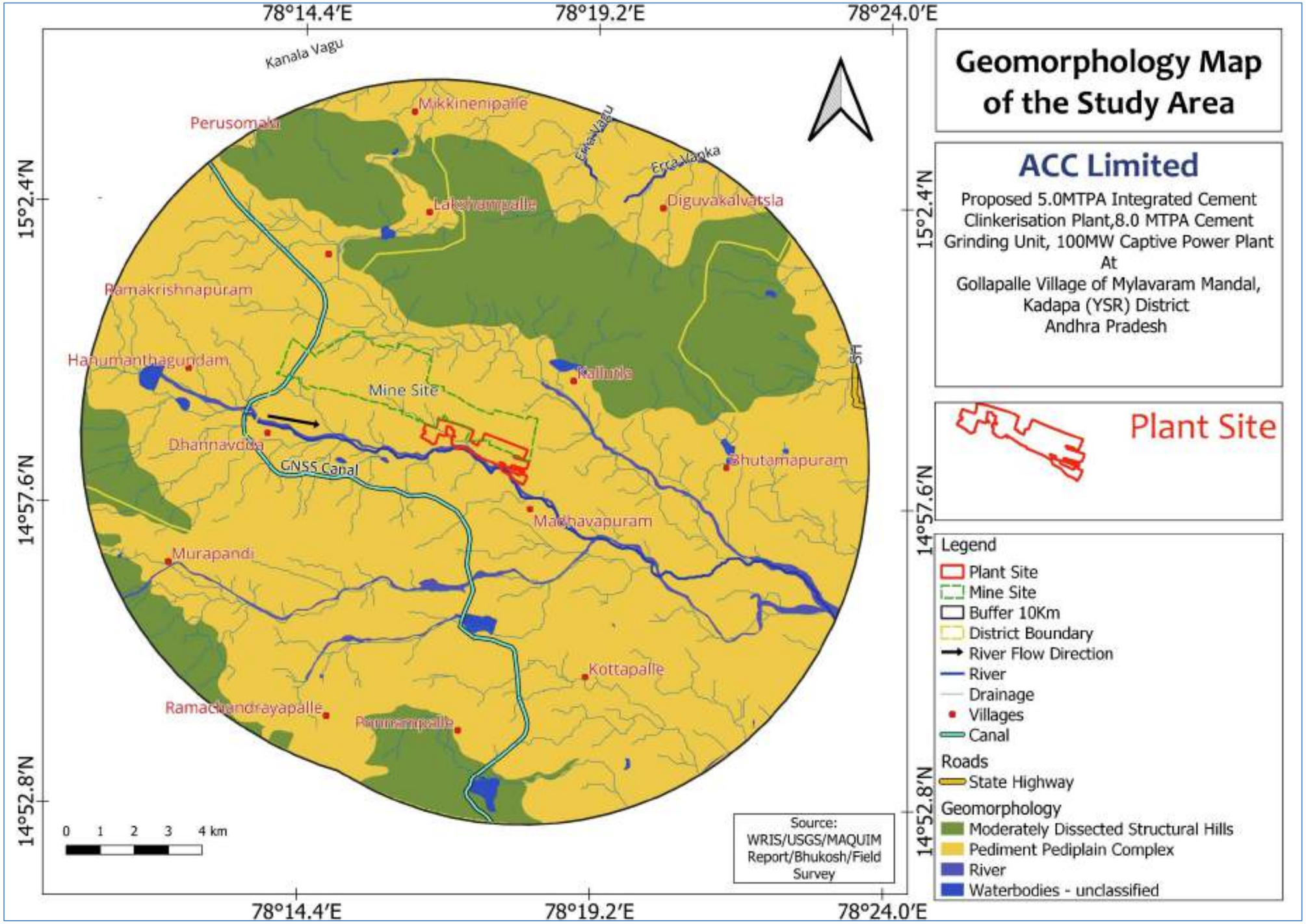



*Figure 6: Geomorphology Map of the Study Area*

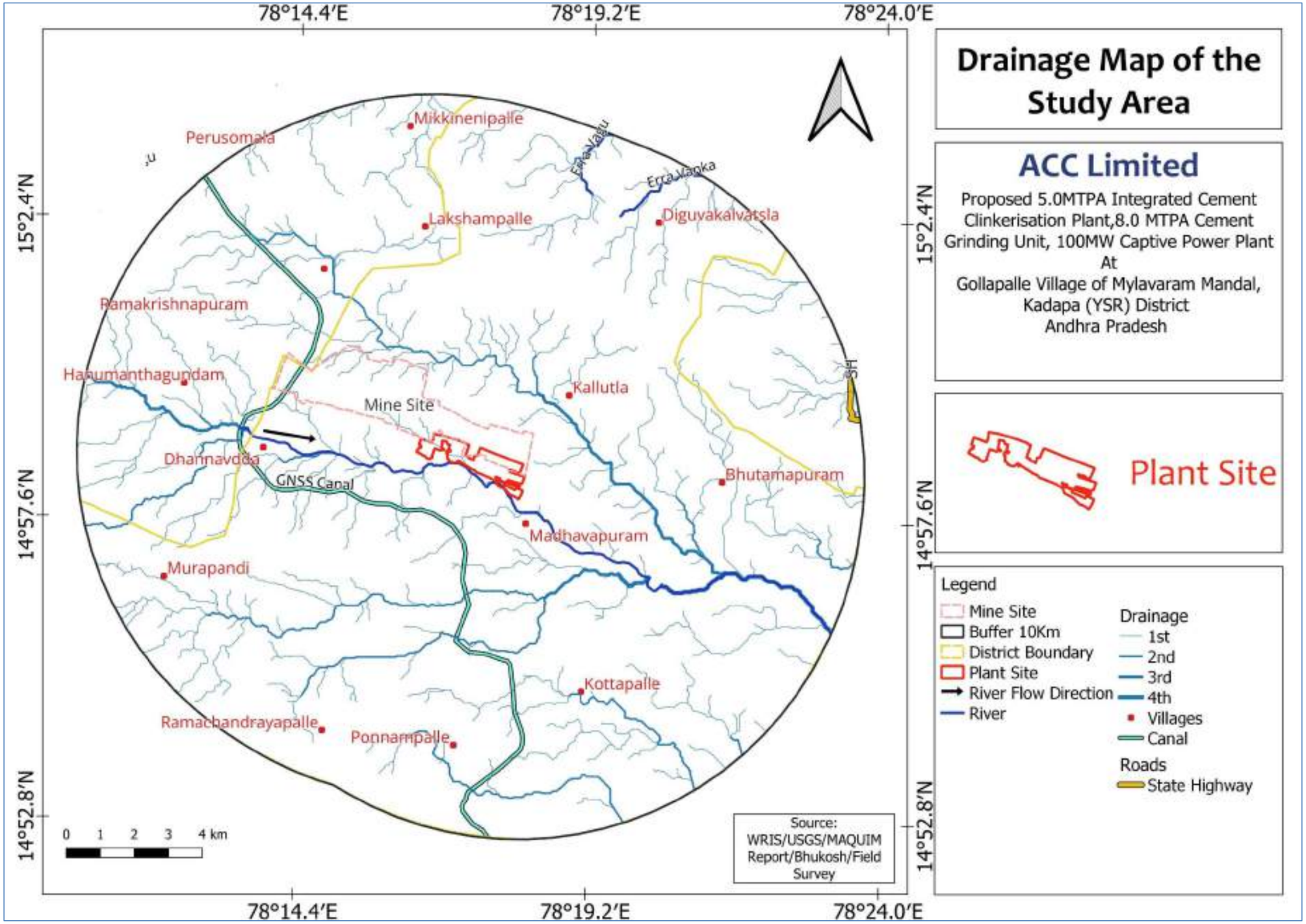



*Figure 7:Drainage Map of the Study Area*

## 2.4 DETAILS OF WETLANDS/ MAJOR WATER BODIES

A wetland is a distinct ecosystem that is flooded by water, either permanently or seasonally, where oxygen-free processes prevail. The primary factor that distinguishes wetlands from other land forms or water bodies is the characteristic vegetation of aquatic plants, adapted to the unique hydric soil. Any wetland site which has been listed under the Ramsar Convention that aims to conserve it and promote sustainable use of its natural resources is called a Ramsar Site. The nearest wetland is Kolleru Lake (Andhra Pradesh) located at a distance of about 359 Km approximately in the NE direction from the Plant Site and about 351 km from the Mine site in NE direction. Therefore, certificate regarding the same is not applicable for this particular proposal.

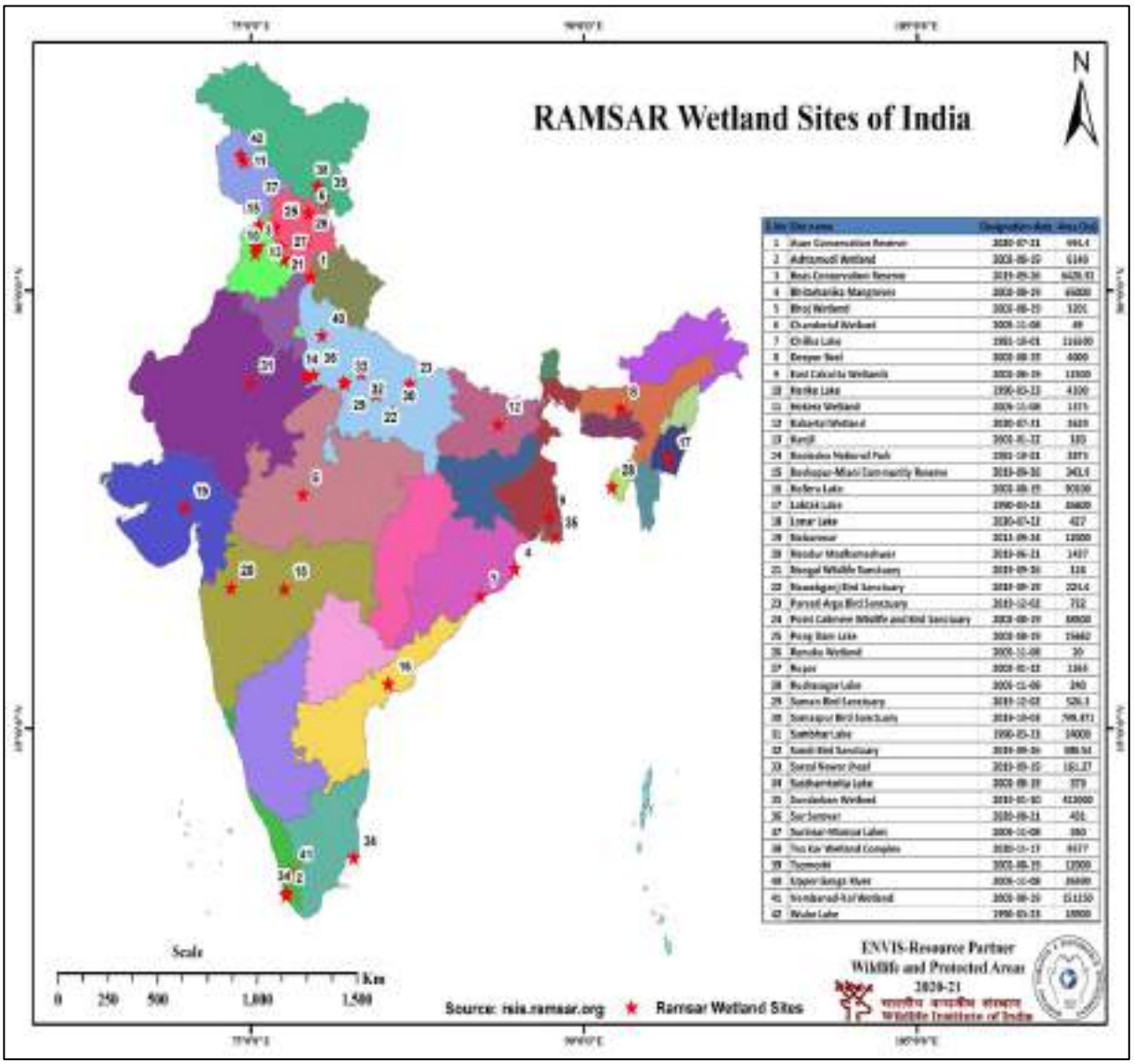



*Figure 8:Ramsar Site Map of India showing Wetlands*

# 3 HYDROGEOLOGY

## 3.1 GEOLOGICAL SETUP

Sedimentary rocks found in the northwestern part of Kadapa district belong to the Kurnool Group. The limestone and other rock formations occurring in the area belong to Kurnool Formations of Indian Stratigraphy sequence. These formations are younger than rocks of the Kadapa Basin and are well preserved in the Kadapa Basin. The Kadapa basin extends from Nagari in the south up to Amaravati in the north east over a length of about 440 km. with width ranging from 80 to 145 km. encompassing an area of about 44000 sq. km. Kadapa and associated younger Kurnool occupy a unique position in Indian Stratigraphy because of economic interest and hence have been the subject of studies for more than seven decades. Kurnool Group of rocks is found confined to two small areas within Kadapa basin one in the area between Kadapa and Kurnool and another in the area West of Amaravati. In general, the Kurnool rocks overlie rocks belonging to the Kadapa. The Kadapa are in turn deposited over the Archaean basement. These rocks are believed to be of Proterozoic age equivalent to early Vindhyan rocks. The Kurnool rocks comprise limestone, shale and sandstones. Unlike the rocks of Kadapa group, which are associated with intrusive and are slightly disturbed, the younger Kurnool group are free from intrusive and are structurally undisturbed. Bruce Foote first studied the area and subsequently W. King gave a detailed account of the stratigraphic sequence of the formations. Later, the Geological Survey of India (GSI) carried out systematic mapping of the region and confirmed the stratigraphy, which was established earlier with minor changes. The regional stratigraphic sequence of rocks is shown in the below:

| | | |
|---|---|---|
| | Recent<br>post-Kurnool | Soil and Alluvium |
| | | Quartz/Calcite/Baryte veins |
| Kurnool Group | Kundair Formation | Nandyal Shales |
| | | Koilkuntla Limestone |
| | Panyam Formation | Pinnacled Quartzites |
| | | Plateau Quartzites |
| | Jammalamadugu Formation | Auk Shales |
| | | Narji Limestone |
| | Banaganapalli Formation | Sandstone |
| Unconformity | | |
| Archean | Granites and granitic gneisses traversed by dolerite dykes & quartz veins | |

Source: Mining plan

The limestone deposit under consideration belongs to the Narji Limestone of Jammalamadugu Formation and is seen to extend from Nalgonda in the NE up to in the SW. The limestone deposits occur in Dondapadu and Wadapalli in Nalgonda District, Dachepalli and Sitarampuram in Guntur District, Panyam, Koilkuntla and Banaganapalli in Kurnool District and Jammalamadugu and Kamalapuram in Kadapa District.

**LOCAL GEOLOGY**

The Geological Formation in the belongs to the Narji Limestone of Jammalamadugu formation in Kurnool group as mentioned earlier. Locally sharp changes in strike direction are also seen due to broad Warping. The local strike of the deposit is N70° -S70° E with 2° dip towards N20° E.

Thick Soil Cover Entire area and only at places limestone could be seen in the cultivated lands. However, the core samples do not indicate any major geologically disturbed zone and indicate that the formations in the area are relatively massive. Thick bedded and fine grained in nature.

| Lithology | Thickness m | |
|---|---|---|
| | Min | Max |
| Overburden Soil | 1 | 6 |
| Grey flaggy limestone | 2.5 | 20.5 |
| Dark Grey Limestone | 8.5 | 31 |
| Light Grey Limestone | 1 | 6.5 |

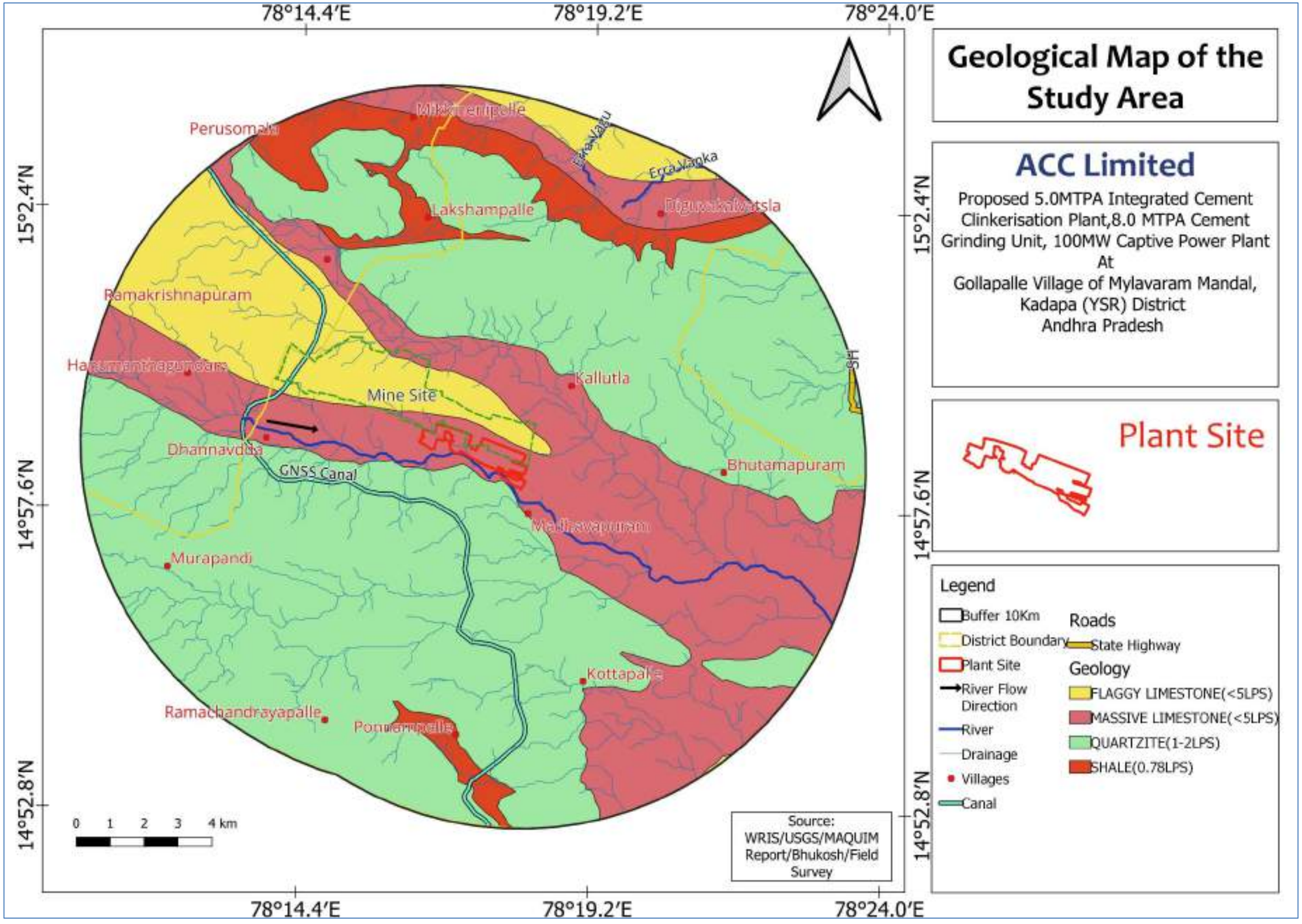



*Figure 9: Geology Map of the Study Area*

## 3.2 HYDROGEOLOGICAL SETUP

Geologically, the area is underlain by formations ranging in age from Late Proterozoic, i.e. limestone, sandstone/quartzite and shale of Kurnool Group to the recent alluvium. The Archean group of rocks comprising of pink colored granites, granite gneisses and quartz and micaceous schist form the basement rocks, although these are not exposed anywhere in the study area. Ground water occurs in the Late Proterozoic to recent formations, under water table conditions. The formations exposed in the buffer area are grouped in to two distinct formations, i.e.

a) quartzite,

b) limestone.

The ground water is transmitted through the fractures, joints and bedding planes of limestone and quartzite. The limestone (Narjee, the cement grade) being hard, non-cavernous and fine grained is impervious in nature and does not have primary porosity. It is well bedded occurring as flag stone and is low dipping. The secondary porosity or fracture porosity decreases with depth due to overlying weight of the rocks which reduces the secondary openings.

### 3.3.1. Aquifer characteristics

Hydraulic parameters of an aquifer system are determined by conducting aquifer performance test at optimum extraction rate on representative set of exploratory and observation tube wells. Data collected during the test were subject to analysis by Jacob's method to calculate hydraulic parameters of aquifer.

**Formulae: $T = 2.3\ Q / 4\pi\ \Delta s$ & $S = 2.25\ T\ t_0 / r^2$**

Where, T =KD = Transmissivity, m2/day; Q = Discharge m3/day, r = Distance (m) between pumping and observation well

Δs = Slope of straight line per log cycle of time, S = Storage coefficient$t_0$= time in days at zero drawdown

Accordingly, the T and K values for the present study area are given in Table 2.

*Table 2:Aquifer Property (Hard Rock) in the Study Area*

| *S. No* | *Particulars* | *Unit* |
|---|---|---|
| 1. | Transmissivity | 600 m2/day |
| 2. | Potential Yield | Limestone= 1 to 10 lps |
| 3. | Sp. Yield of aquifer | 2 % |
| 4. | Depth of the aquifer | 150 m |
| 5. | Hydraulic conductivity of Aquifer (m/day) | 4 m/day |

### 3.3.2. Ground water flow and aquifer interaction with surface water bodies

The groundwater movement in and around the project area as well as the mine lease area is mainly controlled by fractures, bedding Plane. The highest water table in Pre-Monsoon Season is 394.5 m amsl and lowest water table 157.6 m amsl. The direction of water table in general is Towards North East direction.

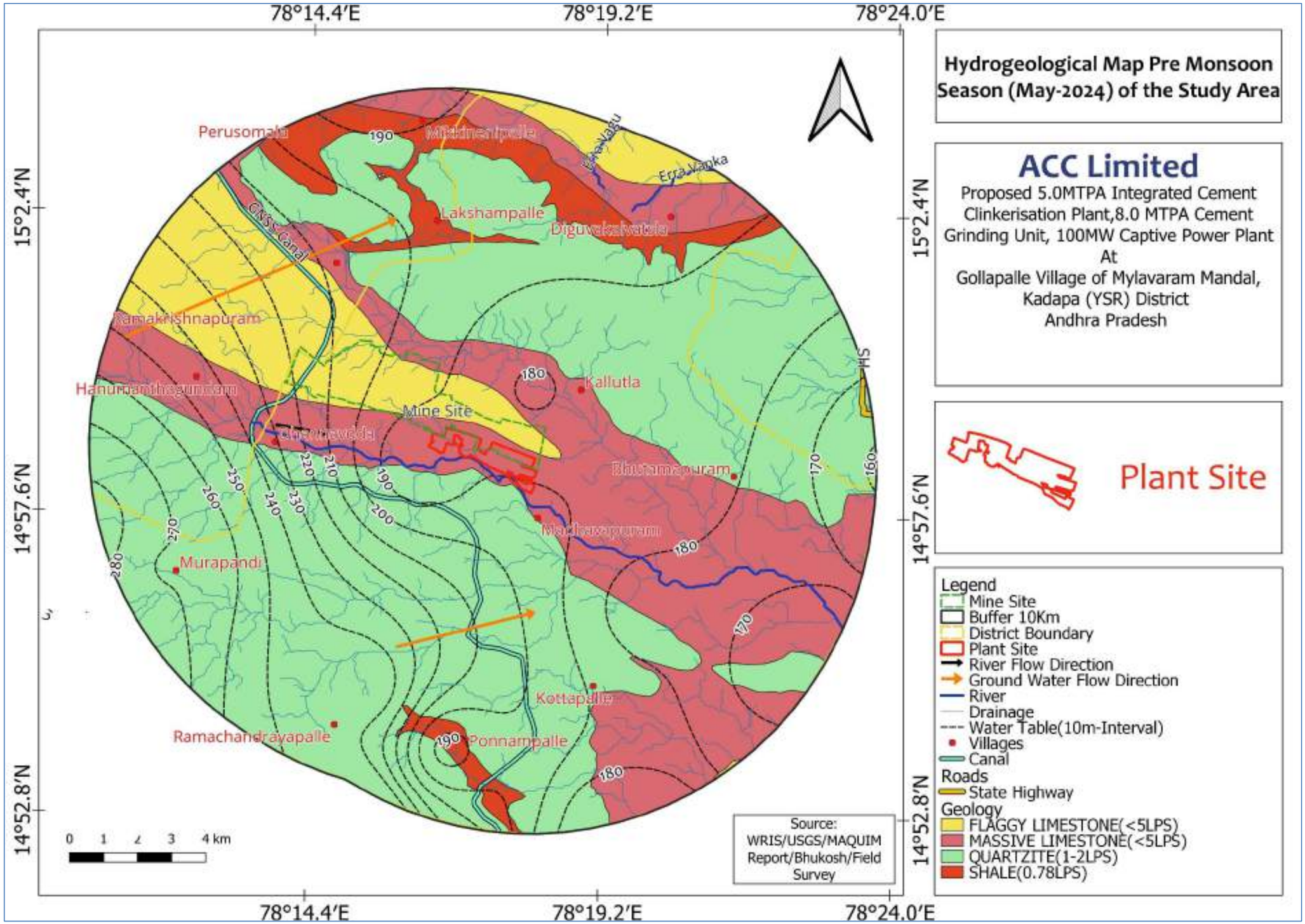



*Figure 10:Hydrogeology Map (Pre-monsoon, May-2024) of the Study Area*

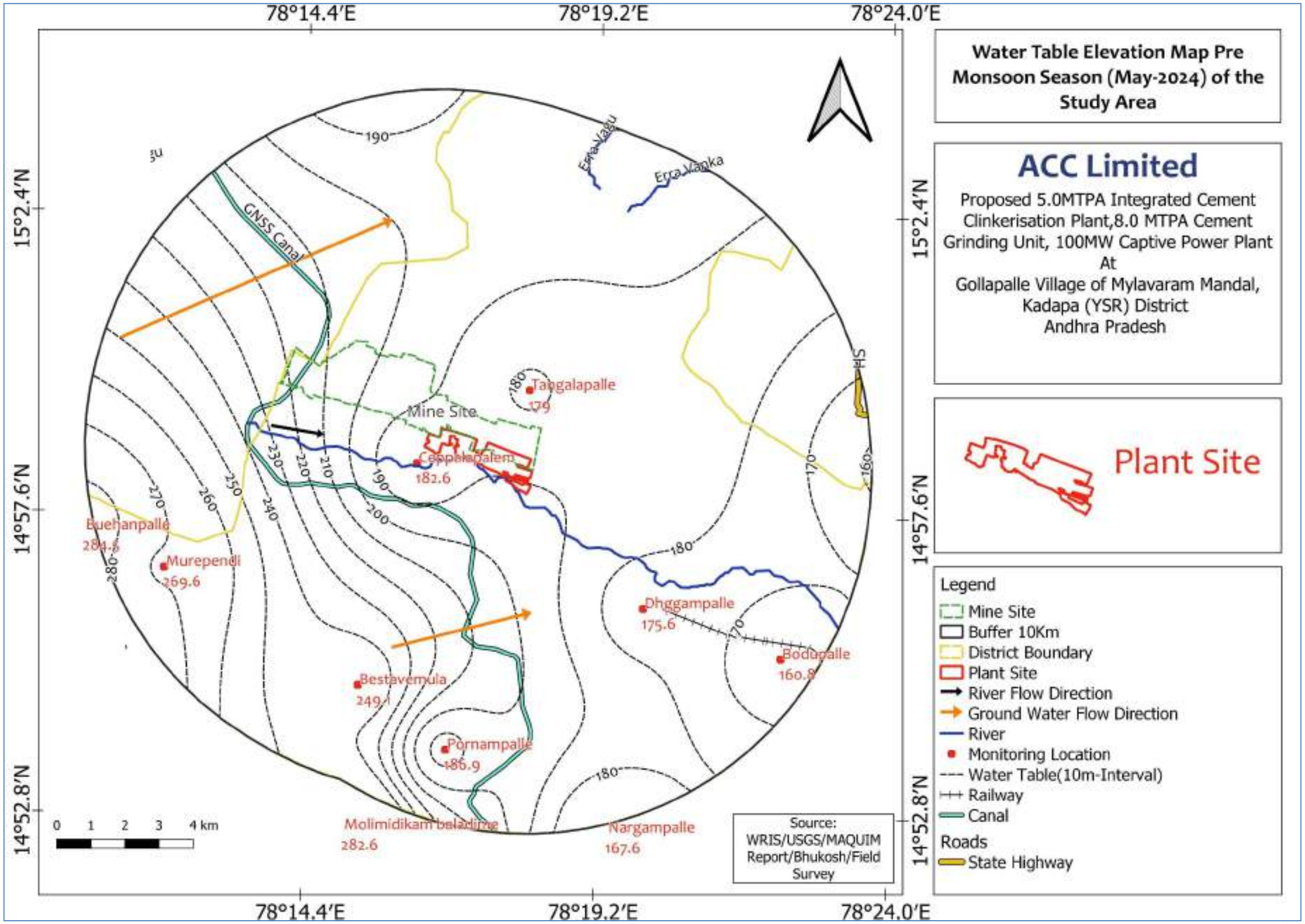



*Figure 11:Water Table Contour Map Pre-Monsoon May-2024 Season of the Area*

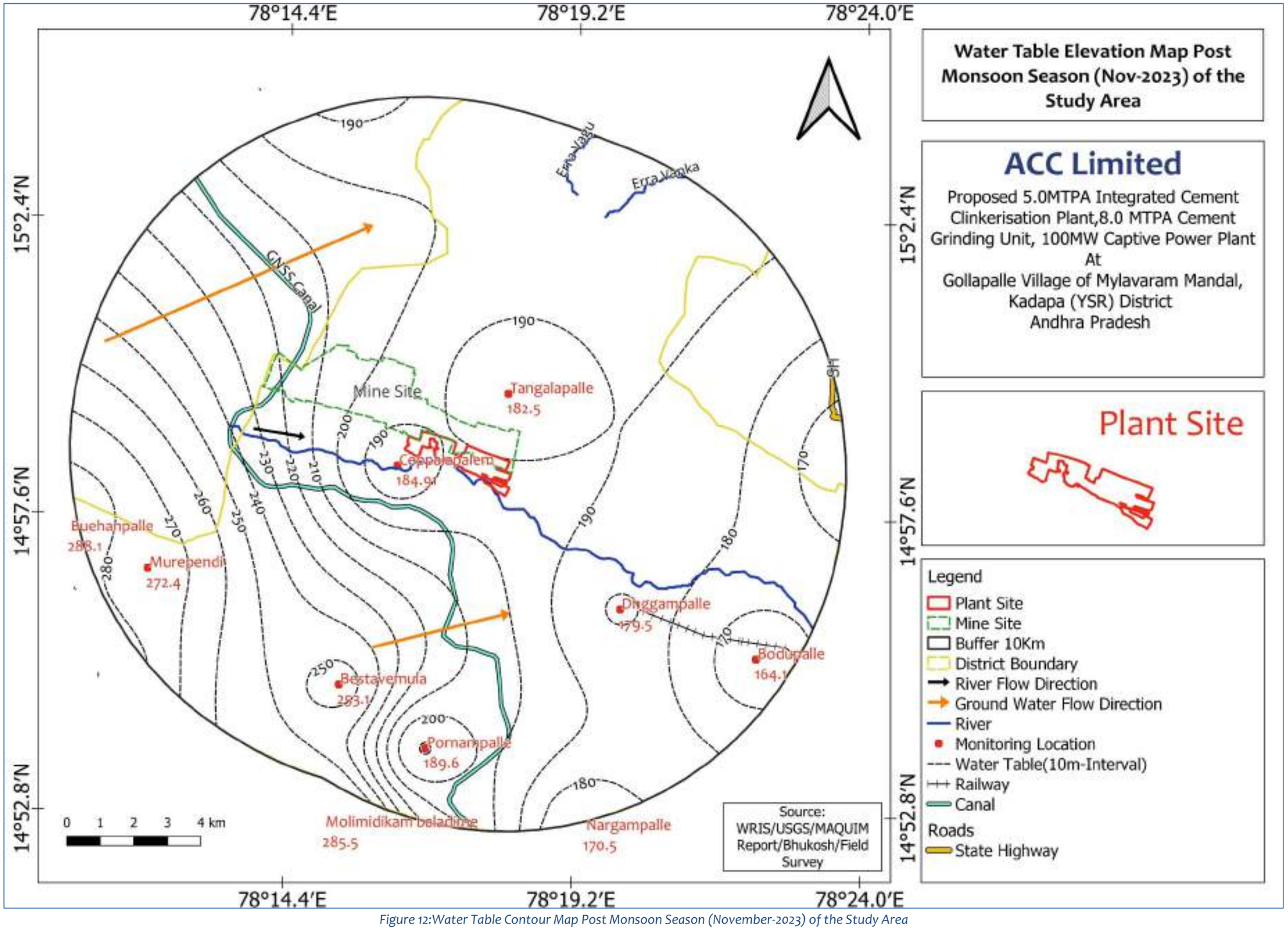



*Figure 12:Water Table Contour Map Post Monsoon Season (November-2023) of the Study Area*

### 3.3.3 Depth to Water level

A detailed groundwater level monitoring has been carried during pre-monsoon season a pre monsoon season at about 14 different locations around buffer zone from existing open wells, dug wells & Key wells. Complete water level and water table details are presented in Table 3.

Depth to water level in study area was found to vary between 17.5 m bgl to 47.4 m bgl during post-monsoon season and 21.4 m bgl to 50.5 m bgl during pre-monsoon season indicating water level to be relatively Shallow to Deep ground water. The minimum and maximum surface elevation of monitoring points in the study area is found to vary between 183 to 445 m AMSL respectively.

| | Depth to Water Level (mbgl) | | | | Water Table Elevation (m amsl) | | | |
|---|---|---|---|---|---|---|---|---|
| | Pre-Monsoon | | Post Monsoon | | Pre-Monsoon | | Post Monsoon | |
| | From | To | From | To | From | To | From | To |
| **Core Zone** | 25 | 25.4 | 21.5 | 23.1 | 179 | 182.6 | 182.5 | 184.91 |
| **Buffer Zone** | 21.4 | 50.5 | 17.5 | 47.4 | 157.6 | 394.5 | 160.8 | 397.6 |

Source: Groundwater Baseline Monitoring

*Table 3:Details of Ground Water in and around Buffer Zone*

| S. No | Village Name | Latitude | Longitude | Elevation (m) | Depth to Water Level Pre-Monsoon Season (m bgl) | Depth to Water Level Post Monsoon Season (m bgl) | Water Table Pre-Monsoon Season (m amsl) | Water Table Post Monsoon Season (m amsl) | Fluctuation (m) | Type of Well | Depth of well (m) | Diameter of Well (Inch) | Distance & Direction from Plant Site and Mine site |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Ceppalapalem | 14.97361 | 78.27056 | 208 | 25.4 | 23.09 | 182.6 | 184.91 | 2.3 | Bore Well | 110 | 8 | 0.1 Km South |
| 2 | Tangalapalle | 14.99333 | 78.30111 | 204 | 25 | 21.5 | 179 | 182.5 | 3.5 | Bore Well | 110 | 8 | 1.8 Km NE |
| 3 | Nosom | 14.97361 | 78.40167 | 183 | 25.4 | 22.2 | 157.6 | 160.8 | 3.1 | Bore Well | 125 | 8 | 10.8 Km East |
| 4 | Bodupalle | 14.9225 | 78.37056 | 196 | 35.2 | 31.9 | 160.8 | 164.1 | 3.3 | Bore Well | 120 | 8 | 9.0 Km East |
| 5 | Nargampalle | 14.87583 | 78.32361 | 193 | 25.4 | 22.5 | 167.6 | 170.5 | 2.9 | Bore Well | 125 | 8 | 10.6 Km SSE |
| 6 | Pornampalle | 14.8975 | 78.27917 | 227 | 40.1 | 37.4 | 186.9 | 189.6 | 2.7 | Bore Well | 150 | 8 | 8.1 Km South |
| 7 | Molimidikam baladime | 14.87583 | 78.25139 | 308 | 25.4 | 22.5 | 282.6 | 285.5 | 2.8 | Bore Well | 120 | 8 | 11 Km South |
| 8 | Dobbudapalle | 14.91333 | 78.16139 | 445 | 50.5 | 47.4 | 394.5 | 397.6 | 3.1 | Bore Well | 150 | 8 | 12.3 Km SW |
| 9 | Murependi | 14.94528 | 78.20167 | 305 | 35.4 | 32.6 | 269.6 | 272.4 | 2.7 | Bore Well | 120 | 8 | 6.9Km SW |
| 10 | Buehanpalle | 14.95472 | 78.17972 | 325 | 40.5 | 36.9 | 284.5 | 288.1 | 3.6 | Bore Well | 125 | 8 | 8.3 Km SW |
| 11 | Gladabela | 15.08444 | 78.255 | 203 | 22.4 | 19.09 | 180.6 | 183.91 | 3.3 | Bore Well | 100 | 8 | 11.2 Km North |
| 12 | Bestavemula | 14.91444 | 78.255 | 273 | 23.9 | 19.9 | 249.1 | 253.1 | 4 | Bore Well | 110 | 8 | 6.8 Km South |
| 13 | Dhggampalle | 14.93556 | 78.33278 | 197 | 21.4 | 17.5 | 175.6 | 179.5 | 3.8 | Bore Well | 100 | 8 | 5.1 Km SE |

*Baseline monitoring

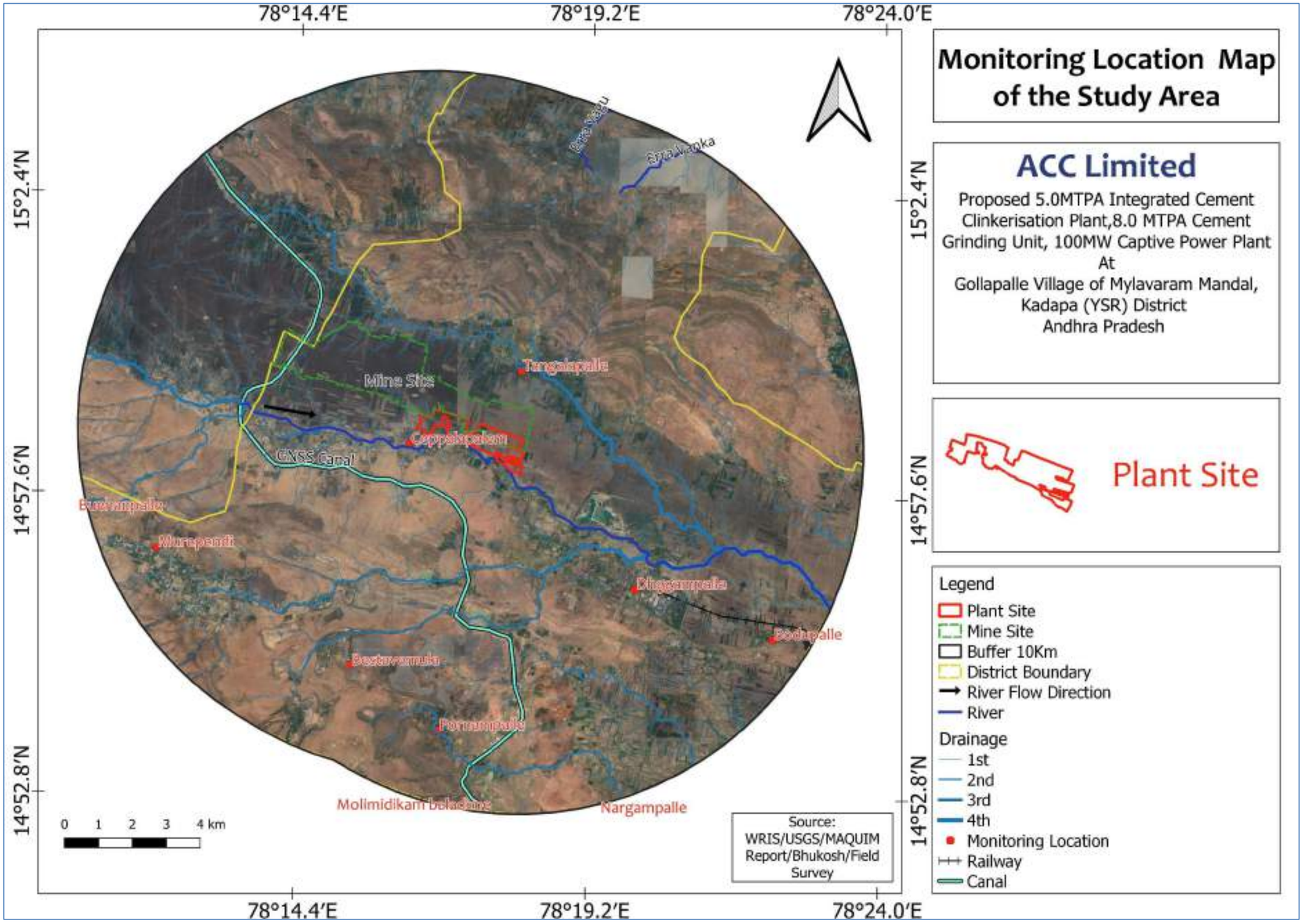



*Figure 13:Monitoring Location Map of the Study Area*

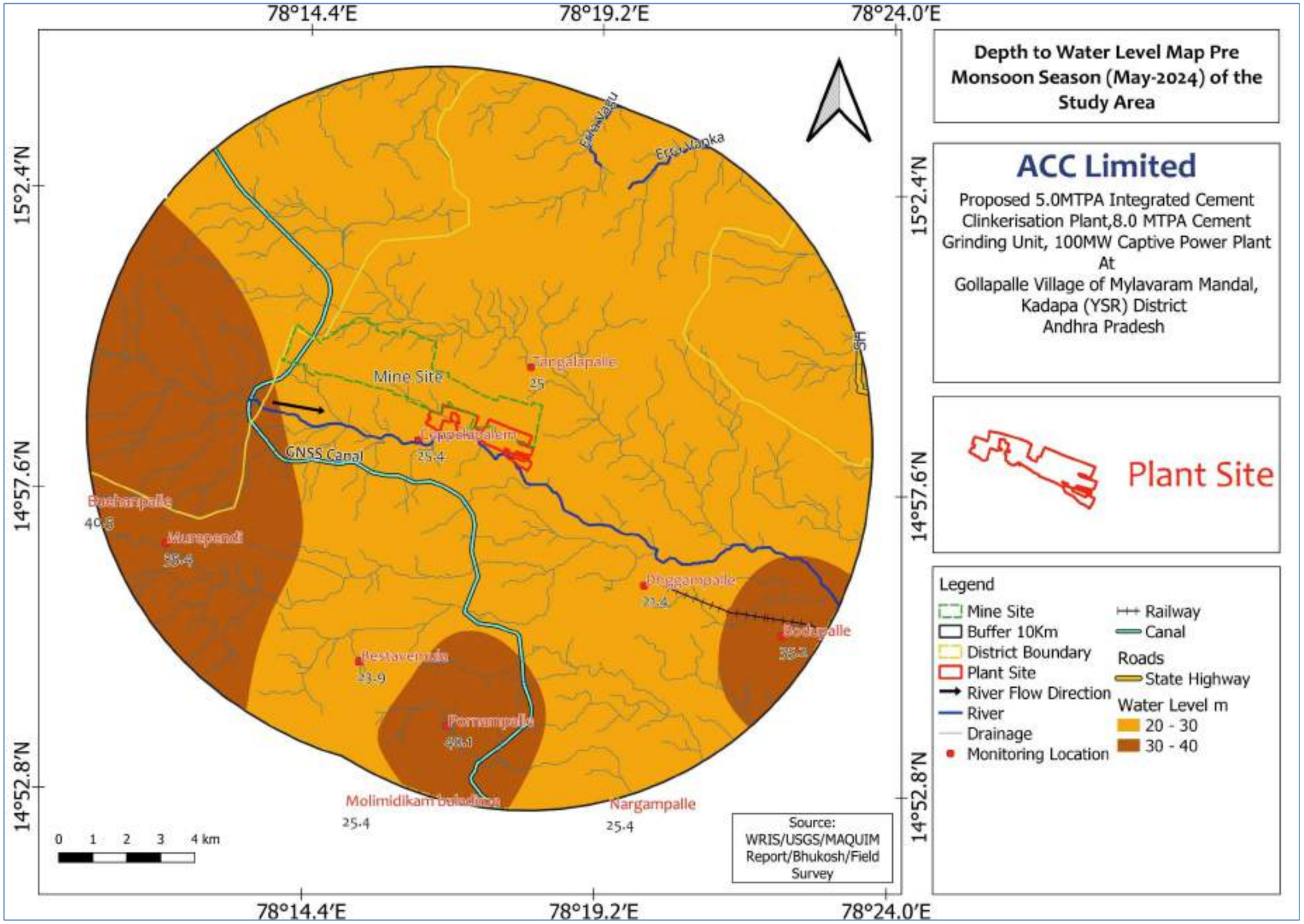



*Figure 14:Depth to Water Level map pre-Monsoon (May-2024) Season*

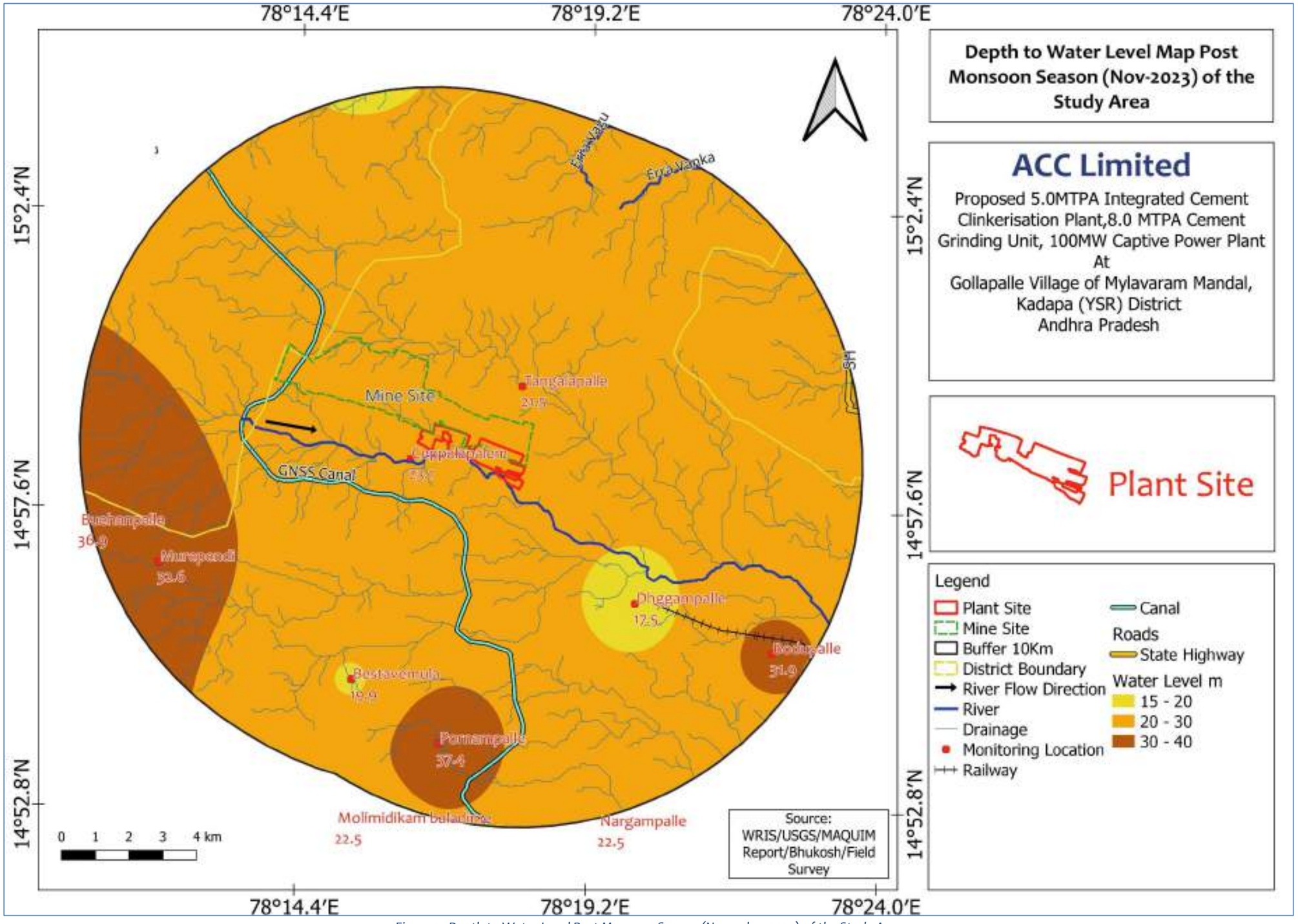



*Figure 15:Depth to Water Level Post Monsoon Season (November-2023) of the Study Area*

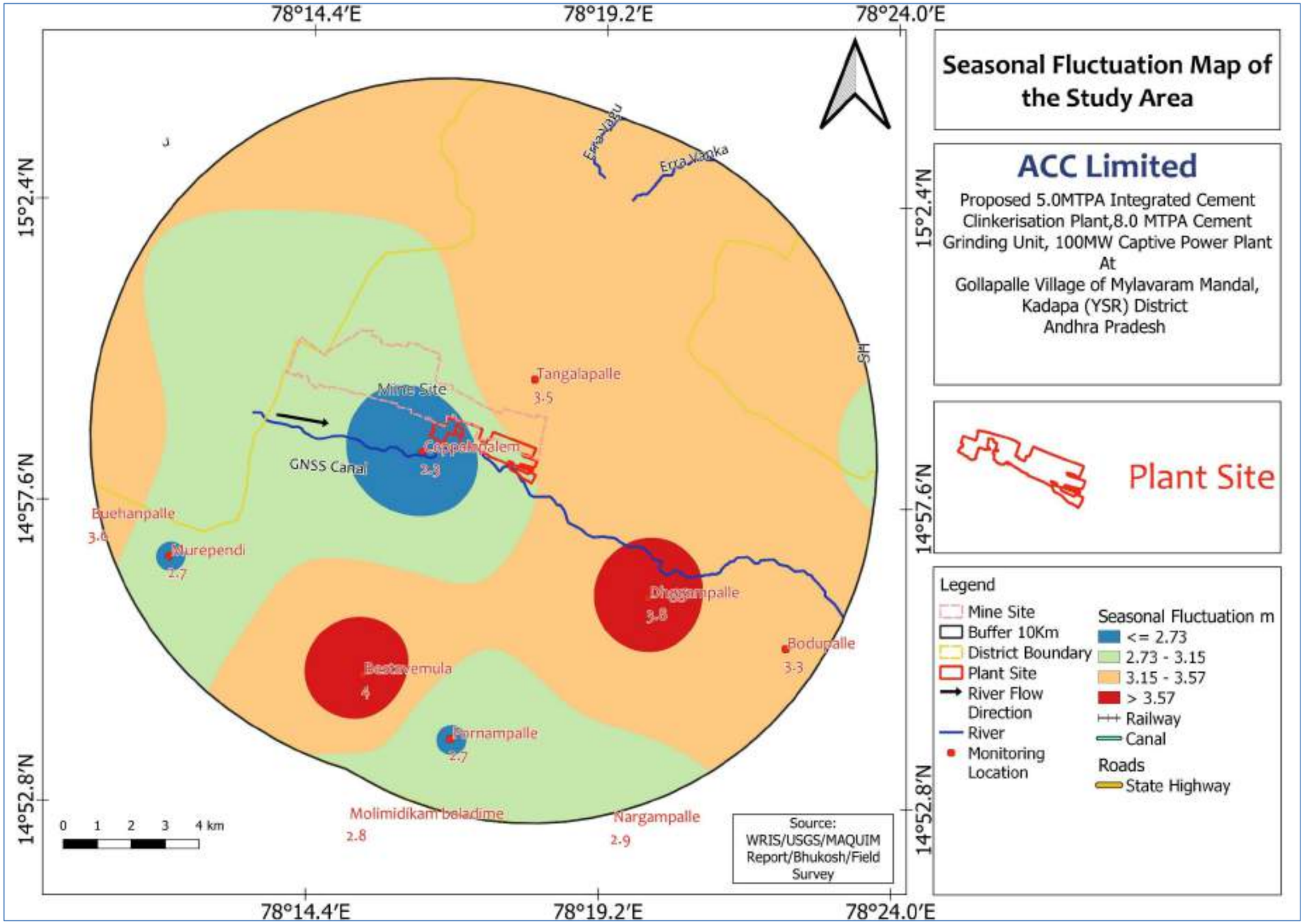



*Figure 16:Seasonal Fluctuation Map of the Study Area*

### 3.3.4 Long term water level data analysis

The ground water levels observed over a period provides valuable information on the Behavior of the ground water regime, which is constantly subjected to changes due to recharge and discharge phenomenon. When the recharge exceeds discharge, there will be a rise in the ground water storage and vice versa. The decline in water level may be due to increase in draft (for different purposes) or decrease in precipitation (less recharge to ground water). On the other hand, a rise in water level may be due to an increase in rainfall and/or due to changes in irrigation practices. From the pre monsoon and post monsoon depth to water level data collected during May and December respectively, water level fluctuation was computed. The water level fluctuation between pre monsoon and post monsoon period of the Study Area varies from 2.3 m to 4 m. On the basis of secondary data collected from WRIS (Water Resource Information System) portal, the pre monsoon depth to water level in last 10 years ranges between 4.95 m bgl to 9.56 m bgl and the post monsoon depth to water level ranges between 0.8 m bgl to 7.67 m bgl. Hydrograph of Nossam station Show Rising Water Level Trend in Pre-Monsoon Season and Post Monsoon Season. Distance of the Nossam station from the Plant site and the mine site is approximately 11 km. The Nossam Station borewell is located in an aquifer with limestone rock formation. Details of water level for last 10 years for pre and post monsoon are given with graph.

*Table 4:Details of Nossam Station*

| Year | Depth to Water Level (m bgl) Pre-Monsoon | Depth to Water Level (m bgl) Post Monsoon |
|---|---|---|
| 2013 | 9.5 | 2.5 |
| 2014 | 9.5 | 5.15 |
| 2015 | 7.6 | 2 |
| 2016 | 9 | 3.27 |
| 2017 | 8.3 | 0.9 |
| 2018 | 9.45 | 7.67 |
| 2019 | 9.56 | 2.39 |
| 2020 | 8.2 | 1.25 |
| 2021 | 5.3 | 2.65 |
| 2022 | 7.8 | 1.013 |
| 2023 | 4.95 | 0.8 |
| **Latitude** | | **14.9916** |
| **Longitude** | | **78.4000** |

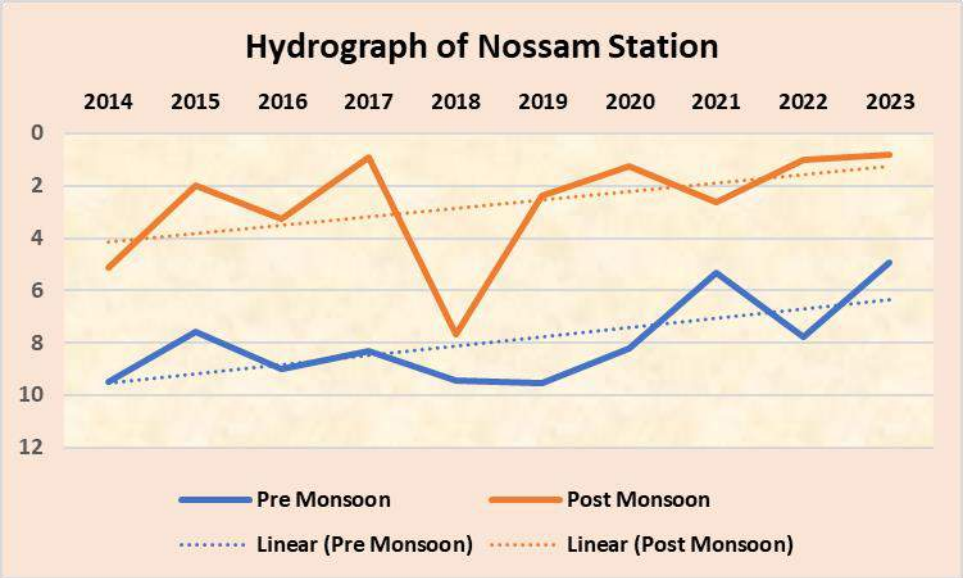



*Figure 17:Water level Fluctuation Graph in last 10 years (Nossam Station)*

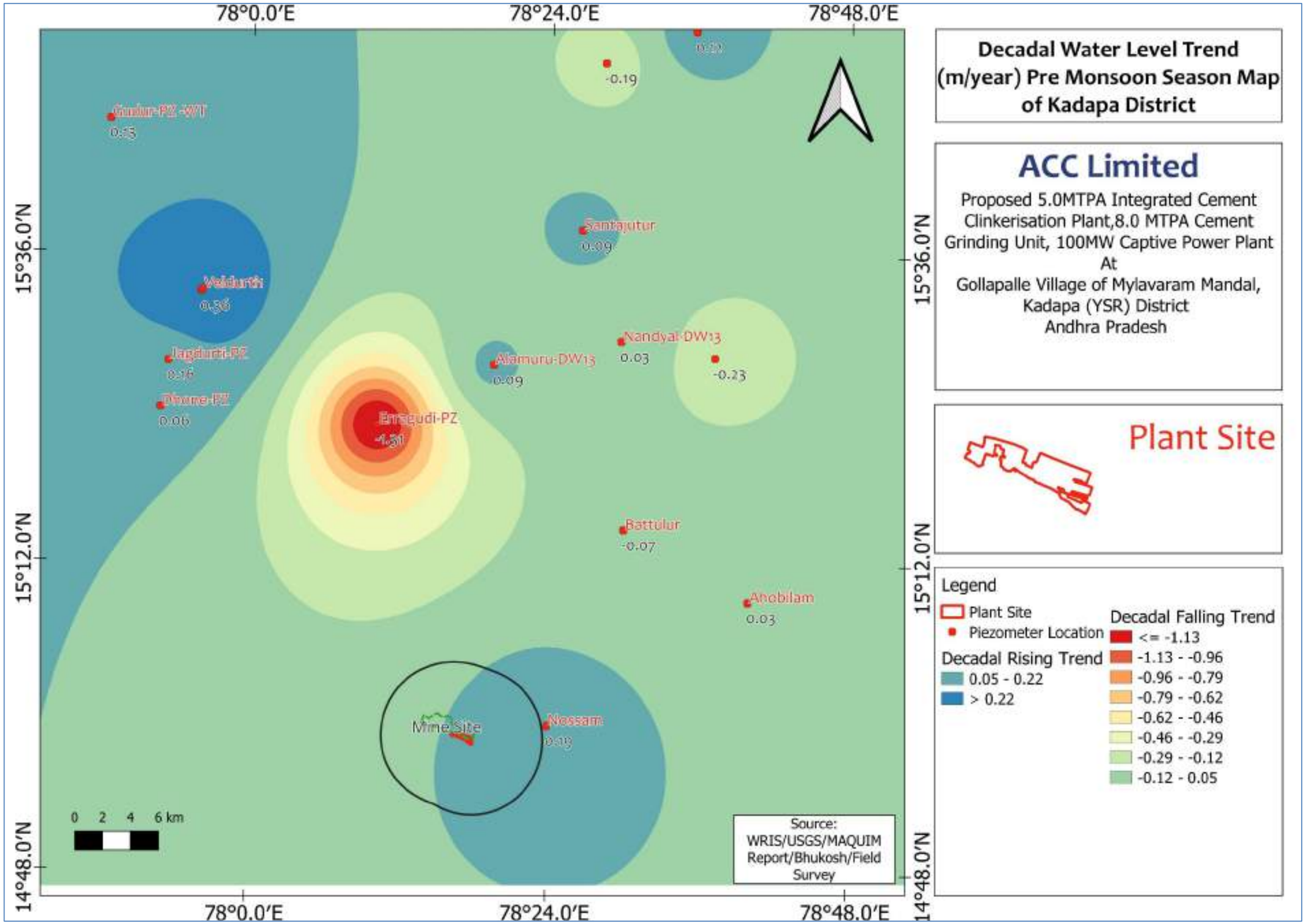



*Figure 18:Decadal Map Post Monsoon Season of Kadapa District*

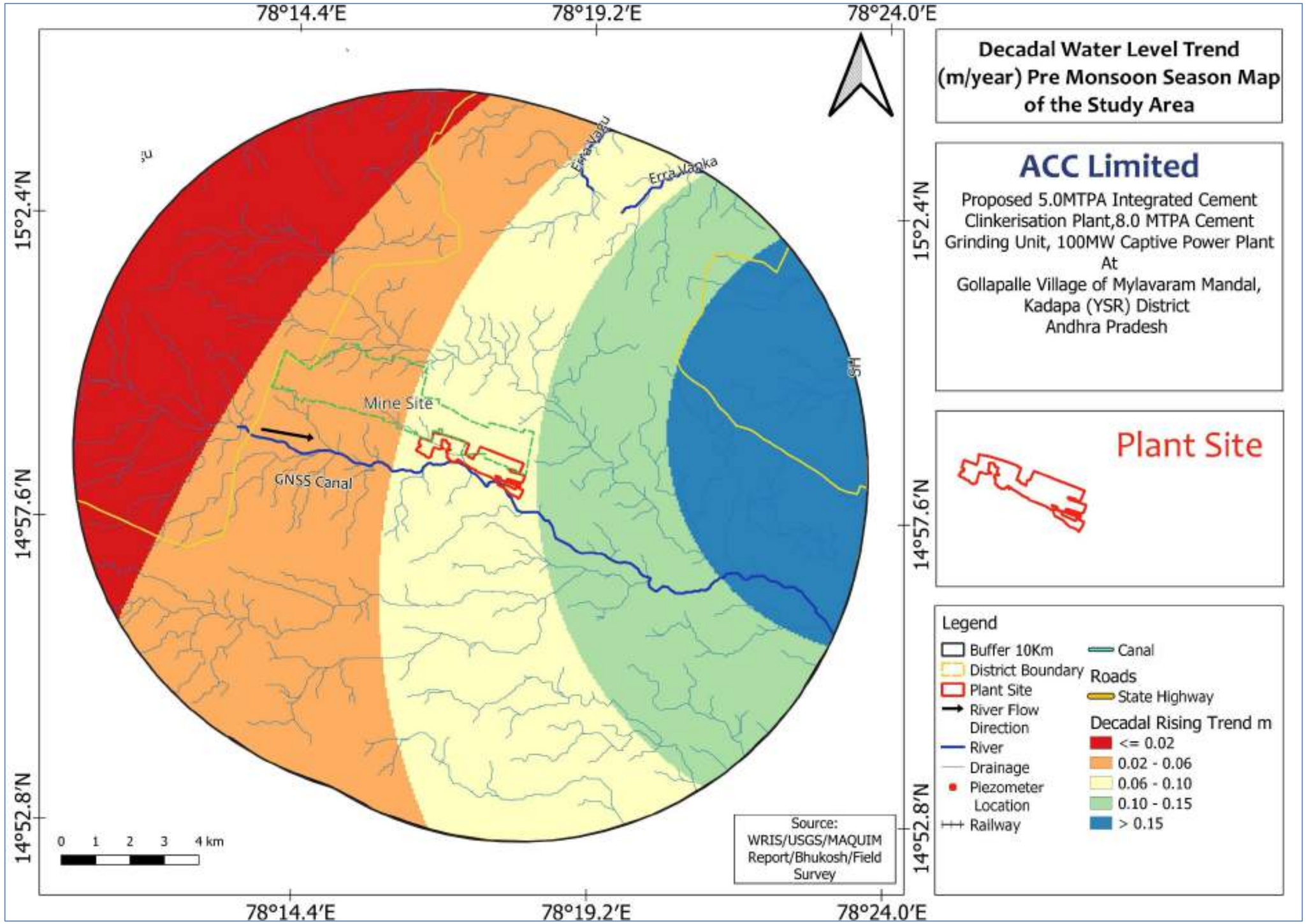



*Figure 19 Decadal (m/year) Map Pre-Monsoon Season (May-2024) of the Study area*

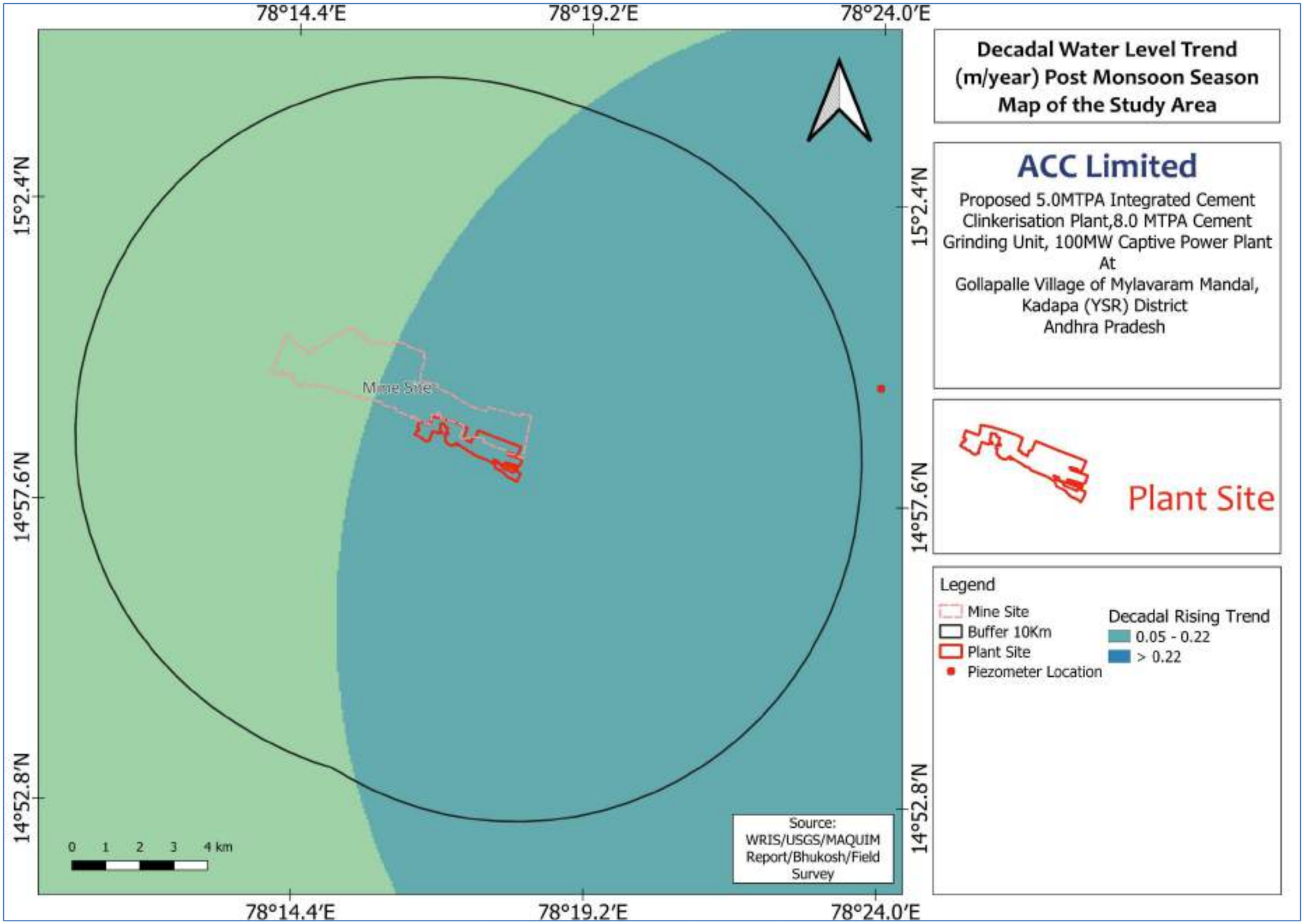



*Figure 20:Decadal(m/year) Map Post Monsoon Season (November-2023) of the Study Area*

### 3.3.5 Ground water quality

Ground water samples were collected from the available water resources around the Plant site and the Mine site. The samples were collected and tested from different sites. The quality of ground water was studied by collecting 9 water samples. The analysis of the samples has been carried out in J.M. EnviroLab Pvt. Ltd. located in Gurgaon, the lab is NABL certified and has approval from MoEFCC and state boards. Details of the same given in the table below.

*Table 5:Ground Water Sampling Result*

| S. No. | Parameters | Unit | Sampling Locations | | | | | | | | | Specification as per IS 10500-2012 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Near Plant Site | Village Ped Daventurla | Village Jangalapalle | Village Talamanchipatnam | Village Vaddirala | Nosam | Dobbudapalle | Bestavemula | Malamidkambaladinne | Requirement Acceptable Limit | Permissible Limit in the Absence of Alternate Source |
| 1. | pH (at 25°C) | - | 7.47 | 7.38 | 7.6 | 7.56 | 7.78 | 7.5 | 7.44 | 7.64 | 7.55 | 6.5-8.5 | No Relaxation |
| 2. | Colour | Hazen Unit | BDL (DL 1.0) | BDL (DL 1.0) | BDL (DL 1.0) | BDL (DL 1.0) | BDL (DL 1.0) | BDL (DL 1.0) | BDL (DL 1.0) | BDL (DL 1.0) | BDL (DL 1.0) | 5 | 15 |
| 3. | Turbidity | NTU | BDL (DL 1.0) | BDL (DL 1.0) | BDL (DL 1.0) | BDL (DL 1.0) | BDL (DL 1.0) | BDL (DL 1.0) | BDL (DL 1.0) | BDL (DL 1.0) | BDL (DL 1.0) | 1 | 5 |
| 4. | Odour | - | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable |
| 5. | Taste | - | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable |
| 6. | Total Hardness as $CaCO_3$ | mg/l | 478.7 | 398.2 | 693.2 | 357.6 | 736.4 | 278.3 | 283.1 | 535 | 239.17 | 200 | 600 |
| 7. | Calcium as Ca | mg/l | 112.6 | 85.66 | 196.84 | 97.55 | 202.3 | 60.61 | 51.63 | 139.2 | 41.74 | 75 | 200 |
| 8. | Alkalinity as $CaCO_3$ | mg/l | 321.1 | 310.7 | 310.8 | 236 | 585.9 | 195.7 | 196 | 270.7 | 185.6 | 200 | 600 |
| 9. | Chloride as Cl | mg/l | 247.6 | 137.29 | 386.3 | 167 | 434.5 | 119.63 | 165.16 | 287.8 | 104.81 | 250 | 1000 |
| 10. | Cyanide as CN | mg/l | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | 0.05 | No Relaxation |
| 11. | Magnesium as Mg | mg/l | 47.9 | 44.72 | 48.85 | 27.63 | 56.04 | 30.8 | 37.42 | 45.43 | 32.76 | 30 | 100 |
| 12. | Total Dissolved Solids | mg/l | 986 | 678 | 1162 | 645 | 1582 | 524 | 567 | 883 | 475 | 500 | 2000 |
| 13. | Sulphate as $SO_4$ | mg/l | 130.3 | 76.59 | 108.3 | 55.2 | 149.4 | 67.56 | 40.38 | 91.2 | 48.23 | 200 | 400 |
| 14. | Fluoride as F | mg/l | 0.63 | 0.28 | 0.73 | 0.63 | 0.76 | 0.16 | 0.43 | 0.52 | 0.36 | 1 | 1.5 |
| 15. | Nitrate as $NO_3$-N | mg/l | 22.86 | 9.95 | 19.68 | 12.05 | 27.6 | 6.24 | 6.47 | 10.37 | 8.19 | 45 | No Relaxation |
| 16. | Iron as Fe | mg/l | BDL(DL 0.02) | BDL(DL 0.02) | 0.06 | 0.07 | 0.11 | BDL(DL 0.02) | BDL(DL 0.02) | BDL(DL 0.02) | BDL(DL 0.02) | 1 | No Relaxation |
| 17. | Aluminium as Al | mg/l | BDL (DL 0.03) | BDL (DL 0.03) | BDL (DL 0.03) | BDL (DL 0.03) | BDL (DL 0.03) | BDL (DL 0.03) | BDL (DL 0.03) | BDL (DL 0.03) | BDL (DL 0.03) | 0.03 | 0.2 |
| 18. | Boron | mg/l | BDL (DL 0.20) | BDL (DL 0.20) | BDL (DL 0.20) | BDL (DL 0.20) | BDL (DL 0.20) | BDL (DL 0.20) | BDL (DL 0.20) | BDL (DL 0.03) | BDL (DL 0.20) | 0.5 | 2.4 |
| 19. | Phenolic Compounds | mg/l | BDL (DL 0.001) | BDL (DL 0.001) | BDL (DL 0.001) | BDL (DL 0.001) | BDL (DL 0.001) | BDL (DL 0.001) | BDL (DL 0.001) | BDL (DL 0.001) | BDL (DL 0.001) | 0.001 | 0.002 |
| 20. | Anionic Detergents as MBAS | mg/l | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | 0.2 | 1 |
| 21. | Hexa Chromium as $Cr^{+6}$ | mg/l | BDL (DL 0.03) | BDL (DL 0.03) | BDL (DL 0.03) | BDL (DL 0.03) | BDL (DL 0.03) | BDL (DL 0.03) | BDL (DL 0.03) | BDL (DL 0.03) | BDL (DL 0.03) | -- | -- |
| 22. | Chromium as Cr | mg/l | BDL (DL 0.002) | BDL (DL 0.002) | BDL (DL 0.002) | BDL (DL 0.002) | BDL (DL 0.002) | BDL (DL 0.002) | BDL (DL 0.002) | BDL (DL 0.002) | BDL (DL 0.002) | 0.05 | No Relaxation |
| 23. | Zinc as Zn | mg/l | 0.06 | 0.09 | 0.03 | 0.07 | 0.1 | 0.08 | 0.04 | 0.08 | 0.11 | 5 | 15 |
| 24. | Copper as Cu | mg/l | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | BDL (DL 0.02) | 0.05 | 1.5 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25. | Manganese as Mn | mg/l | BDL (DL 0.01) | 0.12 | 0.16 | BDL(DL 0.01) | 0.3 | BDL(DL 0.01) | 0.33 | 0.23 | BDL(DL 0.01) | 0.1 | 0.3 |
| 26. | Cadmium as Cd | mg/l | BDL (DL 0.002) | BDL (DL 0.002) | BDL (DL 0.002) | BDL (DL 0.002) | BDL (DL 0.002) | BDL (DL 0.002) | BDL (DL 0.002) | BDL (DL 0.002) | BDL (DL 0.002) | 0.003 | No Relaxation |
| 27. | Lead as Pb | mg/l | BDL (DL 0.008) | BDL (DL 0.008) | BDL (DL 0.008) | BDL (DL 0.008) | BDL (DL 0.008) | BDL (DL 0.008) | BDL (DL 0.008) | BDL (DL 0.008) | BDL (DL 0.008) | 0.01 | No Relaxation |
| 28. | Arsenic as As | mg/l | BDL (DL 0.002) | BDL (DL 0.002) | BDL (DL 0.002) | BDL (DL 0.002) | BDL (DL 0.002) | BDL (DL 0.002) | BDL (DL 0.002) | BDL (DL 0.002 | BDL (DL 0.002) | 0.01 | No Relaxation |
| 29. | Mercury as Hg | mg/l | BDL (DL 0.001) | BDL (DL 0.001) | BDL (DL 0.001) | BDL (DL 0.001) | BDL (DL 0.001) | BDL (DL 0.001) | BDL (DL 0.001) | BDL (DL 0.001) | BDL (DL 0.001) | distri | No Relaxation |
| 30. | Sodium as Na | mg/l | 155 | 85 | 140 | 80 | 280 | 70 | 87 | 108 | 70 | -- | -- |
| 31. | Potassium as K | mg/l | 9 | 6 | 8 | 20 | 11 | 5 | 4 | 9 | 3 | -- | -- |
| 32. | Phosphate as $PO_4$ | mg/l | BDL(DL 0.02) | BDL(DL 0.02) | BDL(DL 0.02) | BDL(DL 0.02) | BDL(DL 0.02) | BDL(DL 0.02) | BDL(DL 0.02) | BDL (DL 0.02) | BDL(DL 0.02) | -- | -- |
| 33. | Nickel | mg/l | BDL(DL 0.005) | BDL(DL 0.005) | BDL(DL 0.005) | BDL(DL 0.005) | BDL(DL 0.005) | BDL(DL 0.005) | BDL(DL 0.005) | BDL(DL 0.005) | BDL(DL 0.005) | 0.02 | No Relaxation |
| 34. | Conductivity | µS/cm | 1490 | 1014 | 1720 | 970 | 2407 | 793 | 870 | 1318 | 714 | -- | -- |
| 35. | Total Suspended Solid | mg/l | BDL(DL 1.0) | BDL (DL 1.0) | BDL(DL 1.0) | BDL (DL 1.0) | BDL (DL 1.0) | BDL(DL 1.0) | BDL (DL 1.0) | BDL (DL 1.0) | BDL (DL 1.0) | -- | -- |

Source: Ground Water Quality Analysis Report BDL – Below Detectable Limit and DL – Detection Level

**Ground Water Quality Analysis**

**pH:** The pH values across sampling locations range from 7.38 to 7.78, within the acceptable limit of 6.5-8.5, indicating neutral to slightly alkaline water, suitable for most purposes.

**Total Hardness:** Total hardness levels vary significantly, with values ranging from 239.17 to 736.4 mg/l as CaCO3. High hardness can cause scale buildup in pipes and appliances but does not pose direct health risks.

**Chloride:** Chloride concentrations exceed permissible limits at several locations, ranging from 104.81 to 434.5 mg/l. Elevated chloride levels can impart a salty taste to water and, in high concentrations, may have adverse health effects.

**Total Dissolved Solids (TDS):** TDS levels are elevated, ranging from 475 to 1582 mg/l. High TDS can affect water taste and contribute to scale formation. It also indicates the presence of dissolved salts, minerals, and other contaminants.

**Sulphate:** Sulphate concentrations vary widely 40.38 to 149.4 mg/l. High sulphate levels may cause a laxative effect in drinking water and can impact water taste and odor.

**Nitrate:** Nitrate levels are within acceptable limits in all locations, ranging from 6.24 to 27.6 mg/l. Elevated nitrate concentrations pose health risks, particularly to infants, and can indicate contamination from agricultural runoff or wastewater.

**Fluoride:** Fluoride levels are generally within acceptable limits, ranging from 0.16 to 0.76 mg/l. Excessive fluoride intake can lead to dental or skeletal fluorosis.

**Other Parameters:** Cyanide, phenolic compounds, anionic detergents, hexavalent chromium, and heavy metals such as lead, arsenic, cadmium, and mercury are below detectable limits (BDL), indicating compliance with standards.

**Electrical Conductivity:**

Groundwater samples with EC values ranging from 714 to 2407 µS/cm fall within the lower salinity range, indicating relatively low concentrations of dissolved salts.

These samples may be suitable for various uses, including drinking water supply and irrigation, with minimal risk of salinity-related issues.

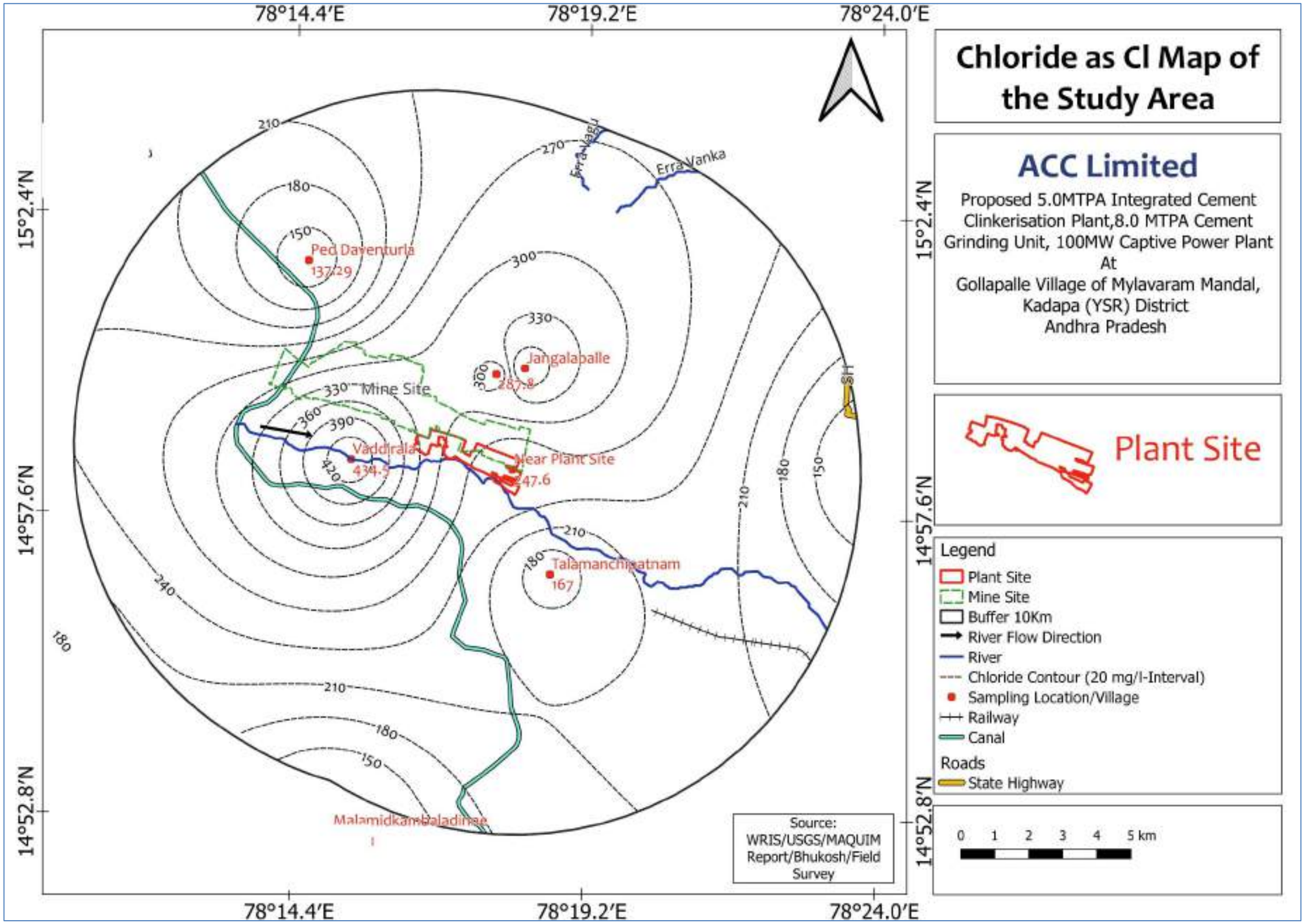



*Figure 21:Chloride Map of the Study Area*

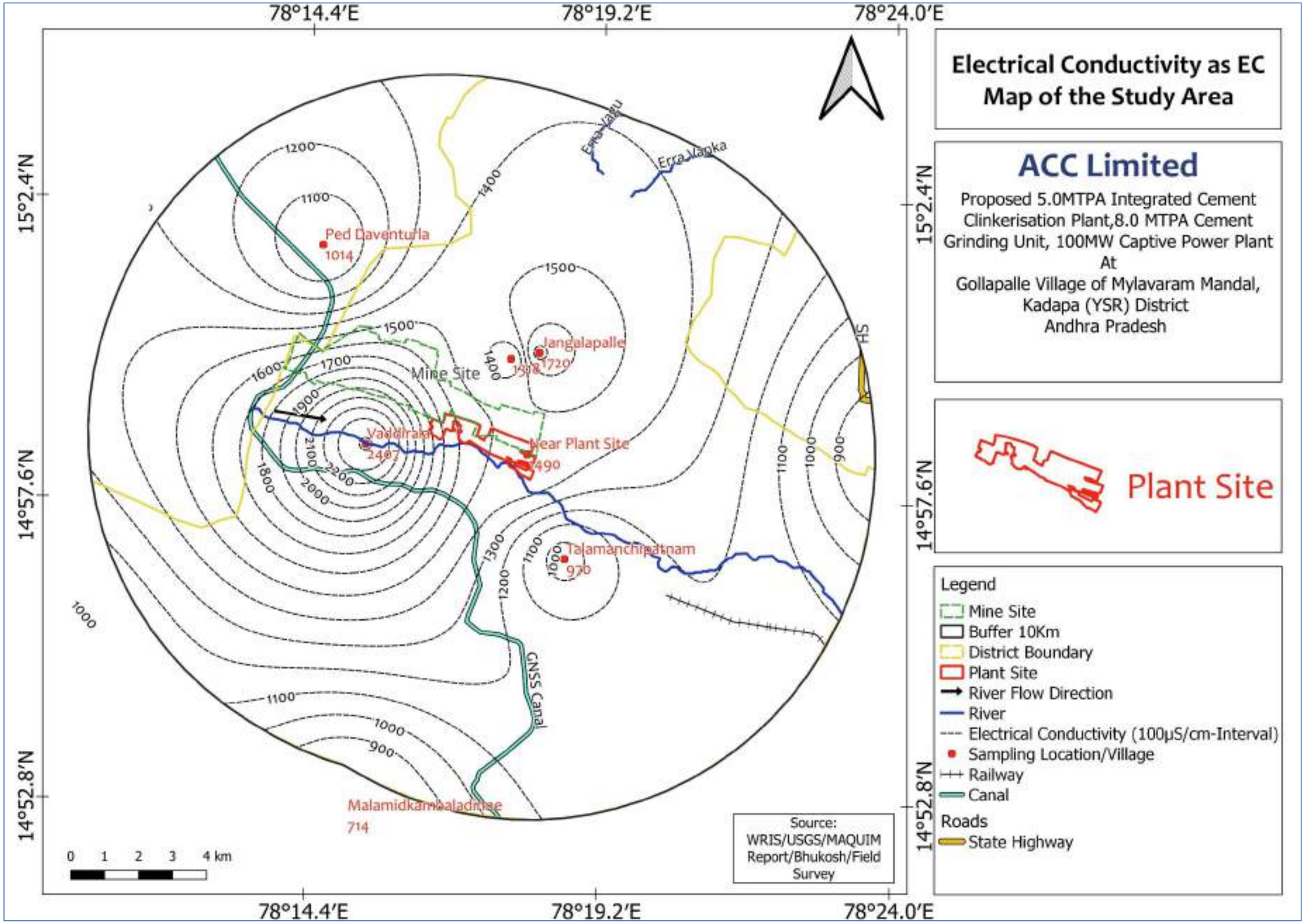



*Figure 22: Electrical Conductivity Map of the Study Area*

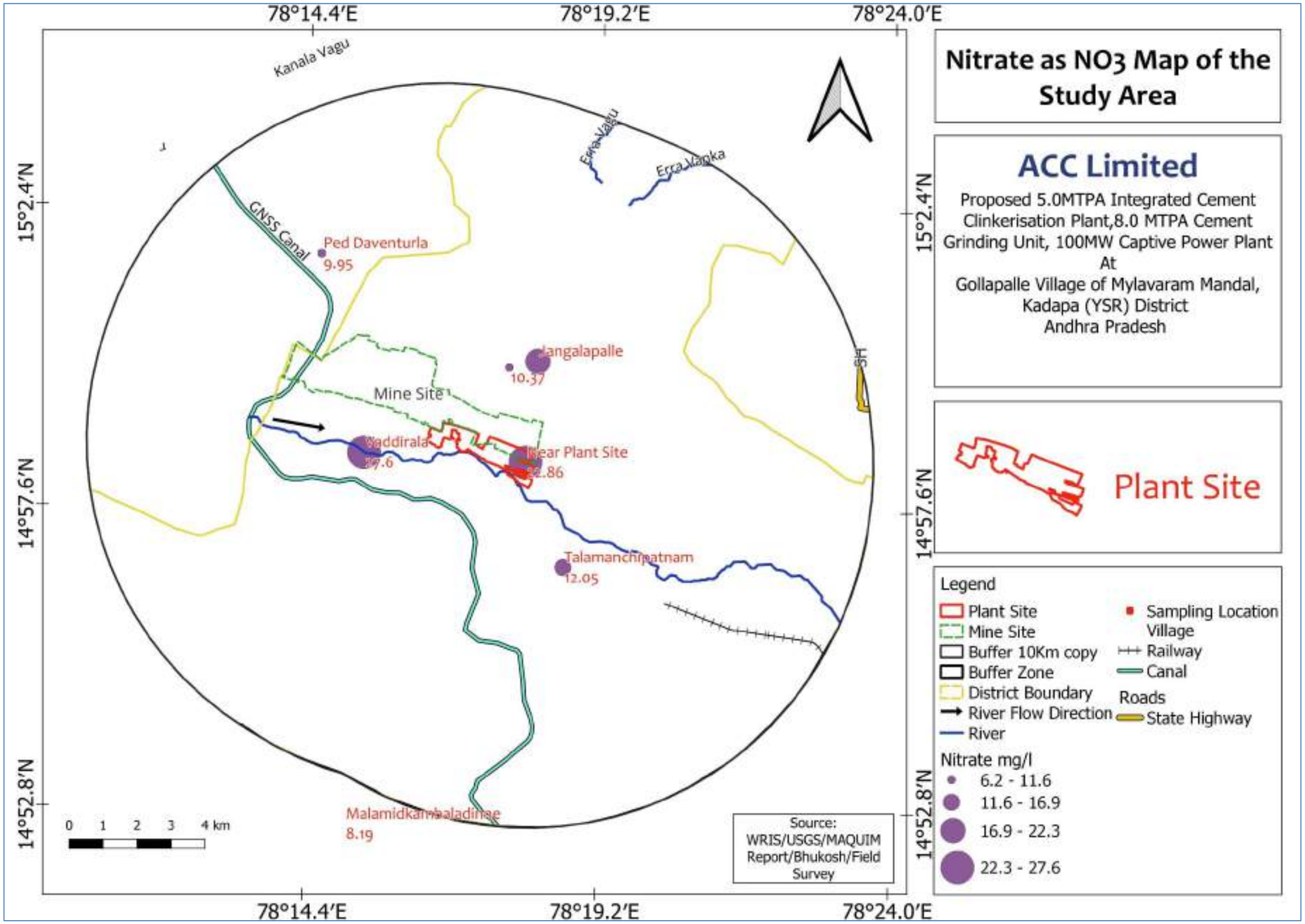



*Figure 23: Nitrate Map of the Study Area*

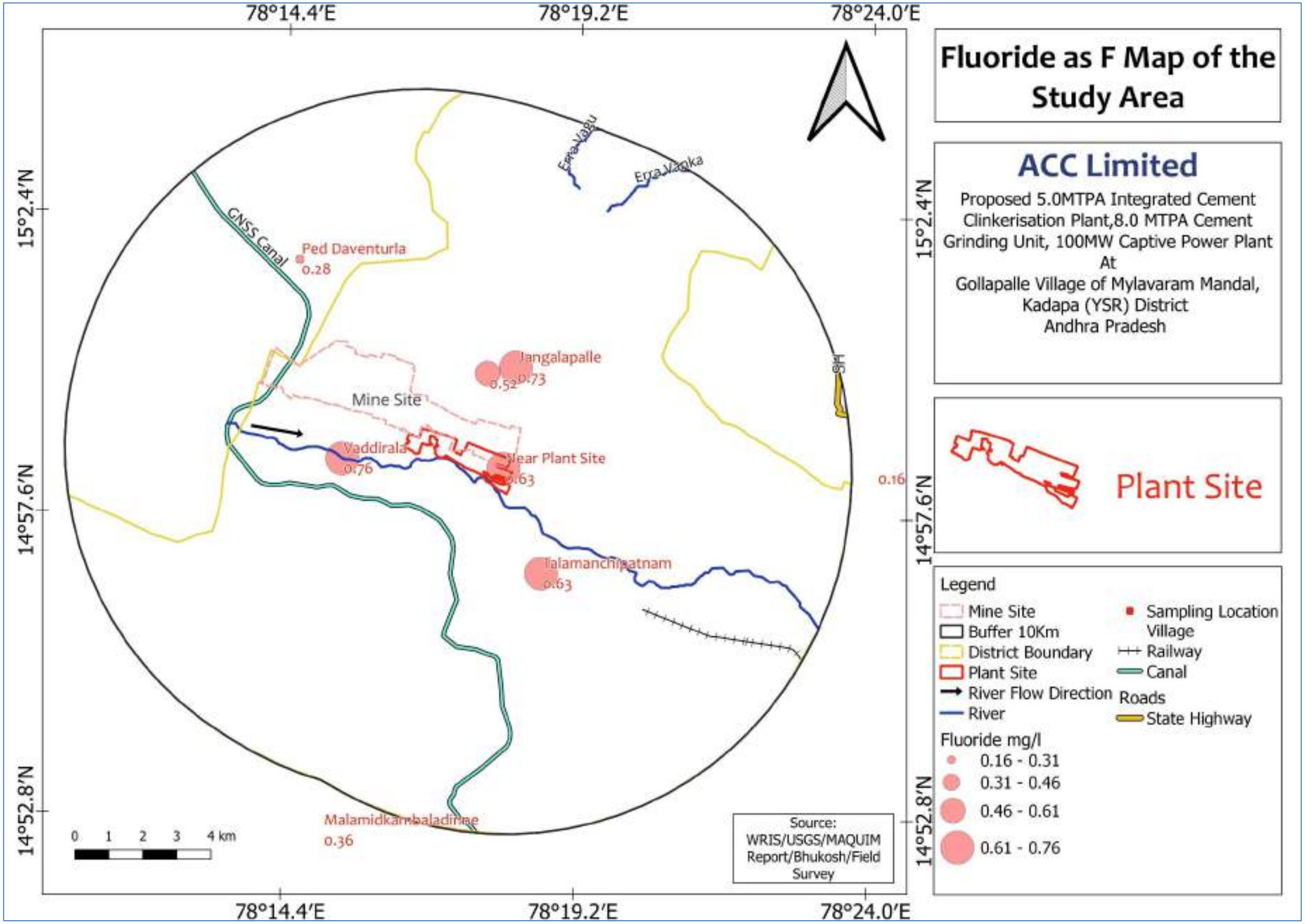



*Figure 24:Fluoride Map of the Study Area*

### 3.3.6 Water Quality of Nearby water body

The water bodies in the study area are seasonal; as the pre-monsoon season falls within the monitoring period, there is no water in the water bodies.

## 4 DETAILS OF PROPOSED / EXISTING TUBEWELLS/ BOREWELLS

Ten bore wells will be installed on the proposed cement plants to meet groundwater requirements. Proposed bore wells fitted with water meter for monitoring quantum of groundwater abstraction. The monitoring of groundwater abstraction is done on regular basis. Details of the Proposed bore well is given below:

*Table 6:Details of Ground Water Abstraction Structure*

| Proposed Groundwater Abstraction Structures | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **S. No.** | **Type of Structure** | **Depth (m) / Dia (mm)** | **Depth to Water Level(m bgl)** | **Discharge ($m^3$/Hr)** | **OperationalHrs. (Day) / Days (Year)** | **Mode of Lift** | **Pump Capacity (HP)** | **Net Ground Water Discharge (KLD)** |
| 1. | Bore well | 150/204 | 26 | 29 | 10/365 | Submersible Pump | 30 | 290 |
| 2. | Bore well | 150/204 | 26 | 29 | 10/365 | Submersible Pump | 30 | 290 |
| 3. | Bore well | 150/204 | 26 | 29 | 10/365 | Submersible Pump | 30 | 290 |
| 4. | Bore well | 150/204 | 26 | 29 | 10/365 | Submersible Pump | 30 | 290 |
| 5. | Bore well | 150/204 | 26 | 29 | 9/365 | Submersible Pump | 30 | 290 |
| 6. | Bore well | 150/204 | 26 | 29 | 9/365 | Submersible Pump | 30 | 290 |
| 7. | Bore well | 150/204 | 26 | 29 | 9/365 | Submersible Pump | 30 | 290 |
| 8. | Bore well | 150/204 | 26 | 29 | 9/365 | Submersible Pump | 30 | 290 |
| 9. | Bore well | 150/204 | 26 | 29 | 9/365 | Submersible Pump | 30 | 290 |
| 10. | Bore well | 150/204 | 26 | 29 | 9/365 | Submersible Pump | 30 | 290 |

# 5. PROPOSED DEWATERING PLANS IN CASE OF INFRASTRUCTURE DEWATERING PROJECTS

This is a Proposed 5.0 MTPA Integrated Cement Clinkerisation Plant, 8.0 MTPA Cement Grinding Unit, 100 MW Captive Power Plant at Gollapalle, Village of Mylavaram Mandal, Kadapa (YSR) District, Andhra Pradesh details regarding approved dewatering plan is not applicable for this project.

# 6 IMPACT ASSESSMENT

## 6.1 IMPACT ON THE GROUND WATER REGIME

Proposed 5.0 MTPA Integrated Cement Clinkerisation Plant, 8.0 MTPA Cement Grinding Unit, 100 MW Captive Power Plant with Kadapa Limestone Mines (Area – 997.08 Ha) at Gollapalle, Village of Mylavaram Mandal, Kadapa (YSR) District, Andhra Pradesh

The total water requirement for integrated cement plant is about 2922 m3/day. The requirement will be met initially from the ground water sources by bore wells made in near plant area Once the mine pits are formed and water is filled in these pits, the collected rain water in mine pits and reservoir will be used for plant purpose. According to GWRE (Ground Water Resource Estimation) 2023, Mylavaram Mandal is in the Safe Category. According to the groundwater resource estimation of the study area, it was found to have a groundwater development of 28% and thus can be put under Safe Category.

**Methodology Used**

The groundwater resources of the study were estimated by following the GEC (Groundwater Estimation Committee) 2015. The data for district groundwater resources was taken from GWRE (Ground Water Resource Estimation) 2023. Further, for calculating the groundwater resources of the study area the data for resources was block was also taken from the IN-GRES website and distributed to the study area on prorate basis.

**GROUND WATER RESOURCES FOR BUFFER ZONE**

Area of buffer zone is coming about 519.9 sq.km. This buffer zone has Limestone/Quartzite as the main aquifer. Main recharging factors in this area is recharge due to rainfall, due to return flow from the applied irrigation from surface and groundwater and recharge form the surface water bodies.

| RECHARGE IN BUFFER ZONE BY WATER LEVEL FLUCTUATION METHOD | |
|---|---|
| | **Monsoon Season** |
| **Description of items** | **Quantity** |
| 1.Total Area (sq.km) | 519.9 |
| 2. Water Table Fluctuation (m) | 3.16 |
| 3. Specific Yield | 0.02 |
| 4. Total Groundwater Storage [ (1) * (2) * (3)] (M cum) | 32.85 |

| RECHARGE IN BUFFER ZONE BY RAINFALL INFILTRATION FACTOR METHOD | |
|---|---|
| **Description of items** | **Quantity** |

| | |
|---|---|
| 1.Total Area (sq.km) | 519.90 |
| 2. Average Annual Rainfall Monsoon Season (mm) | 427.78 |
| 3. Rainfall infiltration factor | 0.06 |
| 4. Rainfall recharge in Buffer zone by Rainfall Infiltration Factor Method (M cum) | 13.34 |

As per the recommendations of Groundwater Estimation Committee (GEC), 2015, if the difference between the two, expressed as a percentage of rainfall infiltration method is greater than or equal to -20% or less than or equal to +20 %, then the recharge is taken as the value estimated by the water table fluctuation method. If it is less than -20%, then it is taken as 0.8 times the value estimated by rainfall infiltration factor method. If it is greater than +20%, then recharge is taken as equal to 1.2 times the value estimated by rainfall infiltration factor method.

| **RAINFALL RECHARGE IN BUFFER ZONE AFTER COMPARING RESULTS FROM WATER LEVEL FLUCTUATION METHOD AND RAINFALL INFILTRATION FACTOR METHOD** | |
|---|---|
| **Description of items** | **Quantity** |
| 1. Rainfall Recharge during monsoon season in Buffer Zone | |
| a) By Water Level Fluctuation Method (Mcum) | 32.86 |
| b) By Rainfall Infiltration Factor Method (Mcum) | 13.34 |
| 1. Difference between (1a) and (1b) expressed as a percentage of (1b), 'PD' [{(1a) – (1b)/ (1b)} *100] | 6.23 |
| 3. Rainfall Recharge in the Buffer Zone during monsoon season (Mcum) [ = (1a) if 'PD' is between -20 and +20% = 0.8 * (1b) if 'PD' is less than -20% = 1.20 * (1b) if 'PD' is greater than +20%] | 16.01 |

Recharge from rainfall in Non- monsoon Season:

| **Non-Monsoon Season** | |
|---|---|
| **RECHARGE IN BUFFER ZONE BY RAINFALL INFILTRATION FACTOR METHOD** | |
| **Description of items** | **Quantity** |
| 1.Total Area (sq.km) | 519.90 |
| 2. Total Annual Rainfall Non-Monsoon Season(mm) | 415 |
| 3. Rainfall infiltration factor | 0.06 |
| 4. Rainfall recharge in Buffer zone by Rainfall Infiltration Factor Method (m cum) | 12.94 |

Draft Due to Domestic utilization:

| **Draft Due to Domestic Utilisation** | |
|---|---|
| Population of Study Area | 51,313 |

| | |
|---|---|
| Census Year | 2011 |
| Current Year | 2024 |
| Annual Growth Rate | 1.38 |
| Projected Population | 60519 |
| Groundwater requirement (KLD) | 133 |

All the other parameters were calculated on pro rata basis and adjusted with intellectual judgments made for the study area considering it demography and geography. Recharge from River, Pond, Canal and Tank were Calculated on pro rata basis. The summary of the Groundwater resources of the study area as per GWRE 2022-23 is given below.

**RECOMMENDATIONS AND SUGGESTION**

- Awareness program about the conservation of ground water resources to make the population aware.
- In order to arrest the declining trends of water levels in the block, the rooftop rainwater harvesting technology shall be further strengthen and more recharge structures may also be constructed in depression areas where water gets accumulated during rainy season. This will help in enhancing the recharge to ground water reservoir.
- The abandoned dug wells may be cleaned and should be used for recharging the ground waterby utilizing the surface runoff.
- The water level monitoring network needs to be increased in the block.

*Table 7: Details of Groundwater resources Available in the study area calculated based on GEC 2015*

| S. NO. | Name | Area (Sq.km) | Ground Water recharge (HAM) | | | | Total Annual Groundwater Recharge (HAM) | Total Natural Discharge (HAM) | Annual Extractable GW Resource (HAM) | Current Annual Groundwater Extraction (HAM) | | | | Annual GW Allocation for (HAM) Domestic Use as on 2025 | Net Ground Water Availability for future use (HAM) | Stage of Groundwater Extraction (%) | Category |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Monsoon Season | | Non- Monsoon | | | | | Irrigation | Industrial | Domestic | Total | | | | |
| | | | Recharge from rainfall | Recharge from other Source | Recharge from rainfall | Recharge from other Source | | | | | | | | | | | |
| 1 | Kadapa | 15379 | 54542.1 | 23121 | 540 | 28810 | 107012 | 5351 | 101662 | 29760 | 390 | 4264 | 34414 | 4264 | 68870 | 34 | Safe |
| 2 | Mylavaram | 365 | 1531 | 649 | 15 | 809 | 3005 | 150 | 2854 | 696 | 22 | 91 | 809 | 13 | 2123 | 28 | Safe |
| 3 | Study Area | 519.9 | 2181 | 925 | 22 | 1152 | 4280 | 214 | 4066 | 991 | 32 | 133 | 1156 | 136 | 2907 | 28 | Safe |

## 6.2 IMPACT ON SURFACE WATER SOURCE

All the project activity to be carried out in the future will not interfere anywhere with the natural drainage pattern. Moreover, no stored water shall be released directly to streams; hence no possibility of any siltation in natural streams and reduction of vertical percolation. It is therefore apparent that there is very less impact of project on the surface water regime.

## 6.3 IMPACT ON WATER QUALITY

Cement manufacturing involves the use of large amounts of water. However, being dry process technology, there will be no waste water generation from cement production. Waste water will be generated from CPP/WHRS as blow down, RO reject and sewages from domestic usage. The discharge of this wastewater outside plant boundary which can contain suspended solids, high pH levels, and trace amounts of heavy metals and other pollutants, will pollute surrounding surface water bodies. Cement production often involves the use of additives, fuels, and raw materials that may contain hard substances. These substances will properly manage and control, the leaching into water sources and potentially contaminate surface water and groundwater. Adopting energy-efficient technologies and optimizing processes to reduce fuel consumption and minimize thermal pollution. No Direct contact with surface water and implementing appropriate measures to mitigate the potential impacts on water quality and protect the surrounding ecosystems.

## 6.4 MITIGATION MEASURES

- Sedimentation pits will be provided at appropriate location to trap the silt laden runoff water and prevent excessive silt from going outside. The storm water drains will be diverted to a water reservoir to collect the runoff.
- Rainwater harvesting will be practiced which helps in recharge of ground water table.
- Waste water will not be discharged outside the plant premises. RO reject from CPP/WHRS will be used in Cooling mill spray.
- Domestic wastewater will be generated from plant & Canteen which will be treated in STP and utilized for greenbelt development/ plantation.
- Rain water harvesting will be practiced inside the plant. One pond will be constructed for the storage of runoff generated throughout the plant. This water will be utilized for greenbelt development and dust separation.
- Regular monitoring of water quality and water level will be carried out.

**Details of Rainwater Harvesting:**

| Sl. no | | Particular | Length (m) | Width (m) | Depth (m) | Area (m) | Volume ($m^3$) | remarks |
|---|---|---|---|---|---|---|---|---|
| 1. | Rainwater Harvesting Pond | Dimension of pond | **250** | **166** | **4.5** | **41,500** | **186750** | |
| | | Capacity of pond ($m^3$/Y) | **560250** | | | | | **3 filling seasons** |
| | | Total capacity of pond ($m^3$/Y) | **560250** | | | | | |

| | |
|---|---|
| Water Requirement ($m^3$/Y) | **9,64,260** |
| Total Runoff generated in Project Site ($m^3$/Y) | **5,59,784** |
| Runoff to be Stored ($m^3$/Y) | **5,59,784** |
| Capacity of RW Harvesting Pond ($m^3$/Y) | **5,60,250** |

- To accommodate the total runoff generated in the project site which is (5,60250 m3/Y), the area of the pond should be approximately, 41,500 m2 which covers 4.15 Ha area.
- As the capacity of the Rainwater Harvesting Pond is higher than that of the runoff which is to be stored, 100% runoff water can be stored.
- The capacity of the rainwater harvesting pond with respect to the water requirement is 58%.

# 7 WATER BALANCE, RECYCLE AND REUSE

The total water requirement for integrated cement plant & CPP 2,922 m3/day. The requirement will be met initially from the ground water sources by bore wells made in near plant area. Once the mine pits are formed and water is filled in these pits by rain harvesting, the collected rain water in mine pits and reservoir will be used for plant purpose.

In the proposed mine area, as the maximum depth is considered to be 193 m and as the water table elevation is 183.7 m in post-monsoon and 180 m in pre-monsoon. The water table is not intersecting with the working depth in the plan period except for the conceptual year. Therefore, there will be no seepage.

The considered normal rainfall in the area is about 0.718 m/annum. With respect to the area of the pit the rainwater that can be accumulated in the pit as per the plan period is 66630, 110069, 135558, 166791 $m^3$/annum respectively. And considering the evaporation loss of 43400 $m^3$/annum, the total amount of water available in the pit will be of 64, 183, 252 and 338 $m^3$/day respectively.

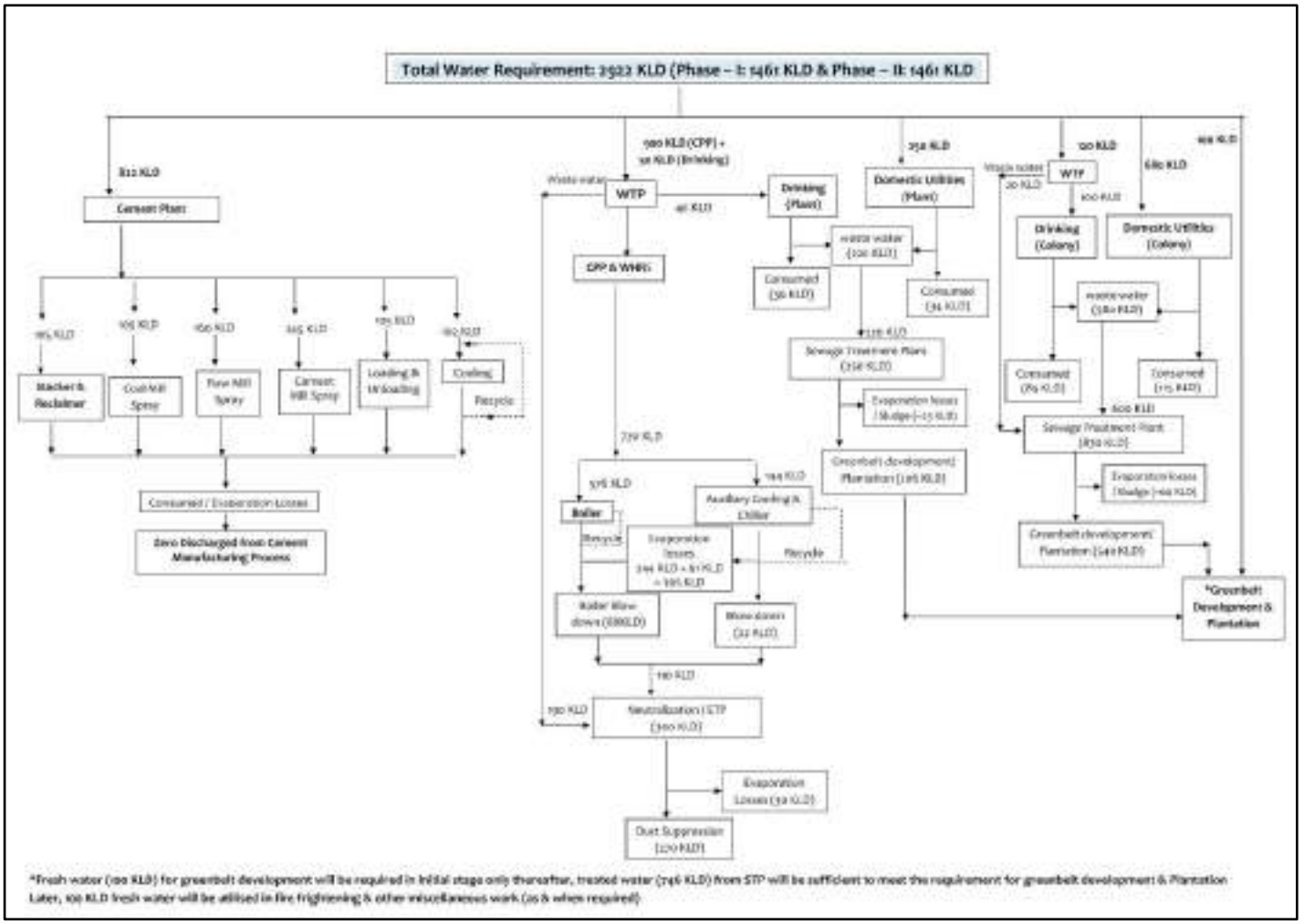
And in the conceptual year as the water table is intersecting the working depth of the mine, Therefore the total water accumulated including the rainfall and the seepage is 2656600 $m^3$/ annum and after the

evaporation loss, the available water in the pit is 4530 $m^3$/day.

Hence, the water accumulated in the mine pits can be considered for usage for mine operations and other purposes.

*Table 8:Break up of Water Requirement*

| Area | Input (KLD) | Input (KLD) | Total | Loss/ Consumption (KLD) | | Wastewater Generated (KLD) | |
|---|---|---|---|---|---|---|---|
| | Phase -I | Phase-II | | Phase -I | Phase-II | Phase -I | Phase-II |
| Cement Plant | 411 | 411 | **822** | 411 | 411 | 0 | 0 |
| CPP | 450 | 450 | **900** | 300 | 300 | 150 | 150 |
| Domestic consumption in the Plant | 150 | 150 | **300** | 40 | 40 | 110 | 110 |
| Domestic consumption in the colony | 400 | 400 | **800** | 100 | 100 | 300 | 300 |
| Greenbelt | 50 | 50 | **100** | 50 | 50 | 0 | 0 |
| **Total** | **1461** | **1461** | **2922** | **901** | **901** | **560** | **560** |




*Fresh water (100 KLD) for greenbelt development will be required in initial stage only thereafter, treated water (746 KLD) from STP will be sufficient to meet the requirement for greenbelt development & Plantation
Later, 100 KLD fresh water will be utilised in fire frightening & other miscellaneous work (as & when required)

*Figure 25:Water Balance Diagram*

**Sewage Treatment Plant**

The sewage treatment plant (STP) of 300 KLD in Plant will be installed for treatment of Domestic waste water generated from Plant. The treatment given to the influent in the STP will be both chemical and biological.

**Process description of STP plant:**

**Screen:**

Screen is mechanical filter used to remove large objects from wastewater. The Sewage is first allowed to pass through screen chamber where heavy waste, floating materials are trapped. Due to this blockage or choking of downstream equipment's is avoided.

**Equalization:**

The sewage from the bar screen chamber, grit trap and oil & grease striper comes to the equalization tank. It is first collection tank of the STP, it acts as buffer: to collect the incoming raw sewage that comes at widely fluctuating rates, and pass it on to the rest of the STP at a constant flow rate.

**Biological Treatment:**

The equalized sewage is passed into the MBBR tank. The bulk of the treatment is provided here, employing microbes/bacteria for the process, where BOD and COD treatments are enhanced. Oxygen is supplied by means of diffused aeration system. The components of the aeration tank are mixed completely. For higher surface area for microorganisms, floating media (MBBR) is provided on which their growth takes place. The MBBR process works on the principle of attached growth system and uses rotating bio-media to retain an active biomass to reduce the influent BOD levels.

**Sludge Settling:**

The bio treated waste water passed through the settling tank, where the biomass gets settle at the bottom and the clear water overflows from the top of settling tank for filtration. Settled sludge has been pumped periodically.

**Membrane diffuser:**

**Dual Media Filter (DMF):** The treated sewage is passed to Dual Media Filter (DMF) for removing of turbidity, suspended solids and Odour of treated sewage. Dual media filters provide very efficient particle removal under the conditions of high filtration rate.

**Activated Carbon Filter (ACF):** It receives the water that is already filtered by the Pressure Sand Filter and improves the multiple quality parameters of the water like BOD, COD, turbidity, color and odor.

**Softener:** After filtration water is passed through Softener to reduce total hardness.

**Disinfection:** The treated water is then disinfected using Sodium hypochlorite (NaOCl) to kill and render harmless disease-causing organisms, such as bacteria, viruses, etc. Sodium Hypochlorite is dosed for disinfection of the treated water.

Finally, the treated water will be collected in the treated water tank for further uses in greenbelt development & plantation and gardening activities. The schematic diagram for sewage treatment plant has been shown below.

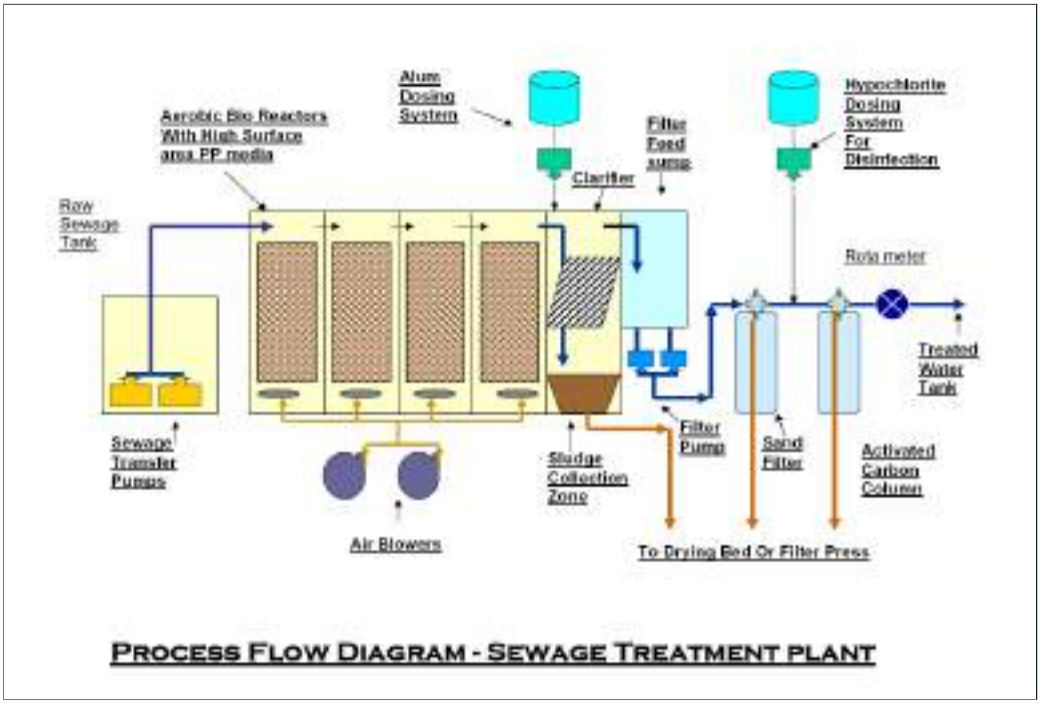



*Figure 26 Schematic Diagram for Sewage Treatment Plant*

*Table 9 Expected Waste Water Characteristics of STP*

| S. No. | Parameters | Unit | Raw sewage quality | Expected Quality of Treated Sewage |
|---|---|---|---|---|
| 1. | pH | - | 7.5 - 8.5 | 6.5 - 9.0 |
| 2. | BOD | mg/L | 300 - 350 | < 10 |
| 3. | COD | mg/L | 500 - 550 | < 100 |
| 4. | Total Coliform | MPN/100 ml | $10^6$ | $10^3$ |
| 5. | TSS | mg/L | 300 | <80 |
| 6. | Oil & grease | mg/L | 20 - 30 | <5 |
| 7. | Total Coliform | MPN/100 ml | $10^6$ | $<10^3$ |

**Water Treatment Process Description (Reverse Osmosis)**

The reverse osmosis of capacity process consists of three main steps: (1) Pre-treatment, (2) Membrane Assembly System and (3) post-treatment.

***Pre-treatment***

The purpose of the pre-treatment step is to avoid any risk of clogging, fouling or scaling of the membrane. Pre-treatment is an important aspect of RO system. All RO devices require pre-treatment to remove the suspended solids, scalants, foulants and colloidal matter. In the pre-treatment system, some chemicals are usually used before the filtration step. Chlorine is often injected to disinfect feed water. Sodium Meta bisulphate is used to dechlorinate the feed water. Ferric chloride, alum or polymers are the typical coagulants used at the pre-filter stage. In the filtration stage, a gravity filter with different sand particle sizes is used. Then a fine cartridge filter is used after the sand filtration. For ground water

treatment, Hydrochloric acid and sodium hexameta phosphate (SHMP) is often used to prevent carbonate scale. The exact dosage of each chemical depends on the chemical analysis of the feed water.

***Membrane Assembly System***

Several types of RO membranes are commercially available. These are prepared either as flat sheet or as hollow fibres made from cellulose acetate (CA) ester or polyamide (PA). There are different ways of packing RO membranes. Of these, three configurations have been produced commercially: tubular, spiral wound (SW) and hollow fine fibre (HFF). Hollow fine fibre and spiral wound modules have proved to be appropriate for several types of raw water in RO desalination systems. Spiral wound has found many applications in the wastewater reclamation. The success of the spiral-bound device has been related to the capability to package a relatively large amount of membrane surface area into a relatively small element while maintaining a certain degree of "cleavability", which, of course, is particularly important for wastewater processes.

***Post-treatment***

In the post-treatment step, product water passes through a de-carbonation system, a pH adjustment system and water passing through UV light. Generally, Sodium Carbonate (Food Grade) is added to the product water to adjust its alkalinity. The purpose of passing the water through UV is to eliminate the presence of microorganisms during storage and distribution.

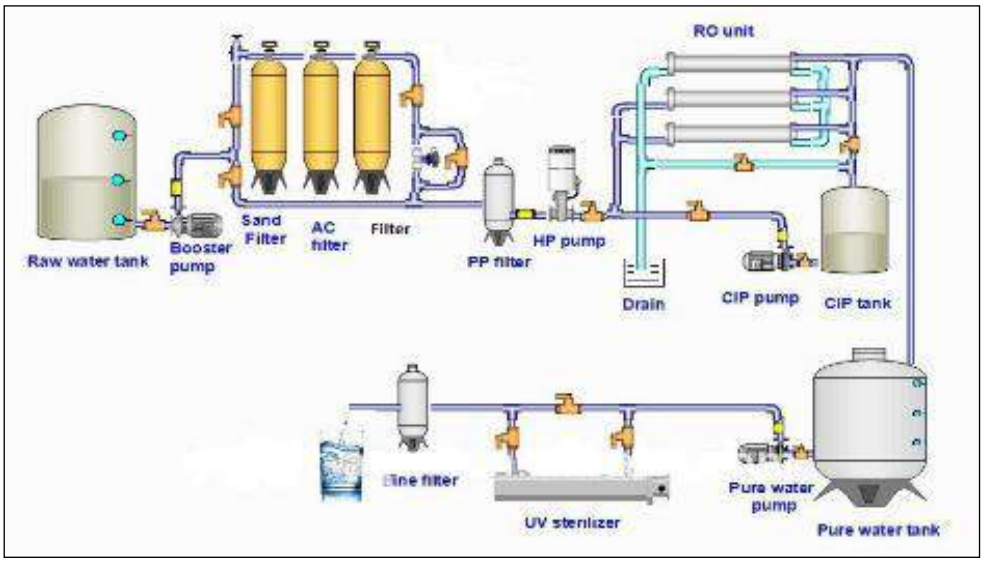



*Figure 27 Schematic Diagram for Reverse Osmosis.*

## 8 SALINE WATER DISPOSAL STRATEGIES

As this project is a Proposed 5.0 MTPA Integrated Cement Clinkerisation Plant, 8.0 MTPA Cement Grinding Unit, 100 MW Captive Power Plant with Kadapa Limestone Mine (Area-997.08 Ha) at Gollapalle, Village of Mylavaram Mandal, Kadapa (YSR) District, Andhra Pradesh and this project site does not fall under saline zone as per CGWA categorization. Therefore, this section on disposal of saline water is not required.

# 9 ANY OTHER DETAILS PERTAINING TO THE PROJECT

All the required details of the project are furnished in the sections above. Any other details as deemed fit by APGWD will be furnished when required for.

# 10 SUMMARY AND CONCLUSION

Proposed 5.0 MTPA Integrated Cement Clinkerisation Plant, 8.0 MTPA Cement Grinding Unit, 100 MW Captive Power Plant at Gollapalle, Village of Mylavaram Mandal, Kadapa (YSR) District, Andhra Pradesh is a Greenfield project which falls under Category 'A' projects as per the EIA Notification, 2006 and as amended thereof; Project or Activity '3(b)' Cement Plants --- in which the plant of proposed capacity will be installed by M/s. ACC Limited. And M/s. ACC Limited also has proposed Kadapa limestone mine of area 997.08 Ha at Dhannawada, Chinna Venturla, Vaddarala, Bestavemula, Gollapalle, G. Uppalapadu Villages of Mylavaram Mandal, Kadapa (YSR) District which is located just above the proposed plant site.

- The elevation of the study area ranges from 171 to 466 m amsl which indicates that it is Gently undulating topography. The digital elevation map is prepared by data taken from USGS SRTM. Similarly, the study area considered for the Kadapa limestone mine, the elevations are ranging from 176 to 430 m asml with gently undulating topography.
- Kadapa district, located in the southern part of the Indian state of Andhra Pradesh, exhibits diverse geomorphological features owing to its location between the Eastern Ghats and the Deccan Plateau. There is a well-defined drainage system having Trellis drainage pattern in the buffer zone, a major part of drainage has been harnessed by constructing irrigation projects, tanks and anicuts.
- The nearest wetland is Kolleru Lake (Andhra Pradesh) located at a distance of about 359 Km approximately in the NE direction from the Plant Site and about 351 km from the Mine site in NE direction. Therefore, certificate regarding the same is not applicable for this particular proposal.
- The Geological Formation in the belongs to the Narji Limestone of Jammalamadugu formation in Kurnool group as mentioned earlier. Locally sharp changes in strike direction are also seen due to broad Warping. The local strike of the deposit is N70° -S70° E with 2° dip towards N20° E.
- Thick Soil Cover Entire area and only at places limestone could be seen in the cultivated lands. However, the core samples do not indicate any major geologically disturbed zone and indicate that the formations in the area are relatively massive. Thick bedded and fine grained in nature.
- The highest water table in Pre-Monsoon Season is 394.5 m amsl and lowest water table 157.6 m amsl. The direction of water table in general is Towards North East direction.
- Depth to water level in study area was found to vary between 17.5 m bgl to 47.4 m bgl during post-monsoon season and 21.4 m bgl to 50.5 m bgl during pre-monsoon season indicating water level to be relatively Shallow to Deep ground water. The minimum and maximum surface elevation of monitoring points in the study area is found to vary between 183 to 445 m AMSL respectively.
- Hydrograph of Nossam station Show Rising Water Level Trend in Pre-Monsoon Season and Post Monsoon Season.

- According to the groundwater resource estimation of the study area, it was found to have a groundwater development of 28% and thus can be put under Safe Category.

  The total water requirement for integrated cement plant & CPP 2,922 m3/day. The requirement will be met initially from the ground water sources by bore wells made in near plant area. Once the mine pits are formed and water is filled in these pits by rain harvesting, the collected rain water in mine pits and reservoir will be used for plant purpose. In the proposed mine area, as the maximum depth is considered to be 193 m and as the water table elevation is 183.7 m in post-monsoon and 180 m in pre-monsoon. The water table is not intersecting with the working depth in the plan period except for the conceptual year. Therefore, there will be no seepage.

  The considered normal rainfall in the area is about 0.718 m/annum. With respect to the area of the pit the rainwater that can be accumulated in the pit as per the plan period is 66630, 110069, 135558, 166791 $m^3$/annum respectively. And considering the evaporation loss of 43400 $m^3$/annum, the total amount of water available in the pit will be of 64, 183, 252 and 338 $m^3$/day respectively.
- As this project is a Proposed 5.0 MTPA Integrated Cement Clinkerisation Plant, 8.0 MTPA Cement Grinding Unit, 100 MW Captive Power Plant with Kadapa Limestone Mine (Area-997.08 Ha) at Gollapalle, Village of Mylavaram Mandal, Kadapa (YSR) District, Andhra Pradesh and this project site does not fall under saline zone as per CGWA categorization. Therefore, this section on disposal of saline water is not required.

## 11 BIBILIOGRAPHY

- Aquifer mapping report Kadapa (YSR) CGWB
- Census of India, 2011
- Drainage & DEM (adopted from USGS SRTM data)
- Geological map, Geomorphological Map (adopted from Bhukosh, Geological Survey of India)
- Ground water estimation committee, Govt. of India (2015)
- India Water Resources Information System (India WRIS)
- RAMSAR Site Information Service https://rsis.ramsar.org/

## 12 ACCREDITATION CERTIFICATE

Quality Council of India
National Accreditation Board for Education and Training
ITPI Building, 6th Floor, 4 - A, Ring Road, I P Estate, New Delhi - 110002

CERTIFICATE OF ACCREDITATION

Under the QCI-NABET Scheme
for
Ground Water Consultant Organisation

M/s J.M. EnviroNet Private Limited

Address: Unit No. 1517, Tower - B, EMAAR DIGITAL GREENS, Golf Course Extension Road, Sector-61, Gurugram-122011 (Haryana)

| S.No. | SCOPE COVERAGE | | |
|---|---|---|---|
| | Industrial Use | Mining Projects | Infrastructure Projects |
| 1 | Hydrogeological report: Comprehensive report on groundwater condition/situation | | |
| 2 | Impact Assessment Reports with modelling studies | | |

Note: Names of approved Project Coordinators and Technical Area Experts are mentioned in IA AC Minutes dated Sep 09, 2021 on QCI-NABET website.

*The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in NABET's letter of accreditation bearing no. QCI/NABET/ENT/GWCO/aCO/21/51 dated Sep 23, 2021. The accreditation needs to be renewed before the expiry date by M/s J.M. EnviroNet Private Limited following due process of assessment.*

Sr. Director, NABET
Issue Date : Sep 23, 2021

Certificate No.
NABET/GWCO/IA/GW018

Valid Upto
Sep 08, 2026

Annexure - 9

GOVERNMENT OF ANDHRA PRADESH
GROUND WATER AND WATER AUDIT DEPARTMENT

From:
Dr.K.Venugopal,
M.Tech, F.I.E, MBA.,Ph.D.,
Director,
Ground Water and Water Audit Department,
4th & 5th floor, VysyaBhawan,
Nambooruvariveedhi, Hanumanpet,
Besides General Hospital,
Vijayawada-520003.
Phone: 0866-2574673.
E-Mail: director_apsgwd@rediffmail.com.

To:
The Managing Director,
M/s ACC Ltd.,
Mylavaram mandal,
Kadapa,
YSR District.

**Letter No:408-11/CDP/Hg-II/2015** **Dated:22.02.2018**

**Sir,**

Sub:- Andhra Pradesh Ground Water and Water Audit Department – Single Desk Policy - M/s ACC Ltd., Mylavaram mandal, Kadapa, YSR District – Communicating the approval - Regarding.

Ref:- Your online application ID:CAE 1700407 dated:01.02.2018.

@@@

With reference to above, I am herewith furnishing the "Report of ground water investigations in M/s ACC Ltd., lands in Mylavaram mandal, Kadapa, YSR District".

The firm is permitted to draw 1325 kld from 10 existing Bore wells (9 with pumpset and 1Borewell without pumpset) and 4 newly recommended borewells at VES1,2,3,&4 @ 7 hrs of pumping in a day.

The firm is also instructed to establish a Piezometer in the premises to monitor ground water levels on Real Time basis.

**Yours faithfully,**

**Sd/-Dr K.VENUGOPAL,**
**DIRECTOR.**

To
The Deputy Director, Ground Water and Water Audit Department,
YSR Kadapa District for information.

///true copy///

For DIRECTOR

**GOVERNMENT OF ANDHRA PRADESH**
**GROUND WATER & WATER AUDIT DEPARTMENT**

From
Sri M. Muralidhar, M.Sc., B.L.,
Deputy Director,
G. W & W A Department,
KADAPA.

To
The Director,
Ground Water & Water Audit Depart.,
VIJAYAWADA.

Lr.No: 354/Hg/Industries/ACC Ltd /2018, Dt: 9 -02-2018

Sir,

Sub:- Ground Water & Water Audit Department, Kadapa – Application ID CAE1700407 - Permission to draw groundwater 2022 KL/Day - Groundwater surveys conducted – Report submitted for Approval – Regarding.

Ref:- Application ID CAE1700407, dt.01-02-18 of ACC Limited.

< <> >

With reference to the above cited, it is to submit that the Groundwater investigations were conducted for selection of borewells to ACC Limited, Gollapalli village, Mylavaram mandal, YSR District, Kadapa. The detailed report is herewith enclosed and submitted for your kind approval.

Yours faithfully

9/2/18
Deputy Director

# REPORT OF GROUND WATER INVESTIGATIONS IN ACC LTD LANDS IN MYLAVARAM MANDAL, KADAPA, YSR DISTRICT

The application ID: CAE1700407 dt: 01-02-2018 of ACC ltd in mylavaram (m), Kadapa, YSR District and posted in AP industries portal under single window. Accordingly the Ground water surveys are being conducted by Sri G.Veeranarayana, Assistant Director(Hg), Sri A.Rajasekhar Reddy, Assistant Geophysicist, Smt P.V.Swapnakala, Assistant Hydrologist and Sri A.V.Raghu Rami Reddy, Assistant Engineer of this office as per the instruction of the Deputy Director, Groundwater and Water Audit Department, Kadapa from 17.02.2018 to 19.02.2018.

## Location :

The ACC ltd has lands in six villages i.e Gollapalli, G.Uppalapadu, Bestavemula, Dannawada, Vaddirala & Chinnavelthur. The represent of ACC ltd named Sri Rami Reddy accompanied during survey and shows their existing borewells in the villages of Gollapalli, G.Uppalapadu and Besthavemula of Mylavaram (m). The area fall in SI.T. No: 57 I/4; I/8; J/1 & J/5. Surveys have been delayed due to non response of the ACC ltd staff as well as local land disputes. So only part of the area is covered now in the above three villages.

## Topography :

The area has generally plain area, gently sloping towards SE. Local streams drain from NW to SE and join to Tigaleru river which altimately joins Kundu river. Draining pattern is sub dendtric. Parallel drainage is observed in large area.

## Claimate and Rainfall :

The area experienced semi arid condition with highest temperature in summer and lowest in winter. The normal rainfall of the mylavaram (m) is 625 mm where as the normal rainfall of the district is 700 mm with 75 mm shortage. Most of the rainfall contributes with SW & NE monsoons. Mylavaram mandal get 574 mm normal rainfall during monsoon and 51 mm during Non monsoon period.

**Geology :**

The area covered with Black cotton soils followed by hard limestone (Nargi) of kurnool group of kadapa super group. Shale are encounted below this limestone at about 30 to 60 m bgl.

**Hydrogeology :**

To assess hydrological particulars of the area 16 borewells are being inventoried. 5 borewells discharges are measured. The present water levels measured, vary from 9.08 to 14.98 m bgl. The discharges vary from 203 lpm to 377 lpm in the existing borewell of ACC ltd. The reported water levels in premonsoon vary from 18.0 to 26.0 m bgl. The data are furnished in table I & II. The water level in Piezometers vary from 5.06 m to 19.28 in pre monsoon and from 0.25 m to 16.92 m post monsoon. The fluctuation vary from 0.4 m to 6.9 m (see table: III)

**Geophysical Surveys :**

To identify new site for borewells geophysical surveys are conducted in Bestavemula village at 4 locations. Mean while the local people (Bhoo Parirakshana Samithi) objected and warned not to do. So surveys are stopped.

**Water Requirement of ACC ltd :**

The ACC ltd has required 2022 KLD wit1h 1772 KLD for factory and 300 KLD for drinking. ( 73.8 ham/ year)

**Categorization of the area :**

The area falls in six villages. The total resource of these villages is 280 ham. The draft and balance are 106 ham and 174 ham respectively, with 40% stage of development.

**Draft Calculation:**

| | | | |
|---|---|---|---|
| 1. | Existing 9 borewell draft<br>2509 lpm X 60 X 7 hours X 365<br>384629700 Liters per Annum | : | 38.463 ham |
| | Draft of these 8 borewell by irrigation<br>40.5 hac ID crops : Monsoon 40.5 X (0.6-0.29) = 40.5 X 0.31<br>Area X Crop water required – Effective rain fall | : | 12.56 ham |
| | In non monsoon No effective rain fall considered = 40.5 X 0.6 | : | 24.30 ham |
| | Total | : | 36.86 ham/1010 KLD |
| 2 | Draft through additional borewell recommended during the survey | | |
| | No of borewells recommended | : | 4 |
| | Expected yield | : | 200 lpm |
| | Total expected draft per day | : | 200 X 4 X 60 X 7 |
| | | : | 336 KLD |
| | Considering 75% as dependable yield | : | 252 KLD |
| 3 | Existing of borewell of ACC Ltd., without pumpset may be utilized with 200 lpm yield. 200 X 60 X 7<br>(75% dependability) | : | 63 KLD |
| | Total additional Ground water draft (2+3) (252+63) | : | 315 KLD |
| | Acc Ltd required water | : | 2022 KLD |
| | Existing draft through existing 9 bore wells which are irrigation 40.5 ha ID in Kharif & Rabi<br>(converted to industry use ) | : | 1010 KLD |
| | Proposed draft through 4 new feasible bore wells with 75 % dependability | : | 252 KLD |
| | Existing bore well (without pump set) recommended | : | 63 KLD |
| | Total | : | 1325 KLD |
| | Balance of required water for ACC Ltd., | : | 697 KLD |

**Conclusions & Recommendation :**

The ACC Ltd area has 9 existing borewells with pumpsets and are being used by the farmers with the consent of ACC Ltd. These borewells irrigate 40.5 ha ID both in Kharif & Rabi seasons with a calculated draft of 36.86 ham. The individual discharges (measured and reported ) are tabulated in Table II. The total draft by these discharges of existing 9 borewells (table V) is 38.463 ham almost equal. Hence this existing draft may be converted to ACC Ltd use. Further one existing borewell with out pump set,( table V) of ACC Ltd., may be used for the firm with an yield of 63 KLD (75% dependability ). Further 4 VES are being conducted at Bestavemula (v) and found feasible (table IV) to a depth of 120 m with an expected yield of 200 lpm. The draft through these feasible site is 252 KLD with 75 % dependability. Totally additional draft to ACC Ltd. Kadapa is 315 KLD. After permitting this draft the area (6 villages) falls in safe category with 42% stage of development. Hence, the ACC Lt., Kadapa is permitted to draw water of 1010 KLD through existing bore wells, 252 KLD from new recommended bore wells and 63 KLD from existing bore well (without pumpset) with 7 hours pumping per day. Totally it is 1325 KLD. Spacing norms are followed for recommended bore well sites.

- The requirement of ACC Ltd. Kadapa is 2022 KLD.
- With 9 existing borewells with pumpsets: one borewell (without pumpset) and 4 new bore well sites recommended the draft is = 1325 KLD.
- Balance requirement is 2022 – 1325 = 697 KLD.
- In future the water accumulated in mining pits may also be utilized.
- To manage the shortage of water reuse/ recycle methods may be adopted .
- Factory may take alternative arrangement to meet the balance requirement of 653 kld.

## Suggestions

- To monitor the Ground water levels & quality 2 to 3 Piezometers should be selected/constructed at different locations and collect data twice in a month (water levels) and collect water samples pre & post monsoons for quality analysis. The data should be produced regularly to the O/o the Deputy Director, Ground water and Water Audit Department, Kadapa.
- The departmental officer should be permitted for inspecting/collecting data regarding Ground water utilization, monitoring, WHS etc., by the plant.
- This department has right to restrict/control on Ground water usage whenever deviation is noticed.
- Rainfall data collected from the existing rainguage station in the premises of factory daily so as to calculate water status.
- Construction of water harvesting structures like Infiltration Ponds, Trenches, Roof top water, rainwater harvesting / collecting structures in a large scale.
- While drilling of new bore wells APWALTA Rules should be strictly followed.

A.Rajasekhar Reddy
Asst., Geophysicist
G.W & W. A Department
Kadapa

A.V.Raghu Rami Reddy
Assistant Engineer
G.W & W. A Department
Kadapa

P.V.Swaphakala
Asst., Hydrologist
G.W & W. A Department
Kadapa

G.Veeranarayana
Assistant Director
G.W & W. A Department
Kadapa

Deputy Director
G .W & W. A Department
Kadapa

ACC ltd 22-2-17-1
5

Map Showing the recommendations of bore wells to ACC Cements L

**Well inventory data collected during Groundwater surveys in ACC Ltd. Lands in Mylavaram Mandal, Kadapa YSR District**

| S. No. | Village | Farmers Name | Survey No. | Well diamesion | | Water level (m) | HP | Ayacut (acr) | Yield LPM | Co-ord |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Dia | Depth | | | | | |
| 1 | G.Uppalapadu | N.Lakshmaiah | 133 | 0.165 | 48 | 9.08 | - | - | - | 14 ° 58<br>78 ° 17 |
| 2 | G.Uppalapadu | N.Lakshmaiah & Bro | 146 | 0.165 | 56 | - | 7.5 | 10.0 | 307 | 14 ° 58<br>78 ° 17 |
| 3 | G.Uppalapadu | N.Kammagiri | 144 | 0.165 | 76 | 9.98 | - | - | - | 14 ° 58<br>78 ° 17 |
| 4 | G.Uppalapadu | Penneru Ankanna | 74 | 0.165 | 70 | - | 7.5 | 8.0 | 264 | 14 ° 58<br>78 ° 17 |
| 5 | G.Uppalapadu | Sanjanna | 71 | 0.165 | 72 | 10.98 | - | - | - | 14 ° 58<br>78 ° 17 |
| 6 | G.Uppalapadu | Sanjanna & Bro | 70 | 0.165 | 72 | 14.98 | - | - | - | 14 ° 58<br>78 ° 17 |
| 7 | G.Uppalapadu | V.Pullaiah | 78 | 0.165 | 72 | - | 7.5 | 10.0 | 287 | 14 ° 58<br>78 ° 17 |
| 8 | Gollapalli | Lakshminarayana | 82 | 0.165 | 90 | - | 7.5 | 10.0 | 377 | 14 ° 58<br>78 ° 16 |
| 9 | Gollapalli | D.Venkata Subbaiah | 75 | 0.165 | 90 | - | 7.5 | 10.0 | 264 | |
| 10 | Gollapalli | D.Sivareddy | 107 | 0.165 | 107 | - | 7.5 | 10.0 | 203 | 14 ° 58<br>78 ° 16 |
| 11 | Bestavemula | Dastagiri | 132 | 0.165 | 120 | | 7.5 | 15.0 | 240 | 14 ° 59<br>78 ° 17 |
| 12 | Bestavemula | Golla Lakshmaiah | 131 | 0.165 | 118 | | 7.5 | 12.0 | 307 | |
| 13 | Bestavemula | Macha pedda Kulay | - | 0.165 | 120 | | 7.5 | 10.0 | 260 | 14 ° 59<br>78 ° 17 |
| 14 | Bestavemula | Padnayam Munaiah | - | 0.165 | 120 | | 7.5 | 10.0 | 260 | 14 ° 59<br>78 ° 17 |
| 15 | Bestavemula | M.Bala Venkata Subbaiah | - | 0.165 | 107 | | 7.5 | 12.0 | 260 | 14 ° 59<br>78 ° 17 |
| 16 | Bestavemula | M.Venkata Subbaiah | - | 0.165 | 107 | | 7.5 | 15.0 | 260 | 14 ° 59<br>78 ° 17 |

**Details of Discharges of Existing borewell in ACC Ltd Lands in Mylavaram Mandal Kadapa YSR Distric**

| S. No. | Village | Farmer's Name | Coordinates | Survey No. | Well diamesion | | Water level Reported (m) | HP | Discharge Particulars | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Dia | Depth | | | I st | 2nd | 3r |
| 1 | G.Uppalapadu | N.Lakshmaiah & Bro | 14 ° 58' 24.0"<br>78 ° 17' 24.0" | 146 | 0.165 | 56 | 10.00 | 7.5 | 42 | 45 | 42 |
| 2 | G.Uppalapadu | Penneru Ankanna | 14 ° 58' 30.0"<br>78 ° 17' 12.0" | 74 | 0.165 | 70 | 10.50 | 7.5 | 51 | 50 | 49 |
| 3 | G.Uppalapadu | V.Pullaiah | 14 ° 58.52.0'<br>78 ° 17.24.0' | 78 | 0.165 | 72 | 15.00 | 7.5 | 47 | 45 | 46 |
| 4 | Gollapalli | Lakshminarayana | 14 ° 58' 31.2"<br>78 ° 17' 14.4" | 82 | 0.165 | 90 | 11.00 | 7.5 | 36 | 34 | 35 |
| 5 | Gollapalli | D.Sivareddy | 14 ° 58' 30"<br>78 ° 16' 52.2" | 107 | 0.165 | 107 | 11.00 | 7.5 | 66 | 65 | 64 |
| | | **Total** | | | | | | | | | |

## Seasonal Water Level Fluctuations in Mylavaram Mandal

| Year | Pre/Post Monsoon | Talamanchipatnam | Torrivemula | Chinnakommerla | HanumantharayuniPeta |
|---|---|---|---|---|---|
| 2013 | Pre mansoon | 7.15 | - | - | - |
| | Post mansoon | 0.25 | - | - | - |
| | Fluctuation | 6.9 m Rise | - | - | - |
| 2014 | Pre mansoon | 5.65 | | Dry | 10.71 |
| | Post mansoon | 0.86 | | Dry | 10.1 |
| | Fluctuation | 4.79 m Rise | | Dry | 0.61 m Rise |
| 2015 | Pre mansoon | 5.06 | | Dry | 10.67 |
| | Post mansoon | 0.85 | | Dry | 10.05 |
| | Fluctuation | 4.21 m Rise | | Dry | 0.62 m Rise |
| 2016 | Pre mansoon | 6.66 | 7.98 | Dry | 10.2 |
| | Post mansoon | 2.34 | 2.49 | Dry | 9.8 |
| | Fluctuation | 4.32 m Rise | 5.49 m Rise | Dry | 0.4 m Rise |
| 2017 | Pre mansoon | 6.44 | 5.56 | Dry | 9.87 |
| | Post mansoon | 0.3 | 1.2 | Dry | 6.51 |
| | Fluctuation | 6.14 m Rise | 4.36 m Rise | Dry | 3.36 m Rise |

**STATEMENT SHOWING THE DETAILS OF RECOMMENDATIONS OF GROUND WATER SURVEYS CONDUCTED IN YSR DISTRICT FOR ACC CEMENTS LTD.**

**Tab**

| S.No | Name of the Mandal | Name of the Gram panchayat | Date of Survey conducted | Total No. of VES conducted | Recom-mended VES No. | Type of Well | Dia in mm | Depth in m | Expected yield in LPM | Location details of recommended site | Rer |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* | *10* | *11* | |
| 1 | Mylavaram | Bestavemula | 19/02/2018 | 4 | **1** | Borewell | 165 | 120 | 200 | *$14^0$ 59' 19.1" N, $78^0$ 17' 15.0" E* | |
| 2 | Mylavaram | Bestavemula | 19/02/2019 | | **2** | Borewell | 165 | 120 | 200 | *$14^0$ 59' 10.7" N, $78^0$ 17' 11.9" E* | |
| 3 | Mylavaram | Bestavemula | 19/02/2020 | | **3** | Borewell | 165 | 120 | 200 | *$14^0$ 59' 15.6" N, $78^0$ 17' 20.0" E* | |
| 4 | Mylavaram | Bestavemula | 19/02/2021 | | **4** | Borewell | 165 | 120 | 200 | *$14^0$ 59' 16.7" N, $78^0$ 17' 23.8" E* | |

**Note**:- (1). It is very essential to implement WALTA act regarding spacing norms maintained from RWS bore well.
(2). Locations of surveyed points are pegmarked and shown to Staff.

A.Rajasekhra Reddy
Asst.Geophysicist

Deputy Director
Ground Water and Water Audit Department
YSR District

**List of bore wells Feasible / Recommended for ACC Ltd. Lands in Mylavaram Mandal, Kadapa**

| S. No. | Village | Farmers Name | Survey No. | Well diamesion | | Water level (m) | HP | Ayacut (acr) | Yield LPM |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Dia | Depth | | | | |
| 1 | G.Uppalapadu | N.Lakshmaiah | 133 | 0.165 | 48 | 9.08 | - | - | - |
| 2 | G.Uppalapadu | N.Lakshmaiah & Bro | 146 | 0.165 | 56 | - | 7.5 | 10.0 | 307 |
| 3 | G.Uppalapadu | Penneru Ankanna | 74 | 0.165 | 70 | - | 7.5 | 8.0 | 264 |
| 4 | G.Uppalapadu | V.Pullaiah | 78 | 0.165 | 72 | - | 7.5 | 10.0 | 287 |
| 5 | Gollapalli | Lakshminarayana | 82 | 0.165 | 90 | - | 7.5 | 10.0 | 377 |
| 6 | Gollapalli | D.Venkata Subbaiah | 75 | 0.165 | 90 | - | 7.5 | 10.0 | 264 |
| 7 | Gollapalli | D.Sivareddy | 107 | 0.165 | 107 | - | 7.5 | 10.0 | 203 |
| 8 | Bestavemula | Dastagiri | 132 | 0.165 | 120 | | 7.5 | 15.0 | 240 |
| 9 | Bestavemula | Golla Lakshmaiah | 131 | 0.165 | 118 | | 7.5 | 12.0 | 307 |
| 10 | Bestavemula | M.Venkata Subbaiah | - | 0.165 | 107 | | 7.5 | 15.0 | 260 |

**Note:-** 9 existing bore wells and 1 drilled bore well to be fitted with pump set

# VILLAGE WISE GROUNDWATER STATUS, Y.S.R.DISTRICT-GEC-2012-

| Mandal Name | Village Name | Net Available | Groundwater Draft for all uses | Annual groundwater availability for future irrigation use | Actual balance groundwater available for future use | Stage % | Village Category | Watershed Name |
|---|---|---|---|---|---|---|---|---|
| | | ha.m | ha.m | ha.m | ha.m | ha.m | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Mylavaram | Bestavemula | 55 | 28 | 27 | 27 | 51 | Safe | KDP_C_68_19_T.M.PATNAM |
| Mylavaram | Chinnaventurla | 69 | 9 | 60 | 61 | 12 | Safe | KDP_C_68_19_T.M.PATNAM |
| Mylavaram | Dhannavada | 37 | 18 | 18 | 19 | 49 | Safe | KDP_C_68_19_T.M.PATNAM |
| Mylavaram | Golla Uppalapadu | 30 | 15 | 14 | 14 | 51 | Safe | KDP_C_68_19_T.M.PATNAM |
| Mylavaram | Gollapalli | 40 | 9 | 31 | 31 | 22 | Safe | KDP_C_68_19_T.M.PATNAM |
| Mylavaram | Vaddiralla | 49 | 27 | 22 | 22 | 55 | Safe | KDP_C_68_19_T.M.PATNAM |

adani Cement

ACC

**Ref. No.:** ACC/ENV/CUD - Forest/09-24/01

**Date:** 20.09.2024

To,
**Chief Wildlife Warden,**
Office Aranya Bhavan, P.V.S. Landmark,
Near APIIC Towers, Mangalagiri,
Guntur District-522503,
Andhra Pradesh.

**Subject:** Authentication of List of Flora and Fauna, Location Map & Composite Wildlife Conservation Plan and Biodiversity Report for Integrated Cement Plant and Limestone Mine proposed by M/s ACC Ltd. at Village Gollapalli, Mylavaram Mandalam, District Kadapa (YSR), Andhra Pradesh.

**Ref.:**

1. ToR issued by MoEF&CC, New Delhi for Integrated Cement Clinkerisation plant *vide* file no. J-11011/265/2012-IA II (I) dated 20.02.2013,
2. ToR issued by MoEF&CC, New Delhi for Limestone mine (ML Area 997.08 ha) *vide* file no. J-11015/133/2012-IA II (M) dated 30.10.2012.
3. Minutes of 16th EAC meeting (Industry-I) held during 6th -7th March 2017.
4. Minutes of EAC (Non – coal mining) held during 23rd to 25th November 2016
5. The Wildlife Protection Act, 1972 and The Wildlife Protection (Amendment) Act, on 20.12.2022 & 01.04.2023

Dear Sir,

With reference to the aforesaid subject, we would like to apprise you that M/s. ACC Limited is in process to obtain the Environment Clearance (EC) for the Integrated Cement Clinkerisation plant and Limestone Mine (ML Area 997.08 ha) at District-Kadapa (YSR), State- Andhra Pradesh from MoEF&CC, New Delhi.

MoEF&CC, New Delhi has issued ToR of above both plant & mine projects *vide* file no. J-11011/265/2012-IA II (I) dated 20th February, 2013 (***Annexure - 1)*** and file no. J-11015/133/2012-IA II (M) dated 30th October, 2012 (***Annexure - 2)*** respectively.

Based on ToR points issued by MoEF&CC for plant (condition no. 58 & 60) & mine (Point no. 12); authentication of list of flora & fauna is to be obtained.

Based on the primary study conducted, a list of flora and fauna was prepared considering condition no. 58 & 60 of ToR - plant (***Annexure - 1)*** and condition no. 12 of ToR - mine (***Annexure - 2)*** and submitted to Office of Divisional Forest Officer, Proddatur (WL) Division dated 18.11.2016 for authentication.

Subsequently, DFO has asked ACC to prepare and submit the revised mitigation plan incorporating conservation of *Melurus ursinus* (Sloth Bear).

ACC Limited
Cement House,
121, Maharshi Karve Road,
Mumbai 400 020, India
www.acclimited.com

adani Cement

ACC

The above both projects of plant & mine was considered for appraisal for grant of Environmental Clearance and EAC (Ind-I) & EAC (Non coal mining) of MoEF&CC asked to submit the authenticated list of flora & fauna vide their MoM (Copies attached ***Annexure - 3 & Annexure - 4***).

The list of flora & fauna has been revised and updated as per the Wildlife (Protection) Amendment Act, 2022 dated 19.12.2022 which came into force from 01.04.2023 as per the MoEFCC Notification vide S.O. 1394(E) dated 22.03.2023.

Accordingly, Composite Wildlife Conservation Plan is also updated incorporating "*Melurus ursinus* (Sloth Bear)" and we are herewith submitting the List of Flora and Fauna, Location Map & Composite Wildlife Conservation Plan and Biodiversity Report for Integrated Cement Plant and Limestone Mine proposed by M/s ACC Ltd. at Village Gollapalli, Mylavaram Mandalam, District Kadapa (YSR), Andhra Pradesh as **Annexure – 5, Annexure – 6 & *Annexure - 7*** respectively for authentication.

Our humble request to authenticate and do the needful as early as possible.

Thanking you and with regards,

**For M/s. ACC Limited**

Prasad

**Sanjay Prasad**

**Authorized Signatory**

***Enclosed: As above***

23.09.2024

**CC To:**

1. Principal Chief Conservator of Forests (HOFF & PCCF), Andhra Pradesh
2. Chief Conservator of Forests (CCF), Kurnool, Andhra Pradesh
3. Divisional Forest Officer, Proddatur (WL) Division, Andhra Pradesh

**Enclosed:**

***Annexure 1. ToR Letter for Integrated Cement Clinkerisation Plant***
***Annexure 2. ToR Letter for Limestone mine(ML Area 997.08 ha)***
***Annexure 3. Minutes of Meeting of EAC (IND- I)***
***Annexure 4. Minutes of Meeting of EAC (Non-coal mining)***
***Annexure 5. Revised List of Flora and Fauna found in 10 km radius of study area.***
***Annexure 6. Location Map of 10 km radius of study area***
***Annexure 7. Composite Wildlife Conservation Plan and Biodiversity Report***

ACC Limited
Cement House,
121, Maharshi Karve Road,
Mumbai 400 020, India
www.acclimited.com

Annexure -11

# ANDHRA PRADESH POLLUTION CONTROL BOARD

## REGIONAL OFFICE

1st Floor, APSFC Building, Narasimha Theertham, Road, TIRUPATI - 517502

**A.NARENDRA BABU,**
Environmental Engineer

Ph.:2253981

Lr.No. K-824/PCB/RO/TPT/2016- 1530

Dt.: 21-10-2016

To
Sri. C.V.G. Murali Krishna
M/s. ACC Limited
Gollapalli village,
Mylavaram Mandal
YSR District.
Ph: 9480686416.
Email: chowadam.muralikrishna@acclimited.com

Sir,

Sub:- EIA Notification – Public Hearing of M/s. ACC Limited has proposed Captive Lime Stone Mining project with mining lease area of 997.08 ha – Communication of Minutes of the Public Hearing – Reg.

Ref:- Public Hearing Meeting held on 20-10-2016 at 2.00 PM near proposed project site.

###

With reference to the above, it is here with submitting the Minutes of the Public Hearing of M/s. ACC Limited proposed Captive Lime Stone Mining project with mining lease area of 997.08 ha at Dhannewada, Chinna Venturila, Vaddarala, Bestavemula, Gollapalli and G.Uppalapadu villages, Mylavaram Mandal of YSR District at Gollapalli village, Mylavaram Mandal of YSR District on 20-10-2016.

Submitted for favour of information and taking necessary action.

Yours faithfully,

ENVIRONMENTAL ENGINEER

Encl: Minutes of Public Hearing.

**Proceedings of the Environmental Public Hearing conducted for the Proposed to establish Captive Lime Stone Mining project with mining lease area of 997.08 ha at Dhannawads, Chinna Venturia, Vaddarala, Bestavemula, Gollapalli and G.Uppalapadu villages in Mylavaram Mandal, YSR District conducted on 20-10-2016 at 2.00 P.M near proposed site near Gollapalli village, Mylavaram Mandal of YSR District.**

In accordance with the Notification No. S.O. 1533 dt. 14.09.2006 of Ministry of Environment & Forests, Government of India, New Delhi, the Environmental Engineer, Andhra Pradesh Pollution Control Board, Regional Office, Tirupati issued a notification pertaining to the Environmental Public Hearing on the proposed to establish Captive Lime Stone Mining project with mining lease area of 997.08 ha at Dhannawads, Chinna Venturia, Vaddarala, Bestavemula, Gollapalli and G.Uppalapadu villages in Mylavaram Mandal, YSR District in leading newspapers inviting suggestions, views, comments and objections of the general public and the same was conducted on 20.10.2016 at 2.00 P.M and the minutes of the meeting are as follows:

**The following Officials attended the Environmental Public Hearing :**

1) **Sri K.V. SATYANARAYANA, I.A.S.,** Collector & District Magistrate, Kadapa.

2) **Sri A.NARENDRA BABU,** Environmental Engineer, AP. Pollution Control Board, Regional Office, Tirupati.

The following Departmental Officials attended the hearing:

| Sl.No. | Name & Designation |
|---|---|
| 1) | Sri K. Vinayakam, Revenue Divisional Officer, Jammalamadugu, YSR Dt |
| 2) | Sri. S. Rajendra, Tahsildar, Mylavaram Mandal, YSR Dt. |
| 3) | Sri P.V.Kishore Reddy, Asst. Environmental Engineer, APPCB, RO, Tirupati |

The following representatives of the industry were present:

| Sl.No. | Name & Designation |
|---|---|
| 1) | Smt. B. Durga Bhavani, M/s Vimta Labs Ltd, Hyderabad, Environmental Consultant of the proposed Project. |
| 2) | Sri. K. Narayana Rao, Director, M/s. ACC Limited. |
| 3) | Dr. S.P. Singh, Cluster South Zone Head, M/s. ACC Limited. |

**The Environmental Engineer, A.P.Pollution Control Board, Tirupati** welcomed the District Collector, YSR District and Chairman of the Environmental Public Hearing Panel and general public to the Public hearing and explained the need to conduct Environmental Public Hearing for the proposed project as per the Ministry of Environment & Forests, Govt. of India, New Delhi notification 2006.

He also explained as per the Terms of Reference (TOR), Ministry of Environment & Forest, Govt. of India, Dt: 30.10.2012 & Dt. 30.11.2015, it is necessary to get the public hearing conducted for this project in accordance with the procedure prescribed under the EIA Notification 2006 in the process of obtaining the Environment Clearance.

**Smt. B.Durga Bhavani, M/s Vimta Labs Ltd, Hyderabad, Environmental Consultant of the proposed Project.,** while speaking on the occasion she explained the salient features of the proposed project.

M/s ACC Cement Ltd is proposed for 7.0 MTPA mine stone lease with mining lease area of 997.08 Ha at Dhannawada, Chinna Venturia, Vaddarala, Bestavemula, Gollapalli and G.Uppalapadu villages in Mylavaram Mandal, YSR District. The expected life time of the mine will be 50 acres. The method of mining considered as open cast mining and the sequence of the operation in quarrying will be drilling, blasting, excavation, loading and transportation. She further informed that during blasting there won't be secondary blasting and they are proposed to use rock breaker for getting small boulders.

With regard to Air quality, Ambient Air Quality monitoring (AAQM) was carried out and analyzed 12 parameters as per the National Ambient Air Quality standard. Results shown that the Ambient Air Quality is well within the National Ambient Air Quality (NAAQ) standards for residential and rural areas.

The industry proposed to provide water sprinkling systems, closed conveyor belts, greenbelt development to control the fugitive emissions. The wastewater containing oil and grease in the mine site work shop will be removed by suitable traps and treated wastewater will be used for dust suppression in the core area. Negligible quantity of oil generated from the workshop will be disposed to through authorized agencies.

With regard to water requirement a quantity of 60 $m^3$/day is required initially for machinery operations, dust suppression and for afforestation. As per analysis and results indicates ground water conforming with the IS 10500 Standards and there is no industrial contamination.

With regard to noise, material handling, movement of vehicle, crushing, blasting, loading, unloading are the main noise generating sources and will be controlled by adopting proper methods.

With regard to CSR activities, the Industry is proposed to spent an amount Rs 2.87 Crores for 10 years and also industry proposed to provide large number of direct employment to the local people.

**Then the District Collector, YSR Dt** requested the public to express their views on the proposed project.

**Smt. G.Venkata Lakshmi W/o. Sri Chandra Sekhar r/o Gollapalli** Opined that none of the speakers spoke earlier have not brought the main demand of the surrounding farmers to the notice of public hearing panel and demanded the management to solve the issue on priority basis.

**Sri Kota Lakshmi Reddy r/o Chinna Vedurla** while speaking on the occasion requested the management to provide proper jobs to the local people, education, medical facilities and also to construct check dams to increase the ground water table.

**Sri Nandyala Venkata Lakshmaiah r/o S.G. Uppalapadu** is requested the District Collector, for taking the responsibility of fulfilling the assurances made by the management of M/s ACC Cement Ltd.,

**Sri Pamilcti r/o Vaddiralla** expressed his un-happiness on filing cases against the farmers for demanding additional compensation. He requested the management to issue proper compensation to the surrounding farmers.

**Sri. Y.Chenna Kesava Reddy r/o T.Sunkesula, an NGO** while speaking on the occasion requested the management to fulfill all promises made by them during land allenation and also requested to take thorough responsibility on the issues of the public.

Then **the District Collector, YSR Dt** while inviting the project proponent to answer the issues raised by the public during public hearing informed that, CSR funds may help for the community development and requested the management to come out of a concrete solution to benefit the local farmers individually after placing this issue in Board's meeting (M/s ACC Cements Ltd) within 3 months.

He also remembered the importance mutual co-operation between the management and the local people and they have work together atleast for 70 years.

**Sri. K. Narayana Rao, Director, M/s. ACC Limited** while answering the issues raised by the public and he answered the following.

1. Industry has not proposed any secondary blasting operations and rock breakers will be used for making smaller boulders.
2. If at all any casualties took place during mining the company will take the responsibility.

3. Industry is proposed to supply the water (mine pit) for farming, drinking and to for surrounding villages.

4. Industry strictly proposed to develop greenbelt of 40% more than 33% of greenbelt as per the regulations of the Government.

5. Industry proposed to develop good greenbelt in consultation of Forest Department, species survive in this area al along the village roads and vacant places of mining area.

6. Industry will close the mine after it's life as per the closure plan according to Indian Bureau of mine.

Then **The District Collector and Chairman of the Environmental Public Hearing Panel** while summed up of the proceedings of the Environmental Public Hearing in vernacular language and he assured the public, that all the opinions/views raised by the public during Environmental Public Hearing will be brought to the notice of Ministry of Environment & Forest, Govt. of India.

He while making the conclusive remarks thanking the public for completing the Environmental Public Hearing in a peaceful manner and made the following few suggestions to the management.

1. Online monitoring systems shall be provided for pollution levels monitoring.

2. Requested the management to take up the CSR activities immediately during the construction stage itself.

3. Establishment of skill development institutes and provide job opportunities to the local public in the industry or Other industry.

4. Requested the management to give written commitment on the promises made by the management during public hearing.

On seeing no more suggestions / objections from the public the District Collector and Chairman of the Environmental Public Hearing was ended the Environmental Public Hearing with vote of thanks by Assistant Environmental Engineer, AP Pollution Control Board, Tirupati.

**A.Narendra Babu,**
Environmental Engineer
&Member Convener,
APPCB, Regional Office,
Tirupati.

**K.V. Satyanarayana,**
Collector & District Magistrate,
Kadapa, YSR District.

Revenue Department

From
Sri K.V. Satyanarayana, I.A.S,
District Collector,
Y.S.R District,
Kadapa-516001.

To
The Environmental Engineer,
A.P. Pollution Control Board,
Regional Office, Tirupathi.

2363
19/10/16

L.Dis. REV-ESECOMNS/35/2016-SA(EZ)-KDPCO dt:06/10/2016

Sir,

Sub:- A.P. Pollution Control Board :- Conduct of public consultation - M/s ACC Limited, Gollapally, Vaddirala and G.Uppalapadu Villages of Mylavaram Mandal - Representation of formers of Gollapally, Vaddirala and G. Uppalapadu Villages of Mylavaram Mandal - Take necessary action - Reg.

Ref:- Government of India, Ministry of Environment, Forests and Climate Change (Regional Office-Chennaiah) Ref. No. F.No. EP/12.1/2016-17/Misc/1/AP/1881, dated: 26-092016.

@@@

It is to inform that the Scientist 'D', Government of India, Ministry of Environment, Forests and Climate Change (Regional Office-Chennaiah) has forwarded copy of representations received from farmers of Gollapally, Vaddirala and G. Uppalapadu Villages of Mylavaram Mandal for taking appropriate action.

I forward herewith the copy of the above reference for taking appropriate action in the above subject matter.

Yours faithfully,
Sd/- BOGINENI ESWARAIAH,
For Collector

Validity unknown
Digitally signed by [illegible]
Eswaraiah
Date: 2016.10.[illegible]
PDT
Reason: Approved

19/10/16

4445/2016/SA(E2)-KDPCO

By Speed Post

F.No.EP/12.1/2016-17/Misc/1/AP/1868
Government of India
Ministry of Environment, Forests and Climate Change
(Regional Office - Chennai)

28 SEP 2016

1st and 2nd floor, HEPC Building,
No.34, Cathedral Garden Road,
Nungambakkam,
Chennai – 600034

E-mail:roefccc1@gmail.com
Tel: 044-28222326

Dated: 26th September, 2016

E E2 Send to the EE APPCB, TPT for necessary 29/9/16

OFFICE MEMORANDUM

Subject: Certain objections against the proposed establishment of Cement factory by M/s ACC Limited, Gollapally, Vaddirala and G.Uppalapadu villages, Mylavaram Mandal, YSR District, Andhra Pradesh – Request to withdraw the proposal of establishment in public interest – Reg.

The undersigned is hereby directed to forward the complaint received from farmers of Gollapally, Vaddirala and G.Uppalapadu villages, Mylavaram Mandal, YSR District, Andhra Pradesh dated 25/08/2016 on the subject cited above for taking action as appropriate.

(Sundar Ramanathan)
Scientist 'D'

Encl: as above

To

The District Collector,
(K.V.Satyanarayen, IAS)
Kadapa District Collector Office,
YSR District – 516001.
Andhra Pradesh.

Copy for information to:-

Shri Lakshmi Narayana, Gollapally Village, Vaddirala Gram Panchayat, Mylavaram Mandal, YSR District, Andhra Pradesh – *with reference to your letter dated 25.8.2016.*

(Sundar Ramanathan)
Scientist 'D'

GTL-28210616

15/28/16

4445/2016/SA(E2)-KDPCO

Hyderabad
Date: 25-08-2016

To
**The Regional Director,**
**Office of the Regional (Southern Zone) Environment,**
**Forest Department,**
Government of India,
Kendriya Sadan, 4th Floor,
Environment and Forest Wings, Koramangala,
BENGULURU - 34

**Respected Sir,**

Sub: Certain objections against the proposed establishment of Cement factory by M/s ACC Ltd., Gollapally, Vaddirala and G.Uppalapadu villages, Mylavaram Mandal, YSR District, A.P. – Request to withdraw the proposal of establishment in public interest – Reg.

********

We, the undersigned farmers of Gollapally village, Vaddirala Gram Panchayat, Dhannawada, Chinnaventurla, Bestaveemula, Uppalapedu villages in Myiavaram mandal, YSR Kadapa district, humbly submit the following few lines for your kind consideration and favourable orders.

That Public opinion has been invited from Andhra Pradesh Pollution Control Board, Tirupathi for environmental objections in the local newspapers on 7-08-2016 for establishment of the proposed cement factory of M/s ACC Ltd., at Gollapally, Vaddirala and G.Uppalapadu villages, Mylavaram Mandal, YSR District.

We submit that we are all small farmers and agricultural labour belong to poor SC, ST and BC (i.e., Reddy, Balija, Yadava, Patra, Mangali, Mala, Madiga, Dudekula, Chakali, Boya, Christian etc.) communities living on cultivation, Cattle, Sheeps and Goats as our occupation.

Contd...2..

In the year 1996 the management of ACC Cement factory visited our Gollapally village and identified heavy deposits of limestone in the village and found the area suitable for establishment of a fullfledged cement factory and asked us to give our agricultural lands. They orally promised to provide employment to our families and also establish school to provide education to our children and hospital for medical facilities if we accepted to their proposal. In accordance with their proposal we, the farmers sold our lands at a cost of Rs. 50,000/- per acre to them in the year 1996. But as per their proposal, they did not built the factory.

Again after 11 years i.e., in the year 2007 they came and wanted to us to give remaining lands also promising to give all the help and assistance as assure in the past. Believing the words of the management we had sold our remaining lands in the year 2007 at a consideration of Rs. 1,25,000/-.

Similarly, during 2009-2010 they asked us to vacate our residential houses in our village promising to pay money for each of the houses in the entire village. Believing the words of ACC Cement management we vacated all our houses and moved our families to different location to facilitate them to take our village for the factory. But as per their assurance, they did not pay any amount in respect of the lands or the houses that we surrendered to them to implement their proposal so far. In this matter since 1996 to 2016, the management of ACC Cement, by continuously making their oral assurances of providing financial benefits to us, have not paid anything, and deceiving us for the last 20 years in the name of false promises and caused huge loss to us.

Contd...3..

All the lands that were surrendered by us to them have become barren lands filled with heavy shrubs and bushes and they cannot be utilized for cultivation. In these circumstances, all our villagers have come to a decision for our live.ihood of our families and worked hard and cleared the shrubs and bushes that were grown in the said lands to bring them into cultivabe lands by spending Rs. 50,000/- to Rs. 75,000/- for each acre. Now the management are again saying to give up our lands for their proposed factory. With the fake promises of the management for the last 20 years, we could not cultivate our lands properly and not provided proper education to our children. In this process, we have faced lot of loss financially and educationally became backward. Taking the help of our illiteracy to their benefit, they have been making false promises and continuously deceiving us and our next generation children also.

We further submit that a cement factory is existing near our villages. When they conducted blasts to obtain limestone most of our houses in our area were got damaged and we are suffering a lot due to the heavy smoke and dust emitted from the factory, which also adversely affected to our lands and they became not useful for cultivation.

In the light of the above facts, if the ACC Cement management builds their factory, our lands and houses will get damaged in huge manner when they conduct blasts to obtain limestone in our area and the emissions of dust and smoke will definitely damage our health and the water also gets polluted, which will cause damage to our cattle and domestic animals apart from heavy noise pollution.

Contd....4..

In view of the all the above facts, we humbly request the Regional Director, Office of the Regional (Soughtern Zone) Environment, Forest Department, Government of India, Kendriya Sadan, 4th Floor, Environment and Forest Wings, Koramangala, Bengaluru, to take appropriate action to fulfill all the promises that were made by the Management of M/s ACC Cement i.e. (1) To provide compensation to the farmers to all the lands surrendered by us in the year 1996 and 2007 as per the present market rates. (2) Payment of the expenses incurred (Rs. 70,000/- per acre) by us for clearing of bushes and shrubs in our lands as explained above. (3) To provide 100% employment guarantee to the children of the farmers, who lost their lands under the proposed factory.

We further request the PCB authorities to provide us the assurance in the form of written agreement from the ACC Cement Management to enable us to relieve our families from our financial crisis and to protect the future of our children, for which act of kindness we shall be ever grateful to you.

If any of the above promises are not fulfilled, kindly take necessary action to cancel the mining permissions of the ACC Cement and also to cancel the grant of permission for establishment of their factory in our village area.

Thanking you Sir,

Yours faithfully,

Villagers of Gollapally village,
Vaddirala Gram Panchayat,
Dhannawada, Chinnaventuria,
Bestavemula, Uppalapadu villages in
Mylavaram mandal,
YSR Kadapa district

1. P. Lakshmi Narayana Gollapalli (V)
2. G. Chandra Sekhar Gollapalli (V)
3. S. [illegible]
4. D. Rama mohan Gollapalli,

AXI-13

1 445/2013(SA(T)2)-KDPCO
2 [illegible]
3 Dakshinamurthy
4 N-[illegible]
5 [illegible]
6 M. [illegible]

Casuals Salary

7 M. V. [illegible]
8 [illegible]
9 D. [illegible]
10 [illegible]
11 [illegible]
12 [illegible]
13 [illegible]
14 V.R.K. Reddy
15 M. DASU
16 [illegible]
17 V. [illegible]
18 [illegible]
19 K. Ravi [illegible]
20 [illegible]
21 [illegible]
22 N. [illegible]
23 [illegible]
24 [illegible]
25 [illegible]
26 [illegible]
27 [illegible]
28 [illegible]
29 [illegible]
30 [illegible]
31 [illegible]
32 [illegible]
33 [illegible]
34 [illegible]
35 [illegible]
36 [illegible]
37 [illegible]
38 [illegible]
39 [illegible]
40 V. Subramanyeswara Rao
41 [illegible]
42 [illegible]
43 N-[illegible]
44 [illegible]
45 [illegible]
46 [illegible]
47 [illegible]
48 [illegible]
49 [illegible]
50 B. P. Obulesu
51 [illegible]
52 [illegible]
53 [illegible]
54 [illegible]
55 [illegible]
56 [illegible]
57 [illegible]
58 [illegible]
59 K. [illegible]
60 [illegible]
61 N. Raghu Rama Naidu
62 [illegible]

Revenue Department

From
Sri K.V. Satyanarayana, I.A.S,
District Collector,
Y.S.R District,
Kadapa-516001.

To
The Environmental Engineer,
A.P. Pollution Control Board,
Regional Office, Tirupathi.

2364
19/10/16

L.Dis.REV-ESECOMNS/36/2016-SA(E2)-KDPCO, dt: 07/10/2016

Sir,

Sub:- A.P. Pollution Control Board - Conduct of public consultation - M/s ACC Ltd.- Representations of farmers of Gollapally, Vaddirala and G. Uppalapadu Villages of Mylavaram Mandal - Take necessary action - Reg.

Ref:- Representation of farmers of Gollapally, Vaddirala and G. Uppalapadu Villages of Mylavaram Mandal.

@@@

Copy of representations received in the reference cited are forwarded for taking necessary action on the above subject.

Yours faithfully,
Sd/-BOGINENI ESWARAIAH,
For Collector

Validity unknown
Digitally signed by Bogineni Eswaraiah
Date: 2016.10.19 14:14:14 PDT
Reason: Approved

19/10/16

4539/2016/SA(E2)-KDPCO

COLLECTOR'S OFFICE - 4 OCT 2016 KADAPA

Gollapally ,G.Uppalapadu(v).
Date : 03-10-2016.

To
The Collector and Magistrate,
YSR Kadapa District,
ANDHRA PRADESH.

Respected Sir,

Sub:- Certain objections against the proposed establishment of Cement Factory by M/s ACC Ltd., Gollapally, Vaddirala and G.Uppalapadu villages, Mylavaram Mandal, YSR District, A.P. – Request to withdraw the proposal of establishment in public interest – Reg.

*******

We, the undersigned farmers of Gollapally village, Vaddirala Gram Panchayath, Dhannawada, Cainnaventurla, Bestavemula, Uppalapadu villages in Mylavaram Mandal, YSR Kadapa District, humbly submit the following few lines for your kind consideration and favourable orders.

That public opinion has been invited from Andhra Pradesh Pollution Control Board, Tirupathi for environmental objections in the local newspapers on 19-09-2016 for establishment of the proposed cement factory of M/s ACC Ltd., at Gollapally, Vaddirala and G.Uppalapadu villages, Mylavaram Mandal, YSR District.

We submit that we are all small farmers and agricultural labour belong to poor SC, ST and BC(i.e., Reddy, Balija, Yadava, Patra, Mangali, Mala, Madiga, Dudekula, Chakali, Boya, Christian etc.) communities living on cultivation, Cattle, Sheeps and Goats as our occupation.

Contd...2

In the year 1996 the management of ACC Cement factory visited our Gollapally village and identified heavy deposits of limestone in the village and found the area suitable for establishment of a fullfledged cement factory and asked us to give our agricultural lands. They orally promised to provide employment to our families and also establish school to provide education to our children and hospital for medical facilities if we accepted to their proposal. In accordance with their proposal we, the farmers sold our lands at a cost of Rs. 50,000/- per acre to them in the year 1996. But as per their proposal, they did not built the factory.

Again after 11 years i.e., in the year 2007 they came and wanted to us to give remaining lands also promising to give all the help and assistance as assure in the past. Believing the words of the management we had sold our remaining lands in the year 2007 at a consideration of Rs. 1,25,000/-.

Similarly, during 2009-2010 they asked us to vacate our residential houses in our village promising to pay money for each of the houses in the entire village. Believing the words of ACC Cement management we vacated all our houses and moved our families to different location to facilitate them to take our village for the factory. But as per their assurance, they did not pay any amount in respect of the lands or the houses that we surrendered to them to implement their proposal so far. In this matter since 1996 to 2016, the management of ACC Cement, by continuously making their oral assurances of providing financial benefits to us, have not paid anything, and deceiving us for the last 20 years in the name of false promises and caused huge loss to us.

Contd....3..

: 3 :

All the lands that were surrendered by us to them have become barren lands filled with heavy shrubs and bushes and they cannot be utilized for cultivation. In these circumstances, all our villagers have come to a decision for our livelihood of our families and worked hard and cleared the shrubs and bushes that were grown in the said lands to bring them into cultivable lands by spending Rs. 50,000/- to Rs. 75,000/- for each acre. Now the management are again saying to give up our lands for their proposed factory. With the fake promises of the management for the last 20 years, we could not cultivate our lands properly and not provided proper education to our children. In this process, we have faced lot of loss financially and educationally became backward. Taking the help of our illiteracy to their benefit, they have been making false promises and continuously deceiving us and our next generation children also.

We further submit that a cement factory is existing near our villages. When they conducted blasts to obtain limestone most of our houses in our area were got damaged and we are suffering a lot due to the heavy smoke and dust emitted from the factory, which also adversely affected to our lands and they became not useful for cultivation.

In the light of the above facts, if the ACC Cement management builds their factory, our lands and houses will get damaged in huge manner when they conduct blasts to obtain limestone in our area and the emissions of dust and smoke will definitely damage our health and the water also gets polluted, which will cause damage to our cattle and domestic animals apart from heavy noise pollution.

Contd 4

-:4:-

In view of the all the above facts, we humbly request the authorities of The Collector, YSR Kadapa District to take appropriate action to fulfil all the promises that were made by the Management of M/s ACC Cement i.e., (1) R&R Special Package in Gollapalle to G. Uppalapadu to provide house compensation to the farmers to all the lands surrendered by us in the year 1996 and 2007 as per the present market rates. (2) Payment of the expenses incurred (Rs. 70,000/-per acre) by us for clearing of bushes and shrubs in our lands as explained above. (3) To provide 100% employment guarantee to the children of the farmers, who lost their lands under the proposed factory.

We further request the PCB authorities to provide us the assurance in the form of written agreement from the ACC Cement Management to enable us to relieve our families from our financial crisis and to protect the future of our children, for which act of kindness we shall be ever grateful to you.

If any of the above promises are not fulfilled, kindly take necessary action to cancel the mining permission of the ACC Cement and also cancel the grant of permission for establishment of their factory in our village area.

Thanking you Sir,

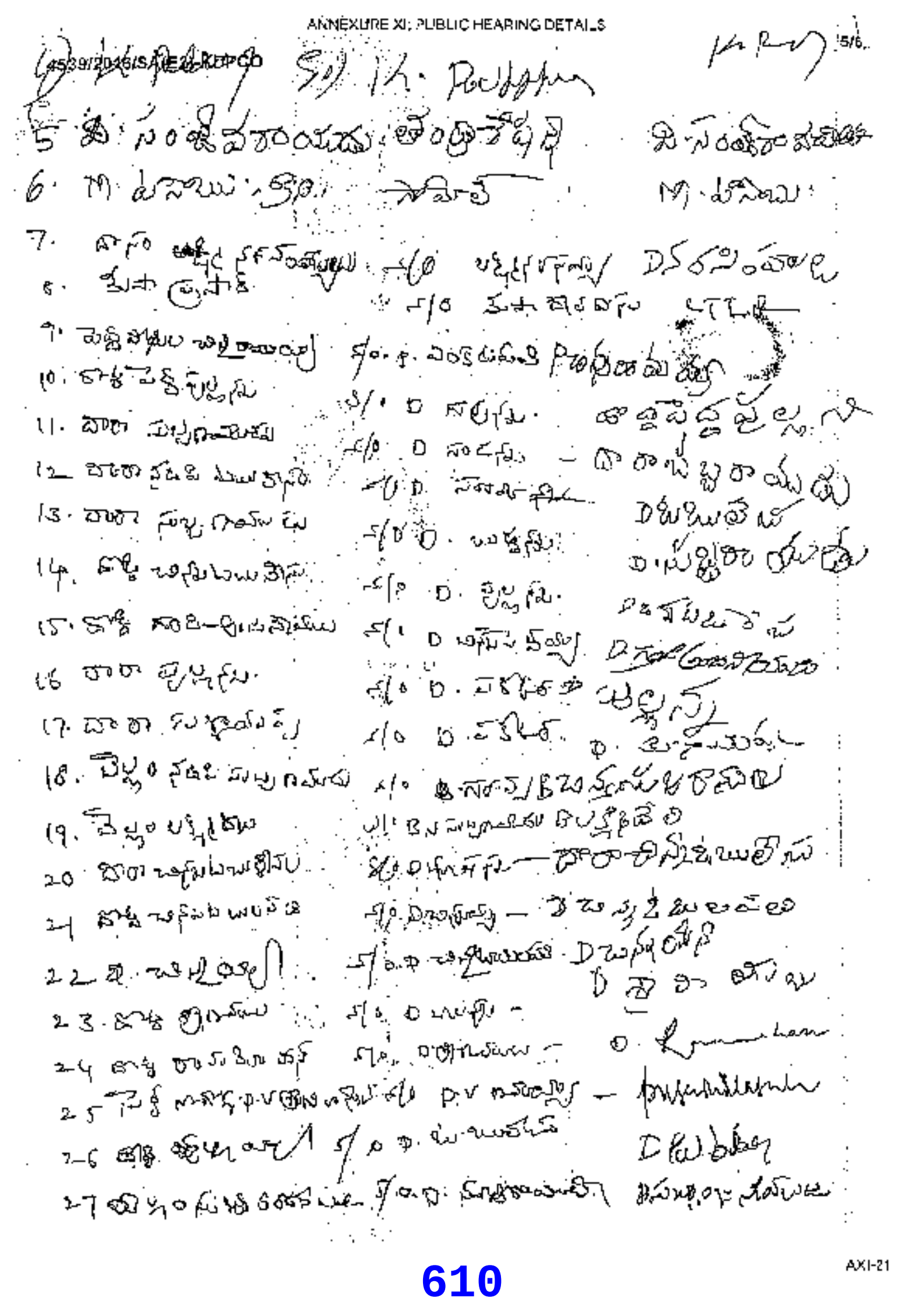
Yours faithfully,

Villagers of Gollapally village,
G. Uppalapadu village in
Mylaveram mandal,
YSR Kadapa district.

1. P. Lakshmi Narayana
2. D. Rama mohan
3. G. [illegible]

Copy to :

1. Andhra Pradesh Pollution Control Board, Tirupathi.
2. The Superintendent of Police, YSR Kadapa District.



4639/2016/SE(EA)/KDPCG and Lemuru D. Lakshmi Narayana D.B. Narayana Reddy

2 [illegible]

3 [illegible]

3 [illegible]

3 [illegible]

33 K. Shivaram Reddy S/o. Chinna Ramaiah

34 [illegible]

35 [illegible]

36 [illegible]

37 [illegible]

38 [illegible]

39 [illegible]

41 [illegible]

42 M. [illegible]

43 M. Narayanaswamy Reddy S/o Nanjayya Reddy

44. V. Subramanyam Achari S/o.

45. A. [illegible]

46 [illegible]

47 Gr. Sharif Saud S/o G. [illegible]

48 [illegible]

49 Chinnakkadapuram w/o Chandrakhar

50 A. Chandra Sekhar Reddy S/o Ramakrishna Reddy

51 M. Joseph S/o M. Abraham

2384
20/10/16

Gollapally ,G.Uppalapadu(vi).
Date : 08-10-2016.

To
**The Environmental Engineer,**
Andhra Pradesh Pollution Control Board,
Regional Office,
S.T. Road,
TIRUPATHI – 517 502

**Respected Sir,**

Sub:- Certain objections against the proposed establishment of Cement Factory by M/s ACC Ltd., Gollapally, Vaddirala and G.Uppalapadu villages, Mylavaram Mandal, YSR District, A.P. – Request to withdraw the proposal of establishment in public interest – Reg.

********

We, the undersigned farmers of Gollapally village, Vaddirala Gram Panchayath, Dharmawada, Chinnaventuria, Bestavemula, Uppalapadu villages in Mylavaram Mandal, YSR Kadapa District, humbly submit the following few lines for your kind consideration and favourable orders.

That public opinion has been invited from Andhra Pradesh Pollution Control Board, Tirupathi for environmental objections in the local newspapers on 19-09-2016 for establishment of the proposed cement factory of M/s ACC Ltd., at Gollapally, Vaddirala and G.Uppalapadu villages, Mylavaram Mandal, YSR District.

We submit that we are all small farmers and agricultural labour belong to poor SC, ST and BC(i.e., Reddy, Balija, Yadava, Patra, Mangali, Mala, Madiga, Dudekula, Chakali, Boya, Christian etc.) communities living on cultivation, Cattle, Sheeps and Goats as our occupation.

Contd...2

In the year 1996 the management of ACC Cement factory visited our Gollapally village and identified heavy deposits of limestone in the village and found the area suitable for establishment of a fullfledged cement factory and asked us to give our agricultural lands. They orally promised to provide employment to our families and also establish school to provide education to our children and hospital for medical facilities if we accepted to their proposal. In accordance with their proposal we, the farmers sold our lands at a cost of Rs. 50,000/- per acre to them in the year 1996. But as per their proposal, they did not built the factory.

Again after 11 years i.e., in the year 2007 they came and wanted to us to give remaining lands also promising to give all the help and assistance as assure in the past. Believing the words of the management we had sold our remaining lands in the year 2007 at a consideration of Rs. 1,25,000/-.

Similarly, during 2009-2010 they asked us to vacate our residential houses in our village promising to pay money for each of the houses in the entire village. Believing the words of ACC Cement management we vacated all our houses and moved our families to different location to facilitate them to take our village for the factory. But as per their assurance, they did not pay any amount in respect of the lands or the houses that we surrendered to them to implement their proposal so far. In this matter since 1996 to 2016, the management of ACC Cement, by continuously making their oral assurances of providing financial benefits to us, have not paid anything and deceiving us for the last 20 years in the name of false promises and caused huge loss to us.

Contd....3..

All the lands that were surrendered by us to them have become barren lands filled with heavy shrubs and bushes and they cannot be utilized for cultivation. In these circumstances, all our villagers have come to a decision for our livelihood of our families and worked hard and cleared the shrubs and bushes that were grown in the said lands to bring them into cultivable lands by spending Rs. 50,000/- to Rs. 75,000/- for each acre. Now the management are again saying to give up our lands for their proposed factory. With the fake promises of the management for the last 20 years, we could not cultivate our lands properly and not provided proper education to our children. In this process, we have faced lot of loss financially-and-educationally became backward. Taking the help of our illiteracy to their benefit, they have been making false promises and continuously deceiving us and our next generation children also.

We further submit that a cement factory is existing near our villages. When they conducted blasts to obtain limestone most of our houses in our area were got damaged and we are suffering a lot due to the heavy smoke and dust emitted from the factory, which also adversely affected to our lands and they became not useful for cultivation.

In the light of the above facts, if the ACC Cement management builds their factory, our lands and houses will get damaged in huge manner when they conduct blasts to obtain limestone in our area and the emissions of dust and smoke will definitely damage our health and the water also gets polluted, which will cause damage to our cattle and domestic animals apart from heavy noise pollution.

Contd....4..

In view of the all the above facts, we humbly request the authorities of Andhra Pradesh Pollution Control Board, Tirupathi to take appropriate action to fulfill all the promises that were made by the Management of M/s ACC Cement i.e., (1) R&R Special Package in Gollapalle to G. Uppalapadu to provide house compensation to the farmers to all the lands surrendered by us in the year 1996 and 2007 as per the present market rates. (2) Payment of the expenses incurred (Rs. 70,000/-per acre) by us for clearing of bushes and shrubs in our lands as explained above. (3) To provide 100% employment guarantee to the children of the farmers, who lost their lands under the proposed factory.

We further request the PCB authorities to provide us the assurance in the form of written agreement from the ACC Cement Management to enable us to relieve our families from our financial crisis and to protect the future of our children, for which act of kindness we shall be ever grateful to you.

If any of the above promises are not fulfilled, kindly take necessary action to cancel the mining permission of the ACC Cement and also cancel the grant of permission for establishment of their factory in our village area.

Thanking you Sir,

Yours faithfully,

Villagers of Gollapally

village,

G. Uppalapadu village in
Mylavaram mandal,
YSR Kadapa district.

P Lakshmi Devi
Gollapalle

Copy to :

1. The Collector, YSR Kadapa District,
2. The Superintendent of Police, YSR Kadapa District. K Rammohan

వద్దిరాల,
తేది :

గౌరవనీయశ్రీ ఆంధ్రప్రదేశ్ కాలుష్య నియంత్రణ మండలి పర్యావరణ ఇంజనీరు సారి దివ్య సన్నిధికి
తమరి విధేయులు, ఎసిసి భూ బాధితులు విషయముతో రాసుకొను మనవి ఏమనగా!

2360
19/10/16

అయ్యా !

అసోసియేటెడ్ సిమెంటు కంపెనీస్ (ఎసి.సి లిమిటెడ్) అను సంస్థ వైయస్.ఆర్ జిల్లా,మైలవరం మండలం వద్దిరాల, గొల్లపల్లి, జి.ఉప్పలపాడు, దున్న వెంకట్లపల్లి, దొన్నేపాడు, భుజంగాలపల్లె గ్రామాల్లో 1996 వ సంవత్సరం నుంచి 2010 సంవత్సరం వరకు విడతల వారీగా దాదాపు 3000 ఎకరాల భూమిని రైతుల నుండి కొనుగోలు చేసింది. 20 ఏళ్ళ నుంచి రైతుల పంట పొలాలను కొంటూనే ఉన్న ఎసిసి లిమిటెడ్ నేటికి ఫ్యాక్టరీ నిర్మించక పోవడం విచారకరం. ఇప్పటికైనా ఫ్యాక్టరీ నిర్మిస్తారన్న ఆశ మాకు లేదు. కేవలం కల్లిబొల్లి కబుర్లు చెప్పి, మరింత కాలయాపన చేసి రైతుల నోట్లో మన్ను కొట్టడానికి ఎసిసి లిమిటెడ్ ప్రయత్నిస్తోంది తప్ప నిజంగా చిత్తశుద్ధితో ఫ్యాక్టరీ నిర్మాణానికి ముందుకు రావడం లేదు.

వచ్చేవానికి 20 ఏళ్ళ క్రితమే ఎసిసి లిమిటెడ్ ఇక్కడ భూములు కొంటున్నప్పుడు మేము ఎంతగానో సంతోషించాము. భూములు కోల్పోయిన మాకు, మా పిల్లలకు ఫ్యాక్టరీలో ఉపాధి లభిస్తుందని మా ఆశలను అడియాశలు చేస్తూ కనీసం పునాది రాయి కూడా వేయకుండా ఎసిసి లిమిటెడ్ నాన్చుడు ధోరణితో వ్యవహరిస్తూ వచ్చింది. సంస్థ కొనుగోలు చేసిన భూములు బీడుగా మారి, అందులో దివ్వెగా తంపచెట్లు పెరిగి, ప్రక్కనే ఉన్న పంట పొలాలకు తీవ్ర ఇబ్బంది కలిగిస్తూ ఉండేవి.

ఎసిసి ఫ్యాక్టరీ వారు భూగర్భ గనుల్నులనకు చెట్లను ఫ్యాక్టరీకి ముందే ఏర్పాటు చేయాలి. ఫ్యాక్టరీ వారు త్రవ్వకాలు జరుపునపుడు డ్రిల్లింగ్ బ్లాస్టింగ్ చేస్తే గ్రామాలలో ఇల్లు నేరలు చీలే అవకాశం ఉంది. అంతేకాక ఏత ఇల్లు కూలిపోతాయి. అలాజరిగితే ప్రస్తుత రేట్ల ప్రకారం నష్టపరిహారం చెల్లించటానికి వ్రాతపూర్వకంగా ఇవ్వవలెను. ధ్వని కాలుష్యనియంత్రణ చర్యలు పాటించాలి. గ్రామాలలో కాలుష్యంకారణంగా చాలా రకాలుగా నష్టపోయే ప్రమాదం ఉన్నది. వాటిని నివారించడానికి అన్ని విధములుగా సిద్ధంగా ఉండాలి. కమ్యూనిటి డెవలప్‌మెంట్ సాంఘీక కార్యకలాపాలు అయిన నీటి సదుపాయాలు, ఆరోగ్యపరమైన వంటి సౌకర్యాలు కల్పించాలి. ప్రభుత్వం అనుమతించిన వేళలలోనే బ్లాస్టింగ్ చేయాలి. కాలుష్యం కారణంగా అనారోగ్యానికి గురియితే వైద్యసదుపాయం ఉచితంగా కల్పించాలి. వాతావరణ కాలుష్యం కాకుండా ఉండేవిధంగా నియంత్రణాచర్యలు చేపట్టాలి. అని నిర్భయంగా వ్రాతపూర్వకంగా మాకు ఇవ్వాలి. రైతుల సంక్షేమము దృష్ట్యా అన్ని గ్రామాలను దత్తత తీసుకోవలెను.

19/10/16
ఈ నేపథ్యంలో మేము అనేక మారులు హెచ్చరికలు చేసిన తర్వాత కూడా ఫ్యాక్టరీ నిర్మాణానికి ఎసిసి లిమిటెడ్ ఏ మాత్రం ముందుకు రాకపోవడంతో భూములు కోల్పోయి ఎలాంటి ఉపాధి లేక ఖాళీగా ఉన్న మేము..... ఏపుగా పెరిగిన తంపచెట్లను తొలగించి అనేక వ్యయ ప్రయాసలు కోర్చి గత ఐదేళ్ళుగా ఆ భూములను సాగు చేసుకుంటున్నాము. ఇన్నేళ్ళ తర్వాత కళ్ళు తెరిచిన ఎసిసి లిమిటెడ్ ఇప్పుడు ఫ్యాక్టరీ నిర్మించబోతున్నామని అందుకోసం పర్యావరణ ప్రజాభిప్రాయ సేకరణ కార్యక్రమాన్ని తమరు ఉద్యోగా పత్రికా ప్రకటన ఇప్పించింది. కానీ గత ఇరవై ఏళ్ళుగా ఎసిసి లిమిటెడ్ నాన్చుడు ధోరణి వల్ల ఎన్నో

కన్నగన్నాలు ఎదుర్కొన్న భూతో కూడు మాత్రమైనా చెప్పకుండా పత్రికా ప్రకటన ఇవ్వించడం శోచనీయం. ప్రస్తుత రేట్ల ప్రకారం ఎకరాకు భూమికోల్పోయిన ప్రతి రైతుకు అధనంగా ప్రశాపలం చెల్లించాలి. భూములు ధ్వనుగోలు విషయంలో ఎ.సి.సి యాజమాన్యానికి మాకు గతంలో ఎన్ని సమస్యలు పెండింగులో ఉన్నాయి. కొత్తగా ఎ.సి.సి లిమిటెడ్ భూములు కోల్పోయిన బాధిత రైతులతో సర్వలు జరిపిన తర్వాతే తమకు పర్యావరణ ప్రజాభిప్రాయ సేకరణ జరిపితే సముచితంగా ఉంటుందని బాధ్యతాయుతంగా తమరికి విన్నవించుకుంటున్నాం. అన్ని తెలిసిన పెద్దలు భూ బాధితుల పట్ల సానుభూతితో స్పందిస్తారని మేము కొరుకుంటున్నాము.

అనేక నమస్కారములతో

ఇట్లు తమ విధేయులు

ఎసిసి భూ బాధితులు,
పద్దరాల, గొల్లపల్లె, జి.ఉప్పలపాడు,
చిన్నవెంకుర్లు, పెన్నవేముల, బి.తంగుటూరు.
గ్రామాల రైతులు.
మైలవరం మండలం
వైయస్.ఆర్ జిల్లా

Y Subbareddy

K Venkata Reddy

V Somasekhar Reddy

K Obulesu

Aruna Kiran Reddy

A Babu Reddy

Chandrasekhar Reddy

10

A.C.C భూనిర్వాసితులు.

| | | తండ్రి పేరు |
|---|---|---|
| 1 | K. Sheshagiri Reddy | S/o [illegible] |
| 2 | V Pamulety. | S/o [illegible] |
| 3 | D వీరాంజనేయులు | S/o [illegible] |
| 4 | B చిన్నపుల్లారెడ్డి | S/o [illegible] |
| 5 | వేలుపుల వెంకయ్య | [illegible] |
| 6 | పి. సంజీవ వెంకయ్య | పి. [illegible] |
| 7 | M. Narasimha Reddy | S/o M. [illegible] |
| 8 | Venkatasiva Reddy | S/o [illegible] |
| 9 | M. బాలకోటి రెడ్డి | S/o M. వెంకటకొండారెడ్డి |
| 10 | P. Sreenivasulu | S/o. P. [illegible] |
| 11 | దుద్దేనహాళ్ రామాంజి | దానిరొద్దుల పుల్లన్న |
| 12 | Hanumanthu Reddy | S/o S Hanumanthu Reddy |
| 13 | చక్రపాణి | S/o. [illegible] |
| 14 | P. Sreenivasulu | S/o. P. [illegible] |
| 15 | M. వెంకటసుబ్బారెడ్డి | S/o K. వెంకటరామిరెడ్డి |
| 16 | [illegible] | S/o [illegible] |
| 17 | P. [illegible] | S/o [illegible] |
| 18 | రామక్క | w/o లక్ష్మయ్య |
| 19 | [illegible] | S/o [illegible] |
| 20 | [illegible] | S/o [illegible] |
| 21 | M. ఉప్పర నారాయణ | S/o [illegible] |
| 22 | G. Ramachandra Reddy | S/o. G. Hanumanthu Reddy |

ACC లోని నివాసితులు – వివరాలు

1. [illegible] s/o Venkata [illegible]
2. [illegible] s/o [illegible]
3. V. [illegible] s/o [illegible]
4. [illegible]
5. P. [illegible] s/o [illegible]
6. K. [illegible]
7. [illegible] s/o. [illegible]
8. P. Tirupathaiah
9. K. [illegible] s/o [illegible]
10. S. [illegible] s/o [illegible]
11. K. Anjaiah s/o. Singaiah
12. [illegible]
13. S. [illegible] s/o [illegible]
14. [illegible]
15. [illegible]

16. [illegible]
17. [illegible]
18. [illegible]

19. [illegible] s/o [illegible]
20. [illegible] s/o [illegible]
21. [illegible]

24 W/o. M. చిన్నయ్య

25 M. శ్రీనివాస్ S/o M.P. రాంరెడ్డి

26 M. రాజిరెడ్డి

27 పుల్లయ్యగారి S/o M.P. వెంకటరెడ్డి W/o K. వెంకమ్మ.

28 L.T.Ent T. నరసింహ W/o T. లక్ష్మమ్మ

W/o B. మాణిక్యమ్మ

L.T.Ent B. వీరన్న

29 పుట్టుగుర్తులు S/o. V. నర్సిరెడ్డి

30

31 D. నారాయణ S/o. పాపయ్య.

32 D. శ్రీనివాసులు S/o. నాగయ్య

33 B. రాజేశ్వర్ S/o. S. యాదగిరి

34 P. Nani Krishna son of P. Peda Ramaiah

35 K. రాజు లేదా S/o K. పుల్లయ్య

36 A. కాసుకొండారెడ్డి S/o. M. వెంకటరామిరెడ్డి.

37 పాండురంగ మల్లయ్య భూపతి S/o. G. వెంకటయ్య

38 G. రుక్మమ్మ S/o G. మోహన్

39 T. రామనర్సమ్మ W/o. గోపిరెడ్డిపల్లి

40 K. ప్రేమలతదేవి W/o K. శ్రీనివాస్

41 A. వెంకటస్వామి S/o. రామాంజనేయులు

42 T. చంద్రశేఖర్ నాగమోహన్ S/o. T. పెద్ద వెంకట్ రెడ్డి

S/o. D. నరసింహులు గుర్తులు

43 D. Lakshmaiah

44 B. జయమ్మ S/o B. మల్లేశం

45 N. వెంకటేశ్వర్లు S/o - N. [illegible]

46 B. RAMAMOHAN S/o B. నరసింహులు

47 M. Ruku S/o. B.K. వెంకన్న

48 N. సరోజారెడ్డి S/o. N. బాలిరెడ్డి.

49 [illegible] S/o [illegible]

50 A. [illegible] S/o [illegible]

51 [illegible]

52 M. [illegible] S/o M. [illegible]

53 [illegible]

54 D. Kasinath D. Kasinath

55 [illegible] S/o [illegible]

56 S Reddy S/o. Chinna Hussain Reddy

57 MK. [illegible] S/o: [illegible]

58 D [illegible]

59 D. Ramulu S/o [illegible]

60 D [illegible] S/o. D. [illegible]

61 [illegible] S/o. D. [illegible]

62 [illegible]

63 [illegible] S/o [illegible]

64 [illegible] S/o. D. [illegible]

65 [illegible] S/o [illegible]

66 D [illegible] S/o. D. [illegible]

67 [illegible] S/o. [illegible]

70 V. [illegible]

71 V. Narasimhulu [illegible] S/o V. [illegible]

72 Mr. [illegible] S/o Ammanna.

73 D. [illegible] S/o. [illegible]

74 D. [illegible] S/o D. [illegible]

75 [illegible] S/o. [illegible]

76 D. [illegible] S/o. D. [illegible]

S/o. [illegible]

77 D. [illegible]

78 [illegible] S/o. M. [illegible]

79 [illegible] S/o. [illegible]

80 [illegible] W/o. [illegible]

81 [illegible] S/o. [illegible]

82 C. [illegible] S/o. C. N. [illegible]

83 [illegible] W/o. [illegible]

84 D. [illegible] S/o. [illegible]

85 [illegible] S/o. M. [illegible]

86 [illegible] S/o. K. [illegible]

87 [illegible] [illegible]

88 [illegible] [illegible]

ACC భూనిర్వాసితులు - ఈ వివరాలు

1. పెండ్యాల శ్రీనివాసులు S/o. కంబన్న.
2. S. సంధ్య వెంకటమ్మలు S/o పాగాలయ్య.
3. బంక ఉపేంద్ర S/o పోచయ్య
4. M. గణేషరావు S/o పెద్దన్న.

N. కనకయ్య
N. శివ
N. లక్ష్మన్న
M. లక్ష్మీనరసయ్య

S/o. బుచ్చిన్న
S/o. కాంచన్న
S/o. నరసింహులు

11. ఇల్లా సుబ్బారావు S/o పెద్దయ్య
12. C. కోటేష్ S/o సుబ్బరాజు
13 మరియు ఇంకా చాలామంది ఇళ్ళు చాలా సంవత్సరాల నుండి

14. N. Srinivasulu S/o N.P రాజన్న.
15. N. V. Krishnam. S/o. N.P Ramanna
16. N.P. Ramanna. S/o N.P. Ramanna.
17. N.C. రామచంద్ర S/o. N.P Ramanna
18. N. లక్ష్మయ్య. S/o N.C Ramanna
19. N. వెంకటరమణ. S/o N.C Ramanna.

E.E, APPCB - Tirupati

Hyderabad
Date: 25-08-2016

The Collector and Magistrate,
Y.S.R. Kadapa District,
KADAPA.

2362 19/10/16

Respected Sir,

Sub: Certain objections against the proposed establishment of Cement factory by M/s. ACC Ltd., Gollapally, Vaddirala and G.Uppalapadu villages, Mylavaram Mandal, YSR District, A.P. – Request to withdraw the proposal of establishment in public interest – Reg.

********

We, the undersigned farmers of Gollapally village, Vaddirala Gram Panchayat, Dhannawada, Chinnaveniurla, Bestavemula, Uppalapadu villages in Mylavaram mandal, YSR Kadapa district, humbly submit the following few lines for your kind consideration and favourable orders.

That Public opinion has been invited from Andhra Pradesh Pollution Control Board, Tirupathi for environmental objections in the local newspapers on 17-08-2016 for establishment of the proposed cement factory of M/s ACC Ltd., at Gollapally, Vaddirala and G.Uppalapadu villages, Mylavaram Mandal, YSR District.

We submit that we are all small farmers and agricultural labour belong to poor SC, ST and BC (i.e., Reddy, Balija, Yadava, Patra, Mangali, Mala, Madiga, Dudekula, Chakali, Boya, Christian etc.) communities living on cultivation, Cattle, Sheeps and Goats as our occupation.

Contd...2..

19/10/16

RR147964566
22/8/16

In the year 1996 the management of ACC Cement factory visited our Gollapally village and identified heavy deposits of limestone in the village and found the area suitable for establishment of a fullfledged cement factory and asked us to give our agricultural lands. They orally promised to provide employment to our families and also establish school to provide education to our children and hospital for medical facilities if we accepted to their proposal. In accordance with their proposal we, the farmers sold our lands at a cost of Rs. 50,000/- per acre to them in the year 1996. But as per their proposal, they did not built the factory.

Again after 11 years i.e., in the year 2007 they came and wanted to us to give remaining lands also promising to give all the help and assistance as assure in the past. Believing the words of the management we had sold our remaining lands in the year 2007 at a consideration of Rs. 1,25,000/-.

Similarly, during 2009-2010 they asked us to vacate our residential houses in our village promising to pay money for each of the houses in the entire village. Believing the words of ACC Cement management we vacated all our houses and moved our families to different location to facilitate them to take our village for the factory. But as per their assurance, they did not pay any amount in respect of the lands or the houses that we surrendered to them to implement their proposal so far. In this matter since 1996 to 2016, the management of ACC Cement, by continuously making their oral assurances of providing financial benefits to us, have not paid anything and deceiving us for the last 20 years in the name of false promises and caused huge loss to us.

Contd....3..

All the lands that were surrendered by us to them have become barren lands filled with heavy shrubs and bushes and they cannot be utilized for cultivation. In these circumstances, all our villagers have come to a decision for our livelihood of our families and worked hard and cleared the shrubs and bushes that were grown in the said lands to bring them into cultivable lands by spending Rs. 50,000/- to Rs. 75,000/- for each acre. Now the management are again saying to give up our lands for their proposed factory. With the fake promises of the management for the last 20 years, we could not cultivate our lands properly and not provided proper education to our children. In this process, we have faced lot of loss financially and educationally became backward. Taking the help of our illiteracy to their benefit, they have been making false promises and continuously deceiving us and our next generation children also.

We further submit that a cement factory is existing near our villages. When they conducted blasts to obtain limestone most of our houses in our area were got damaged and we are suffering a lot due to the heavy smoke and dust emitted from the factory, which also adversely affected to our lands and they became not useful for cultivation.

In the light of the above facts, if the ACC Cement management builds their factory, our lands and houses will get damaged in huge manner when they conduct blasts to obtain limestone in our area and the emissions of dust and smoke will definitely damage our health and the water also gets polluted, which will cause damage to our cattle and domestic animals apart from heavy noise pollution.

Contd....4..

In view of the all the above facts, we humbly request the Collector, YSR Kadapa district to take appropriate action to fulfil all the promises that were made by the Management of M/s ACC Cement i.e., (1) To provide compensation to the farmers to all the lands surrendered by us in the year 1996 and 2007 as per the present market rates. (2) Payment of the expenses incurred (Rs. 70,000/- per acre) by us for clearing of bushes and shrubs in our lands as explained above. (3) To provide 100% employment guarantee to the children of the farmers, who lost their lands under the proposed factory.

We further request the PCB authorities to provide us the assurance in the form of written agreement from the ACC Cement Management to enable us to relieve our families from our financial crisis and to protect the future of our children, for which act of kindness we shall be ever grateful to you.

If any of the above promises are not fulfilled, kindly take necessary action to cancel the mining permissions of the ACC Cement and also to cancel the grant of permission for establishment of their factory in our village area.

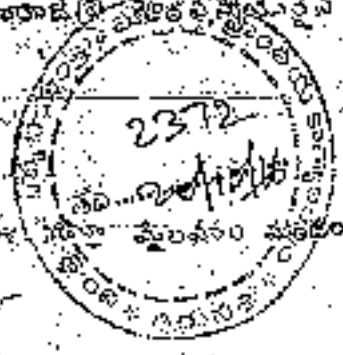
Thanking you Sir,

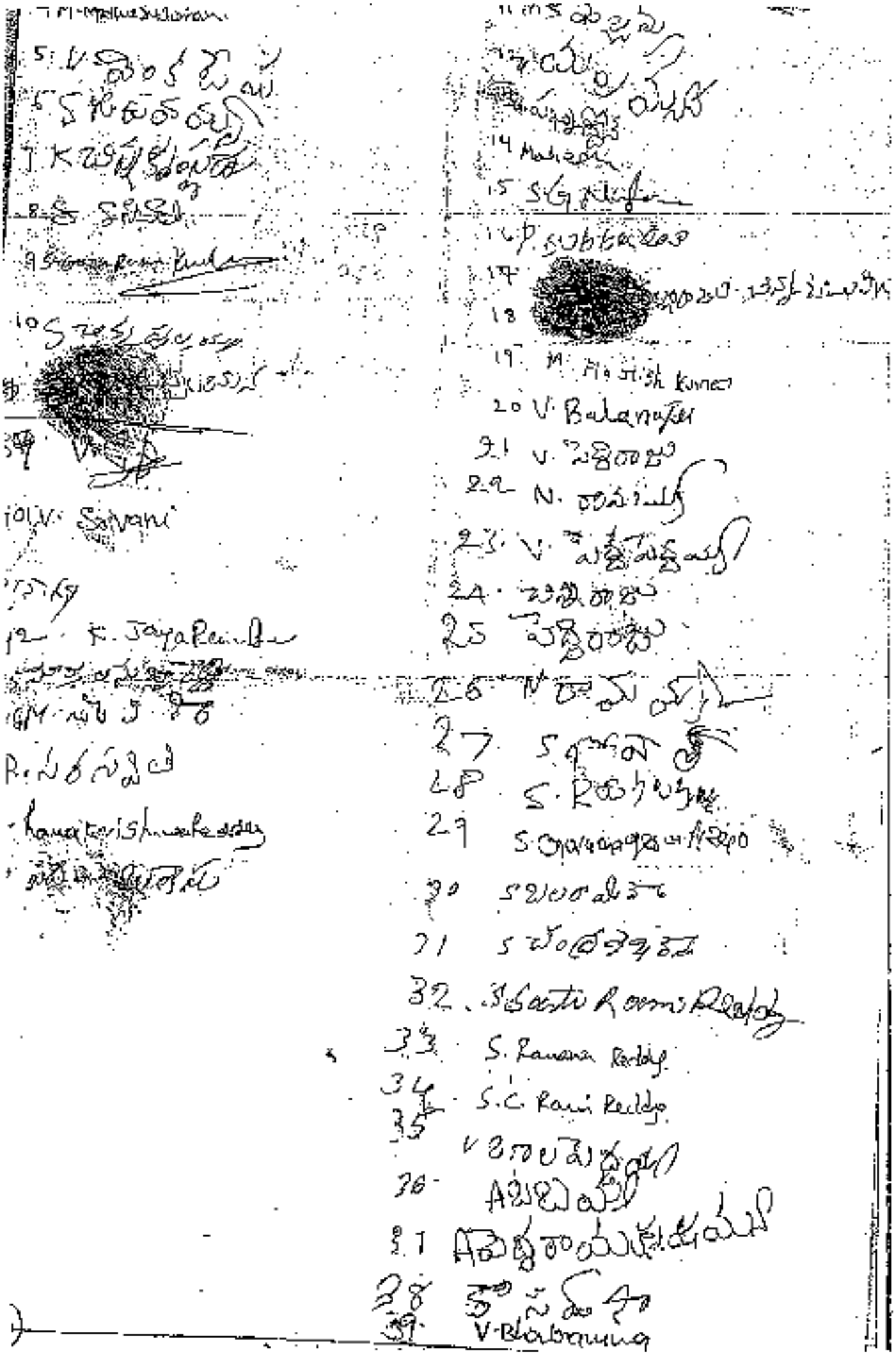
Yours faithfully,

Villagers of Gollapally village,
Vaddirala Gram Panchayat,
Dhannawada, Chinnaventurla,
Bestavemula, Uppalapadu villages in
Mylavaram mandal,
YSR Kadapa district

1. P. Lakshmi Narayana (Gollapalli)
2. G. Chandra Sekhar Gollapalli
3. S. [illegible]
4. O. Ramamohan Gollapalli

5 V
6
7. D. Lakshmaiah
8
9
10. M.
11
12. V.
13
14 D.
15. D
16
17
18
19 C VRK Reddy
20 M. DBA
21
22
23 V. Ramadurgaiah
24
25 K. Ravi Kumar
26
27 V.
28 N. Venkateswarlu
29
30
31
32
33
34
35
36 D. Jayaramudu
37 K
38
39
40 V. Subramanyam Adapa
41
42 N
43 N
44 N.
45
46
47
48
49
50
51
52
53 T
54 D
55
56 K.
57 K.
58
59 D.
60
61 V. Raghu Rama Naidu
62.





AXI-44

8/7/16

— ఆంధ్రప్రదేశ్ కాలుష్య నియంత్రణ మండలి గారికి, తిరుపతి

గౌరవనీయులైన ఏ.సి.సి.రాజమాన్యం గారికి,

అయ్యా!

కడప జిల్లా మైలవరం మండలం చిన్నవెంతుర్ల గ్రామరైతులు ప్రాసుకున్న విన్నపము,

1. పెద్దవంతుర్ల దాన తారురోడ్డు వరకు భూమిని కొనవలెను (నంక వరకు).
2. ఎకరాకు ఇప్పుడు కొన్న భూమికి రూ.15,00,000/- వున్న భూమిని కొనుగోలు చేయవలెను.
3. భూమిని కోల్పోయిన వారికి ఉద్యోగము చదువును బట్టి మరియు చదువులేనివారికి ఉపాధి కల్పించవలెను. ఈ విషయములను ఎ.సి.సి.లెటరు ప్యాడ్ మీద లిఖితపూర్వకముగా ప్రాయవలెను.
4. భూమిని కోల్పోయిన వారికి స్థానికులకు వాహనాలు మరియు మిషనరీలు, కాంట్రాక్ట్ పనులు స్థానికులకు ఇవ్వవలెను.
5. రూ.50,000/- మరియు రూ.1,25,000/- పోయిన భూమికి వారికి రూ.4,00,000/- రేటుతో కల్పించవలెను.
6. గ్రామంలో విద్య మరియు వైద్యము మరియు స్త్రీలకు పారిశుధ్యము మరియు గోశాల పెంపకం ఆర్థిక సహాయం చేయవలెను.
7. ఫ్యాక్టరీ మొదట పెట్టువరకు కొన్న భూములు రైతులు పండించుకొనవలెను.
8. ఏ.సి.సి.సిమెంట్ ఫ్యాక్టరీ త్వరగా కట్టమని కోరికలు తీర్చవలెను.
9. మేము ఏ.సి.సి ఫ్యాక్టరీకి రావడానికి స్వాగతిస్తున్నాము. మాకు ఎలాంటి అభ్యంతరము లేదు ఫ్యాక్టరీని తొందరగా కట్టవలెను.
10. మైనింగ్స్ వలన ఇళ్లులకు ముడలగు వారికి నష్టము కలుగకుండా చూడవలెను.

8/7/16

ఇట్లు,

గ్రామ రైతులు

Date
8.7.2016

2375

గౌరవనీయులైన: AP కాలుష్య నియంత్రణ మండలి, తిరుపతి గారికి

కడప జిల్లా ప్రొద్దుటూరు మండలం విద్యుత్తోటల గ్రామానికి చెందిన 'బైరెడ్డి-యుటిలిటీ సంస్థ' నుంచి (మనుకొన్న ఆసవి ...

ఈమెయిల్!

A.C. వారు సిమెంట్ ఫ్యాక్టరీకు ఇచ్చిన అనుమతి కాలపరిమితి ముగియడంతో మళ్ళీ పునరుద్ధరణకోసం దరఖాస్తు చేసుకున్నారు. ఫ్యాక్టరీ ఇచ్చిన దరఖాస్తులో ఎన్నో విషయాలు దాచిపెట్టి, అబద్ధాలు చెప్పి. ఫ్యాక్టరీ వల్ల ఇక్కడి ప్రజలు ఎదుర్కొంటున్న సమస్యలపట్ల మౌనం వహించారు. ప్రజల బ్రతుకుతెరువులను దెబ్బతీశారు. ఈ విషయాలపట్ల ప్రజాభిప్రాయ సేకరణ జరిపినప్పుడు ఇవన్నీ బయటపడతాయి. ఫ్యాక్టరీ వల్ల ప్రజలకు ఎదురవుతున్న సమస్యలను పరిష్కరించడానికి ఎటువంటి చర్యలు తీసుకోవాలో ఆదేశించాలి. ఈ యుటిలిటీ సంస్థకు ఇచ్చిన అనుమతిని రద్దుచేసి, ఫ్యాక్టరీ మూసివేయించాలి. ఫ్యాక్టరీ వల్ల ప్రజలకు ఎదురవుతున్న సమస్యలపట్ల ఫ్యాక్టరీ యాజమాన్యం ఎటువంటి చర్యలు తీసుకోలేదు. ఫ్యాక్టరీ వల్ల ప్రజలకు ఎదురవుతున్న సమస్యలపట్ల ఫ్యాక్టరీ యాజమాన్యం ఎటువంటి చర్యలు తీసుకోలేదు. ఫ్యాక్టరీ వల్ల ప్రజలకు ఎదురవుతున్న సమస్యలపట్ల ఫ్యాక్టరీ యాజమాన్యం ఎటువంటి చర్యలు తీసుకోలేదు.

Dust control measures should be taken.

PTO

గ్రామంలోని రాళ్లు పగిలిపోవ్వు, ఇసినాకు భయంకర మోతాదు - నిద్రాభంగాలకు సమంగా చెయవలెను. చుట్టు పక్కల గ్రామాలకు ప్రమాదాల మరియు రోగ వ్యాధులు గ్రామంలో చిన్న పిల్లలకు రక్షణ ఏర్పాట్లు చేయవలెను గ్రామస్థులు.

పై రంగాలను ACC వారి దృష్టికి తీసుకెళ్ళి వారిచే తగిన చర్యలు 'పెట్రోల్ యువజన సంఘం' కోరుతున్నది.

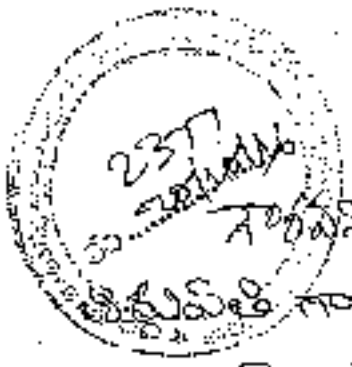
వినతి

పెట్రోల్ యువజన సంఘం
సభ్యులు.

విన్నవించిన గ్రామం.

1. P. Alagathi
2. K. Shakunthi.
3. M. Merlin.
4. P. Laxminarayana
5.

7-9-16



ప్రియ

A.C.C సిమెంట్ ఫ్యాక్టరీ కర్మాగారాన్ని మేము రంగీకరిస్తున్నాము మాకు పొల్యూషన్ లేకుండా ఫ్యాక్టరీ నడుపుతారని ఆశిస్తున్నాము. ఫ్యాక్టరీ కర్మాగారాన్ని ప్రజలకి కూడా ఉపయోగపడే విధంగా ఆర్థిక సహాయాలు బాగా చేయాలి. గతంలో C.S.R ప్రాజెక్ట్ క్రింద నిరుద్యోగులకు ట్రైనింగ్ ట్రైనింగ్ కంప్యూటర్ ట్రైనింగ్ ఇవ్వడంతో పాటు ఫ్రీ ఎంబ్రాయిడరీ ట్రైనింగ్ ఇచ్చినారు. మీ మేనేజ్మెంట్ సంతృప్తి చేసినారు. కానీ ఎన్నో రకాలు ఉంటాయి.

నిరుద్యోగులైన మాకు ఉద్యోగం, వ్యాపారం ఏర్పాటు చేసి తగు సహాయం చేయగలరు. నేను C.S.R క్రింద ట్రైనింగ్ కూడా తీసుకున్నాను. రెండు దస్తా మాటలు

ధన్యవాదాలు

ఇట్లు

K. కుమార్

చిన్నమంతూర్

Date 7/9/16

To

గౌరవనీయులైన కాలుష్య నియంత్రణ మండలి అధికారులు

From

గోసల వెంకటరావు కుమారుడు బాలరాజు మాము శ్రీకాకుళం (మం) జిల్లా/పట్టణం/గ్రామం కొవ్వరసత్తిడ్డిన

మనవి.

విషయం!

Acc cement ఫ్యాక్టరీ కట్టడాన్ని మేము వ్యతిరేకిస్తున్నాము. మాకు ఎటువంటి ఆక్షేపణ లేదు. కనుక కొరు తప్పకుండా ఫ్యాక్టరీని కట్టనివ్వలేను. ఫ్యాక్టరీ కట్టిన తరువాత పొల్యూషన్ వల్ల శ్వాసకోశ వ్యాధులు వస్తాయి. గతంలో ACC వాళ్ళు ట్రైబు నిరుద్యోగులకు డ్రైవింగ్ ట్రైనింగ్, కంప్యూటర్ ట్రైనింగ్ ఇవ్వడం జరిగింది. కాని కొంత మందికి మాత్రం కోచింగ్‌కు ఇ నోటిఫికేషన్ చేయడం జరిగింది. కావున ఇలాంటి మోసపూరిత అవకాశాలు ఇవ్వొద్దు.

ఇందువలన నిరుద్యోగులైన మాకు ఉద్యోగం, వ్యాపారం అభివృద్ధికి సహాయపడుగలరు. నేను ఇప్పటికే ACC లో డ్రైవింగ్ కోచింగ్ ట్రైనింగ్ తీసుకొన్నాను. ఇందువలన తమరు దయచూపించి మాకు ఉద్యోగం కల్పించిదరని కోరుచున్నాము.

7/9/16

ఇట్లు

తమ విధేయుడు

G. బాలరాజు

[Signature]

గౌరవనీయులైన A.P. పొల్యూషన్ కంట్రోల్ బోర్డు
-వారికి

తిరుపతి

కడప జిల్లా పైలచరు మండలం చిన్నపెసుతున్న గ్రామ రైతులు ప్రాసుకున్న విన్నపము.

1. టెప్పవేముల చావ తారి రోడ్డు వరకు అనుగా పాలవాగు పోయినట్లు ఇక పీడలు పోయిన భూమిని కొనుగోలు చేయాలి

2. ఎకరాకు ఇప్పుడు కావే భూమికి 15,00,000/- పున్న భూమిని కొనుగోలు చేయాలి.

3. భూమిని కోల్పోయిన వారికి ఉద్యోగము చదువును బట్టి మరియు మధ్య గల వయస్సు గల వారికి ఉపాధి కల్పించవలెను.

4. భూమిని కోల్పోయిన వారికి స్థానికులకు వాహనాలు మరియు మిషనరీలు కాంట్రాక్ట్ పనులు స్థానికులకు ఇవ్వవలెను.

5. 50,000/- మరియు 1,25,000/- పోయిన భూమికి బాలకి 4,00,000/- రేటుతో కల్పించవలెను.

6. గ్రామంలో విద్య మరియు వైద్యము మరియు స్త్రీలకు పాడి పశువులు మరియు గొర్రెల పెంపకం ఆర్థిక సహాయం చేయవలెను

7. ఫ్యాక్టరీ మొదలు పెట్టేలగకు కొన్న భూములు మేమే వేయుకొనవలెయును.

8. ఏ.సి.సి సిమెంట్ ఫ్యాక్టరీ త్వరగా కట్టి మా కోరికలు తీర్చవలెను.

9. మేము ఏ.సి.సి ఫ్యాక్టరీకి రావడానికి స్వాగతిస్తున్నాము కాని ఎలాంటి అభ్యంతరము లేదు ఫ్యాక్టరీని త్వరగా

కట్టవలెను

1

2. K. నాగభూషణం

3 K. Thippareddy

4. B. వీరనీరుపాటు

5 B. నాగభూషణం

6 V. వెంకటయ్య

7 O. వెంకటేశ్వర్లు

ఇట్లు

గ్రామ రైతులు

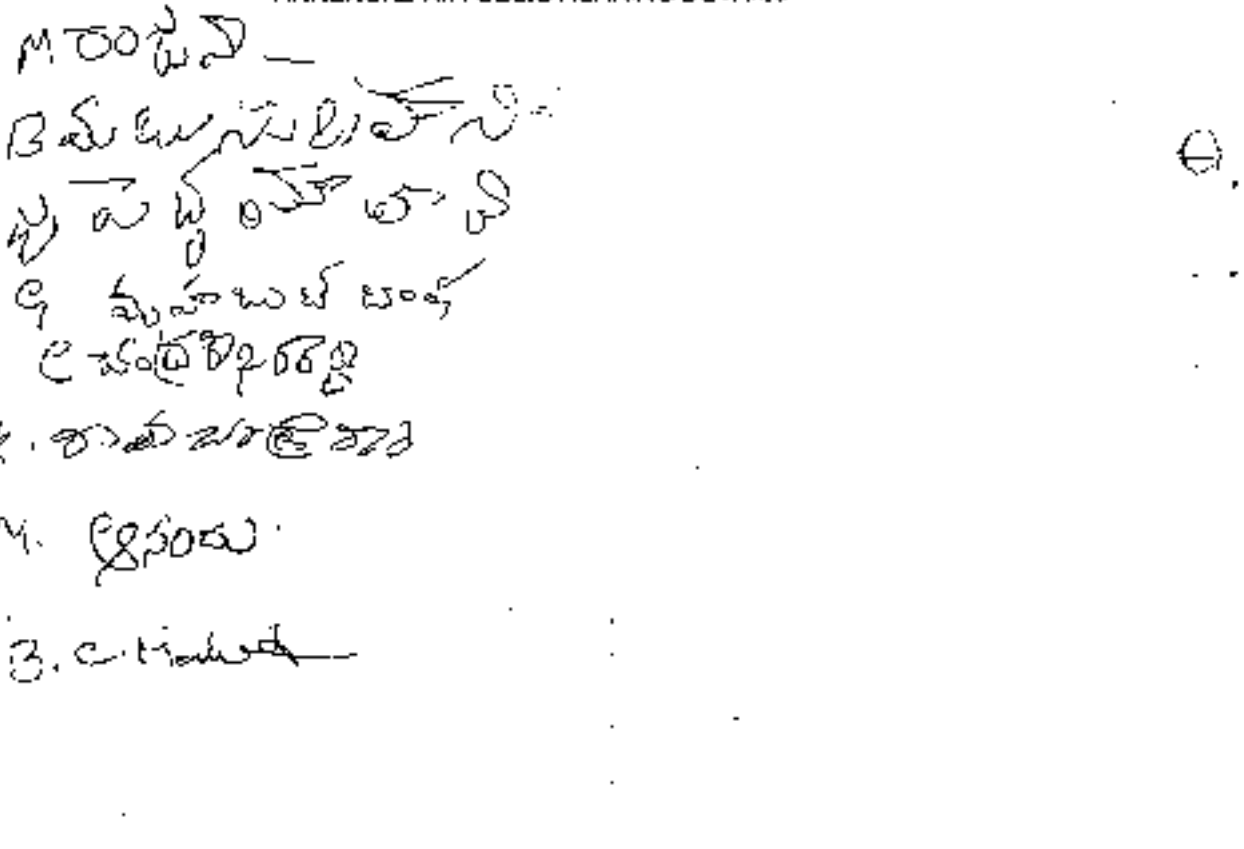
ఓ. వెంకటేశ్వర్లు

వై. నాగభూషణం

K. Lakshmana Reddy

కొండ్లి ప్రసాద్

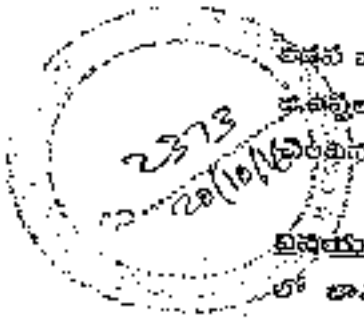
M. Maxumi Reddy



# మిమ్మలకు విజ్ఞప్తి న్యాయం చేయండి

తేది :- 20-12-2016

గౌరవనీయులు కడప జిల్లా కలెక్టరు గారికి,



కడప జిల్లా మైలవరం మండలం పరిధిలోని వల్లిరాల, గొల్లపల్లి, జి.ఉప్పలపాడు, చిన్న వెంకుర్ల, దిన్నేపాములు, ఆరంగాలపల్లి గ్రామాలకు చెందిన రైతులు వ్రాసుకున్న అర్జి.

విషయము :- అసోసియేటెడ్ సిమెంటు కంపెని (ఎసిసి) స్థాపన లో భాగం మరియు ఎ.సి.సి ద్వారా నిర్వహించిన భూ సేకరణలో నిర్వాసితులైన ఆరు గ్రామాల రైతుల దీనాందములను గురించు.

అయ్యా !

ఎసిసి అనే సంస్థ మైలవరం మండల పరిధిలోని గొల్లపల్లి, జి.ఉప్పలపాడు, దిన్నేపాముల, ఆరంగాలపల్లి గ్రామాలలో తొలిసారిగా 1996 సం॥లో ఎకరా 1 కి రూ. 50,000/- లతో రైతులతో ఒప్పందం కుదుర్చుకొని త్వరలో ఫ్యాక్టరీని ఏర్పాటు చేసి భూమి కోల్పోయిన ప్రతి రైతు కుటుంబానికి విద్యా అర్హత ఉన్నా, లేకున్నా, వయస్సు సంభంధం లేకుండా శాశ్వత ఉద్యోగ అవకాశం కల్పిస్తామని మాట ఇచ్చి, సుమారు 810 ఎకరాల భూమిని కొనుగోలు చేసినారు. భూమి కోల్పోయిన ప్రతి రైతుకుటుంబంలో వారి చేపట్టలేదు, ఉపాధి లేదు. తరువాత 1998 సం॥నుండి 2006 వరకు ప్రతి సంవత్సర కాంట్రాక్ట్ ఫ్యాక్టరీ వారు తీసుకున్న భూములలో తంప చెట్లు పెరిగి అడవి పందులు, అడవి అవులు చేరుకొని పూర్తి భూమి మట్టు ఉన్న మిగిలిన భూములలో పోసిన పైరుకు కూడా తీరని నష్టం జరిగినది. ఈ విధముగా తొలి పది సంవత్సరాల కాలంలో కంపెని ద్వారా తపోగించి పొందలేక పంటలను పండించుకోలేక రైతులు తీరని నష్టానికి గురి కావలసివచ్చింది. ఈ విషయాలను అనేక మార్లు కంపెనీ దృష్టికి తీసుకొని వెళ్లిన ఫలితం లేకుండా పోయింది.

10 సంవత్సరములు తరువాత అనగా 2006 సం॥లో మా మండల పరిధిలోని వల్లిరాల, గొల్లపల్లి, జి.ఉప్పలపాడు, దిన్నేపాములు, చిన్నవెంకుర్ల భూములు తొలగోలు చేయుటకు వచ్చి ఎసిసి యాజమాన్యం వారు ఆర్.డి.ఓ ఆఫీసు వద్దకు ప్రజా ప్రతినిధులు సమక్షంలో పైన తెలిపిన గ్రామాల ప్రజలను పిలిపించి ఫ్యాక్టరీ నిర్మించుటకు ఇంకా భూములను అమ్మండి మీ భూములు ఇస్తే మేము త్వరలో ఫ్యాక్టరీ నిర్మిస్తాము అని నమ్మకలికి ఎకరం 1 కి రూ. 1,25,000/- లతో దాదాపు 1000 ఎకరాలు తొలగోలు చేసినారు. ఆ రోజు కూడా విద్యా అర్హతలు మరియు వయస్సుతో సంభంధం లేకపోయినా భూమి కోల్పోయిన ప్రతి రైతు కుటుంబానికి శాశ్వత ఉద్యోగం కల్పిస్తామని చెప్పినారు. మరియు భూమి కోల్పోయిన ప్రతి రైతు క్రింద పనిచేసే కూలీలకు కూడా ఉపాధి కల్పిస్తామని కూడా చెప్పి ఉన్నారు. ఫ్యాక్టరీ నిర్మించగానే యువకులం ఉద్యోగ అవకాశాలు కోల్పోయి ప్రస్తుతము వయస్సు మీరి మా పిల్లలకు కూడా ఉద్యోగ అవకాశాలు లేంటాయో లేదో బాధలతో ఉన్నాము.

ఎసిసి వారు రైతులకు నాడు చెల్లించిన డబ్బులను కూడా ఆడపిల్లల పెళ్లిళ్లకు, పిల్లల చదువులకు ఖర్చు చేయగా రైతుల ఆర్థిక పరిస్థితి అగమ్య గోచరంగా మారింది. ఎసిసి కంపెనీ ఉపాధి కల్పించక పోవడం వలన రైతులమే కూలీగా మారి సిందూర ప్రాంతాలకు వెళ్ళి కష్టపడ వలసి వచ్చినది. ఏసిసి యాజమాన్యం వారు మరలా 2010 సం॥లో వల్లిరాల గ్రామ పంచాయతీ ప్రభుత్వ అనుమతి మేరకు ఆర్.డి.ఓ, ఎం.ఆర్.ఓ వారి సమక్షంలో గ్రామ పంచాయితీ ప్రజల

సమక్షంలో పెంటనే ఫ్యాక్టరీ నిర్మిస్తామని ఎకరా 1 కి రూ. 4,00,000/- లతో రేటు నిర్ణయించి కొన్ని చోట్ల చేసి ఉన్నారు. ఆ సమయంలో అదే రోజు రేటు ప్రకటించగా పెంటనే 1996, 2006 సం॥లో భూములు కోల్పోయిన భూ నిర్వాసితులు అందరము తలసి పి.సి.సి యాజమాన్యం వారిని మరియు ఆర్.డి.ఓ గారిని స్త్రీ ప్రజల సమక్షంలో మాకు ఫ్యాక్టరీ నిర్మించగగగ నిడుపునిడతలుగా భూములు ఫొటోలు చేస్తూ అందరికీ అన్యాయం చేస్తున్నారు. ఫ్యాక్టరీ నిర్మించలేదు కాబట్టి అదే రేటు మాకు కూడా ఇవ్వవలయునని రేటు విషయంలో అన్యాయం జరిగిందని అడగడం జరిగింది. ఆ మరునాటి రోజునే ఆరు గ్రామాల భూ నిర్వాసితుల రైతులు భూ నిర్వాసిత పోరాట కమిటీ ఏర్పాటు చేసుకోవడం జరిగింది.

మొదటి సారిగా 05-06-2010 సం॥లో భూ నిర్వాసితులము అందరము పెద్ద ఎత్తున ర్యాలీ ధర్నా జిల్లాబంద్‌లో చేసి ఆర్.డి.ఓ గారికి వినతి పత్రం సమర్పించిన తరువాత పి.సి.సి ఆఫీసు వద్దకు పోయి మేనేజరు మురళి కృష్ణ గారికి మా సమస్యల వినతి పత్రము సమర్పించడమైనది. వినతి పత్రంలో ఫ్యాక్టరీ తట్టుకుందుకు అదే రేటు రూ. 4,00,000/-ల ప్రకారం ఇవ్వవలసినది అని అడుగగా మురళి కృష్ణ గారు సమాధానంలో ఎక్కడైనా ఏ ఫ్యాక్టరీ వారైనా అధికముగా సబ్సిడీగా ఇవ్వరము చెప్పినప్పే భూ పి.సి.సి వారు కూడా మీకు డబ్బులు చెల్లించడానికి సిద్ధంగా ఉంటుంటని సోకు ఇచ్చినారు.

ఇందుకు సాక్ష్యాధారముగా 17-05-2010 సం॥న భాధితి సిమెంటు వారి ఎకరా 1 కి అధనముగా అప్పటి రేటు ప్రకారం రూ. 2,00,000/-ల నష్టపరిహారం చెల్లించినారు. రైతులకు చెల్లించిన చెక్కుల జిరాక్స్ కాపీని చూపించడం జరిగినది. ఇందుకు సంబంధించిన ప్రచురితమైన వార్త పత్రికల నకలు కాపీని సమర్పించడమైనది. అప్పటికీ కూడా పి.సి.సి యాజమాన్యంలో చలనం లేనందున భూ నిర్వాసితులము అందరము ఇక్కు ఉపాధి లేక ఇక్కు భూమి లేకు దిక్కుతోచని స్థితిలో జీవనోపాధి కరువైనందున జీడుగా ఉన్న దట్టమైన కంపచెట్లు నాటలతో కూడిన భూభాగాలను తయారు చేసుకొనుటకు సిద్ధపడినాము. తరువాత 07-08-2010 తారీఖున పి.సి.సి భూ నిర్వాసితులము అయిన 6 గ్రామాల రైతులము అందరము కలిసి ఆర్.డి.ఓ కార్యాలయం ఎదుట 3 రోజుల పాటు రిలే నిరాహార దీక్ష చేయగా భూ దీక్షకు అప్పటి ఆర్.డి.ఓ గారు మద్దత తెలుపుతూ పి.సి.సి ప్రతినిధులతో సంప్రదింపులు జరిపి ఫ్యాక్టరీ నిర్మాణం చేసేవరకు ఎవరి భూములు వారు సాగు చేసుకొనుటకు అనుమతి ఇచ్చినారు. ఎకరా భూమిని సాగు చేయడకు దాదాపు రూ.40,000/- లు ఖర్చు చేయడం జరిగినది. అయినా భూములు ఖాళీగా ఉన్నందున సాగు చేసిన భూములు కూడా వంట పోనీనా కూడా పంట పండలేదు. ఈ విధముగా కూడా నష్టం జరిగినది. పి.సి.సి యాజమాన్యం వారు అక్రమముగా రైతులపై కేసులు పెట్టి ఈ కుధముగా నష్టము జరిగించినారు

ఫ్యాక్టరీ నిర్మించనందున అనేకసార్లు అనాకి ఆత్మీయులు గారికి, ఆర్.డి.ఓ గారికి పి.సి.సి. యాజమాన్యం వారికి భూ నిర్వాసితులము అంతా కలిసి వినతి పత్రములు ఇచ్చినాము. మరియు ధర్నాలు, ర్యాలీలు, దీక్షలు, చేసినాము. అయినా స్పందన లేదు. అధికారులు ప్రభుత్వాలు మారినా మా బ్రతుకులు మాత్రము మారలేదు. ఇందుకు సాక్ష్యాధారాలు వినతిపత్రములతో ఆతపరుచుడమైనది. ఇదే సమయంలో అగ్గారం 2010 సం॥లో గొల్లపల్లి గ్రామ ప్రజలందరికీ పి.సి.సి కంపెని వారు తీరని నష్టం కలిగించారు. పి.సి.సి కంపెనీని త్వరగా మూసివేస్తామని మీరు కంపెనీ నిర్మాణానికి సహకరించాలని, మీరు మీ గ్రామాన్ని ఖాళీ చేసి వేరొక చోట పునరావాసాన్ని ఏర్పాటు చేసుకోవాలని అందుకు ప్రతిఫలముగా ప్రతి ఇంటికి నష్టపరిహారం చెల్లిస్తామని నమ్మపలికి ఆర్ & ఆర్ చట్టాన్ని సవ్యంగా జరిపించి ప్రతి ఇంటిని కొలిపించి అప్పటి రేటు ప్రకారం రేటు వేయించడం జరిగినది.

పి.సి.సి వారు చెప్పిన మోసపూరిత మాటలను నమ్మిన గొల్లపల్లి గ్రామ ప్రజలందరము

గ్రామాన్ని వదలిపెట్టి మా ఊరి పై భాగాన దక్షిణ దిక్కుగా జమ్ములమడుగు, వాడిపత్రి రోడ్డు ప్రక్కన కొండపైన ప్రజలందరూ అప్పులు చేసి కొత్తగా ఇండ్లను నిర్మించడం జరిగినది. ఇప్పటికి 8 సం॥లు గడిచి పోయినా మా గ్రామంలో ఉన్న ఇండ్లకు ఎలాంటి నష్టపరిహారం చెల్లించకపోవడం వల్ల కొత్త ఇళ్ల నిర్మాణానికి అప్పుగా తెచ్చిన డబ్బులకు వడ్డీలు చెల్లించలేక మొత్తం గ్రామ ప్రజలంతా ఆర్థికముగా చితికిపోవడం జరిగినది. ఇపుడు మా పిల్లలకు చదివించుకోవడానికి కూడా ఆర్థిక స్థితిగతి లేక వారిని కూడా కూలీ పనులకు పంపించడం జరుగుతున్నది. ఇప్పటికి ఇట్లకు నష్టపరిహారం చెల్లించకపోవడం చాలా బాధాకరము. చాలా అన్యాయము. 2010 సం॥లోనే మా ఆరు గ్రామాల ప్రజలము ఏ.పి.ఐ.ఐ.సి కంపెనీ వారు మరొక నాలి మోసపూరిత మాటలతో త్వరలో ఫ్యాక్టరీలు నిర్మిస్తామని నమ్మపలికి ఎకరా భూమి రూ. 4,00,000/-లతో దాదాపు 700 ఎకరాలు తీసుకోని చేసి రైతులకు మోసగించి ఫ్యాక్టరీలు నిర్మాణం చేయలేదు.

ఏ.పి.ఐ.ఐ.సి కంపెనీ వారు ఫ్యాక్టరీలు ఏర్పాటు చేయుటకు వాతావరణ కాలుష్య నియంత్రణ మండలికి చేసుకున్న దరఖాస్తు మేరకు వాతావరణ కాలుష్య నియంత్రణ మండలి వారు 07-08-2016 సబ్లిక్ హియరింగ్ కొరకు పేపర్ ప్రకటన 29-07-2016 న జరుగుతుందని వివరం ఇవ్వడం జరిగినది. ఇప్పటికి అనేక సర్వాయము ఏ.పి.ఐ.ఐ.సి ప్రతినిధుల ద్వారా మోసపోయిన 6 గ్రామాల రైతులము అంతా కలిసి ఏ.పి.ఐ.ఐ.సి వారు మోసపూరిత మాటలకు నమ్మకూడదని భావించి ఆ కంపెనీకి చెందిన ఉన్నత స్థాయిలో ఉన్న అధికారులు ప్రతినిధులు మరియు ఉన్నతాధికారుల సమక్షంలో రైతుల డిమాండ్లను వ్రాత మూలకంగా ప్రాయించుకొనుటకు నిర్ణయించుకున్నాము. ఏ.పి.ఐ.ఐ.సి కంపెనీ వారికి భూములు కోల్పోయిన మా 6 గ్రామాల రైతులకు చెందిన డిమాండ్లను మీ ముందు ఉంచుతున్నాము. అందులో ప్రధానమైనవి.

1. గొల్లపల్లె గ్రామాన్ని 2010 సం॥లో ఆర & ఐ వారిచే సర్వే చేయించిన ప్రతి ఇంటిని కొలతలు వేయించి అప్పటి రేట్ల ప్రకారం నిర్ణయించినారు. ప్రస్తుత రేట్ల ప్రకారం నష్టపరిహారం చెల్లించాలి

2. 1998 సం॥లో ఎకరా 1 కి రూ. 50,000/-లు కొన్న భూములకు 2008 సం॥లో 1 కి రూ. 1,25,000/-ల ప్రకారం కొన్న భూములకు పట్టాదారు, గొల్లపల్లి, ఉప్పలపాడు, బెస్తవేములు, తంగేలపల్లి, చిన్నవెంతుర్ల గ్రామాల భూ నిర్వాసితులకు ప్రస్తుతము ఉన్న రేట్ల ప్రకారము నష్టపరిహారం చెల్లించాలి. లేని పక్షంలో మా భూములు మాకు తిరిగి అప్పచెప్పవలెను.

3. ఫ్యాక్టరీ నిర్మాణం జరిగితే 2016, 2017 సం॥లో నే నిర్మాణం చేపట్టాలి. అదే విధముగా ఎక్కువ భూమిని సేకరించిన గ్రామ పంచాయతీ పరిధిలోనే ఫ్యాక్టరీ నిర్మాణం జరగాలి. ఫ్యాక్టరీ ఎక్కడ నిర్మించేది ఇప్పుడే మాకు తెలియజేయాలి.

4. భూ నిర్వాసితుల సమస్యలను పరిష్కరించిన తరువాతనే వాతావరణ కాలుష్య సభ జరపాలి.

5. కేంద్ర ప్రభుత్వము, పార్లమెంటులో భూ సేకరణ చట్టము 2013 సం॥లో మార్పులుగా భూమి కోల్పోయిన భూ నిర్వాసితులకు ఆ కంపెనీ ఉత్పత్తి ఆదాయంలో 30% ఇవ్వాలి.

6. ఏ.పి.ఐ.ఐ.సి ఫ్యాక్టరీ నిర్మాణము భూమి పూజ చేసినప్పటి నుంచి పూర్తి నిర్మాణము చేసేవరకు భూమి కోల్పోయిన అన్ని గ్రామాల రైతులకు కంపెనీ నిర్మాణంలో కాంట్రాక్టు పనులను రైతుల ద్వారా కొనసాగించాలి. ఈ విషయంలో ఎలాంటి రాజకీయాలకు తావు లేకుండా రైతులకు న్యాయం చేయాలి.

7. అన్ని గ్రామాలను దత్తత తీసుకొని అభివృద్ధి చేయాలి. ప్రతి రైతు కుటుంబానికి శాశ్వత ఉద్యోగాలు ఇవ్వాలి. నిరక్షరాస్యులకు కూడా ఉపాధి కల్పించాలి.

8. 1996 సం॥లో రైతుల నుండి ఏ.పి.ఐ.ఐ.సి వారు భూములు తీసుకున్నప్పటి నుండి ఈ రోజు వరకు ప్రతి ఎకరానికి వచ్చే బోనస్ డబ్బులు కూడా ప్రతి రూపాయితో సహా తప్పకుండా అన్ని గ్రామాల రైతులకు నష్టపరిహారం చెల్లించాలి.

9. ఎక్కడైతే ఏ.పి.ఐ.ఐ.సి ఫ్యాక్టరీలు నిర్మిస్తారో ఆ ప్రాంత భూమి తప్ప దిగిలిన భూములలో మీరు క్వారీక

బగే వరకు రైతుల పొలాలు వేసుకొనే అవకాశం కల్పించాలి. ఈ విషయంలో రైతులకు ఎలాంటి ఆటంకాలు కల్పించరాదు.

10. ఏసిసి ఫ్యాక్టరీ వారు మైనింగ్ తీసే క్రమంలో బ్లాస్టింగు చేయటం వల్ల మా గ్రామాల ఇండ్లకు ఎలాంటి నష్టం జరగకుండా చూడాలి. అలా జరిగితే ప్రస్తుత రేటు ప్రకారము నష్ట పరిహారము తక్షణమే చెల్లించాలి.

11. ఏసిసి ఫ్యాక్టరీ వారు నిర్మాణంలో గాని తరువాత కాని వాతావరణం కాలుష్యం లేకుండా నియంత్రణ చర్యలు చేసి ఫ్యాక్టరీకి ముందే చుట్టు నాటే కార్యక్రమం చేపట్టాలి.

12. మా గ్రామాలలో మౌలిక సదుపాయాలు అంటగా విద్యా, వైద్యా, నీరు, విద్యుత్తుతో పాటుశుభ్రం మొదలైన అంశాలతో బ్రాంచ్ను ఇవ్వు ఉచితంగా ఏర్పాటు చేయాలి. మరియు సిమెంటు రోడ్లు డ్రైనేజి, మంచినీటి వాటర్ ప్లాంట్లు ప్రతి గ్రామంలో ఏర్పాటు చేయాలి. భూములు కోల్పోయిన ప్రతి గ్రామంలోనుంచి కలిపి ఎల్‌డెజి నుండి బయటికి పరిచయ పెంచేసినే లాంటి ఉన్నత చదువులు మా గ్రామాల పిల్లలు చదువుకొనుటకు కార్పొరేటు స్థాయిలో ఉచితంగా విద్యను అందించేందుకు విద్యా సంస్థలను మా ప్రాంతంలోనే ఏర్పాటు చేయాలి.

13. ఏసిసి వారు ఫ్యాక్టరీ నిర్మాణము కొరకు కొనుగోలు చేసిన భూముల పక్కన ఉన్న కుంటలు భూములను, ఫ్యాక్టరీ పరిధిలో ఉన్న భూములను ప్రస్తుత రేట్ల ప్రకారం కొనుగోలు చేయాలి.

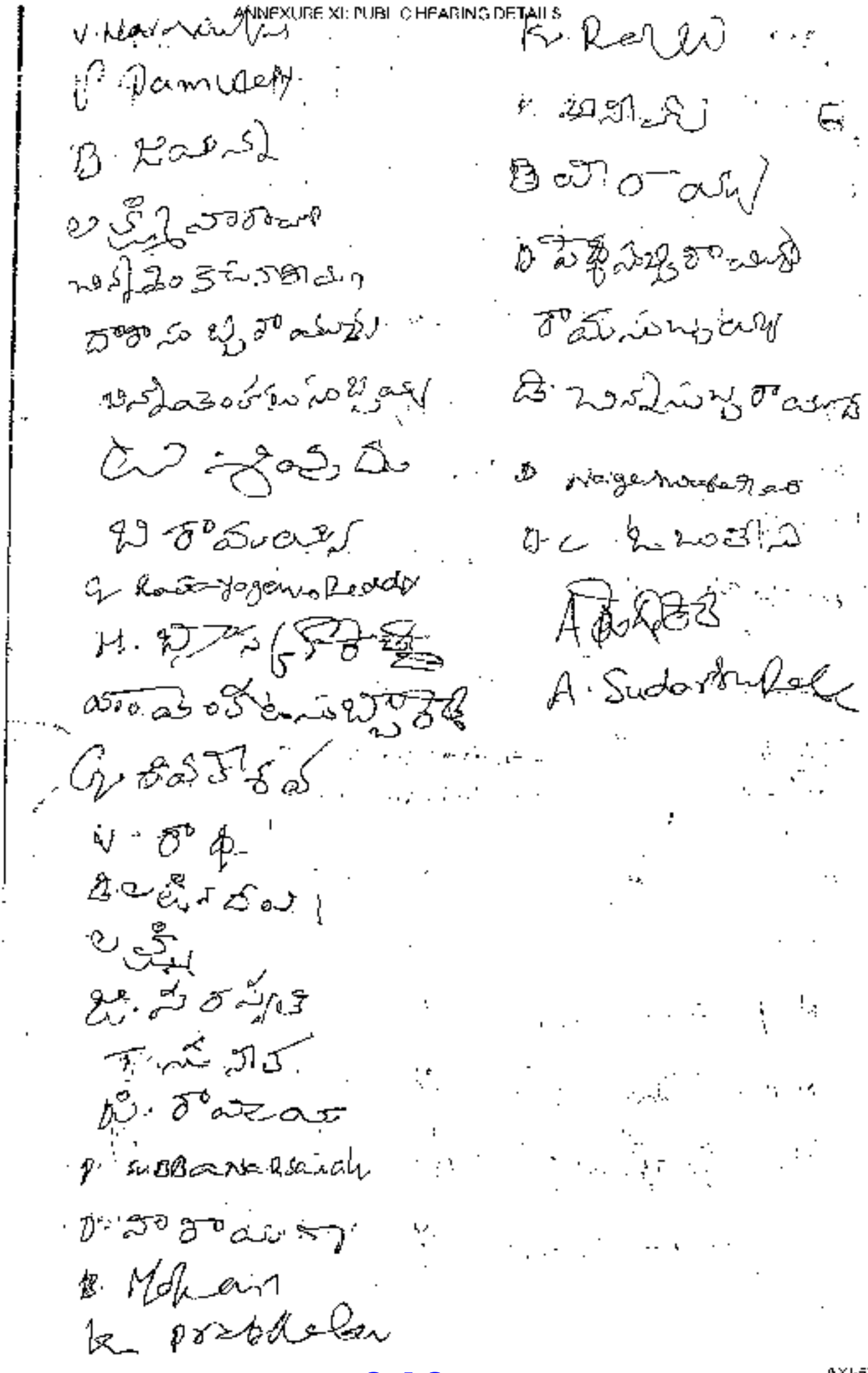
14. మనస్ఫూర్తిగా సొంత గ్రామాలను వదిలి పెట్టి కొత్త గ్రామాలకు వెళ్ళుటకు సిద్ధపడ్డ ఇప్పలపాడు గ్రామాలలో అన్ని రకాల సదుపాయాలతో పాటు మూడు దేవాలయాలను నిర్మించాలి. సొంత గ్రామాలలో ఉన్న స్మశాన భూములను యధాతథిగా కొనసాగించాలి.

15.1998 సం॥ నుండి ఇప్పటి వరకు ఫ్యాక్టరీ నిర్మించినందున ఉద్యోగము లేక ఉపాధి కోల్పోయినందుకు అన్ని గ్రామాలలో భూ నిర్వాసిత రైతులకు అప్పటినుండి ప్రతి నెలకు రూ. 20,000/-లు ఇప్పటి వరకు చెల్లించాలి.

ముఖ్యముగా తెలియజేయు విషయము ఏమనగా అన్ని గ్రామాల భూనిర్వాసితుల అన్ని సమస్యలను పరిష్కరించిన పెంటనే ఫ్యాక్టరీ నిర్మించాలి. అంతే కాక సుమారు 20 సం॥ నుండి భాదపు 900 కుటుంబాల దగ్గరి నుండి అవేదనను మీరు విన్నవించుకుంటున్నాము. మా బాధలను పూర్తి మానసికంగా కనికరించి మా సమస్యలను అర్థంచేసుకొని అన్ని గ్రామాల రైతులకు న్యాయం చేయుదురని శతకోటి వందనాలు తెలియజేయుచూ మా విన్నపాన్ని విన్నవించుకుంటున్నాము.

ఇట్లు,
ఏసీసి భూ నిర్వాసితులు

ANNEXURE-X PUBLIC HEARING DETAILS



తేదీ 7.9.2016

గౌరవ నీయులైన A.P.I.I.C.A అధికారులకు

మైలవరం మండలము ధన్నవాడ గ్రామస్థులు రాసుకున్న

మనవి చేయునది

అయ్యా,

A.P.I.C సిమెంటు ఫ్యాక్టరీ వారు మా గ్రామం దగ్గర ఏర్పాటు చేయుటకు

సంకల్పించారు ఫ్యాక్టరీ కట్టడానికి మా గ్రామం దగ్గర భూములు

అంగీకరించిన్న నాము మాకు ఎలాంటి ప్రమాదం లేదు

ఇంతవరకు మా గ్రామమునకు A.P.I.C వాళ్ళు ఒక్కసారి

భూమిక్రింద కొన్నది లేదు. మేము భూములు అమ్ము దానికి

సిద్ధంగా లేము

ఫ్యాక్టరీ వస్తే ఈ ప్రదేశములో ధూళిలోకు అనుకూలంగా ఉండదని

ఊపిరి అందకపోవడం కొంతమంది చనిపోవడం. రోజుల జీవనం

పాడుకాకుండా మీరు సహాయం చేయగలరని, గ్రామం మంచి

రోడ్డులకు పాఠశాల పరిస్థితి చేయగలరని ఉన్నది

భూములు ఇచ్చే ప్రతి కుటుంబానికి ఉద్యోగం ఇవ్వగలరని

కాలువ అవసరాల కొరకు భూములన్నీ కొనగలరని కోరుచున్నాము

కొన్నియెడల యుద్ధమయమవుతుందని కోర్టు దిద్దుతుంది. వీధి వైద్యం

తదితర అభివృద్ధి కార్యక్రమాలు చేపట్టగలరని.

ఇట్లు

P. వెంకటరెడ్డి

కె. శివరామకృష్ణ

C. G. సుబ్బారెడ్డి

K. వెంకటేశ్వర్లు

జూకు-బాలసుబ్రహ్మణ్యం

K. Siva Reddy.
A. రామకృష్ణ
y. వెంకటరెడ్డి
Y. Nagamma.
D. Siddaiah.
G వెంకన్న
S Srinivas.
X రామానందప్రసాద్
K. Narayanna
G గోవిందప్ప
D గురుకరెడ్డి
P Venkatramaiah
P రామకృష్ణ
D వెంకటేశ్వరమ్మ
D. చిన్నవెంకటయ్య
G. చిన్నవెంకటరెడ్డి
P రంగనాయకులు
M. గురివిందరెడ్డి
T. శ్రీనివాసులు
C Govindu
M. లక్ష్మీరెడ్డి
A చిన్నవెంకటరామయ్య
K చిన్నవెంకటరామిరెడ్డి
K. [illegible]
T. Narasimha Kumar
C [illegible]
Jr. Pullaiah Reddy
Y నాగేశ్వరరెడ్డి

(5)

సౌరవిద్యుత్ APPCB అధికారులకు,

పొలాలకు చుండూరు వద్దిరాలపాడు గ్రామాల రైతులు వ్రాసుకున్న

మనవి.

ఐకమత్యంతో

ప్రతి ఎంపీటీసీ

తీర్మానం

అయ్యా,

A.C.C వారు నెలకొల్పిన సౌరవిద్యుత్ ప్లాంటుకి దగ్గరగానే మా పొలాలు ఉండడం వల్ల మేము చాలా ఇబ్బందులకు గురవుతున్నాము. మీరు మా పొలాలకు వచ్చి మా సమస్యలను పరిశీలించి మాకు న్యాయం చేయగలరని మనవి.

1. సౌరవిద్యుత్ ప్లాంటు చాలా ఎత్తులో ఉండటం వల్ల దుమ్ము ధూళి మా పొలాలపై పడి పంటలు సరిగా పండటం లేదు. కావున ప్లాంటు చుట్టూ పెద్ద చెట్లు పెంచేటట్లు ఏర్పాటు చేయగలరు.

2. ఎండాకాలంలో ప్లాంటులో ఉత్పత్తి అయిన విద్యుత్ ను మా పొలాలకు ఇవ్వడం వల్ల మోటార్లు కాలిపోతున్నాయి. కావున ఈ సమస్యను పరిష్కరించగలరు.

3. వర్షాకాలం వరదనీరు మా పొలాలలోకి వచ్చి పంటలు పాడవుతున్నాయి.

4. ఎలాంటి ప్రమాదాలు జరగకుండా తగు జాగ్రత్తలు తీసుకోగలరు.

పైవిషయాలను, మీరు వెంటనే పరిశీలించి తగిన చర్యలు తీసుకోగలరని కోరుతున్నాము.

ఇట్లు

వద్దిరాలపాడు గ్రామస్థులు.

S. Neelakanta Reddy
P. Suryachandra Reddy
T. Madhusudhan
M. Madhusudhana Reddy
M. Raghava
M. Madhusudhana
P. Sudhakar Reddy
S. Subramanyam Naidu

వడ్డిరాలపాడు గ్రామస్థులు

K. Chandrasekhar Reddy, మాజీ సర్పంచ్

S. గంగయ్య

రామయ్య

పి.వి.కోటిరెడ్డి

K. Ramakrishna Reddy

వెంకటేశ్వర్లు

S. వీరయ్య

M. Ramanjaneyulu
M. Venkata Siva Reddy
I.C వెంకటరెడ్డి

30-10-2016
కలెక్టరేట్ కార్యాలయము.

విషయం: ప్రతిపాదిత కాకినాడ సెజ్ కోసం భూసేకరణ (రద్దుచేయుట) విషయమై ఇట్టి ప్రజాభిప్రాయ సేకరణ సభలో మా అభ్యంతరాలు మరియు సూచనలు క్రింద తెలియజేయుచున్నాము.

మా గ్రామాలలో ఉన్న మొత్తం భూమి విస్తీర్ణం సుమారు 2000 ఎకరాలు. ఇందులో A.C.C. యాజమాన్యం ఎకరం ఫ్యాక్టరీ నిర్మాణానికి అని మరియు తోపుడు చేసినారు. ఫ్యాక్టరీలో వారికి C.S.R. నిధులు ఉన్నాయి మాకు ఇళ్ళు, మరుగుదొడ్లు, మురుగునీటి కాల్వలు, తాగునీటి బోర్లు, విద్యుత్ దీపాలు, మురికివాడ కాకుండా బాగు చేయించి ఇవ్వాలి. ఇళ్ళ నిర్మాణం లేని నూతన వధూవరులకు ఇళ్ళు నిర్మించి ఇవ్వాలి. మా గ్రామం నుండి సుమారు 2000 మంది ఓటర్లు ఉన్నారు. వీరందరి అభిప్రాయం తెలుసుకొనుటకు మేము సిద్ధంగా ఉన్నాము. ఇట్టి C.S.R. నిధుల ద్వారా మా గ్రామాభివృద్ధి అంటే వసతులు కల్పించవలసినదిగా కోరుచున్నాము.

M. పాపారెడ్డి

M. నాగిరెడ్డి

29/10/16

కాకినాడ తహసీల్దార్ గారికి

M. సుబ్బారెడ్డి

M. సత్యనారాయణ

M. సుబ్బారెడ్డి

వినతి పత్రం

తేది. 20-10-2018

పరిసరాల ప్రజా ప్రతినిధులకు

గొల్లపల్లి గ్రామము

మైలవరం మండలం

కృష్ణా జిల్లా

విషయం :- N.C.C. సిమెంటు పరిశ్రమ మరియు దాని అనుబంధ పరిశ్రమల వలన కలిగే నష్టాలు.

(1) పరిశ్రమ కోసం గొల్లపల్లి మరియు ఉప్పులపాడు గ్రామ ప్రజలు మరియు పశువుల కొరకు ఏమి చూపించారు.

(2) ఈ గొల్లపల్లి మరియు ఉప్పులపాడు గ్రామాలు పరిశ్రమ పరిధి లోకి పోతాయని ఉప్పులపాడు గ్రామానికి పరిహారం వచ్చింది కాని గొల్లపల్లి గ్రామ ప్రజలు మాకు ఎటువంటి పరిహారం రాలేదని గ్రామ రైతులు పశువులమీద ఆధారపడి జీవిస్తున్నారు.

(3) పశువులకు మేత నీరు లేక మూగజీవాలు రైతులు తీవ్ర భారం పడుతున్నారు. కనీసం పట్టించుకునే నాధుడే లేడు.

(4) రైతు చిట్టాలు. చిన్న అంగిలి. ఆర్థికంగా చితికి పోయాం. కాపుకు కాచుకోలేని దుస్థితి ఎదురవుతుందని కోరుకుంటున్నాం.

(5) మా ... ఈ ... చుట్టూ సారవంత మైన భూములు

20-10-2018

Hyderabad
Date: 25-08-2016

To.
**The Environmental Engineer,**
Andhra Pradesh Pollution Control Board,
Regional Office,
S.T. Road,
TIRUPATHI -517 502

2361
19/10/16

**Respected Sir,**

Sub: Certain objections against the proposed establishment of Cement factory by M/s ACC Ltd., Gollapally, Vaddirala and G.Uppalapadu villages, Mylavaram Mandal, YSR District, A.P. – Request to withdraw the proposal of establishment in public interest – Reg.

********

We, the undersigned farmers of Gollapally village, Vaddirala Gram Panchayat, Dhannawada, Chinnaventurla, Bestavemula, Uppalapadu villages in Mylavaram mandal, YSR Kadapa district, humbly submit the following few lines for your kind consideration and favourable orders.

That Public opinion has been invited from Andhra Pradesh Pollution Control Board, Tirupathi for environmental objections in the local newspapers on 7-08-2016 for establishment of the proposed cement factory of M/s ACC Ltd., at Gollapally, Vaddirala and G.Uppalapadu villages, Mylavaram Mandal, YSR District.

We submit that we are all small farmers and agricultural labour belong to poor SC, ST and BC (i.e., Reddy, Balija, Yadava, Patra, Mangali, Mala, Madiga, Dudekula, Chakali, Boya, Christians etc.) communities living on cultivation, Cattle, Sheeps and Goats as our occupation.

Contd...2..

19/10/16

In the year 1996 the management of ACC Cement factory visited our Gollapally village and identified heavy deposits of limestone in the village and found the area suitable for establishment of a fullfledged cement factory and asked us to give our agricultural lands. They orally promised to provide employment to our families and also establish school to provide education to our children and hospital for medical facilities if we accepted to their proposal. In accordance with their proposal we, the farmers sold our lands at a cost of Rs. 50,000/- per acre to them in the year 1995. But as per their proposal, they did not built the factory.

Again after 11 years i.e., in the year 2007 they came and wanted to us to give remaining lands also promising to give all the help and assistance as assure in the past. Believing the words of the management we had sold our remaining lands in the year 2007 at a consideration of Rs. 1,25,000/-.

Similarly, during 2009-2010 they asked us to vacate our residential houses in our village promising to pay money for each of the houses in the entire village. Believing the words of ACC Cement management we vacated all our houses and moved our families to different location to facilitate them to take our village for the factory. But as per their assurance, they did not pay any amount in respect of the lands or the houses that we surrendered to them to implement their proposal so far. In this matter since 1996 to 2016, the management of ACC Cement, by continuously making their oral assurances of providing financial benefits to us, have not paid anything and deceiving us for the last 20 years in the name of false promises and caused huge loss to us.

Contd....3..

All the lands that were surrendered by us to them have become barren lands filled with heavy shrubs and bushes and they cannot be utilized for cultivation. In these circumstances, all our villagers have come to a decision for our livelihood of our families and worked hard and cleared the shrubs and bushes that were grown in the said lands to bring them into cultivable lands by spending Rs. 50,000/- to Rs. 75,000/- for each acre. Now the management are again saying to give up our lands for their proposed factory. With the fake promises of the management for the last 20 years, we could not cultivate our lands properly and not provided proper education to our children. In this process, we have faced lot of loss financially and educationally became backward. Taking the help of our illiteracy to their benefit, they have been making false promises and continuously deceiving us and our next generation children also.

We further submit that a cement factory is existing near our villages. When they conducted blasts to obtain limestone most of our houses in our area were got damaged and we are suffering a lot due to the heavy smoke and dust emitted from the factory, which also adversely affected to our lands and they became not useful for cultivation.

In the light of the above facts, if the ACC Cement management builds their factory, our lands and houses will get damaged in huge manner when they conduct blasts to obtain limestone in our area and the emissions of dust and smoke will definitely damage our health and the water also gets polluted, which will cause damage to our cattle and domestic animals apart from heavy noise pollution.

Contd....4..

In view of the all the above facts, we humbly request the authorities of Andhra Pradesh Pollution Control Board, Tirupathi to take appropriate action to fulfil all the promises that were made by the Management of M/s ACC Cement i.e., (1) To provide compensation to the farmers to all the lands surrendered by us in the year 1996 and 2007 as per the present market rates. (2) Payment of the expenses incurred (Rs. 70,000/- per acre) by us for clearing of bushes and shrubs in our lands as explained above. (3) To provide 100% employment guarantee to the children of the farmers, who lost their lands under the proposed factory.

We further request the PCB authorities to provide us the assurance in the form of written agreement from the ACC Cement Management to enable us to relieve our families from our financial crisis and to protect the future of our children, for which act of kindness we shall be ever grateful to you.

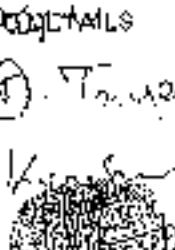
If any of the above promises are not fulfilled, kindly take necessary action to cancel the mining permissions of the ACC Cement and also to cancel the grant of permission for establishment of their factory in our village area.

Thanking you Sir,

Yours faithfully,

Villagers of Gollapally village,
Vaddirala Gram Panchayat,
Dharmawada, Chinnaventuta,
Bestavemula, Uppalapadu villages in
Mylavaram mandal,
YSR Kadapa district

1 P. Lakshmi narayana Gollapalli
2 G. Chandra Sekhar Gollapalli (V)
3 B. [illegible]
4 D. Rama mohan



# Rural Environment Education and Health Awareness Society

Regd.No: 1702/2007

TO,
THE ENVIRONMENTAL ENGINEER,
Thirupathi Regional office ,
Chittoor Dist. APPCB.

Gollapalli,
Date: 20.10.2016.

RESPECTED SIR,

SUB:- review of public hearing of M/s ACC Ltd. Proposed Limestone Mine 7.0 MTPA with 57.30 crores in 997.08 Ha Man power of 62 at Dhannawada,Chinna venturla,Vadderala, Besta vemula,Gollapalli & G.Uppalapadu (V) Mylavaram (Mdl) YSR Kadapa (Dist) A.P.

I, P.Madhubabu Environment Voulenteer (REEHAS, Rural Environment Education and Health Awareness Society) R/O of Hyderabad, Most Respectfully Submit That:

In this regard as a Environment Volunteer I am giving few suggestions to the proponent
So Please Kindly Consider the Below Points ,

All Environmetallsts are opposing the industries but I am supporting the industries why because, in the time of Independece our country population 30 crores but now it increased to 130 crores, every year 50 lakhs Graduates coming for employment but Government giving employment 5 lakhs people only, others are getting job opportunites in private sector so we must welcome to the industries.

Especially after Sidercation of State of Andhra Pradesh Industries must, that also cement industry essential for construct of new Capital city and all Govt offices, for development of residential houses. Hon'ble Chief Minister Mr. N.Chandrababu naidu also inviting to establish Industries.

All are discussing about pollution ... pollution... but main pollution of our country is unemployment is most dangerous pollution to all

1. The Proponent of M/S ACC Cement Ltd Proposed lime stone Mine 7.0 MTPA with 57.30 Crores Man power of 62 in 997.08 Ha at Golla palli, Dhannawada, Chinna venturla, Vadderala, Besta vemula & G.Uppalapadu(V) Myalavaram (Mdl) YSR Kadapa(Dist) A.P.

2. The Environment consultant Vimta Labs Pvt.Ltd. of this project study area coverd 10 k.m radius around the proposed Project area, they studied locations of air ambipent quality , noise levels recorded , water samples collected,soil samples also collected these all are in norms of CPCB. This is satisfactory.

3. The consultant please take health states of village people in 10 km radius around is must, why because it is very useful in future.

[redacted]
# 1 7-495/9, Musheerabad, Hyderabad-500 020.
Email : madhuhanumandla@gmail.com, reehas76@gmail.com
Cell : 9908612657

# Rural Environment Education and Health Awareness Society

Rege. No: 1702/2007

4. For operation of the project water requirement is 60 m3/day . It is taking from ground water source, in summer season chance to down fall water level so please arrange rain water harvesting system.

5. Please utilise waste water to plantation, sprinkling on roads. It controls Dust Pollution when your vehicles transport time.

6. Your taking 33% for plantation for Green belt is good it is CPCB norms, but I requesting to improve 50% if any possible.

7. You take avenue plantation to near villages, road side it is useful to save environment. Plant fruit baring and medicinal value trees.

8. Please give employment opportunities to local people first.

9. Give medical facilities to near villages, Conduct Medical Camps Regularly.

10. Give drinking water facility to near villages.

11. Give good education to near village children

12. Develop all main roads and street roads of near villages.

13. The project will contribute additional revenue to the State & Central Govt.

I am recommending authorities of pollution control panel of MOEF, for grant a permission to the above proponent.

Thanking you.

Yours faithfully,

H Madhubabu (REEHAS, Rural Environment Education and Health Awareness Society)

1) copy to R.O Thirupathi, APPCB.
2) copy to Project Proponent M/s ACC Ltd.
3) copy to Project Consultant Vimta Labs Ltd.

# 1-7-485/9, Musheerabad, Hyderabad-500 020.
Email : madhuhanumandla@gmail.com, reehas78@gmail.com
Cell : 9908612657

# Rural Environment Education and Health Awareness Society

Regd. No: 1702/2007

2368
29/10/16

TO,
THE ENVIRONMENTAL ENGINEER,
Thirupathi Regional office ,
Chittoor Dist. APPCB.

Gollapalli,
Date: 20.10.2016.

RESPECTED SIR,

SUB:- review of public hearing of M/s ACC Ltd.- Proposing Cement Plant 5 MTPA Clinker, 8 MTPA Cement, 100 MW Captive Power Plant along with Captive Limestone Mine 7.0 MTPA with 7100 crores in 279.028 Ha Man power of 499 at Gollapalli (V) Mylavaram (Mdl) YSR Kadapa(Dist) A.P.

I, H.Madhubabu Environment Vocienteer (REEHAS, Rural Environment Education and Health Awareness Society) R/O of Hyderabad, Most Respectfully Submit That:

In this regard as a Environment Volunteer I'am giving few suggestions to the proponent
So Please Kindly Consider the Below Points .

All Environmetalists are opposing the industries but I am supporting the Industries why because, in the time of Indepandece our country population 30 crores but now it increased to 110 crores, every year 50 lakhs Graduates coming for Employment but Government giving employment 5 lakhs people only, others are getting job opportunities in private sector so we must welcome to the industries.

Especially after Bifercation of State of Andhra Pradesh Industries must, that also cement industry essential for construct of new Capital city and all Govt offices, for development of residential houses. Hon'ble Chief Minister Mr. N.Chandrababu naidu also inviting to establish industries.

All are discussing about pollution ... pollution... but main pollution of our country is unemployment is most dangerous pollution to all.

1. The Proponent of M/S ACC Cement Ltd Proposing Cement Plant Clinker 5 MTPA, Cement 8 MTPA, Captive power 100 MW along with Captive lime stone 7.0 MTPA with 7100 Crores Man power of 499 in 279.028 Ha at Gollapalli(V) Myalavaram (Mdl) YSR Kadapa(Dist) A.P.

2. The Environment consultant Vimta Labs Pvt.Ltd. of this project study area coverd 10 k.m radius around the proposed Project area, they studied locations of air ambient quality , noise levels recorded , water samples collected,soil samples also collected those all are in norms of CPCB. This is satisfactory.

3. The consultant please take health states of village people in 10 km radius around is must, why because it is very useful in future.

29/10/16

[redacted]
# 1-7-496/9, Musheerabad, Hyderabad-500 020,
Email : madhusanumandla@gmail.com, reehas78@gmail.com
Cell : 9908612657

# Rural Environment Education and Health Awareness Society

Regd. No: 1702/2007

4. For operation of the project water requirement is 7750 m3/day. It is taking from ground water source, in summer season chance to down fall water level so please arrange rain water harvesting system.

5. Please utilise waste water to plantation, sprinkling on roads. It controls Dust Pollution when your vehicles transport time.

6. Your taking 33% (90.75 Ha) for plantation for Green belt is good it is CPCB norms, but I requesting to Improve 50% if any possible.

7. You take avenue plantation to near villages, road side it is useful to save environment Plant fruit bearing and medicinal value trees.

8. Please give employment opportunities to local people first.

9. Give medical facilities to near villages, Conduct Medical Camps Regularly.

10. Give drinking water facility to near villages.

11. Give good education to near village children.

12. Develop all main roads and street roads of near villages.

13. The project will contribute additional revenue to the State & Central Govt.

I am recommending authorities of pollution control panel of MOEF, for grant a permission to the above proponent.

Thanking you.

Yours faithfully,

N.Madhubabu (REEHAS, Rural Environment Education and Health Awareness Society)

1) copy to R.O Thirupathi, APPCB.
2) copy to Project Proponent M/s ACC Ltd.
3)copy to Project Consultant Vimta Labs Ltd.

# 1-7-495/0, Musheerabad, Hyderabad-500 020.
Email : madhuhanumandla@gmail.com, reehas78@gmail.com
Cell : 9908612657

గౌరవనీయులైన ఆంధ్రప్రదేశ్ కాలుష్య నియంత్రణ మండలి గారికి,

తిరుపతి

కడప జిల్లా మైలవరం మండలం చిన్నఅణుతుర్ల గ్రామ రైతులు గ్రామసభలో తీర్మానించిన విన్నపము.

1. ఐస్తావేముల రావ తాల్ రోడ్డు వరకు అనగా పాలవాగు పోయినట్టు ఇక మీదట పోయిన భూమిని కొనుగోలు చేయాలి

2. ఎకరాకు ఇప్పుడు కొనే భూమికి 15,00,000/- వున్న భూమిని కొనుగోలు చేయాలి.

3. భూమిని కోల్పోయిన వారికి ఉద్యోగము చదువును బట్టి మరియు మధ్య గల వయస్సు గల వారికి ఉపాధి కల్పించవలెను.

4. భూమిని కోల్పోయిన వారికి స్థానికులకు దొహనాలు మరియు మిషనరీలు కాంట్రాక్ట్ పనులు స్థానికులకు ఇవ్వవలెను.

5. 50,000/- మరియు 1,25,000/- పోయిన భూమికి వారికి 4,00,000/- రేటుతో కల్పించవలెను.

6. గ్రామంలో విద్య మరియు వైద్యము మరుగు స్త్రీలకు పాడి పశువులు మరియు గొర్రెలు పెంపకం ఆర్థిక సహాయం చేయవలెను.

7. ఫ్యాక్టరీ మొదలు పెట్టేవరకు కొన్న భూములు మేమే వేయుకొనవలెయును.

8. ఏ.సి.సి సిమెంట్ ఫ్యాక్టరీ త్వరగా కట్టి మా కోరికలు తీర్చవలెను.

9. మేము ఏ.సి.సి ఫ్యాక్టరీకి రావడానికి స్వాగతిస్తున్నాము. మాకు ఎలాంటి అభ్యంతరము లేదు ఫ్యాక్టరీని తొందరగా కట్టవలెను.

ఇట్లు

గ్రామ రైతులు

K. Thippa Reddy

అక్కోబరు 2019 వ తేదీన జరుగనున్న ప్రజాభిప్రాయ సేకరణ సందర్భంగా పెన్నా సిమెంట్ల కడప సిమెంటు కర్మాగార ప్రతిపాదనపై తయారు చేసిన నివేదిక లో మీ అందోళన కలిగిస్తున్న విషయాలపై కొన్ని ప్రశ్నలు. వీటికి కంపెనీ వారు నియమానుసారంగా రాత పూర్వకంగా సమాధానాలు చెప్పాలని కోరుతున్నాము.

1. సిమెంటు ప్లాంట్ల అతి కాలుష్యకారక పరిశ్రమలు. పరిసర ప్రజల ఆరోగ్యంపై పడే ప్రభావం గురించి నివేదికలో ఏమీ చెప్పలేదు. ఎందువల్ల? సున్నపురాయి గాలి పీల్చుకు జీవిస్తున్న మాకు యీ శ్వాసలు వల్ల కలుషిత గాలి పీల్చుతూ బతక పలుసీస పరిస్థితి ఏర్పడుతుంది. ప్రపంచ ఆరోగ్య సంస్థ సంయుక్త కాలుష్యం వల్ల ప్రపంచంలో ఏటా 70 లక్షల మంది ముందుగా చనిపోతున్నారని చెబుతున్నది. భూమ్మీ భూతి కాలుష్యాన్ని లాన్సెట్ కాన్సర్ ప్రపంచ ఆరోగ్య సంస్థ. యూ మధ్యనే హార్వర్డ్ విశ్వ విద్యాలయం రోజువారీ వాడే రసాయనాలు క్రిమి సంహారకాలూ, చర్మ సౌందర్య సాధకాలూ, పొగ్మూలూ, కల్మష హారకాలూ (డీటర్జెంట్లు) వల్ల అమెరికా ప్రజల ఆరోగ్యంపై ఏటా 340లు కోట్ల డాలర్ల భారం పడుతోందని పరిశోధించి చెప్పింది. అలాగే బొగ్గుతో విద్యుదుత్పత్తి వల్ల ఆరోగ్య నష్టంగా అమెరికా ప్రజలపై 34500 కోట్ల డాలర్ల ఆర్థిక భారం పడుతోందనీ ఇటీవల వ్రాతమే చెప్పింది. థర్మల్ విద్యుత్ కేంద్రాలూ, సిమెంటు ఫ్యాక్టరీలూ కాలుష్య పరంగా యిరువైపుల ఒకే స్థాయిలో వుంటాయి. మీలాభాల కోసం నడుపుకునే యీ వ్యవహారం వల్ల మీపై పడే ఆర్థిక భారానికి మీరు బాధ్యత తీసుకోవాలి. మీ సమాధానం ఏమిటి?

2. ఇది వర్షాధారిత జీవన ప్రాంతం. తరతరాలుగా భూగర్భ జలాలమీ ఆధారపడుతూ బ్రతుకుంటున్నాము. మీరు సిమెంటు ఉత్పత్తికీ, విద్యుదుత్పత్తికి కలిపి 7750 ఘనపు మీటర్ల నీటిని రోజూ భూగర్భ జలాలనుండి తీసుకుంటామని నివేదికలో తెలిపారు. ఇ రోజులో వాడే నీటితో 6 ఎకరాల పరి పండించు కోవచ్చు. మా ఉన్నతి మనుగడ ఘోరంగా అర్థిక, రాజకీయ బలంతో భాగేసుకుంటే చూసు రక్షణది? మీరు ఉన్నతి సహజ వనరులతో వ్యాపారం చేసుకునేందుకు, అభివృద్ధిలో మిషతో మా జీవించే హక్కును హరిస్తారా?

3. నిజంగా అంత నీరు కావాలా? మీ కంపెనీ నివేదికలలో ఉన్న క్లింకర్ ఉత్పత్తికి కేవలం 60 లీటర్ల నీరు మాత్రమే వాడుతున్నట్లు చెప్పుకుంటూ, మరి యీ ప్లాంటులో రోజుకి 480 లీటర్లెందుకు చూపుతున్నారు? ఇది మోసం కాదా? అనేకమి అధికార వ్యవస్థతో కుమ్మక్కై మా జీవనాధార వనరు దోచుకుంటారా?

4. ప్లాంటు విద్యుదవసరాల కొరకు నిర్మించనున్న 100 మెగావాట్ల బొగ్గు ఆధారిత విద్యుత్ కేంద్రానికి రోజుకి 900 ఘనపు మీటర్ల నీరు కావాలని చూపారు. దాని ప్రతిపాదిక వివరాలు తెలియ జేయండి. గాలిలో నీటి ఆవిరిని ద్రవీకరించే పద్ధతి వాడతామని చెబుతూ అంత నీరు కావాలని ఎందుకు చూపారో వివరించాలి.

5. మన దేశంలో పర్యావరణ ప్రభావ అంచనా నివేదికలు హాస్యాస్పదంగా తయారయ్యాయి. ఎసిసి అంతర్జాతీయ కంపెనీ లఫార్జ్ హాల్సిమ్ లో భాగమైనా అలాంటి దేశాలలో పాటించే కనీస ప్రజాస్వామిక విలువలూ, అంతర్జాతీయ పర్యావరణ ఒప్పందాల సూచ్యత తోసిరాజని తప్పుడంకెలతో నివేదికలు నిలవడం ఎలా సమర్థించు కుంటారు?

6. పవర్ ప్లాంటులో వెలువడే వాయువులతో సల్ఫర్ ఆక్సైడ్ మోతాదు 450 మిల్లీగ్రాములకు మీటరుకి గా తీసుకున్నారు. ఏ ప్రమాణాల ఆధారంగా ఆ సంఖ్య తీసుకున్నారు. 2017 నుండి అమలయ్యే ప్రమాణాల కేవలం 100 మాత్రమే. పాత సాంకేతికతతో నూతన ప్రమాణాలు ఎలా సాధిస్తారు?

7. ఆంధ్ర ప్రదేశ్ లో మిగులు విద్యుత్ ఉందనీ, పొరుగు రాష్ట్రం పై భారం మోపిన తరువాత కూడ ఉద్యోగాలను పెంచే విధాన పరంగా భారత్ కిరస్తురించిన సబ్ క్రిటికల్ సాంకేతికతతో పవర్ ప్లాంటు నిర్మించటం ఎంతవరకు సామాజిక బాధ్యత?

8. ఎందుకని 2 మిలియన్ టన్నుల స్థాయిలో బొగ్గు దాడి పరిశ్రమకు తొగ్గ మంత్రిత్వ శాఖ నుండి అనుమతులు రావాలి. బొగ్గు లభ్యతకు అంగీకార పత్రం వుండాలి. ఇవేవీ ఉన్నట్లు చూపలేదు. నీటి అనుమతి లేదు. జనసరుమైన అనుమతులు లేకుండా పర్యావరణ అనుమతికి తొందర పడటంలో అంతర్యం ఏమిటి?

9. ఎగరు కాలుష్య పెరుగుదలపై ఎన్నిన అంకెలు అనుమానాస్పదం, నమ్మశక్యంగా లేవు. స్వతంత్ర పరిశీలన అవసరంగా భావిస్తున్నాము.

10. వాహనాల ద్వారా పోకడ వల్ల లేదే దూళి. దగ్గరలోనే వున్న సున్నపురాయి గని నుండి వెలువడే దూళి కలిసి కాలుష్యం జనావాస స్థాయికి చేరుతుంది. ప్రపంచ ఆరోగ్య సంస్థ నిర్ణయించిన మార్గదర్శకాలు చాలా భారత నియమాలు పరిశ్రమలకు అనుకూలంగా వున్నాయి. అవి మానవ ఆరోగ్య హాని స్థాయి ప్రాతిపదికన వైజ్ఞానిక పరిశోధనల ఆధారంగా నిర్ణయించినవి కావు. ఏమైందో స్థానిక పరిసరాలలో కాలం మారి బతికిన్నవి కాని కానున్నాయో కాలమే చెబుతుంది. మీ గాలిలో విషమయం కాకుండా పీల్చి పూకలాటి ఆరోగ్య రక్షణ కల్పిస్తుంది?

11. వైట్రిక్ ఆక్సైడ్ వదులలయ్యే పరిశ్రమల చుట్టూ వాయు రవాయన చర్యల వల్ల ఓజోను పొరలు పెరుగుతుంది. అవి ప్రజారోగ్యానికి, పంటలకూ హానికారి. పంటలకు జరిగే హానిని బీమాపై నివేదిక ప్రస్తావించలేక పోయింది. ఓజోనుతో పంటలకు జరిగే నష్టంపై ఎన్నో పరిశోధనలూ, సాహిత్యాల నివేదికలూ ఉన్నాయి. మీకు తెలుసా, మీకు వివిధ రకాల నష్టాలు. చాలినవరు శాస్త్రీయత ఉన్నదా?

12. పరిశ్రమలు బట్టీ (కోలగే కిల్న్) లో హానికర రసాయన వ్యర్థాలను దహించే ప్రక్రియను కాలుష్య నియంత్రణ మండలి ప్రోత్సహిస్తోంది. ఉత్పత్తి ప్రారంభమైన తరువాత యీ ప్లాంటులోనూ ఆ పని చేస్తే అలాంటి ఉ స్పష్టంగా నివేదికలో లేదు. అది చేయడానికి మీకు జరిగే హాని స్థాయి పెరుగుతుంది. కడప జిల్లాలోనే ఇతర సిమెంటు ప్లాంట్లు చేస్తున్న రసాయన వ్యర్థాల దహనంతో ప్రజలు ఇబ్బందులు పడుతున్నారు వారి భాధ వినిపించుకునే నాథే లేరు. అధికారులకు దృష్టి, శ్రవణ లోపం ఎక్కువగా వుంది.

13. సెప్టెంబరు, 2016 లో ప్రకటించిన ప్రజాభిప్రాయ సేకరణకు ప్రజలకు పర్యావరణ ప్రభావ అంచనా నివేదిక ప్రవేశపెట్టలేదు పంచాయితీలలో అందుబాటులో పెట్టలేదు. అప్పుడేమో రకరకాల నిర్బంధ నిబంధనలు ప్రారంభించారు. ఇది ప్రజాస్వామ్యాన్ని, పర్యావరణ సమితి విశ్వసనీయతను అపహాస్యం చేయడం. మొదట్లోనే ఇంత దౌర్జన్యానికి ఒడిగట్టే ఒక బహుళ జాతి కంపెనీ ఇక ముందెన్ని అరాచకాలకు దిగకుండా ఉంటుంది? ఇలాంటి మనుష్యులను కలిగి వీస్తోంది. మీకు భారత రాజ్యాంగం కల్పించిన ప్రాథమిక హక్కులున్నా మిగులుతాయా? మీ వ్యాపార ప్రయోజనాల కోసం మమ్మలను బానిసత్వంలోకి నెట్టుతారా?

14. సిమెంటు బట్టీ దూళి (సి కె డి) ప్రమాదకరమైనది. అందులో విష భార లోహాలుంటాయి. బయటి నుండి సేకరించే వ్యర్థాలను దహనం చేసే ప్లాంట్ల నుండి వెలువడే సి కె డి లో భారలోహాల మోతాదు తగ్గి ఉంటుందని వాదిస్తారు. ఆ బట్టీల నుండి వెలువడే సి కె డి కంటే 5 నుండి 9 రెట్లు ఎక్కువగా ప్రమాదకరమని అమెరికా పర్యావరణ రక్షణ సంస్థ అధ్యయనాలు చేసాయి. ఈ దూళిని ఏంచేస్తారనే వివరాలు ఇవ్వని నివేదికలో స్పష్టంగా లేదు. వివరాలివ్వండి.

15. కాలుష్యం తగ్గించడానికి హరితహారాన్ని ప్లాంటు చుట్టూ పెంచాము లేక్కపని ప్రతిపాదించారు. కనీసం పుట మీటర్ల వెడల్పున్న హరిత వనం మాత్రమే కాలుష్యాన్ని గణనీయంగా తగ్గించగలదని పరిశోధకులు చెప్పుతున్నారు. కేవలం పర్యావరణ మంత్రిత్వ శాఖ నియమాలను పాటించడం కోసమే 33 శాతం హరితవనం నాటితే, అదిన్నా అప్పుడప్పుడూ భూమిలున్న చోట నాటుతూ పోతే దాని ప్రయోజనం శూన్యం. శాస్త్రీయంగా రూపకల్పన చేసి మొక్కలు నాటాలి. ఏ ప్రాంతి పడికన గ్రీన్ బెల్ట్ ప్లాను నిర్ధారించారు? కాలుష్య క్షీణత గుణకం ఎంత? వివరాలివ్వండి.

తేదీ: 28/10/2016

(3)

మహాగురాజశ్రీ !

గౌరవనీయులైన జిల్లా [illegible] గారికి [illegible] గ్రామం

నివాసము :

విన్నపం !

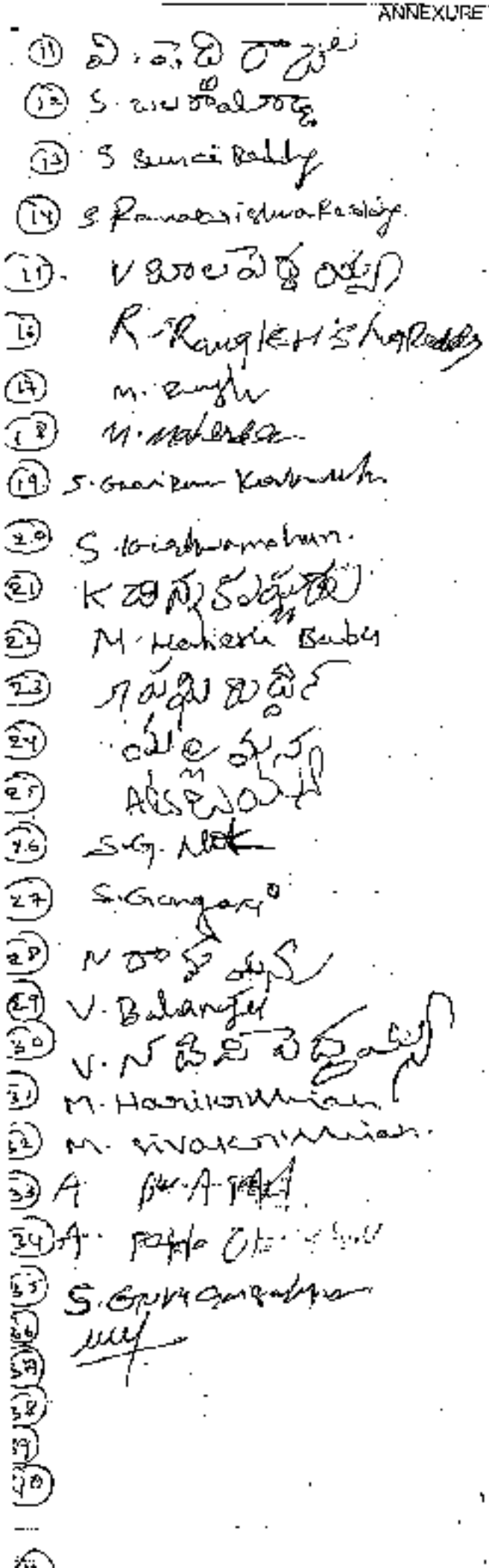
కృష్ణపట్నంలో మైలవరం మండలం పెద్దకాలేరు గ్రామం దగ్గర A.C.C సిమెంట్ కర్మాగారము నిర్మించు భూమి చుట్టూ మరియు ఎంతటి దూరంలేదు మేము ఉండు గ్రామం మీరు మాకు సిమెంట్ కర్మాగారం నిర్మించే పరిసరాలలో కాలుష్యం వాతావరణం మాకు ఆరోగ్యానికి బద్ధ కలుగు ఉంటుంది కనుక మేము ఒప్పుకోలేము. మీరు ఏర్పాటు చేసే ఆ పక్కన ఉపకర్మాలను కర్మించి జీవనోపాధి కల్పించే పరిసరాలలో మాకు చూపించవలసిందిగా మరియు త్రాగునీటి సదుపాయాలను కూడా మీరే ఏర్పాటు చేయవలసిందిగా కోరుచున్నాము.

మీ విధేయులు

28/10/16

గ్రామస్థులు సంతకములు

1. H. Hathi Seshaiah
2. S. Sambasiva Rama Reddy
3. M. N. [illegible]
4. V. [illegible]
5. M. [illegible]
6. S. [illegible]
7. S. [illegible]
8. S. P. Pullaiah
9. S. Rama Sudhakar Reddy
10. S. Venkateswara Phaniraj



ప్రజాభిప్రాయ సేకరణకు

గొల్లపల్లి
20-10-2016

20/10/16

గౌరవనీయులగు A.C.C. సమక్షం లో భూసేకరణ యొక్క అభ్యంతరాలపై

గొల్లపల్లి నివాసి కొల్లి సోమిరెడ్డి (లేట్) S/o K. పుల్లారెడ్డి అనుబంధ వివరణ సమర్పించి రాయడం విన్నవించడమైనది!

నా భూమి (Pass Book No 177643, పట్టా నెం 158 సర్వేనెం 19/1 143 లో 93/10A) 5 ఎంపి ప్రాంతం ఎకరాల ఇరవై సెంట్లు మొత్తం యింటిమీదికి అని ప్రాంతం ఇవ్వడానికి ఇప్పటికి పట్టా పెట్టడానికి ప్రాంతం ఇవ్వడానికి ఇప్పటికి పట్టా పెట్టడానికి ఎవరూ ముందుకు రాలేదు - B.P. కుటుంబాలు ఆనాడు.. నా తండ్రిగారు బాగా తెలిసి - B.P. కుటుంబాలు ఆనాడు.. నా తండ్రిగారు బాగా తెలిసి ఆనాడు ఎలా బాధపడ్డారో చూసాము. వాళ్ళకు నిర్వహించినవాళ్ళు తెలిసి.. ఏ అధికారం వచ్చినప్పుడు ఎప్పుడు ఎప్పుడు కాకుండా మీరు ఇవ్వాలని చూసిన వారికి ఉద్యోగం ఇస్తాం అని చెప్పి ఉండాలి - నాకు ఉద్యోగం ఎవరు ఇవ్వలేదని శత్రు శేషమందిన నా ఇద్దరు కొడుకులకి ఇవ్వమని ధృఢమైన నిశ్చయంతో మానవత్వంలో ఎకరానికి 3 లక్షలు లక్ష రూపాయలు మూడు లక్షలు కావాలంటే ఇవ్వలేం అని చెప్పలేదని. ఇదివరకు సమయం ఇచ్చినా రని పరిహారం ఇవ్వలేదని నివేదించుకుంటున్నాను. నేను నా భూమి వదిలిపోవడం లేదు.. నేరేవాళ్ళ దొరికినట్లు వెళ్ళకుండా నిలిచి. నేను కోర్టు గారి దర్శనం కు వెళ్ళి పోరాడి చేసుకుంటాం అనే ఉద్దేశంతో

మీరు ఫ్రెండ్ కోసం అన్నారు... నాకు దగ్గరగా వచ్చి వెళ్ళినది... మీరు ఫ్రెండ్ షిప్ కోసం నాకు చేసి ఫ్రెండ్ కోసం అంటారని... ఇకనుండి వాళ్ళకు ఇవ్వండి... కావాలంటే కాదండి... తప్పకుండా తిరిగిస్తారని ఆశిస్తున్నాను... మీ నాలుగు రూ... మీరు ఇచ్చిన వారి ఆంప్లేం ప్రకారం పెట్టాలని పెట్టకపోగా కూడా తిరుగుతూ ఉన్నారని... ఈరు కావాలని ప్రాబ్లమ్ మీ (భర్త చనిపోయాడు)

K. Savithri w/o late [illegible]
Cell No:- 8008464585
గాజువాక
మహారాణి మండలం
కడప జిల్లా
A.P

వేద:

గౌరవనీయులైన పర్యావరణ ప్రభావ కారిగారికి,

భన్నవాడ, చిన్నతెప్పలపల్లి, వడ్డిరాల, పెద్దచేపులు, గొల్లపల్లి, దిప్పలపాడు గ్రామస్థులకు చెందిన రైతులము విన్నపం మనవి చేసునది...

2344
14/10/16

మెస్సర్ Acc లిమిటెడ్ వారికి సంబంధించిన మైనింగ్ లీజు క్లింకర్ ప్రొడక్షన్ సిమెంట్ గ్రైండింగ్ మరియు పవర్ ప్లాంట్ సంబంధించి 19-9-2016 తేదీన ప్రజాభిప్రాయ సేకరణ నిమిత్తమై మండల పరిషత్ కార్యాలయం చిరుమామిడి వారు 20-9-2016న పర్యావరణ ప్రభావ అంచనా ప్రకటన జారీ చేయుచున్నారు. గతంలో కూడా 8-8-2016న మరొక పత్రిక ప్రకటన జారీ చేసారు. దీనితో 9-9-2016న జరిగిన ప్రజాభిప్రాయ సేకరణ సమావేశాన్ని రైతులందరు బహిష్కరించి నిరసన తెలియజేయడంతో అధికారులు సమావేశాన్ని వాయిదా వేయడం జరిగింది. రైతుల సమస్యలను తెలుసుకోకుండా, సమస్యలను పరిష్కరించకుండా సమావేశాన్ని నిర్వహించడం అంటే రైతులను బలవంతం చేయడమే అవుతుంది. పరిశ్రమ నెలకొల్పితే ఉద్యోగాలు, ఉపాధి కల్పిస్తామని రైతులకు ఎర్రగాలు, కల్పవృక్షాలు కల్పిస్తామని కల్లబొల్లి కబుర్లు చెబుతూ కాలయాపన చేస్తూ 1996, 2006, 2010 సం. కాలంలో ఎకరాల లెక్కలతో భూములు కొంటున్నారే తప్ప పరిశ్రమ సంబంధించిన ఉద్యోగాలు ఇవ్వడం బాధాకరం. పరిశ్రమ సంబంధించిన వివరాలను తెలిపిన చాంప్లెట్ పుస్తకమును మరియు FICC యూనిట్ స్థాపనకి అనుకూలంగా ఉన్న అధికారులకు, ఉన్నతాధికారులకు భూములు ఇచ్చిన రైతులకు మాత్రం 15 పేజీలున్న పుస్తకమును కొందరికి ఇవ్వడం వలన రైతులందరు అసంతృప్తిగా ఉన్నారు. ఉండగా 62 ఉద్యోగాలు ఉన్నాయి మరియు సారవంతమైన భూములను బీడు భూములుగా చూపడం, గ్రామాలలో నివసిస్తున్న ప్రజలను.

వలసవెళ్ళినట్లుగా చూపడం దారుణమైన విషయము. రైతులు సాగు చేస్తున్న భూమి నల్లరేగడి భూమి కావడంతో వానాకాలంలో అధిక దిగుబడి వస్తుంది. రైతులంతా వ్యవసాయమే జీవనాధారంగా జీవిస్తున్నారన్న విషయాన్ని ACC యాజమాన్యం మరిచిపోయింది. వర్షం రాకున్న కూడ భూగర్భజలాలు పుష్కలంగా ఉండటంతో బోర్లతో రైతులు పంటలు పండిస్తున్నారు. మరికొందరు వర్షాధార పంటలు ఎడాదికి రెండో లేక మూడు పంటలు పండిస్తూ జీవనం సాగిస్తున్నారు. కొన్ని గ్రామాల ప్రజలు తాము నివసిస్తున్న గ్రామాన్ని ACC వారు పరిశ్రమ పేరుతో మింగి వేయటంతో చేతులుగాని చేతులు ముఖాన్ని కుప్పుకున్నారు. తీయనప్పటికీ పరిశ్రమ వస్తుందన్న ఆశతో రైతులు తిప్పలు చూసి ఇళ్ళు నిర్మించుకొని నాడు రైతులుగా ఉన్నవారు నేడు రైతు కూలీలుగా మారిపోయారు. ఇగ్గోళ్ళుగా గుర్తుకు రాని పరిశ్రమ నేడు మారిపోయి గుర్తుకు రావడం ఆశ్చర్యాన్ని కల్గిస్తోంది. పరిశ్రమ రాకపోవడంతో భూములున్నో, పాత ఇళ్ళలో ప్రజలు ఉండి మళ్ళా నివాసస్థావరాలు ఏర్పరచుకున్నారు. పట్టపగలు నేటికీ కూడ రైతులకు కనిపించి రైతులను భయాందోళనకు గురిచేస్తున్నాయి పరిశ్రమపై ప్రజలకు ఎన్నో ఆశలు ఉన్నాయి. పరిశ్రమతో భూమి, నీరు, గాలి కాలుష్యంతో పాటు పరిశ్రమల వల్ల పేటెడు కాబోయే ఇళ్ళు కూడా కూలిపోయి గ్రామాలన్నీ శాశ్వతంగా మాయమౌతాయి. కాబట్టి పరిశ్రమకు భూములు ఇవ్వడానికి సిద్ధంగా లేము. కనుక మాయందు దయచూపాలని ACC ప్రతినిధులు సేకరించేయత్నం నుండి తగిన చర్యలు చేపట్టి చుట్టుప్రక్కల 39 గ్రామాలను తొలగించవలసినదిగా పాఠశాస్తున్నాము. మా జీవనాధారాన్ని, మమ్మునుగడను, పర్యావరణాన్ని రక్షించవలసినదిగా కోరుతున్నాము.

ధన్యులు

తమ విధేయులు

మెస్సర్స్ ACC పరిశ్రమ భూ నిర్వాసిత గ్రామాల

రైతులు మరియు ప్రజలు

మైలవరం {మండలం}

# Signatures for Vaddirala Villagers

1. A. [illegible]
2. V.C. [illegible]

[redacted]

11. P.V. Sivaiah
12. K. Ramanaiah.
13. KN peddaiah
14. [illegible]
15. M. Malleswara Yadav
16. [illegible]
17. [illegible]
18. [illegible]
19. [illegible]
20. S. [illegible]
21. (MCR) M.V. Sita Reddy
22. [illegible]
23. P.C. Sullamuni
24. [illegible]

26. [illegible]
27. K.S.P. [illegible]
28. A. [illegible]
29. S. [illegible]
30. S. [illegible]
31. K. [illegible]
32. [illegible]
33. [illegible]

[redacted]

P. [illegible]

S. [illegible]

M. [illegible]

[illegible]

[illegible]

[illegible]

S. [illegible]

[illegible]

[illegible]

P. [illegible]

S. [illegible]

25 కానడీ ఓ తెలుగు

26 [redacted]

27 [redacted]

28 R. [redacted]

29 [redacted]

30 S. [redacted]

31

32 [redacted]

33

34 [redacted]

35

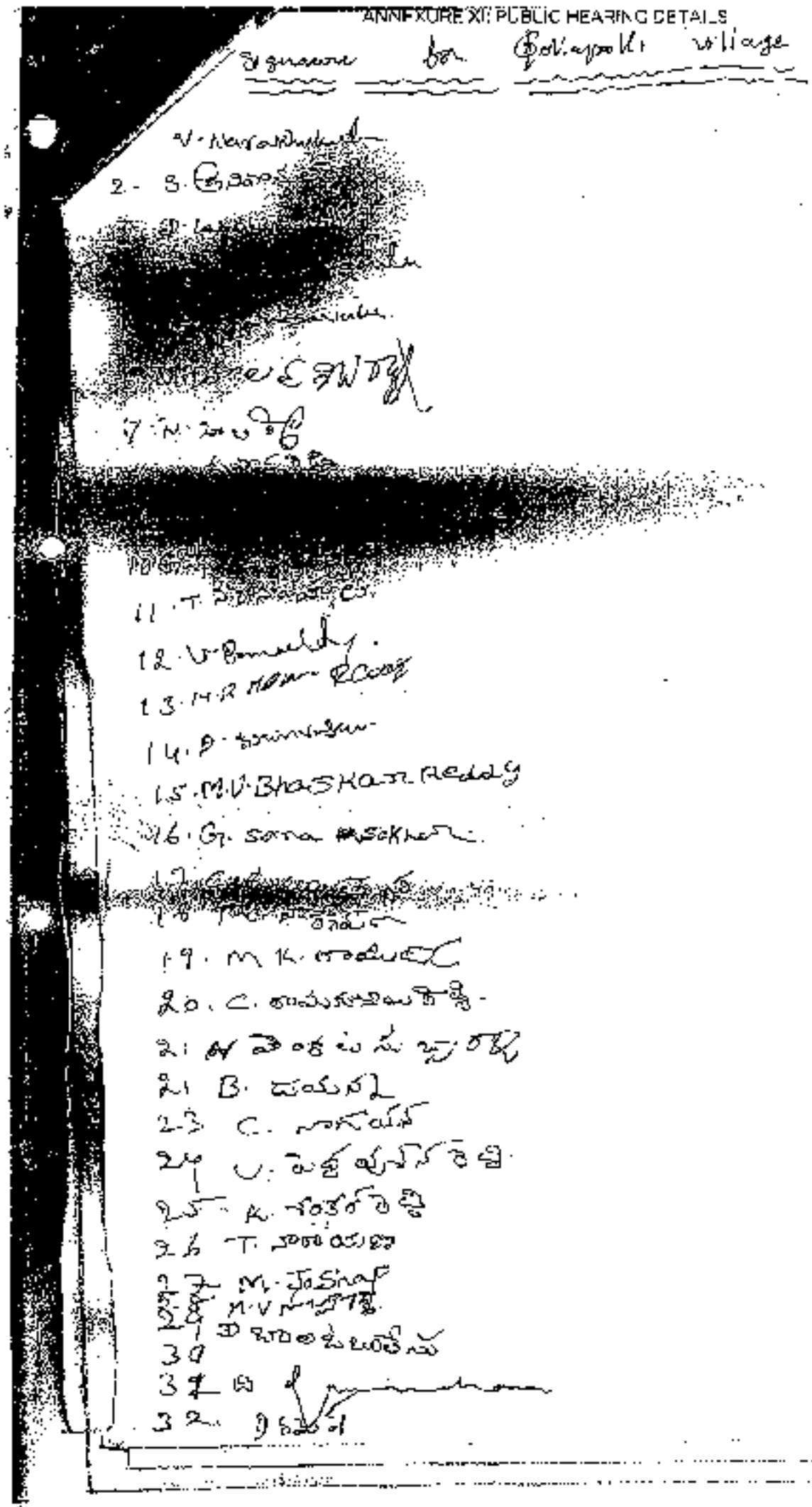
36 [redacted]

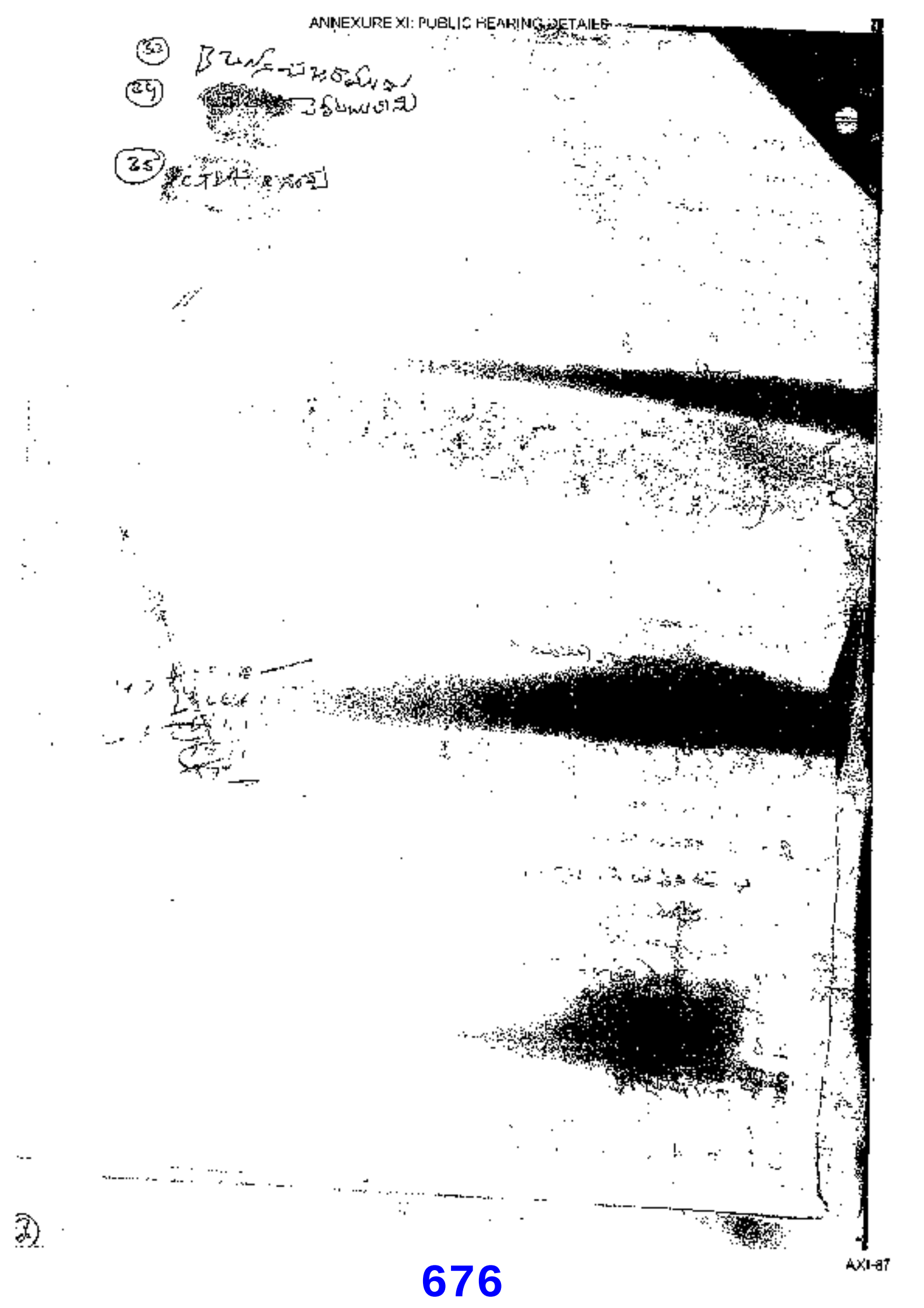
37

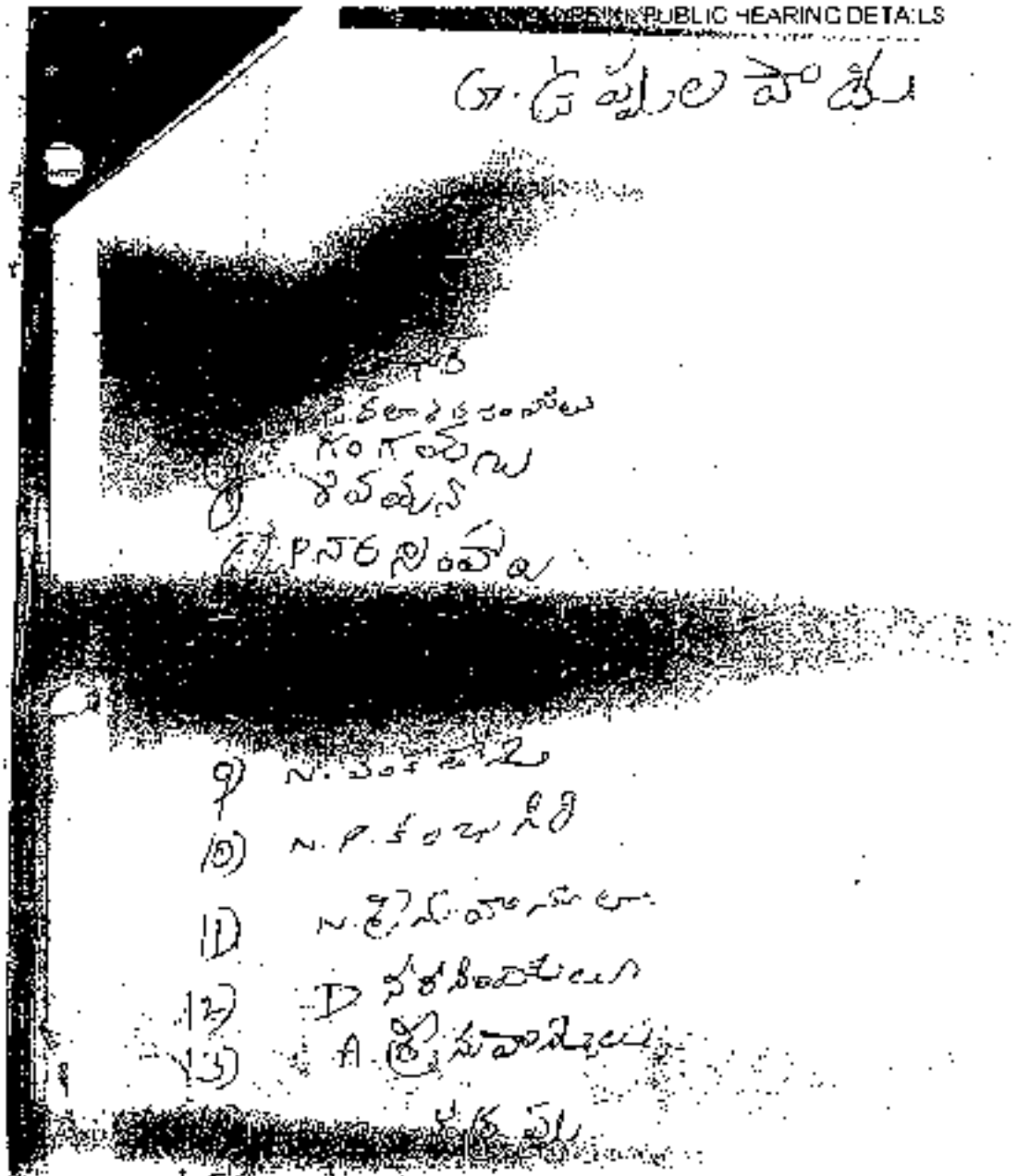
38

39

Signature for Bollapalli village







1 సంతకాలు తీసివేసుట కొరకు కొందరు

2. కొందరు వెంకటేశ్వరులు కొన్ని తొగిలులనై.

3. కలింకేతు కొంతమంది కొ/ సాయంత్ర

4. ఎఱ్ఱసంజీవరాయుడు కొ/ సుబ్బరాజు

5. N. కొండారెడ్డి కొ/ N వెంకటరెడ్డి

6. N శివరాజు కొ/ కొండయ్య

7. N. లక్ష్మన్న కొ/ కోటన్న

8) N. లక్ష్మీనరసయ్య కొ/ నరసింహులు చెట్టి

P. బాలసుబ్బరాయుడు కొ/ చెన్నకొండ

5. సుబ్బారెడ్డి కొ/ వీరారెడ్డి

పట్టిన బాలసుబ్బరాయుడు కొ/. బాలసుబ్బరాయుడుకొ

N. Bhaskara Rao S/o N R Ramana

N. V. Venkatramana S/o N.R Ramana

N. R. Ramanna S/o NP Ramanna

N. C. Bhaskar S/o N.R Ramanna

N. Gopalachari S/o NC Bhaskar

N. కొండారెడ్డి రామచంద్రుడు S/o N. C Ramanna

V. Narasimha

P. Ramulu

B. Yadaiah

Lakshminarayana

Venkateshwarlu

Gopalakrishna

Shivaiah

G. Ramaiah

M. Bhaskar

Venkateshwarlu

G. Yadagiri

V. Rao

Laxmi Devi

Laxmi

K. Saraswathi

T. Sunitha

Bhoomaiah

D. Subba Narasaiah

D. Narayana

B. Mohan

K. Prabhakar

K. Ravi

Dayakar

D. Vijaya Lakshmi

Ramakrishna

D. Narasimha Reddy

D. Nageshwar

D. C. Jayaraj

A. Shanker

A. Venkateshwarlu

# విజ్ఞాపన విజ్ఞప్తి న్యాయం చేయండి

తేదీ: 20-10-2012

మహారాజశ్రీ గౌరవనీయులైన పొల్యూషన కంట్రోల్ బోర్డు గారికి,

కడప జిల్లా ప్రొద్దుటూరు మండలం పరిధిలోని గొల్లపల్లె, జి. ఉప్పలపాడు, బెస్తవేములు, జంగాలపల్లె, వర్దరాల, చిన్నవెంతుర్ల గ్రామాలకు చెందిన రైతులం ప్రాసుకున్న అర్జి.

విషయము : అసోసియేటెడ్ సిమెంటు కంపెని (ఎ.సి.సి) స్థాపన లో జాప్యం మరియు ఎ.సి.సి ద్వారా నష్టపోయిన భూ నిర్వాసితులైన అరు గ్రామాల రైతుల విజ్ఞాపనలను గురించి.

అయ్యా !

ఎసిసి అనే సంస్థ ప్రొద్దుటూరు మండల పరిధిలోని గొల్లపల్లె, జ.ఉప్పలపాడు, బెస్తవేములు, జంగాలపల్లె గ్రామాలలో తొలిసారిగా 1996 సం॥లో ఎకరా 1 కి రూ. 50,000/- లతో రైతులతో ముప్పందం కుదుర్చుకొని త్వరలో ఫ్యాక్టరీని ఏర్పాటు చేసి భూమి కోల్పోయిన ప్రతి రైతు కుటుంబానికి విద్యా అర్హత ఉన్నా, లేకున్నా, వయస్సు సంభంధం లేకుండా శాశ్వత ఉద్యోగ అవకాశం కల్పిస్తామని పాటు ఇచ్చి సుమారు 800 ఎకరాల భూమిని కొనుగోలు చేసినారు. భూమి కోల్పోయిన ప్రతి రైతుకుటుంబానికి నుండి చేసే కూలీలకు కూడా ఉపాధి తప్పిస్తాము అని చెప్పి ఉన్నారు. కాని ఫ్యాక్టరీ నిర్మాణం చేపట్టలేదు, ఉపాధి లేదు. దీనులను 1996 సం॥నుండి 2006 వరకు పది సంవత్సరాల కాలంలో ఫ్యాక్టరీ వారు తీసుకున్న భూములలో కంప చెట్లు పెరిగి అడవి వండుము, అడవి అవుకు చేయకొని వారి భూమి చుట్టూ తుగ్గ మిగిలిన భూములలో వేసిన పైరులకు కూడా తీరని నష్టం జరిగినది. ఈ విధముగా తొలి పది సంవత్సరాల కాలంలో కంపెని ద్వారా ఉపాధిని పొందలేక సంతలను వండించుకోలేక రైతులు తీరని నష్టానికి గురి కావలసివచ్చింది. ఈ విషయాలను అనేక మార్లు కులెన్ దృష్టికి తీసుకొను రావడం ఫలితం కనుగలేదు.

10 సంవత్సరముల తరువాత అనగా 2006 సం॥లో మళ్ళీ మండల పరిధిలోని గొల్లపల్లె, జ. ఉప్పలపాడు, బెస్తవేములు, జంగాలపల్లె, వర్దరాల, చిన్నవెంతుర్ల భూములు కొనుగోలు చేయుటకు వచ్చి ఎసిసి యాజమాన్యం వారు ఆర్.డి.ఓ ఆఫీసు వద్దకు ప్రజా ప్రతినిధులు సమక్షంలో సైన తెలిపిన గ్రామాల ప్రజలను పిలిపించి ఫ్యాక్టరీ నిర్మించుటకు ఇంకా భూములను ఆఫ్కండి గీసు భూములు ఇస్తే మేము త్వరలో ఫ్యాక్టరీ నిర్మిస్తాము అని నమ్మబలికి ఎకరా 1 కి రూ. 1,25,000/- లతో దాదాపు 1200 ఎకరాలు కొనుగోలు చేసినారు. ఆ రోజు కూడా విద్యా అర్హతలు మరియు వయస్సుతో సంబంధం లేకపోయినా భూమి కోల్పోయిన ప్రతి రైతు కుటుంబానికి శాశ్వత ఉద్యోగం కల్పిస్తామని చెప్పినారు. మరియు భూమి కోల్పోయిన ప్రతి రైతు క్రింద పనిచేసే కూలీలకు కూడా ఉపాధి కల్పిస్తాము అని కూడా చెప్పి ఉన్నారు. ఫ్యాక్టరీ నిర్మించబడుతున్న యువకులు ఉద్యోగ అవకాశాలు కోల్పోయి ప్రస్తుతము వయస్సు మీరి మా పిల్లలకు కూడా ఉద్యోగ అవకాశాలు ఉంటాయో లేదో బెంగతో వున్నాము.

ఎసిసి వారు రైతులకు నాడు చెల్లించిన డబ్బులను ఆనాడు ఆడపిల్లల పెళ్ళిళ్ళకు, పిల్లల చదువులకు ఖర్చు చేయగా రైతుల ఆర్థిక పరిస్థితి అగమ్య గోచరంగా మారింది. ఎసిసి కంపెనీ ఉపాధి కల్పించక పోవడం వలన పని దొరుకుతోందని పరిస్థితులలో రైతులమే కూలీగా కూలి నుయూర ప్రాంతాలకు వెళ్ళి కష్టపడ పలసి వచ్చినది. ఏసిసి యాజమాన్యం వారు మరణా 2010 సం॥లో వర్దరాల గ్రామ పంచాయతీ ప్రభుత్వ అనుమతి నైదాసులో ఆర్.డి.ఓ, ఎం.ఆర్.ఓ ప్రజా ప్రతినిధులతో గ్రామ పంచాయతీ ప్రజల సమక్షంలో పెంటనే ఫ్యాక్టరీ నిర్మిస్తామని ఎకరా 1 కి రూ. 4,00,000/- లతో రేటు కుదుర్చుకొని కొనుగోలు చేసి ఉన్నారు. ఆ సమయంలో అదే రోజు రేటు ప్రకటించిన పెంటనే 1996, 2006 సం॥లో భూములు కోల్పోయిన భూ నిర్వాసితులు అందరము కలిసి ఏసిసి యాజమాన్యం వారిని మరియు ఆర్.డి.ఓ గారిని ప్రజా ప్రతినిధుల సమక్షంలో మాకు

ఫ్యాక్టరీ నిర్మించకుండ మరతదిడతలుగా భూములు కొనుగోలు వేస్తూ అందరికీ అన్యాయం చేస్తున్నాయి. ఫ్యాక్టరీ నిర్మించలేదు కాబట్టి అనే రోటు మాకు కూడా ఇన్వేసలయ్యునను రేటు విషయంలో అన్యాయం జరిగిందని అడిగడం జరిగింది. ఆ మరునాటి రోజున ఆరు గ్రామాల భూ నిర్వాసితుల రైతులు భూ నిర్వాసిత పోరాట కమిటీ ఏర్పాటు చేసుకోవడం జరిగినది.

మొదటి సారిగా 05-09-2010 నంలో భూ నిర్వాసితులము అందరము పెద్ద ఎత్తున ర్యాలీ ధర్నా ఇప్పలయడుగులో చేసి ఆర్.డి.ఓ గారికి మనత పత్రం సమర్పించిన తరువాత ఏ.సి.సి ఆఫీసు వద్దకు పోయి మేనేజరు మురళి కృష్ణ గారికి మా సమస్యల వినతి పత్రము సమర్పించడమైనది. మనత పత్రంలో ఫ్యాక్టరీ కట్టనందున అదే రోటు రూ. 4,00,000/-ల ప్రకారం ఇవ్వనేలసినది అని జరుగుగా మురళి కృష్ణ గారు సమాధానంలో ఎక్కడైనా ఏ ఫ్యాక్టరీ వారైనా అదనపుయుగా నష్టపరిహారము చెల్లిస్తే మా ఏ.సి.సి వారు కూడా మీకు డబ్బులు చెల్లించడానికి సిద్ధంగా ఉంటుంది మాకు ఇచ్చినాయి.

దానితో సాక్ష్యాధారముగా 17-05-2010 నంలో భారతీ సిమెంటు వారి ఎకరా 1 కి అదనముగా అప్పటి రోటు ప్రకారం రూ. 2,00,000/-ల నష్టపరిహారం చెల్లించినారు. రైతులకు చెల్లించిన చెక్కుల జిరాక్స్ కాపీని చూపించడం జరిగినది. భూసేకరణ సంభందించిన ప్రచురితమైన వార్త పత్రికల నికలు కాపీని సమర్పించడమైనది. అప్పటికి కూడా ఏ.సి.సి యాజమాన్యంలో చలనం లేనందున భూ నిర్వాసితులము అందరము ఇటు ఉపాధి లేక అటు భూమి లేకు తిర్కుతోవని స్థితిలో జీవనోపాధి తరుమైపందున పేదుగా ఉన్న చిన్నమైన కుటుంబాలతో కూడిన భూములను తయారు చేసుకొనుటకు సిద్ధపడినాము. తరువాత 07-08-2010 తారీఖున ఏ.సి.సి భూ నిర్వాసితులము అందరము 6 గ్రామాల రైతులము అందరము కలిసి ఆర్.డి.ఓ కార్యాలయం ఎదుట 3 రోజుల పాటు రిలే నిరాహార దీక్ష చేయగా మా దీక్షకు అప్పటి ఆర్.డి.ఓ గారు మద్దతు తెలుపుతూ ఏ.సి.సి ప్రతినిధులతో సంప్రదింపులు జరిపి ఫ్యాక్టరీ కట్టాము చేసేవరకు ఎసరి భూములు పాడు సాగు చేసుకొనుటకు అనుమతి ఇచ్చినారు. ఎకరా భూమిని సాగు చేయుటకు దాదాపు రూ.40,000/- లు ఖర్చు చేయడం జరిగినది. అయినా చాలా కొలతుగా భూములు బీడుగా ఉన్నందుని సాగు చేసిన భూములు కూడా వంట చేసినా కూడా వంట కుంటలేదు. ఈ విధముగా రూడా నష్టం జరిగినది. ఏ.సి.సి యాజమాన్యం మాకు అక్రమముగా రైతులపై కేసులు పెట్టి ఈ విధముగా నష్టము జరిపించినారు.

ఫ్యాక్టరీ నిర్మించలేదని అనేకసార్లు ఆనాటి కలెక్టరు గారికి, ఆర్.డి.ఓ గారికి ఏ.సి.సి. యాజమాన్యం వారికి భూ నిర్వాసితులము అంతా కలిసి వినతి పత్రములు ఇచ్చినాము. మధ్య ధర్నాలు, ర్యాలీలు, దీక్షలు, చేసినాము. అయినా స్పందన లేదు. అధికారులు ప్రభుత్వాలు మారినా మా బ్రతుకులు మాత్రము మారలేదు. ఇందులకు సాక్ష్యాధారాలు వినతిపత్రములతో జతపరచడమైనది. ఇదే సమయంలో ఆగస్టు 2010 నంలో గొల్లపల్లె గ్రామ ప్రజలందరికీ ఏ.సి.సి కంపెనీ వారు తీరని నష్టం కలిగించారు. ఏ.సి.సి కంపెనీని త్వరగా ఏర్పాటు చేస్తామని మీరు కంపెనీ ఏర్పాటుకు సహకరించాలని, మీరు మీ గ్రామాన్ని ఖాళీ చేసి వేరొక చోట మౌలిక సదుపాయాలను ఏర్పాటు చేసుకోవాలని అందుకు ప్రతిఫలముగా ప్రతి ఇంటికి నష్టపరిహారం చెల్లిస్తామని నమ్మపలికి ఆర్ & ఐ చాలతో సర్వే జరిపించి ప్రతి ఇంటికి కొలిపించి అప్పటి రోటు ప్రకారం రేటు వేయించడం జరిగినది.

ఏ.సి.సి వారు చెప్పిన మోసపూరిత మాటలను నమ్మిన గొల్లపల్లె గ్రామ ప్రజలందరము గ్రామాన్ని వదలిపెట్టి మా ఊరి పై భాగాన దక్షిణ దిక్కుగా ఇప్పలపడుగు, తాడిపత్రి రోడ్డు ప్రక్కన కొండపైన ప్రజలందరూ అప్పులు చేసి కొత్తగా ఇండ్లను నిర్మించడం జరిగినది. ఇప్పటికి 8 సంలు గడిచి పోయినా ఏంత గ్రామంలో ఉన్న ఇండ్లకు ఎలాంటి నష్టపరిహారం చెల్లించకపోవడం వల్ల కొత్త ఇళ్ల నిర్మాణానికి అప్పుగా తెచ్చిన డబ్బులకు వడ్డీలు చెల్లించలేక మొత్తం గ్రామ ప్రజలంతా ఆర్థికముగా చితికిపోవడం జరిగినది. ఇపరకు మా పిల్లలను చదివించుకోవడానికి కూడా ఆర్థిక స్థోమత లేక పిలలని కూడా కూలి పనులకు పంపించడం జరుగుతున్నది. ఇప్పటికి ఇళ్లకు నష్టపరిహారం చెల్లించకపోవడం చాలా బాధాకరము, బాధా అన్యాయము. 2010 నంలోనే మా ఆరు గ్రామాల ప్రజలము ఏ.సి.సి కంపెని వారు మరొక సారి మోసపూరిత మాటలతో త్వరలో ఫ్యాక్టరీ నిర్మిస్తామని నమ్మపలికి ఎకరా భూమి రూ. 4,00,000/-లతో దాదాపు 700 ఎకరాలు

తొగుంగోలు చేసి రైతులను మోసగించి ఫ్యాక్టరీ నిర్మాణం చేయబోము.

ఏ.సి.సి తంపెస్ వారు ఫ్యాక్టరీ ఏర్పాటు చేయుటకు పాఠంపరణ కాలుష్య నియంత్రణ మండలికి చేసుకున్న విన్నపం మేరకు పాఠంపరణ కాలుష్య నియంత్రణ మండలి వారు 07-08-2010 పబ్లిక్ హియరింగ్ కొరకు పేపర్ ప్రకటన 09-09-2016 న జరుగుతుందని వివరం ఇవ్వడం జరిగినది. ఇప్పటికి అనేక పర్యాయము ఏ.సి.సి ప్రతినిధుల ద్వారా మోసపోయిన 6 గ్రామాల రైతులము అంతా కలిసి ఏ.సి.సి వారు మోసపూరిత మాటలను నమ్మకూడదని భావించి ఆ కంపెనీకి చెందిన ఉన్నత స్థాయిలో ఉన్న అన్నలు ప్రతినిధులు రులియు ఉన్నతాధికారుల సమక్షంలో రైతుల డిమాండ్లను ప్రాథమికంగా వ్రాయించుకొనుటకు నిర్ణయించుకున్నాము. ఏ.సి.సి తరపని వారికి భూములు కోల్పోయిన మా 6 గ్రామాల రైతులకు చెందిన డిమాండ్లను మీ ముందు ఉంచుతున్నాము. అందులో ప్రధానమైనవి.

1. భూ నిర్వాసితుల సమస్యలను పరిష్కరించిన తరువాతనే పాఠంపరణ కాలుష్య సభ జరపాలి.

2. పాతగొల్లపల్లి గ్రామాన్ని 2010 సం॥లో అగ్ని ని జ వారిచే సర్వే చేయించిన ప్రతి ఇంటిని కూలతలు వేయించి అప్పటి రేట్ల ప్రకారం నిర్ణయించినారు. ఇప్పటికే 7సం॥రాలు పూర్తి అయినప్పుడు కల్ల ప్రస్తుత రేట్ల ప్రకారం ప్రతి ఇంటికి నష్టపరిహారం చెల్లించాలి

3. 1996 సం॥లో ఏ.సి.సి తంపెని వారు గొల్లపల్లి, బి.ఉప్పలపాడు, బెస్తవేములు గ్రామ పొలములో ఎకరా 1 కి రూ. 50,000/-లు కొన్న భూములకు ప్రస్తుతం భూములకు ఉన్న రేట్ల ప్రకారం నష్టపరిహారం చెల్లించాలి.

4. 2006 సం॥లో గొల్లపల్లి, బి. ఉప్పలపాడు, బెస్తవేములు, జంగాలపల్లి,వల్లిరాల, గున్నపెంటుగ్లు గ్రామాలలో ఒక్క ఎకరా1 కి రూ. 1,25,000/-ల ప్రకారం కొన్న భూములకు కూడా ప్రస్తుతము ఉన్న రేట్ల ప్రకారము నష్టపరిహారం చెల్లించాలి. లేని పక్షంలో అన్ని గ్రామాల భూములు మాకు తిరిగి అప్పచెప్పవలెను.

5. ఏ.సి.సి వారు ఫ్యాక్టరీ నిర్మాణము కొరకు తొగుంగోలు చేసిన భూముల పక్కన ఉన్న మిగిలిన భూములను, ఫ్యాక్టరీ సరిహద్దులో ఉన్న భూములను ప్రస్తుత రేట్ల ప్రకారం తొగుంగోలు చేయాలి.

6. ముఖ్యముగా పాత గ్రామాలను పదిని పెట్టి కొత్త గ్రామాలను ఏర్పాటు చేసుకున్న గొల్లపల్లి, బి.ఉప్పలపాడు గ్రామాలలో అన్ని మౌలిక సదుపాయాలతో పాటు అన్నిరకాల వాక్కులను పునరుద్ధరించాలి

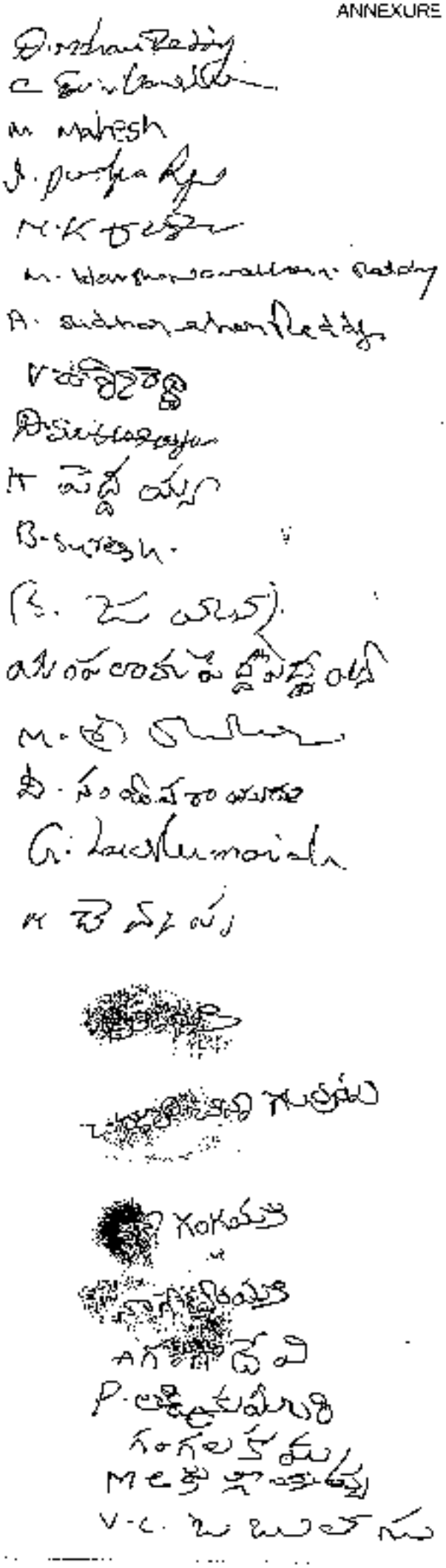
7.1996 సం॥ నుండి ఇప్పటి వరకు ఫ్యాక్టరీ నిర్మించనందుని ఉద్యోగము లేక ఉపాధి కోల్పోయినందుని అన్ని గ్రామాలలో భూ నిర్వాసిత రైతులకు అప్పటినుండి ప్రతి నెలకు రూ. 20,000/-లు ఇప్పటి వరకు చెల్లించాలి.

8. ఏ.సి.సి యాజమాన్యం పైన తెలిపిన డిమాండ్లు తీర్చిన వెంటనే రైతులకు ఉద్యోగాలు మరియు మిగిలిన అంశాలన్నిటిని అధికారుల సమక్షంలో వ్రాతపూర్వకమైన హామీని ఇచ్చి ఫ్యాక్టరీని నిర్మించాలి.

ముఖ్యముగా తెలియజేయు విన్నపము ఏమనగా అన్ని గ్రామాల భూనిర్వాసితుల అన్ని సమస్యలను పరిష్కరించిన వెంటనే ఫ్యాక్టరీ నిర్మించాలి. అంతే కాక సుమారు 20 సం॥ నుండి దాదాపు 800 కుటుంబాల కన్నీటి ఆవేదనను మీకు విన్నవించుకుంటున్నాము. మా బాధలను మంచి మనస్సుతో పరిశీలించి మా సమస్యలను అన్నింటిని సహృదయంతో రైతుల బాధను అర్థం చేసుకొని అన్ని గ్రామాల రైతులకు న్యాయం చేయవలసిందిగా శతకోటి వందనాలు తెలియచేయుచూ మా విన్నపాన్ని విన్నవించుకుంటున్నాము.

ఇట్లు,
ఏ.సి.సి భూ నిర్వాసితులు

AXI-93



**GOVERNMENT OF ANDHRA PRADESH**
**FOREST DEPARTMENT**

From

Sri M. Nagarjuna Reddy,
Forest Range Officer (FAC),
**MUDDANUR**

To

The Divisional Forest Officer,
Proddatur Division
**PRODDATUR**

**Rc.No.Misc/2006, Dt: /08/2006**

Sir,

Sub:- ACC Cements -- Classification about lands purchased by ACC report submitted - Regarding.

Ref:- ACC PD/PVR/0/22, Dt:12/07/2006.

* * *

With reference to the above, I submit that I have inspected the lands shown in the Map near Dhannawada, Vaddirala, Chinnaventuru, Gollapalle, Besthavemula, C-Uppalapadu Villages on 04-08-2006 and found that the lands shown in the map do not fall in the Reserve Forest of Muddanur Range.

This is submitted for favour of information and necessary action.

Yours faithfully

Forest Range Officer
MUDDANUR.

Copy to the Associated Cement Companies Ltd, Proddatur Camp for information and necessary action.

**To:** **2360/ 19/10/16 (True Translated)**

Environmental Engineer
Andhra Pradesh Pollution Control Board

---

**Subject: Concerns from Affected Farmers Regarding ACC Limited**

Dear Sir/Madam,

We, the farmers from the villages of Veddirala, Gollapalle, G. Uppalapadu, and Chinna Venturlu, write to express our serious concerns regarding the ongoing situation with Associated Cement Companies (ACC Limited).

Since 1996, ACC has acquired approximately 3,000 acres of farmland from us with promises of establishing a factory that has yet to materialize. This prolonged delay has left us without livelihoods or employment opportunities, resulting in significant distress within our communities. The lands we once farmed have become fallow, overrun with weeds and camphor trees, which disrupts our neighbouring fields.

We kindly urge ACC Limited and the relevant authorities to consider the following requests:

1. **Community Engagement**: We request regular updates and open communication regarding the factory's status and expected timeline for development.
2. **Environmental Safeguards**:
    - We ask for the establishment of green buffers through tree planting before construction to mitigate dust and air pollution.
    - We require stringent measures to control noise and air pollution, along with written guarantees of these measures.
3. **Compensation and Support**:
    - We insist that if any drilling or blasting occurs, proper compensation for damages to our homes be provided as per current rates.
    - Additionally, free medical care should be made available for those suffering health issues due to pollution.

ATTESTED BY

K. RAMA MOHAN, B.A., LL.B
ADVOCATE & NOTARY
TAMMALAMADUGU-516 434
Y.S.R. (DT.) A.P. INDIA

4. **Community Development Initiatives**: We seek investments in local infrastructure, including water and health facilities, to support our communities.

Despite numerous reminders, ACC Limited has yet to take substantial action towards building the factory. We have dedicated considerable resources to maintain our lands during this uncertain period. Now that ACC has issued a press release regarding public Hearing, we have some pending demands with the company in the purchase of balance lands.We urge that our voices be heard, and our concerns addressed promptly.

It is truly disheartening to see a press release issued by ACC Limited without any communication with those of us who have faced significant hardships. We believe that every farmer who has lost land deserves compensation according to current rates for each acre lost.

Additionally, we still have unresolved issues regarding ACC's ownership and the terms of land acquisition. Therefore, we strongly urge that an environmental referendum be conducted only after meaningful discussions with the affected farmers who have lost their lands to ACC Limited.

We beseech the esteemed elders and authorities to act compassionately on behalf of the victims of this land acquisition.

With many greetings,

**Sincerely,**
ACC Land Victims, Farmers
Vadddirala, Gollapalle, G. Uppalapadu,Chinnavengurla, Bestavemula,
JangalapalleMylavaram Mandal, YSR District

| | |
|---|---|
| Y. Surya Peddiraju | A. Ramakittaiah |
| S.Gangaraju | A. Obulesu |
| V Pamuleti | S. Chinna Pullaiah |
| K. Jayanna | Chakali Gurrappa |

ATTESTED BY

03/10/18

K. RAMA MOHAN, B.A., LL.B
ADVOCATE & NOTARY
AMMALAMADUGU-516 434
Y.S.R. (DIST.) A.P. INDIA

2374/20/10/16 (True Translated)

**Subject: Petition from Chinnaventurla Village Farmers of Mylavaram Mandal**

Dear Sir/Madam,

We, the farmers of Chinnaventurla of Mylavaram Mandal in Kadapa District, respectfully submit this petition regarding the land acquisition by ACC Limited. Our requests are as follows:

1. **Land Purchase**: We urge the elders to ensure that land is purchased up to the tarred road (up to the curve) with price of Rs.1500000/ per acre.
2. **Employment Opportunities**: Employment should be provided to those who have lost their land, including educational opportunities for the uneducated.
3. **Written Assurance**: ACC Limited should provide a written commitment on official letterhead regarding the aforementioned points.
4. **Local Engagement**: Vehicles and machinery, as well as contract work, should be allocated to local residents who have lost their land.
5. **Compensation**: A compensation amount of ₹50,000/- and ₹1,25,000/- should be provided at the rate of ₹4,00,000/- per acre.
6. **Support for Livelihoods**: Financial assistance for education, medical care, and initiatives such as dairy and cow rearing for women should be offered.
7. **Utilization of Land**: Farmers should provide the opportunity to cultivate the lands purchased by the factory initially.
8. **Factory Construction**: The ACC Cement factory should be constructed with care to fulfil the needs and wishes of the community.
9. **Acceptance of Factory**: We welcome the establishment of the ACC factory and have no objections to its timely construction.
10. **Preventive Measures**: It should be ensured that there is no damage to houses and surrounding areas due to mining activities.

We appreciate your attention to these matters and look forward to a positive response

Yours

ATTESTED BY
03/10/24
A. RAMA MOHAN, B.A., LL.B
ADVOCATE & NOTARY
AMMALAMADUGU-516 434
Y.S.R. (DT.) A.P. INDIA

| | |
|---|---|
| C.Surendra | Chittiboina Nadipi Subbarayudu |
| C.Pullaiah | C. Suresh Kumar |
| M. Subbanna | C.P Subbarayudu |
| M. Venkateswarlu | K. Harikumar |
| N. Chennaiah | C. Sudhakar |
| B. Venkateswarlu | B. Sunil Kumar |
| Chereddy Hrusikesava Reddy | B. Chinnamahamad |
| C.C Subbarayudu | |

ATTESTED BY

K. RAMA MOHAN, B.A., LL.B
ADVOCATE & NOTARY
AMMALAMADUGU-516 434
Y.S.R. (DT.) A.P. INDIA

**2375/20/10/2016 (True Translated)**

**To:**
Andhra Pradesh Pollution Control Board
Tirupati

---

**Subject: Written Petition Regarding ACC Cement Factory**

Dear Sir/Madam,

We are pleased to express our support for ACC Limited, as they take the initiative to build a cement factory in our region. The establishment of this factory will provide fresh opportunities and raw materials for local businesses, and we believe it will significantly improve the economic conditions of our community.

If the factory is built, the livelihoods of the people here will enhance, leading to better living standards. We are optimistic that employment opportunities will arise, particularly for our youth, allowing them to contribute positively to the community.

We also seek your assistance in helping our community grow, particularly through the empowerment of women. Initiatives such as the "Driving License" program and the Women's Associations are already making strides in this direction and should continue to be supported.

Furthermore, we request improvements in our village infrastructure, including the installation of streetlights and better roads. Access to basic amenities and well-maintained infrastructure is crucial for the development of our community.

Sincerely,
Chaitanya Yuvasangam

1.P.Chantrapthi

2.K. Umakanth

3.M. Murali krishna

4. P. Laxminarayana

ATTESTED BY

03/10/2016
K. RAMA MOHAN, B.A., LL.B
ADVOCATE & NOTARY
AMMALAMADUGU-516 434
(S.R. DIST.) A.P. INDIA.

689

**2377/20/10/16 (True Translated)**

**Subject: Support for ACC Cement Factory Construction**

Dear Sir/Madam,

I am Subbayya Setty, son of Baisani Balasubramaniam, from Chinnamenthurla village in Mylavaram Mandal. I would like to express our acceptance of the construction of the ACC Cement factory, and we have no objections to this initiative.

We believe that the establishment of the factory will significantly improve the economic conditions in our region. Previously, under various CSR projects, driving training was provided to the unemployed, and skill training was offered to local residents. This initiative created numerous opportunities, and we are hopeful for similar programs in the future.

With the factory's presence, there will be increased chances for employment and business growth in our community. I am also conducting driver training under the CSR initiatives, and I appreciate the support for such programs.

Thank you for your attention to this matter. We look forward to the positive changes that the ACC Cement factory will bring to our community.

Sincerely,
B.Subbayya Setty

ATTESTED BY

23/10/2016

K. RAMA MOHAN, B.A., LL.B
ADVOCATE & NOTARY
AMMALAMADUGU-516 434
Y.S.R. (DT.) A. P. INDIA

**2378/20/10/16 (True Translated)**

**Subject: Support for ACC Cement Factory Construction**

Dear Sir/Madam,

I am G. Baladasu, son of Gosala Devaraju, the guardian of Bestavemula village. We, the residents of our village, hereby express our acceptance of the construction of the ACC Cement factory. We have no objections to this initiative.

We believe that the establishment of the factory will lead to significant improvements in the economic conditions of our area. In the past, various CSR projects have provided valuable training and computer skills to underprivileged individuals in our community.

Such initiatives can greatly assist unemployed individuals like us in gaining employment and fostering business development. I am currently involved in coaching (training) under the CSR programs and would greatly appreciate your consideration for job opportunities in this regard.

Thank you for your attention to this matter. We look forward to the positive changes that the ACC Cement factory will bring to our community.

Sincerely,
G. Baladasu
Bestavemula

ATTESTED BY

K. RAMA MOHAN, B.A., LL.B
ADVOCATE & NOTARY
AMMALAMADUGU-516 434
Y.S.R. (DT.) A.P. INDIA

**2379/20/16 (True Translated)**

**To:**
**Andhra Pradesh Pollution Control Board**
**Tirupati**

---

**Subject: Written Petition from Farmers of Chinna Venturla Village**

Dear Sir/Madam,

We, the farmers of Chinna Venturla village of Mylavaram Mandal, Kadapa district, wish to express our concerns and requests regarding the construction of the ACC Cement factory. Below are our key points:

1. Land should be purchased up to Betha Vemula road (above the Palavagu).
2. Should purchase balance land ₹15,00,000 per acreas current rate
3. Employment opportunities should be provided to the landless and middle-aged individuals in our community.
4. Locals who have lost land should be given priority for contract work and vehicle operations.
5. Compensation of ₹50,000 and ₹1,25,000 should be provided for the loss of land at the rate of ₹4,00,300 per acre.
6. Financial assistance should be directed towards education, healthcare, and the rearing of livestock in the village.
7. Until the factory is operational, we request that the land we have sold be utilized for cultivation.
8. We welcome the establishment of the ACC Cement factory and hope it will fulfill our community's needs.
9. We have no objections to the construction of the factory and are eager for it to commence.

K. Narayana Reddy Reddy Laxmi Reddy

ATTESTED BY

K. RAMA MOHAN, B.A., LL.B
ADVOCATE & NOTARY
AMMALAMADUGU-516 434
Y.S.R. (DL) A.P. INDIA

K. Thippa Reddy

K. Venkata Rami Reddy

B. Narasimhulu

Bysani Venkata Subbaiah

B. Mahammad

K. Lokeswara Reddy

V. Balaiah

Kota Thippa Reddy

C. Balaiah

K. Laxmi Reddy

C. Pedda pullaiah

ATTESTED BY

03/10/86

K. RAMA MOHAN, B.A., LL.B
ADVOCATE & NOTARY
SAMMALAMADUGU-516 434
YSR (DT.) A P INDIA

**2373/20/10/16 (True Translated)**

**Subject: Appeal Regarding the Demands of the Farmers Affected by ACC**

Dear Sir/Madam,

We, the farmers affected by the establishment of the Associated Cement Company (ACC) in our region, write to appeal for justice and assistance regarding our longstanding grievances.

In 1996, ACC began operations in Gollapalle, G. Uppalapadu, Besthavemula, and Janggalapalli villages under Mylavaram Mandal, purchasing land at a rate of ₹50000 per acre. Upon entering into agreements with us, they promised to establish a factory and provide permanent employment to every farming family that lost their land, regardless of educational qualifications or age. They assured us that every farmer who lost their land would also secure employment for their labourer's.

However, to date, the factory has not been constructed, and no employment opportunities have materialized. From 1996 to 2006, the lands acquired by ACC became overgrown with kampa trees, and wild animals such as pigs and cows caused significant damage to the remaining crops. During this time, we faced substantial financial losses as we were unable to cultivate our lands or find employment with the company.

In 2006, at a public meeting held at the DEO office, ACC representatives, including owner R., called upon the residents of the aforementioned villages to offer additional land for factory construction, promising ₹1,25,000 per acre for approximately 1000 acres. They reiterated their commitment to provide permanent employment for all displaced families.

Unfortunately, the factory has still not been built, and our youth have lost job opportunities. We are deeply concerned about our children's prospects for employment in the future. As of 2010, the financial situation of the farmers has deteriorated significantly. The money we received from ACC has been exhausted on essential needs such as education for our children. Without employment, many farmers have been forced to seek work far from home.

After being misled by ACC, we took loans to build new houses on the hill near Jmmalamadugu and Tadipatri road. Despite eight years passing, no compensation has been paid for the houses in our old village, leaving us

ATTESTED BY

K. RAMA MOHAN, B.A., LL.B
ADVOCATE & NOTARY
JAMMALAMADUGU-516434

financially ruined and unable to educate our children. Many families are sending their children to work instead.

We also wish to bring to your attention that ACC purchased factory land at a price of ₹4,00,000 per acre, claiming that construction would begin immediately. On the same day the rate was announced, landowners who lost their lands in 1996 and 2006, along with ACC management and the RDO, expressed concerns about the lack of factory construction and demanded that we be given the same rate due to the unjust circumstances.

On 05-06-2010, farmers from six villages formed a committee and held a large rally in Jammalamadugu, submitting a petition to the RDO and presenting our issues to Manager Murali Krishna Gori at the PCC office. He assured us that if a factory were built, our committee would be compensated fairly. As evidence, we highlighted that on 17-05-2010, Bharti Cement compensated landowners ₹2,00,000 per acre for similar circumstances.

Despite our efforts, we have seen no action from ACC, leaving landowners in a state of confusion and despair, with neither employment nor land. On 07-08-2016, farmers from the six villages initiated a relay hunger strike outside the RDO office, seeking to cultivate their lands until the factory was constructed. Unfortunately, the cultivated lands produced no crops due to their barrenness, further exacerbating our losses.

Additionally, ACC has legally filed cases against the farmers, adding to our hardships. We have submitted petitions to the collector, organized rallies, and conducted dharnas, yet there has been no response. The change in government has not improved our situation.

We hereby place before you the demands of the farmers from our six villages who have lost their lands to ACC:

1. Compensation for every house surveyed by R&B in Gollapalle village in 2010, at prevailing rates.
2. Compensation for land displaced persons of Vaddirala, Gollapalle, Uppalapadu, Bestavemula, and Jangalapalle villages, as per existing rates for the lands purchased in 1996 (₹50,000 per acre) and 2006 (₹1,25,000 per acre). If not, our lands should be returned to us.
3. The construction of the factory should commence as promised, within the limits of the village panchayat where the land was acquired.

ATTESTED BY 03/10/2016
K. RAMA MOHAN, B.A., LL.B
ADVOCATE & NOTARY
JAMMALAMADUGU-516434
A.P. INDIA

4. Air pollution meetings should be held only after resolving the issues of the land dwellers.
5. According to the Land Acquisition Act of 2013, 30% of the company's production benefits should be allocated to the displaced farmers.
6. Farmers who lost their land should be employed in the construction of the factory from the beginning until completion.
7. Permanent jobs should be provided for every farmer's family, including unskilled labourers.
8. Compensation, including bonuses, should be paid to all farmers from 1996 to the present.
9. ACC should be allowed to quarry only in areas not designated for the factory.
10. It should be ensured that there is no damage to houses and surrounding areas due to mining activities.
11. **Environmental Measures**: A.C.C. should implement control measures during construction, and before the factory opens, they should plant trees to prevent environmental pollution.
12. **Infrastructure Development**: Infrastructural facilities such as education, healthcare, water, electricity, and sanitation should be provided free of charge in our villages. Cement roads, drainage systems, and mineral water plants should be established in every village. Educational institutions should be set up in our area to provide free education for higher studies, such as B.Tech and Medicine, to the children of villages that have lost their lands.
13. **Fair Land Compensation**: Surplus lands next to those purchased by A.C.C. before the construction of the factory and lands within the factory area should be acquired at current market rates.
14. **Community Development**: New temples should be built in Unalapadu villages along with all necessary infrastructure. Cemetery lands in older villages should continue to be used as usual.
15. **Support for Displaced Farmers**: Since 1996, displaced farmers in all villages who have lost their jobs or livelihoods due to the non-construction of the factory should receive Rs. 20,000/- in compensation, which has not been paid to date.

ATTESTED BY

03/10/Eng

K. RAMA MOHAN, B.A., LL.B
ADVOCATE & NOTARY
AMMALAMADUGU-516 434
Y.S.R. (DT.) A.P. INDIA

The important request is that the factory should be built immediately after resolving all the problems of the land dwellers in all villages. For nearly 20 years, we have heard the struggles of almost 500 families. We sincerely hope that you will empathize with our suffering, understand our problems with compassion, and work towards justice for the farmers of all villages.

Yours Faithfully

All affected Villagers

ATTESTED BY

03/10/2011

K. RAMA MOHAN, B.A., LL.B
ADVOCATE & NOTARY
AMMALAMADUGU-516 434
Y.S.R. (DIST.) A.P. INDIA

**2376/20/10/16 (True Translated)**

Dear APPCB Officers,

We, the villagers of Mylavaram Mandal and the residents of Dannavada, wish to express our support for the establishment of the proposed cement factory in our area. We have no objections to this project and are ready to sell our land to facilitate its construction.

We believe that the factory will bring significant benefits to our community, providing numerous job opportunities that can uplift the livelihoods of many families in both villages. We look forward to your support in making this project a reality.

Thank you for your attention.

Sincerely,

P.Ankalu

K.Jayaramireddy

CG Sekher

K. Rami Reddy

Jodu Bala Subba Rayudu

ATTESTED BY

03/10/2024

K. RAMA MOHAN, B.A., LL.B
ADVOCATE & NOTARY
AMMALAMADUGU-516 434
Y.S.R (DT.) A.P. INDIA

**2380/20/10/16 (True Translated)**

Dear APPCB Officers,

We, the residents of Mylavaram Mandal and Vaddhirala villagers, are writing to seek your support for our community's welfare. We have a few important requests:

1. We are demanding to pay additional compensation for their sold lands.

   **Community Development:** We request assistance in ensuring that community needs are prioritized and addressed effectively. We urge you to provide job opportunities for the children of farmers in our area to help improve their livelihoods.

2. **Establishment of a Cement Factory:** We believe that establishing a cement factory in Vaddhirala Panchayat will greatly benefit our community by providing jobs and fostering economic development.

3. **Support for Displaced Families:** We request that support be provided to those who are losing their land, particularly in areas such as education, healthcare, and other essential services.

We are also pleased to express our support for the establishment of the factory in our area. The community is optimistic that this development will bring positive changes, and we have no objections to the factory's presence. We believe it will provide valuable opportunities and contribute to the economic growth of our village.

Thank you for your attention to these matters. We appreciate your support in enhancing the well-being of our community.

Sincerely,

1.S. Neela Kanta Reddy

2. P Surya Chandra Reddy

3. T. maddileti

4. Madhu Sudhakar

5. Sudarsha Reddy

S. Chandra Sekhar Reddy

K. Pullaiah

S. Gangaiah

Rayudu

Pakruddin

ATTESTED BY

23/10/2016

K. RAMA MOHAN, B.A., LL.B
ADVOCATE & NOTARY
AMMALAMADUGU-516434
Y.S.R. (DT.) A.P. INDIA

| | |
|---|---|
| 6. Nadipi Madileti | K. Rama Krishna Reddy |
| 7. M. Ramanjaneyulu | V. Venkatesu |
| 8. M. Venkata Siva Reddy | Subba Reddy |
| 9. KC Peddaiah | S. Krishnaiah |

ATTESTED BY

03/10/2025

K. RAMA MOHAN, B.A., LL.B
ADVOCATE & NOTARY
PAMMALAMADUGU-516 434
Y.S.R. (Dt.) A.P. INDIA

**2381/20/10/16 (True Translated)**

**To**
The Honourable Magistrate (Collector)
**District:** Kadapa District

**Subject:** Public Hearing on Land and Development Initiatives

Greetings on behalf of the Kallutala villagers,

We, the farmers of Kallutala, wish to bring to your attention the following concerns regarding the land acquired for the establishment of the factory and the subsequent development initiatives:

1. **Land Acquisition:** The land of all farmers has been given for the establishment of the factory. We request transparency regarding the use of this land.
2. **CSR Initiatives:** We have made efforts to ensure that the Corporate Social Responsibility (CSR) funds are utilized for the betterment of our community. We propose the following facilities to be funded through CSR:
    - Construction of roads
    - Development of freshwater and drainage systems
    - Installation of a proper sewage system
    - Establishment of community welfare posts

With Kind Regards

| | |
|---|---|
| B. Nageswara Rao | Laxumaiah |
| Pedda Thiripelu | K. Girija Reddy |
| Battu Chinna Naganna | B. Pedda gaibulu |
| M. Thippa Reddy | B. Subba Rayudu |
| M. Narayana Reddy | C. Gopal |
| G. Laxminarayana | |

ATTESTED BY

03/10/2016
K. RAMA MOHAN, B.A., LL.B
ADVOCATE & NOTARY
AMMALAMADUGU-516 434
Y.S.R. (DT.) A.P. INDIA

**2383/20/10/16 (True Translated)**

**From:** Gollapalle Village, Mylavaram Mandal, Kadapa District

Dear Sir,

We wish to express our concerns regarding the establishment of the ACC Cement industry and its adverse effects on our community.

1. **Impact on Gollapalle:** The people of Gollapalle and surrounding villages have faced significant hardships due to the industry. While other villages received compensation, Gollapalle has been left in a state of disaster, with no compensation offered to our farmers.
2. **Livestock and Agriculture:** The introduction of the industry has disrupted local agriculture, making it increasingly difficult for farmers to provide adequate water and feed for their cattle. This situation is exacerbated by the loss of fertile land, which has severely affected our livelihoods.
3. **Call for Support:** We urgently request measures to improve our financial situation. It is essential that we receive fair compensation and support for the fertile lands that have been impacted by the industry.
4. **Need for Medical and Educational Assistance:** The children of our farmers have suffered due to the financial strain, leading to a lack of access to proper education and healthcare. We request your assistance in providing medical and educational support for these children, as their future depends on it.

We hope for your understanding and prompt action to address these pressing issues.

Sincerely,

Gollapalle Villagers

ATTESTED BY

03/10/16

K. RAMA MOHAN, B.A., LL.B
ADVOCATE & NOTARY
AMMALAMADUGU-516 434
Y.S.R. (DT.) A.P. INDIA

**2369/20/10/16 (True Translated)**

**Dear Andhra Pradesh Pollution Control Board,**

**Tirupati:**

**Subject: Requests from Farmers of Chinna Vanuthurla Village, Mylavaram Mandal, Kadapa District**

We, the farmers of Chinna Vanuthurla Village, respectfully submit the following requests regarding the establishment of the ACC cement factory:

1. The land should be purchased up to the Bestavemula Bava Thar road.
2. The purchase price for the land should be set at ₹15,00,000 per acre.
3. Employment opportunities should be provided to landless individuals and the middle-aged population.
4. In cases of land loss, appropriate compensation should be given to the locals, and contract work should be awarded to local residents.
5. Compensation of ₹50,000 and ₹1,25,000 should be provided at the rate of ₹4,00,000 for the lost land.
6. We request support for education and healthcare in the village, as well as financial assistance for women in dairy and goat rearing.
7. We seek permission to cultivate the land until the factory is operational.
8. We urge the prompt construction of the ACC cement factory to fulfil our community's needs.
9. We welcome a visit to the ACC factory and have no objections to its establishment.

We appreciate your attention to our requests and hope for a favourable response.

Sincerely,

K. Venkata Siva Rami Reddy — Ex Sarpanch

Reddy Laxmi Reddy

K. Thippa Reddy

ATTESTED BY

23/10/2016

K. RAMA MOHAN, B.A., LL.B
ADVOCATE & NOTARY
JAMMALAMADUGU-516 434
Y.S.R. (DL) A P INDIA

**2365/20/10/16 (True Translated)**

On October 20, the **Prajabhi praya Sekharana (Publik Hearing)** concerning the new ACC cement factory raises several questions about the matters of concern related to the company.

1. Cement plants are among the most polluting industries. The report does not address the impact on the health of surrounding communities. Why? This plant creates a situation where we have to live with polluted air. The World Health Organization states that air pollution kills 7 million people globally each year. Outdoor dust pollution has been classified as a carcinogen. Harvard University has reported that the daily use of chemicals, insecticides, and contaminated food costs the health of the American population $34 billion annually. Additionally, coal-fired power generation has imposed an extra burden of $34.5 billion on the U.S. population in terms of health costs. Thermal power plants and cement facilities have similar levels of caustic emissions. What is your response regarding the financial implications driven by a profit-oriented industry?

2. This is a rain-fed area, and we have relied on groundwater for generations. According to the report, 7,750 cubic meters of water will be drawn daily for cement production and electricity generation. This amount could irrigate 6 acres of rice. If you take away our common resource using economic and political power, how will we be protected? Will we have to sacrifice our right to live and thrive for the sake of exploiting our natural resources?

3. Do you really need that much water? Your company's reports state that only 60 liters of water is required for clinker production, yet this new factory indicates a need for about 480 liters per tonne. Is this misleading? Will there be collusion with unscrupulous entities to rob us of our livelihoods?

4. It has been stated that 900 cubic meters of water per day will be necessary for the 100 MW power station to be constructed for the plant's electrical needs. What is the basis for this requirement? Please explain why such a high volume of water is needed.

ATTESTED BY

03/10/2016

K. RAMA MOHAN, B.A., LL.B
ADVOCATE & NOTARY
AMMALAMADUGU-516 434
A.P. INDIA

5. Environmental impact assessment reports in our country have become questionable. ACC is part of the international company LafargeHolcim; how can they justify presenting reports with inaccurate figures while disregarding democratic values that are upheld in European countries and aligned with international environmental agreements?

6. The nitric oxide concentration in power plant emissions is listed as 350 mg/cubic meter. On what criteria was this figure determined? Will the new standards, which come into effect in 2017, be met with existing technologies?

7. While there is surplus electricity in Andhra Pradesh, what is the social responsibility of building a power plant with sub-critical technology, which increases carbon emissions after India signed the Paris Agreement, a treaty that India rejected as a matter of policy?
8. The 2 million tonnes per annum coal mining industry requires permissions from the Ministry of Coal and Coal Availability Consent, none of which is available, including no water permit. What is the point of rushing for environmental clearance without the necessary approvals?
9. The figures given on the increase in air pollution are suspicious and unreliable. We feel that independent verification is necessary.
10. There is dust due to vehicular traffic; however, dust from a nearby limestone mine contributes to pollution levels, exceeding the threshold set by the World Health Organization. Indian regulations in favour the industry and are not based on medical research concerning the level of harm to human health. How do air conditioning units protect our air from toxins?
11. Ozone is produced by chemical reactions around industries that emit nitrogen oxides, which are harmful to public health and crops. The land report does not mention the damage to crops. Numerous studies and government reports do not address the impact of ozone on agriculture. While you profit, we suffer various losses. Who is responsible for the damage?
12. The Pollution Control Board is promoting the incineration of hazardous chemical wastes in rotary kilns. The report suggests that once production starts, there will be plans to take up this work as well. If this continues, the level of loss will be increase. People in Kadapa district are already suffering from the burning of chemical waste by cement plants, and there is no voice to be heard. Officers seem to have limited vision and hearing.

ATTESTED BY

03/10/2017

K. RAMA MOHAN, B.A., LL.B
ADVOCATE & NOTARY
AMMALAMADUGU-516 434
A.P. INDIA

**2344/14/10/16 (True Translated)**

To the Hon'ble Environment Officer,

Villagers of Dhannawada, Chinnaventurla, Vaddhirala, Bestavemula, Gollapalle, Uppalapadu, Andhra Pradesh.

Subject: Plea Regarding Issues Pertaining to M/s ACC

We, the farmers, wish to address the Andhra Pradesh Pollution Control Board Regional Office in Tirupati concerning the Mining Lease, Clinkerization, Cement Grinding, and Power Project related to M/s ACC. A press release was issued on 08-08-2016. However, the public referendum meeting held on 09-09-2016 was boycotted by all the farmers, and the authorities postponed the meeting. Organizing the meeting without understanding the farmers' problems is disingenuous.

It is disheartening that no efforts have been made to address our concerns, apart from the piecemeal acquisition of land in 1996, 2006, 2010, and 2011, while perpetuating the narrative that the industry will create jobs for farmers. All farmers are dissatisfied because they received an English booklet detailing the industry. This document, while extensive, was given only to officials favouring the project and to some farmers, but it was not shared equally or transparently among all stakeholders.

It is unjust to pretend to be a migrant. The land cultivated by farmers is known as Nallaregadi land, which produces high yields of commercial crops. ACC has stated that agriculture is the main source of livelihood for farmers, yet this ownership is being overlooked. Farmers continue to grow crops using boreholes, even in dry conditions, due to the availability of good groundwater. Others rely on rain-fed crops, cultivating cane or three crops in the summer.

The people of Gollapalle have vacated their homes in the name of industrial development. Meanwhile, many farmers who took loans and refrained from building houses did so in the hope that the industry would arrive. It is surprising that an industry long forgotten is suddenly being remembered.

The absence of industry has allowed wild animals to establish habitats in our lands and old homes. Wild boars appear in broad daylight, scaring the farmers. There are many misconceptions about the industry. The pollution of land, water, and air caused by industrial activities, along with the noise from

ATTESTED BY

03/10/2016

K. RAMA MOHAN, B.A., LL.B
ADVOCATE & NOTARY
AMMALAMADUGU-516 434

706

explosions, makes homes feel like graveyards. Therefore, we are not willing to give our land to industry.

We urge ACC to take appropriate measures to halt these efforts, as we strive to protect the 39 villages in the surrounding area. Our community is burdened, and we wish to safeguard our livelihoods and our environment. We urge you to consider our grievances seriously and address the issues impacting our livelihoods.

Sincerely,

Farmers and People

1. Peddiraju A. Subba Reddy

2.V. Pamuleti Y. Surya Peddi Raju

3. S. Gangaraju A. Bhaskar Reddy

ATTESTED BY

K. RAMA MOHAN, B.A., LL.B
ADVOCATE & NOTARY
AMMALAMADUGU-516 434
Y.S.R. (DL) A P INDIA

**2366/20/10/16 (True Translated)**

**Appeal to the District Magistrate( Collector)**

**Subject**: Justice for Farmers of Kallutla Village of Mylavaram by ACC Mylavaram Mandal

Dear Respected Sages,

We, the farmers from the villages of Gollapalle, Uppalapadu, Bestavemula, Jangalapalle, Vaddirala, and Chinnaventurla, write to bring to your attention the injustices we have faced since our lands were acquired for the establishment of the Associated Cement Company (ACC).

In 1996, ACC entered into an agreement with our farmers, promising to pay Rs. 50,000 per acre for our land and assuring permanent job opportunities for every displaced family. However, despite these commitments, we have not seen any substantial employment or support.

Since then, our lands have been ravaged by wild boars and other wildlife, damaging any crops we managed to grow. Our attempts to seek assistance from ACC have gone unanswered, leading to severe financial hardship. In 2006, further land was acquired under the promise of employment, yet the factory has not been built, leaving our youth without job prospects, and forcing many of us to seek labour far from home.

As the situation worsened, ACC halted payments meant to support our families, compelling us to use our meagre resources for basic needs, including marriage and education for our children.

On June 5, 2010, the farmers from six displaced villages formed a land displacement committee and staged a large rally at Jammalamadugu. After submitting a petition to the RDO, we went to the ACC office to submit our concerns to Manager Murali Krishna. We demanded that, since the factory had not been built, the compensation rate should be increased to Rs. 4,00,000 per acre. Murali Krishna assured us that if other factories were paying additional compensation, ACC would also be willing to compensate us accordingly.

ATTESTED BY

03/10/2016

K. RAMA MOHAN, B.A., LL.B
ADVOCATE & NOTARY
JAMMALAMADUGU-516 434

As evidence of this, on May 17, 2010, Bharti Cement had paid Rs. 2,00,000 as compensation to affected farmers, and we have documentation to support this claim. Despite our efforts, there was no movement from ACC, leaving us in a state of disorientation without employment or land. Consequently, we prepared to occupy the vacant lands with thick fences and bushes.

On August 7, 2010, farmers from three villages displaced by ACC came together and initiated a hunger strike for three days in front of the RDO office. The then ARO supported our protest and held discussions with ACC representatives, allowing us to cultivate our lands until the factory was established. However, due to most of the agricultural land being barren, even our efforts to cultivate resulted in crop failures, leading to further losses.

Moreover, ACC management has illegally filed cases against us, adding to our distress. Despite our repeated petitions to the then Collector and RDO, and our protests, including dharnas and rallies, we received no response. Changes in government have not improved our situation; the evidence for our claims is attached to this document.

In 2010, ACC caused immense damage to the people of Gollapalle village, asking us to vacate our homes with promises of support and compensation for relocating. Many villagers, received by these promises, moved to Jammamadugu Thadipatri Hai way and taking loans to build new homes. However, after five years, we have yet to receive any compensation for our original houses, leading to severe financial ruin. Many families struggle to pay back loans, and parents are forced to send their children to work to make ends meet.

The factory was not constructed, and we feel deceived by ACC's practices. According to ACC's plea to the Air Pollution Control Board for setting up a factory, the Air Pollution Control Board announced a public hearing on April 20, 2016. All farmers from the six villages, who have been cheated by ACC's representatives, decided to present our demands in the presence of high-level company representatives, determined not to be misled by their deceitful words.

Our main demands include:

1. The air pollution meeting should only be held after addressing the issues of land-dwellers.

ATTESTED BY

03/10/2024

A. RAMA MOHAN, B.A., LL.B
ADVOCATE & NOTARY
JAMMALAMADUGU-516434
Y.S.R. (DT.) A.P. INDIA

2. Compensation should be paid for each house surveyed by R &B in Gollapalle village in 2010, reflecting current rates, as seven years have passed.
3. Compensation for land acquired in 1996 should align with current land rates, as the original agreement of Rs. 50,000 per acre is no longer fair.
4. For lands purchased in 2006, compensation should be paid at existing rates instead of the previously agreed Rs. 1,25,000 per acre. If this is not feasible, the lands should be returned to us.
5. Surplus land adjacent to the factory site and land within the factory premises should be acquired at prevailing rates.
6. Infrastructure and rights in Gollapalle, where old villages were destroyed and new ones established, should be restored.
7. Due to the loss of job opportunities since 1996, all landless farmers in our villages should receive Rs. 20,000 as compensation.
8. ACC management must provide a written guarantee that jobs will be offered to farmers as soon as the aforementioned demands are met, and the factory is constructed.

We urgently request that the factory be built immediately after resolving all issues faced by land-dwellers in our villages. For nearly 20 years, we have endured hardships, and we ask for your compassion and understanding in addressing our suffering.

We look forward to your support in ensuring justice for the farmers of all our villages.

Sincerely,
The Farmers of Gollapalle, Uppalapadu, Bestavemula, Jangalapalle, Vaddirala, and Chinnaventurla Villages

1.K.Rama Mohan ReddySC Kondaiah

2,K. Sankar Reddy

3. P. Bala Narasimhulu

4. G. Chandra Sekhar Reddy

ATTESTED BY

03/10/2025

K. RAMA MOHAN, B.A., LL.B
ADVOCATE & NOTARY
AMMALAMADUGU-516 434
Y.S.R. (DIST.) A.P. INDIA

**2382/20/10/16 (True Translated)**

Respected the District Collector

We, the villagers of Kallutla, would like to bring the following issues to your attention:

In Upplapadu, specifically in Jangalipalli, fields were acquired by the ACC company in 1996. They purchased land for Rs.50000/ per acre At the time of purchase, it was promised that jobs would be provided to those who gave up their fields for the factory. However, to this day, the factory has not been constructed, leaving the fields barren and uncultivated.

As a result, the surrounding fields are facing issues with wild pigs and cows, which are damaging our crops. We have suffered financially for the past 20 years due to the absence of the factory and the loss of our livelihoods.

We kindly request that you take our situation into consideration and ensure justice is served for the affected farmers.

Thank you for your attention.

Sincerely,

C. Gopal Reddy

K. Germia

B. Lukaiah

E Thiripelu

B. Nageswara Rao

E. Pedda Thiripelu

Battu Chinna Naganna

M. Thippa Reddy

M. Narayana Reddy

K. Chandra Sekhar Reddy

K. Girija Reddy

B. Subba Rayudu

B. Chinna Subba Rayudu

B. Pedda Gaibulla

LTI of M Chinna Subbi

LTI of B. Purushotham Reddy

Laxumaiah

G. Laxminarayana

ATTESTED BY

03/10/2016

K. RAMA MOHAN, B.A., LL.B
ADVOCATE & NOTARY
AMMALAMADUGU-516 434
Y.S.R. (DT.) A.P. INDIA

**2371/20/10/16 (True Translated)**

**To**

**The District Officer,**

Respected Sir,

We are writing from the Kadapa District, specifically from the Myalavaram Mandal, representing the villagers of Vaddhirala. We welcome the establishment of the ACC cement factory in our area and have no objections to its construction.

We believe that this factory will provide valuable job opportunities for our farmers based on their qualifications and skills. Additionally, we request that the company adopt our village and contribute to its development.

Furthermore, we ask that the remaining fields of our village be acquired by the ACC cement factory, ensuring that the needs of our community are considered in the process.

We hope you will support our requests and facilitate the successful establishment of the factory in our region.

Thank you for your attention.

Sincerely,

R. Rama Govindu ( Surpanch)

M. Madhu Sundaram

G. Santi Rami Reddy

M. N Mallaiah

V. Chinna Raju

M.Mallaiah

S. Raja Gopal

S. Suresh Reddy

S.P Pullaiah

S. Rama Subba Reddy

S.Venkata Laxumaiah

ATTESTED BY

03/10/16

K. RAMA MOHAN, B.A., LL.B
ADVOCATE & NOTARY
AMMALAMADUGU-516 434
Y.S.R. (Dt.) A.P. INDIA

## Brief Summary of Limestone Mine (Kadapa Limestone Deposit Mine)

### 1.0 INTRODUCTION

M/s. ACC Limited is proposing a Kadapa Limestone Mine (ML Area: 997.80 ha) with Limestone production capacity of 7.0 million TPA at Villages: Dhannawada, Chinna Venturla, Vaddarala, Bestavemula, Gollaapalle, G. Uppalapadu of Mandal: Mylavaram, District: Kadapa (YSR), Andhra Pradesh.

As per EIA Notification dated 14th September, 2006 as amended from time to time, the project falls under Category "A" (>250 ha), Project or Activity 1(a) (3) for Mining of Mineral.

**JUSTIFICATION FOR THE PROJECT**

M/s ACC Limited has proposed to set up a new cement plant (Clinkerization) of 5.0 million TPA in the area in planned manner. The first plant of 2.5 million TPA (3.5 million TPA Limestone) clinkerization is proposed to be set up within 3 years of mining lease execution followed by another line of 2.5 MTPA (3.5 MTPA Limestone) in next 5 years of commissioning of 1 unit. The major raw material, Limestone requirement for the plant will be met from this mine. Being a virgin land at present, lots of developmental and infrastructural jobs are to be started in advance before actual production starts. In the southern states, due to a number of major infra-structural projects planned by State/Central Governments and also rapid growth of industries, the demand is likely to be higher than average for the country. Considering the proximity of the project site to all the three major metros, Hyderabad, Bangalore and Chennai and neighboring states of Tamil Nadu and Karnataka, the growing demand can be met with less transportation costs of cement. From the market analysis data, it is evident that the states of Tamil Nadu, Kerala, Karnataka, will continue to show an above average growth of demand. Because of limited limestone deposits in Tamil Nadu and Kerala, the creation of additional capacities in Southern states has to be in Andhra Pradesh and Karnataka. Kadapa district being nearer to both Tamil Nadu and Karnataka states, the selected plant location is ideal for growing markets especially Tamil Nadu. Further, proximity to the Krishnapatnam port is ideal for export of cement/Clinker to neighboring countries in future. Hence, ACC proposed 7.0 million TPA Limestone Mine with ML area of 997.08 ha at Mylavaram Mandal of Kadapa (YSR) District, Andhra Pradesh, to cater the need of limestone requirement for the proposed cement plant.

### 1.1 SIZE OR MAGNITUDE OF OPERATION

The production capacity of limestone will be 7.0 Million TPA along with Limestone Mine (ML Area – 997.08 ha). Total cost of the project is Rs. 437.768 Crore. Capital cost for Environment Protection measures is Rs. 3.84 Crore and recurring cost for the EMP is Rs 0.18 Lakh/ Annum.

| S. No. | Particulars | Details |
|---|---|---|
| 1. | Area | 997.08 ha |
| 2. | Total Geological Resources | 647.1 million Tonnes |
| 3. | Mineable Reserves | 6.11 million Tonnes |
| 4. | Production Capacity | 7.0 million TPA |

| | | |
|---|---|---|
| 5. | Life of Mine | 50 Years |
| 6. | Method of Mining | Fully Mechanized opencast mining method |
| 7. | Man Power (Nos.) | 106 Persons |
| 8. | Total Cost of the Project | Rs 437.768 Crores |
| 9. | Water Requirement | 60 KLD |
| 10. | Power Requirement | 1 MW |

## 1.2 PROJECT DETAILS

**Table - 1.2**

**Project Details**

| S. No. | Particulars | Details |
|---|---|---|
| **A.** | **Nature of the Project** | Proposed Opencast Limestone Mining Project |
| **B.** | **Size of the Project** | |
| 1. | Mining Lease area | 997.80 ha |
| 2. | Proposal | Limestone Production Capacity: 7.0 million TPA |
| **C.** | **Project Location** | |
| 1. | Villages | Dhannavada, Chinna Venturla, Vaddarala, Bestavemula, Gollapalle, G.Uppalapadu |
| 2. | Tehsil | Mylavaram |
| 3. | District | Kadapa (YSR) |
| 4. | State | Andhra Pradesh |
| 5. | Latitude & Longitude | Latitude: 14°59'20" N to 15°00'10" N<br>Longitude: 78°13'55" E to 78°18'08" E |
| 6. | Toposheet No. | D44A8(57I/8), D44A4(57I/4), D44G1(57J/1), D44G5(57J/5) |
| **D.** | **Environmental Setting Details** *(with approx. aerial distance & direction from the mining lease boundary)* | |
| 1. | Nearest Villages | Regdapalle (~ 0.43 km in East direction) |
| 2. | Schools | MPPS Lakshmipalli (~0.4 km in North direction) |
| 3. | Nearest Town | Jammalamadugu (~ 17.0 km SE direction) |
| 4. | Nearest National / State Highway | SH- 57 (~0.80 km in South direction) |
| 5. | Nearest Railway station | ➢ S. Uppalapadu (~11.9 km in SE direction)<br>➢ Jammalamadugu Railway Station (~18.0 km in SE direction) |
| 6. | Nearest Airport | ➢ Kadapa Airport (~70.0 km in SE direction)<br>➢ Kurnool Airport (~80.0 km in North direction)<br>Tirupati Airport (~200.0 km in SE direction) |
| 7. | National Parks, Wildlife Sanctuaries, Biosphere Reserves, within 10 km radius | No National Parks, Wildlife Sanctuaries, Biosphere Reserves, within 10 km radius. |
| 8. | Reserve Forests (RF) / Protected | Dhodiyam RF (~8.2 km in SW direction) |

| S. No. | Particulars | Details |
|---|---|---|
| | Forest (PF) within 10 km radius | |
| 9. | River / Water Body (within 10 km radius) | ➢ SRBC Canal (Inside the mining lease area)<br>➢ GNSS Canal (Inside the Mining lease area)<br>➢ Kanala Vagu (~8.0 km in North direction)<br>➢ Canal (~8.6 km in North direction)<br>➢ Rambhadra Cheruvu (~7.3 km in NNW direction)<br>➢ Canal (~7.0 km in NNW direction)<br>➢ Nalla Cheruvu (~3.2 km in NNW direction)<br>➢ Pond (~4.0 km in South direction)<br>➢ Nallha (~0.23 km in South direction)<br>➢ Pond (~4.3 km in SSE direction)<br>➢ Pandula Vagu (~7.8km in North direction)<br>➢ Pond (~1.6km in NE direction)<br>➢ Erra Vagu (~5.7 km in NNE direction)<br>➢ Pond Near kallutla (~1.5 km in ENE direction)<br>➢ Erra Vanka (~9.2 km in NE direction) |
| 10. | Seismic Zone | Zone – II (Low Damage Risk Zone) as per IS:1893 (Part-1) 2002 |
| **D.** | **Cost Details** | |
| 1. | Total Project Cost | Rs. 437.768 crores |
| 2. | Cost for Environment Protection Measures | Capital Cost: Rs 3.840 crore<br>Recurring Cost: Rs 0.180 crore |

***Source:*** *Site Visit & Approved Mining Plan.*

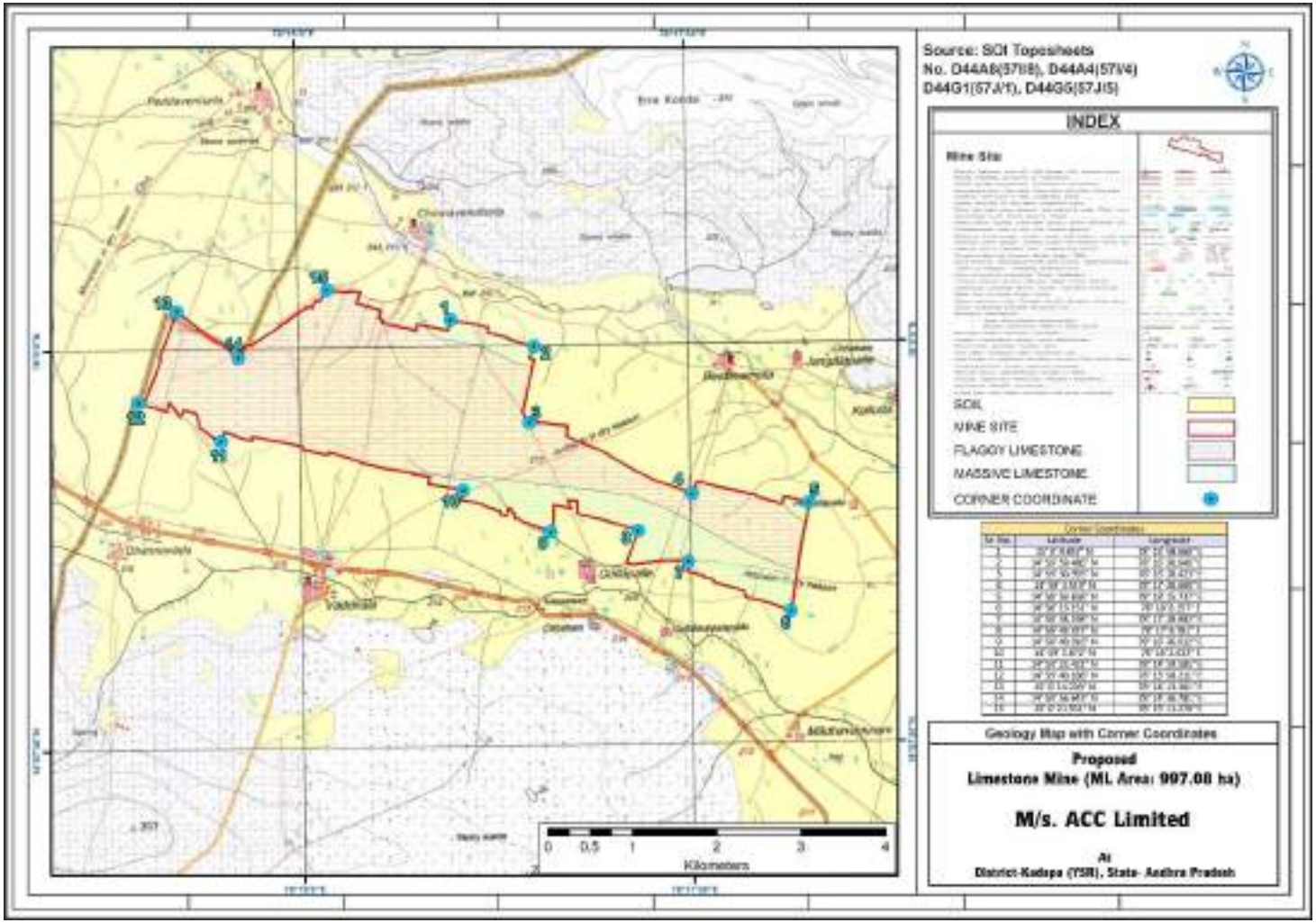



**Figure 1.1 Map showing Geology with corner coordinate of the Mine Site**

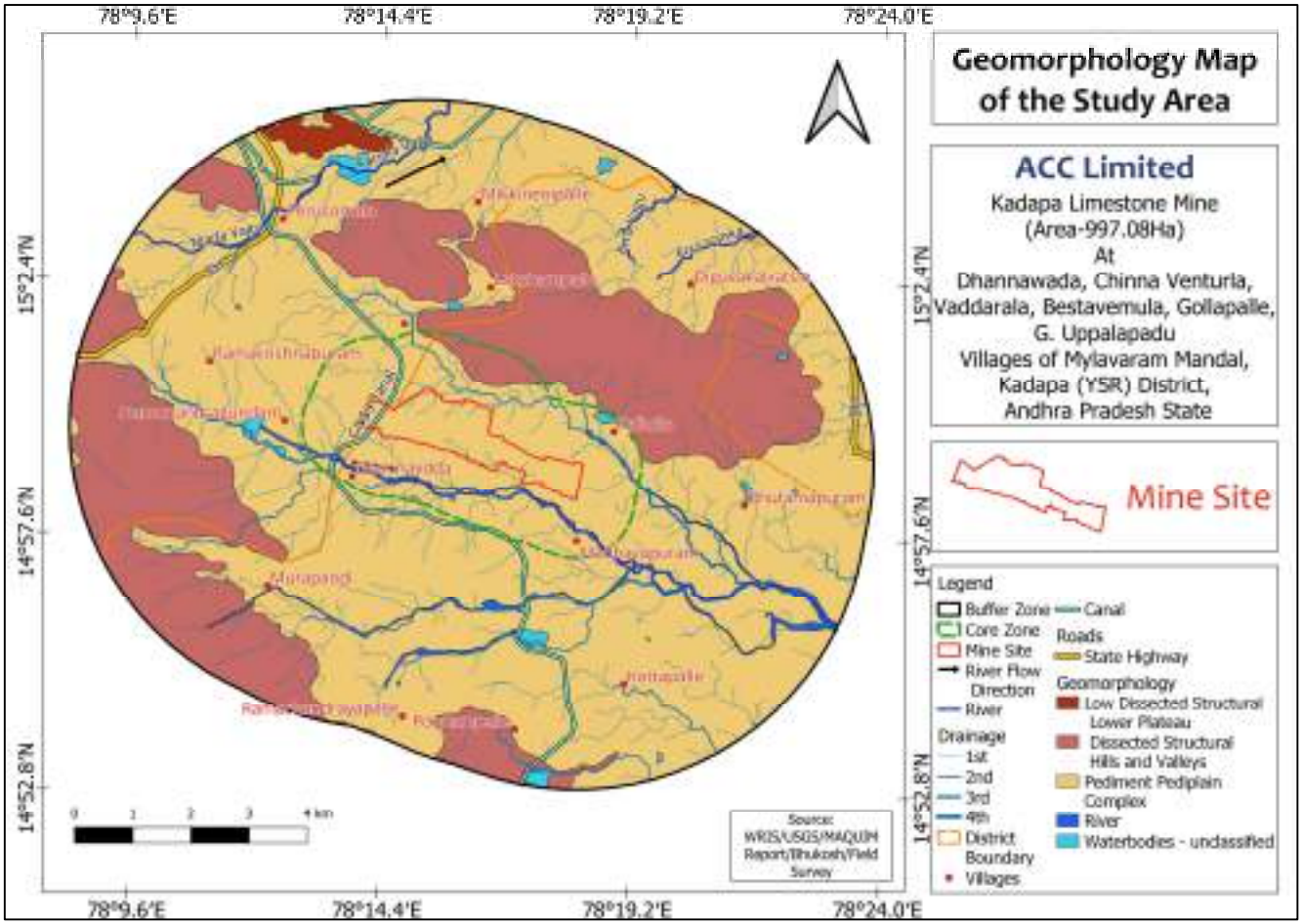



**Figure 1.2 Map showing Geomorphology of the Mine Site and 10 km of Study Area**

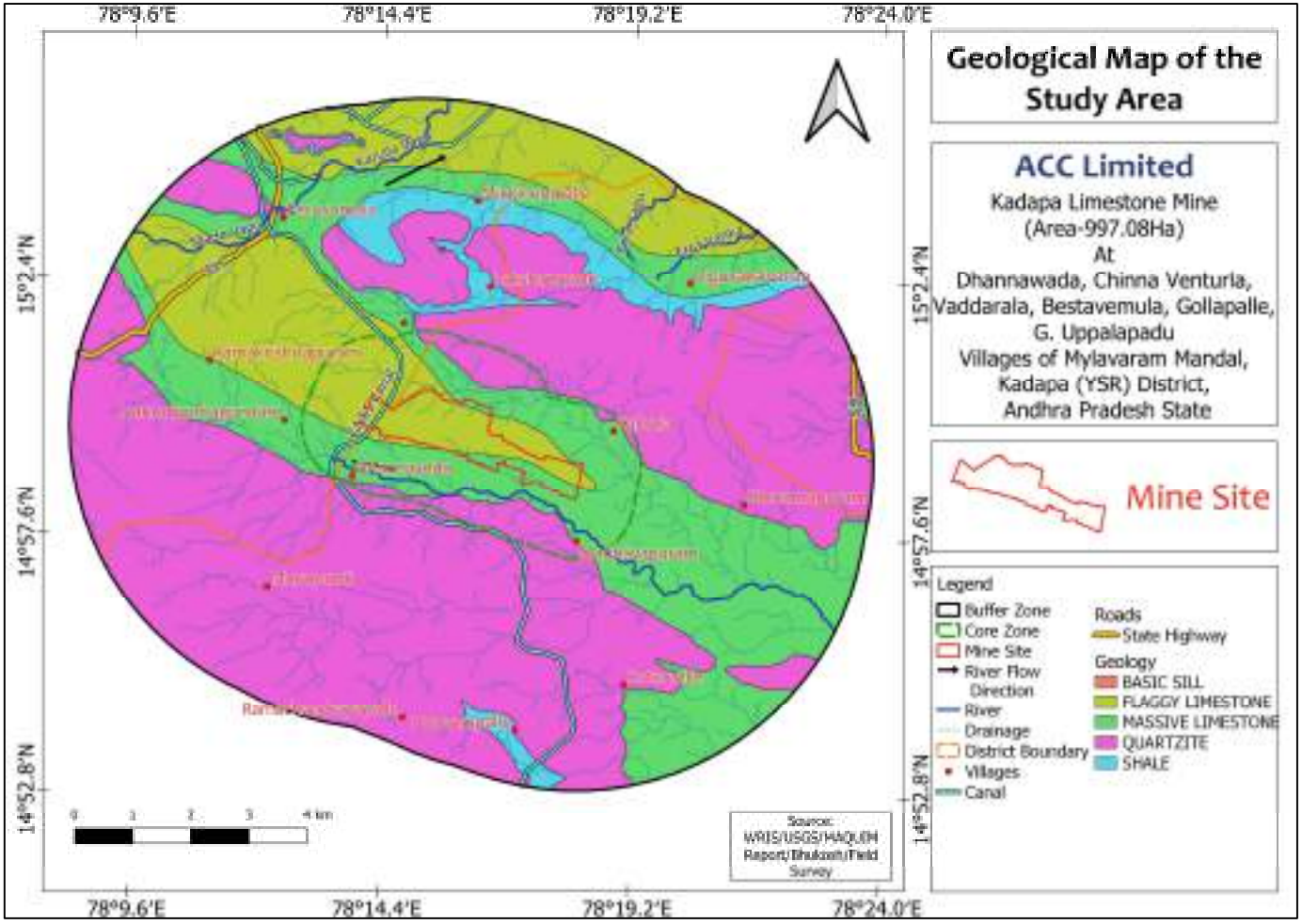



**Figure 1.3 Map showing Geomorphology of the Mine Site and 10 km of Study Area**

## 1.3 MINING DETAILS

**Table - 1.3**

**Mining Details**

| S. No. | Particulars | Details |
|---|---|---|
| 1. | Mining Method | Fully Mechanized Opencast Mining Method |
| 2. | Total Geological Resources | 647.11 million tonnes |
| 3. | Mineable reserves | 6.11 million Tonnes |
| 4. | Life of Mine | 50 years |
| 5. | Bench Height | 8 - 12 m |
| 6. | Bench Width | 30 m |
| 7. | No of benches | 5 - 12 Nos. |
| 8. | Overall pit slope | 60°s |
| 9. | Elevation Range | 204 to 226 m AMSL |
| 10. | Depth of water table | Pre-Monsoon: 25 m to 25.4 m bgl<br>Post Monsoon: 21.5 m to 23.1 m bgl |
| 11. | Ultimate working depth | 17 to 55 m (166 mRL) |
| 12. | Stripping Ratio | 1: 0.13 (T: T) |
| 13. | Number of Working days | 290 |
| 14. | Number of Working Shifts | 02 |

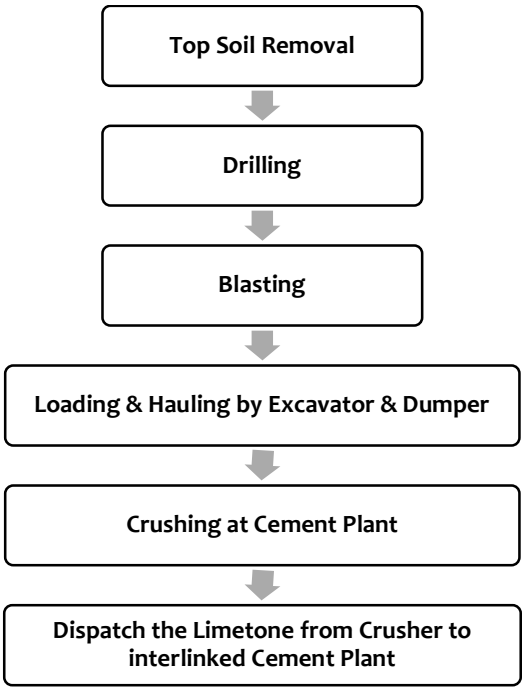
***Source:*** *Derived from Approved Modified Mining Plan with Progressive Mine Closure Plan*

## 1.4 PROCESS & DESCRIPTION

### i. PROPOSED METHOD OF MINING

Mining will be done by fully opencast mechanized method. All operations of mining will be done by deployment of Heavy Earth Moving Machineries (HEMM) for deep hole drilling, excavation, loading & transport. All these mining activities will be conducted in such a way to ensure maximum mineral conservation and minimum environmental degradation.

***Flow chart for mining process is as given below:***




**a) Top Soil Removal**

Top soil cover is soft in nature and will be removed by dozer and then stacked separately in non-mineralized zone. This stacked top soil will be simultaneously used for plantation and greenbelt development.

**b) Drilling**

Since the limestone is hard and compact, drilling is required to break the rock. Blast holes of 115 mm dia. to be drilled with hole burden of 3 to 4 m and spacing of 4 to 6 m. The parameters for drilling are given below:

**Table – 1.4**

**Drilling Parameters**

| S. No. | Particular | Units | Details |
|---|---|---|---|
| 1 | Diameter of Hole | mm | 115 |
| 2 | Depth | m | 8 to 12 |
| 3 | Spacing | m | 4-6 |
| 4 | Burden | m | 3-4 |

***Source:*** *Approved Modified Mining Plan along with Progressive Mine Closure Plan*

**c) Blasting**

The blast hole will be changed with ANFO and slurry explosive (booster charge). NONEL for will be used to control ground vibration, noise and fly rocks. No secondary blasting will be envisaged in this mine. Rock breaker will be deployed for breaking of oversized boulders generated during blasting.

**d) Loading and Hauling**

Loading is proposed to be with excavator having bucket capacity of 4 & 7 cu. m and limestone will be transported from mine face to crusher by dumper of 50 to 60 Tones capacity.

**e) Crushing**

A Crusher is proposed within the proposed cement plant premises. Capacity of the crusher will be 1500 TPH and the feeding size of the crusher will be 1500 mm.

**f) Transportation**

After crushing, limestone will be transported from crusher to cement plant Limestone will be transported to its interlinked Cement Plant via covered belt conveyor.

## 1.5 DESCRIPTION OF THE ENVIRONMENT

Baseline study of the study area was conducted during Pre-Monsoon Season (March to May 2024).

**Ambient Air Quality**

Ambient Air Quality Monitoring reveals that the concentrations of PM2.5 and PM10 for all the 13 AAQM stations were found between 20.1 to 41.8 µg/m3 and 36.4 to 76.5 µg/m3 respectively. As far as the gaseous pollutants SO2 and NO2 are concerned, the prescribed CPCB limit of 80 µg/m3 has never surpassed at any station. The concentrations of SO2and NO2were found to be in range of 4.1 to 11.7 µg/m3 and 8.9 to 22.2 µg/m3 respectively. The Concentration of CO is found BDL at all monitoring locations except Village Perusomula.

**Noise Quality Levels**

Ambient noise levels were measured at 11 locations around the mine site. Noise levels varied from 47.5 to 53.9 Leq dB (A) during day time and from 37.7 to 42.5 Leq dB(A) during night time.

From the above study and discussions, it can be concluded that noise levels in the study area are well within the prescribed limits as prescribed by the CPCB.

Maximum noise levels during day time and during night time were observed at Village Chinnavenuturala due to various anthropogenic activities. Whereas, the minimum noise levels were found at Mine site.

**Surface Water Quality**

During the baseline study, seven water bodies were found and all the water bodies and all the water bodies were dry.

**Ground Water Quality**

The pH of the water samples ranged from 7.38 to 7.78 indicating slightly alkaline nature; and maximum pH was recorded at the Village - Vaddirala. The colour and turbidity were BDL, and odour and taste were agreeable at all sampling locations. The values of total hardness (239.17 to 736.4 mg/l), alkalinity (185.6 to 585.9 mg/l) and total dissolved solids (475 to 1582 mg/l) were low; however, maximum Hardness, total dissolved solids and maximum alkalinity were found in the sample of Village Vaddirala. The concentration of chloride was found to be (104.81 to 434.5 mg/l) and sulphates (40.38 to 149.4 mg/l). The concentrations of other micro and macro nutrients were also at low level i.e. nitrate (6.24 to 27.6 mg/l), calcium (41.74 to 202.3 mg/l), magnesium (27.63 to 56.04 mg/l), and iron (0.06 to 0.11 mg/l). The fluoride (0.16 too.76 mg/l) concentration is at

optimum level which prevents dental health problems of the consumers. Ground water quality was also analyzed for Cyanide as (CN), Aluminium as (Al), Phenolic Compounds, Anionic Detergents as (MBAS), Hexa Chromium as (Cr+6), Chromium as (Cr), Zinc as (Zn), Copper as (Cu), Boron , Cadmium as (Cd), Lead as (Pb), Arsenic as (As), Mercury as (Hg), Phosphate as (PO4), Nickel, Total Suspended Solid (TSS) are reported to be their Below detection limit at all the sampled locations.

**Soil Quality**

The pH of the soil samples varies from 8.0 at Village Erragudi to 8.63 at the village Talamanchipatnam which indicates the soil samples are moderately alkaline in nature.The texture of the soil samples majorly consists of Sandy Loam to Silty. The soil samples majorly exhibit Dull Yellowish Brown, Grayish Brown and Light Gray color at all the sampled villages. The indicator such as organic matter varies from 0.55 % to 0.88 % and Organic carbon varies from 0.32 % to 0.51 %. The Water holding capacity varies from 27.72 % at T. Kammavaripalli to 36.43 % at Vaddirala. Examined six essential nutrients required for an ideal plant growth are Nitrogen, Phosphorus, Potassium, Magnesium, Sulfur and calcium. Nitrogen ranged between 174.02 kg/ha at VillageT. Kammavaripalli to 318.18 kg/ha Village – Jangalapalle, Phosphorous ranged between 8.93 kg/ha at Village Jangalapalle to 37.76 kg/ha Village – Jangalapalle, Potassium (300.63 kg/ha at Mine Site to 591.96 kg/ha at Plant site), Magnesium (561.64 mg/kg at Mine Site to 917.93 mg/kg at Village Jangalapalle, Calcium (3653.65 mg/kg at Village Nawabpeta n to 5267.12 mg/kg at Village T. Kammavaripalli and Sodium (158.69 mg/kg at Village Nawabpeta to 263.37mg/kg at Plant site). The SAR value was observed under the limits at all the sampling locations with maximum value of 0.93 at Plant Site to minimum value 0.64 at Village Nawabpeta.

## 1.6 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

**On Air Environment**

The Proposed project includes various mining operations involving development of benches, excavation, drilling, blasting, loading, unloading, transportation of material etc. These operations generally result in generation of dust and thereby pose health hazards. However, adequate control measures will be provided at every stage of operation to reduce fugitive dust emissions. Gaseous pollutants ($SO_2$, $NO_2$) are anticipated from blasting operations and movement of machineries like excavator, loaders, dumpers, tippers & other vehicles; while generation of pollutants during blasting is instantaneous & momentary. The generation of dust is anticipated from various mining activities like drilling, blasting, excavation, loading, transportation, unloading, and other mining related activities.

Proper mitigation measures will be taken like controlled blasting, wet drilling arrangements as well as dust collection system for drilling equipment, water sprinkling before drilling, blasting & during transport activities and development of greenbelt/plantation area to control fugitive emissions. To avoid secondary blasting rock breaker will be used. Better maintenance of equipment also helps to reduce such emissions. Development of green belt/plantation around lease boundary, roads, safety zone & backfilled area to trap fugitive dust and other places to control the air pollution.

**Water Environment**

**Surface Water**

In the Coore zone Two Canals are passing through the lease area. GNSS Canal (Galeru Nagari Sujala Sravanthi Canal) is flowing in west side within the mining lease and SRBC (Srisailam Right Bank Canal) is flowing in east portion witing the lease area. in addition to this, One pond is also present within the mine lease. Pond is located in South west of lease area near to GNSS canal. In the Buffer zone Seasonal water bodies are present in the study area Viz. Pandula Vagu (~7.8 km in North direction), Kanala Vagu (~8.0 km in North direction), Tigaleru River (~7.6 km in South East direction), Rambhadra Cheruvu (~7.3 km in NNW direction), Erra Vagu (~5.7 in NNE direction), Erra Vanka (~9.2 km in NE direction). The mineral limestone and associated rocks do not contain any toxic substance. These water bodies are distantly located from the mine site Therefore, there is no significant impact of mining activities on quality of surface and ground water.

**Ground Water**

Mine working will not intersect ground water table during the plan period and at the conceptual stage, ultimate working depth will be 55 m bgl. Depth to water table during Pre-Monsoon: 25 m to 25.4 m bgl and during Post Monsoon: 21.5 m to 23.1 m bgl level in the lease area. Hence, the ground water will be intersected. Permission form Central Ground Water Authority will be taken before intersection of ground water table.

**Impact due to Noise & Vibration**

**Due to Mining Activities**

Major noise generating sources of the mining activity are drilling, blasting and HEMM movement used for transportation of limestone.

All DGMS guidelines will be followed to reduce the impact of blasting on the nearest habitation. HEMMs equipped with acoustic cabins will be provided for the operators. Controlled blasting techniques through proper blast design and explosive selection will be used to reduce the vibrations to a greater extent. Hydraulic rock breaker will be used in place of secondary blasting. PPEs like earplugs/earmuffs will be provided to mine workers. HEMMs equipped with acoustic cabins will be provided for the operators. Proper maintenance, oiling and greasing of HEMMs will be done. Development of green belt/plantation along the mining lease boundary and mining activity help in reducing noise level.

**Impact on Land Environment**

Land use of the lease area will alter due to mining activities such as formation of pits, built up areas of office, workshop, crusher, greenbelt, water reservoir etc.

As per approved mining plan out of the total Mining Lease area i.e. 997.08 ha, total excavated area will be 707.1 ha, out of which 390.6 ha will be converted into water reservoir and 146.5 ha will be backfilled area and 170.0 Ha area will be used for storage of sub grade. 9.5 ha area will be under waste dump outside excavated area. The other infrastructure like Workshop, Admin Building & Road exists in 2.90 ha area. The remaining 247.58 ha area will be left undisturbed at the end of life of mine.

The active mining area and the waste dump areas will be biologically reclaimed to protect soil erosion at the abandoning stage of mine Care will be taken to disturb minimum vegetation. Adequate compensatory afforestation in lieu of forest land will be done.

**Solid Waste Management**

Total Top soil generated during the plan period will be 0.0540 million tonnes. The topsoil will be appropriately stacked at a designated dump site located in the NNE direction of the mining lease area. First two years there will be no utilization of topsoil and in further years the top soil will be utilized for afforestation in the backfilled areas.

In the first five years total of 925000 tonnes of over burden will be generated and dumped in to the proposed dumping area inside the mining lease area. & later on, it will be reclaimed by backfilling & rehabilitated by plantation/re-grassing.

## 1.7 ANALYSIS OF ALTERNATIVES (TECHNOLOGY & SITE)

- Letter of Intent has been granted for grant of Mining lease with conditions for Limestone (under major mineral) in villages Dhannawada, Chinna Venturla, Vaddarala, Bestavemula, Gollapalle and G.Uppalapadu in Mylavaram Mandal, District Kadapa(YSR) in Andhra Pradesh over an area of 997.08 ha. in favour of M/s. ACC Limited Vide Govt. of Andhra Pradesh memo bearing number MEMO 16073/M.III (1)/2006-1 dated 22.06. 2010.
- Mining will be done by fully opencast mechanized method. All operations of mining will be done by deployment of Heavy Earth Moving Machineries deep hole drilling, excavation, loading, hauling & transportation to ensure maximum mineral conservation and minimum environmental degradation.
- In case of Mining projects alternate site selection is not necessary as the mining is site specific and the area in which mining will be carried out has been adequately proved for presence of mineral.

## 1.8 POST PROJECT ENVIRONMENTAL MONITORING PROGRAMME

**Table - 1.5**

**Post Project Monitoring**

| S. No. | DESCRIPTION | FREQUENCY OF MONITORING |
|---|---|---|
| 1. | Micro - Meteorological Data | Hourly |
| 2. | Ambient Air Quality Monitoring | Twice in a week and Online CAAQMS |
| 3. | Ground Water Quality & Level Monitoring | Quarterly |
| 4. | Surface Water Monitoring | Seasonal |
| 5. | Noise Level Monitoring | Fortnight |
| 6. | Ground Vibration Monitoring | On every blast |
| 7. | Crusher Stack Monitoring | Monthly |
| 8. | Medical Checkup of employees | 3 to 5 Year Interval<br>➢ Age of workers <45 years: After every 5 years<br>➢ Age of workers >45 years: After every 3 years |

### 1.8.1 HYDRO - GEOLOGICAL STUDY

Total water requirement for the project will be 60 KLD for domestic & other use, green belt & dust suppression of the mines. The water will be met from rainwater accumulated in mine pit.

Mine working will not intersect ground water table during the plan period and at the conceptual stage, ultimate working depth will be 55 m bgl. Depth to water table during Pre-Monsoon: 25 m to 25.4 m bgl and during Post Monsoon: 21.5 m to 23.1 m bgl level in the lease area. Hence, the ground water will be intersected. Permission form Central Ground Water Authority will be taken before intersection of ground water table.

### 1.8.2 BIOLOGICAL ENVIRONMENT

**Flora:** During the survey, an inventory was created of the various plant groups was discovered in the study region. In the Study area,187 plant species from 69 families were identified. Among them 38 trees, 22 shrubs, 54 herbs, 10 grasses, 45 aquatic plants as well as 10 climber species have been recorded in the study area based on primary observation as well as based on information collected from the secondary data. The dominant family in the project area is Fabaceae, which has 18 species, followed by Poaceae, which has 15 species.

**Fauna:** Total 11 species of Schedule - I fauna was recorded according to The WildLife (Protection) Amendment Act, 2022 dated 19th December 2022. Out of these 03 mammal species, 05 species of reptiles and amphibians and 03 species of Avi Fauna i.e ndian Grey Mongoose (*Herpestes edwardsii*), Indian Porcupine (*Hystrix indica*), Golden Jackal (*Canis aureus*), Indian Rat Snake (*Ptyas mucosa*):, Indian Cobra (*Naja Naja*):, Russell's Viper (*Daboia russelii*):, *Indian Chameleon (Chamaeleon zeylanicus),* Red Sand Boa (*Eryx johnii*), Barn Owl (*Tyto alba*), Shikra (*Accipiter badius*) and River Tern (*Sterna aurantia*).

### 1.8.3 RESETTLEMENT & REHABILITATION

The total mining lease area is 997.08 ha which falls into villages Dhannawada, Chinna Venturla, Vaddarala, Bestavemula, Gollaapalle, G. Uppalapadu of Mandal: Mylayara, District: Kadapa (YSR), Andhra Pradesh. Out of total lease area 9.81 ha is government land and 987.27 ha is private land. Out of the total private land, 681.47 ha land is under possession and remaining land to be acquired.

Total budget for R&R is estimated as Rs. 298.648 Crore

## 1.9 ENVIRONMENT MANAGEMENT PLAN

M/s. ACC Limited has a full-fledged Environmental Management Cell (EMC) for environmental monitoring and control. The roles and responsibilities of various personnel, who manage, perform and verify the activities having effect on environment and/or OH & S have been fixed by the Top Management. Total cost of the project is Rs. 437.768 Crore. Capital cost for Environment Protection measures is Rs. 3.840 crore and recurring cost for the EMP is Rs 0.180 crore/Annum is also envisaged for the proposed project.

## 1.10 CONCLUSION

Baseline data of land, air, water, noise, biological and socio-economic environment was duly assessed by conducting field investigation as well as by having an access to the available secondary information. The prediction of impacts was identified & evaluated and EMP is suggested to mitigate the environmental concerns arising from the proposed project.

The proposed project will prove beneficial to the local people as direct and indirect employment opportunity will be generated. There will be increase in revenue generation to the government by way of royalty, excise and government taxes etc. Further improvement in various area takes place like infrastructure education, roads, availability of drinking water, medical facilities in adjacent villages. There will be an increase in earnings of local villagers, as they get employment in the limestone mine, which ultimately resulted in better standard of living of the villagers. There is no significant pollution of air, water, soil and noise. Regular monitoring of all the components of environment will be done. Increased social welfare measures will be taken by the company is bringing development in the nearby villages.

adani

ACC

Cement

**Ref. No.:** ACC/ENV/GF-CUD/10-24/05

**Date:** 09.10.2024

**To,**
**Executive Engineer,**
**Quality Control Division,**
**Water Resource Department,**
Nagarajupeta, Kadapa, Andhra Pradesh - 516001

**Subject:** Proposed 5.0 MTPA Clinkerisation Plant, 8.0 MTPA Cement Grinding Unit, 100 MW Captive Power Plant at Gollapalle Village of Mylavaram Mandal, Kadapa (YSR) District, Andhra Pradesh by M/s. ACC Limited - ***Reg. Issuance of No Objection Certificate for the seasonal nalla passing through the project site.***

Ref.: 1. Copy of Terms of reference vide F. No. J-11011/265/2012-IA I (I) dated 20.02.2013 **(Enclosure – 1)**
2. Map showing seasonal nalla passing through proposed plant area **(Enclosure – 2)**

Respected Sir,

With reference to above subject matter, we would like to bring to your kind notice that M/s. ACC Limited has proposed 5.0 MTPA Clinkerisation Plant, 8.0 MTPA Cement Grinding Unit, 100 MW Captive Power Plant at Gollapalle Village of Mylavaram Mandal, Kadapa (YSR) District, Andhra Pradesh for which Terms of Reference (ToR) was issues by MoEFCC vide *letter* No. F. No. J-11011/265/2012-IA II (I) dated 20th February 2013 **(Enclosure - 1).**

In the same context, we would like to inform you that there is a Seasonal Nalla passing through the project site entering from NW direction to NE direct on. Map showing seasonal nalla passing through proposed plant area is attached as **Enclosure – 2.**

In this regard, we would like to apprise you that the Company has proposed minor re-alignment for part of nalla traversing through the proposed plant area to protect the seasonal nalla and maintain the natural course without disturbing the flow. Company has no proposal for construction of Manufacturing section of plant in that area where the Nalla is crossing the site. Also, company will adopt all the mitigation measures which are as follows –

1. During the construction & operation of the project the seasonal nalla will not be disturbed in any case.
2. Natural flow pattern of the Nalla will not be disturbed as it will be covered to maintain the natural flow & prevent debris to enter into the Nalla
3. The plant will be based on the dry process technology, ZLD will be maintained and hence no waste water will be discharged.
4. The rainfall runoff within the plant site will be diverted through the drains to the recharge pit and rain water harvesting pond.
5. Storm water drains will be made immediately after starting construction activity. The drains will be properly aligned in conformity with the site drainage pattern.
6. All Stacking/ storage areas will be provided with proper garland drains to prevent the wash off.

Looking to the above, we request you to kindly issue us the No Objection Certificate (NOC) for the Seasonal Nallah passing through the project site. We shall be thankful to you for the same and any document required in this regard, we shall be pleased to provide.

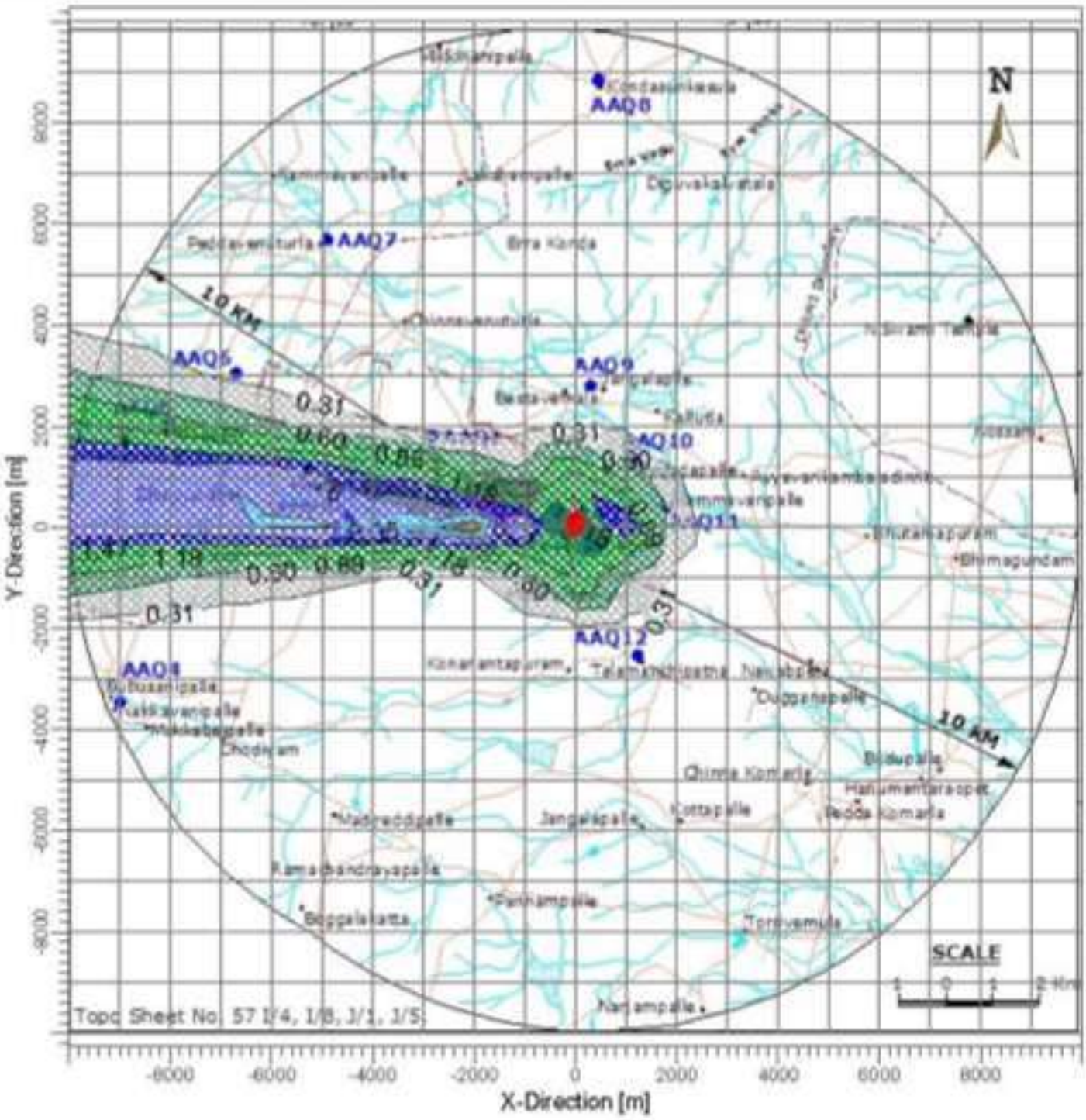
Thanking you and with regards,
**For M/s. ACC Limited**

***(Authorized Signatory)***
***(Sanjay Prasad – Head Env. Project)***
***Encl: As above***

Office of the Executive Engineer, I.D.
No.
Date. 14/10/2024
Kadapa Division, KADAPA.

ACC Limited
Cement House,
121, Maharshi Karve Road,
Mumbai 400 020, India
www.acclimited.com

PROJECT TITLE:
**ACC Kadapa**
**Cement Plant+CPP**




PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL

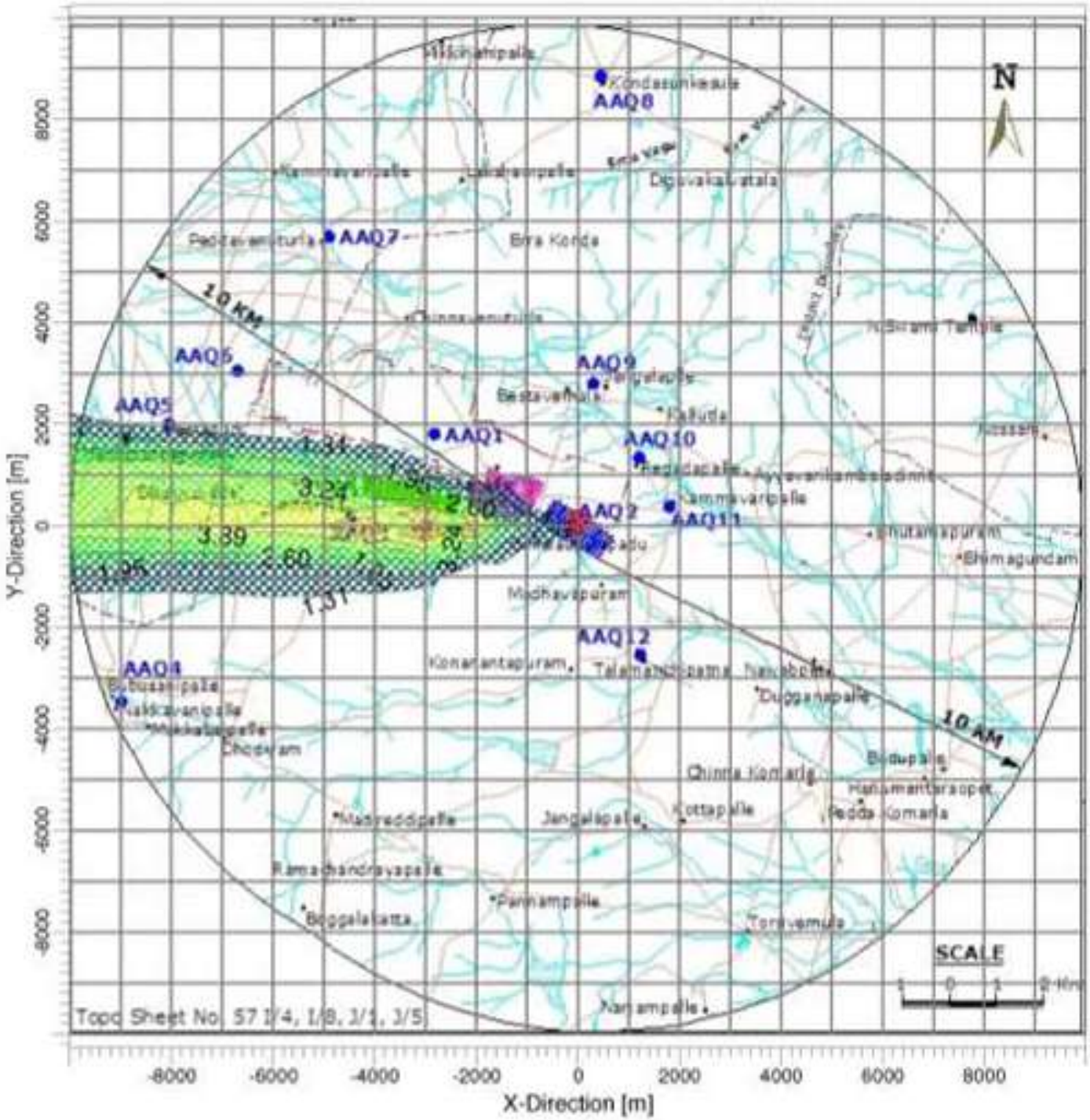
ug/m^3

0.310 | 0.601 | 0.891 | 1.181 | 1.472 | 1.762 | 2.053 | 2.343 | 2.633

| | | |
|---|---|---|
| COMMENTS: Predicted GLCs Particulate Matter(NOx) | SOURCES: 2 | COMPANY NAME: Vimta Labs Limited |
| | RECEPTORS: 441 | MODELER: M.Janardhan Bh.Durga Bhavani |
| | OUTPUT TYPE: Concentration | SCALE: 1:129,327 (0 — 5 km) |
| | AVG. TIME: 2.63333 ug/m^3 | PROJECT NO: |

PROJECT TITLE:

**ACC Kadapa**
**Cement Plant & CPP**




PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL

ug/m^3

1.307 | 1.953 | 2.598 | 3.244 | 3.889 | 4.535 | 5.180 | 5.826

| | | |
|---|---|---|
| COMMENTS: Predicted GLCs Particulate Matter (PM10) | SOURCES: 1 | COMPANY NAME: Vimta Labs Limited |
| | RECEPTORS: 442 | MODELER: M.Janardhan Bh.Durga Bhavani |
| | OUTPUT TYPE: Concentration | SCALE: 1:129,027 0 5 km |
| | MAX: 5.8255 ug/m^3 | PROJECT NO: |

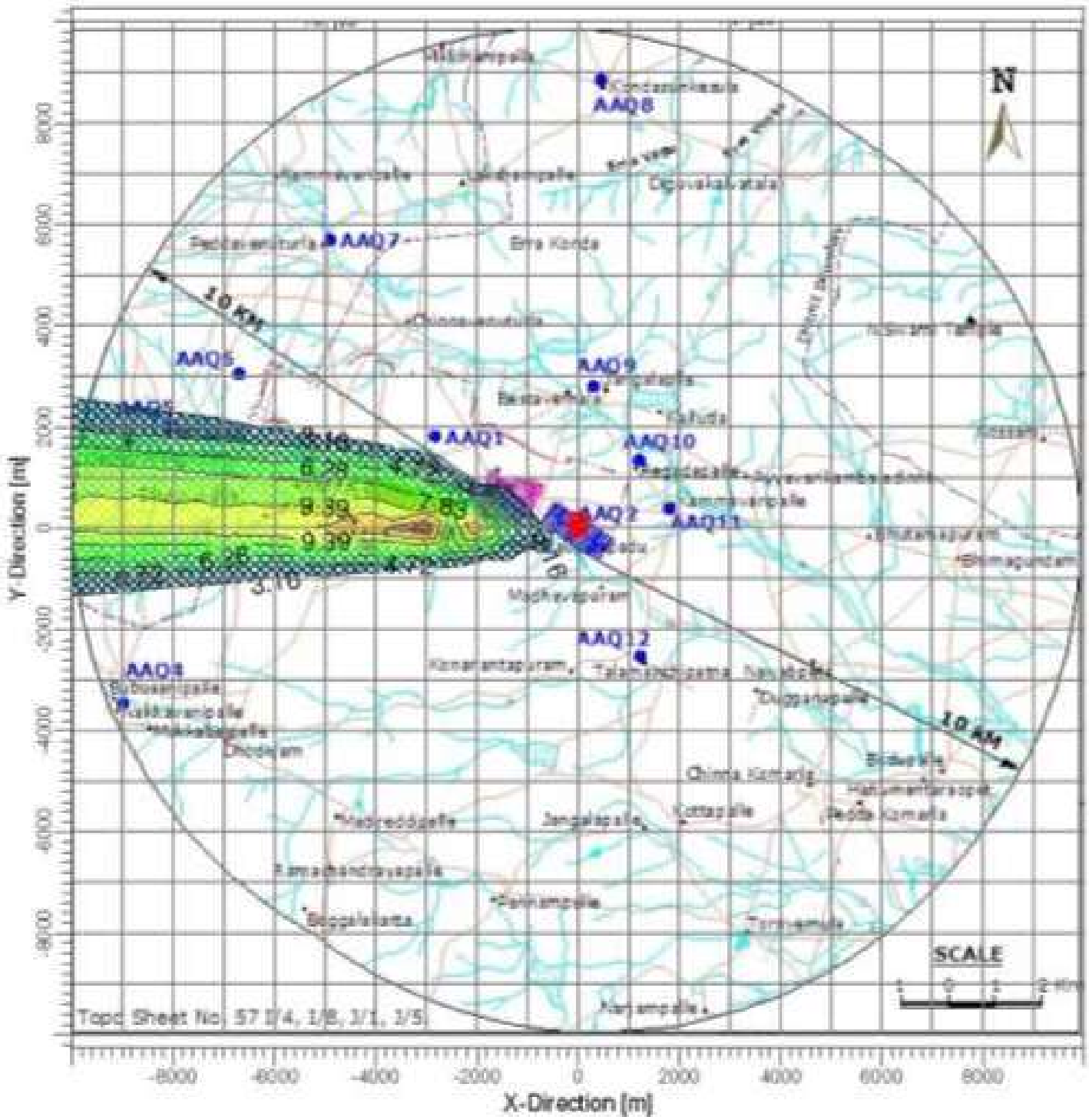


AERMOD View - Lakes Environmental Software

D:\BKP OF Viz\ENVDPD rtz\DDurga\Reports\Modeling 2019\ACC Kadapa\PM_Cement\CM.isc

PROJECT TITLE:

**ACC Kadapa**
**Cement Plant - CPP**




PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL

ug/m^3

3.163 | 4.719 | 6.275 | 7.831 | 9.387 | 10.943 | 12.499 | 14.055

| | | |
|---|---|---|
| COMMENTS: Predicted GLCs Particulate Matter(SO2) | SOURCES: 2 | COMPANY NAME: Vinita Labs Limited |
| | RECEPTORS: 441 | MODELER: M.Janardhan Bh.Durga Bhavani |
| | OUTPUT TYPE: Concentration | SCALE: 1:129,327 0 5 km |
| | AVG: 14.0553 ug/m^3 | PROJECT NO: |

भारत सरकार/ Government of India
रेल मंत्रालय / Ministry of Railways
दक्षिण मध्य रेलवे/South Central Railway

DR. M.SRAVAN KUMAR, IRTS
Sr. Divisional Operations Manager,
Email: srdomgtl@gmail.com
Tel No. 9701374900

Office of the
Divisional Railway Manager (Operations)
DRM Office Compound
Guntakal – 515801

No.G/T. 143/ACC/NOSM/2024 Date: 15.11.24

**To,**
**MGR Infra Techno Economical Services LLP.**
**1408, 14th Floor, Hemkunt Chambers,**
**Nehru Place,**
**New Delhi-19.**
**Cell-9885207376**

SUB: In principal Approval(IPA) for new Siding M/s ACC Ltd. under new GCT Policy take off from Nossam(NOSM) Station.
Ref: Online application in GCT portal on 05.06.2024

*******

With reference to the letter cited above, the competent Authority has **accorded 'IN PRINCIPLE APPROVAL'** for the provision of rail connectivity taking off at Nossam(NOSM) Station in Yerraguntla(YA)-Nandyal(NDL) Section to serve Siding **M/s ACC Ltd.** Subject to the submission of documents & Dept. wise remarks mentioned below.

**Documents:**

- Application fee (non-refundable) of Rupees 20,000/-(Twenty thousand rupees) plus GST as applicable to be paid.
- Notarized or registered copy of Power of Attorney in favour of individual to sign in behalf of and to create liability against firm to be submitted.
- Resolution of the Directors of the company, ermitting the company to set up and/or operate a GCT
- All the procedures & time line as per Master Circular on 'Gati Shakti Multi-Modal Cargo Terminal(GCT)' -2022 vide Railway Board Circular No. 2021/TC(FM)/18/23 dated 06.12.2022 and its amendments time to time shall be adhere to.

**Commercial:**

- Static Weigh Bridge on Silo system
- Standard pathways for GDR check and lighting
- IP based CL Cameras for monitoring loading/unloading

**Engineering:**

- Within Railway boundary with 60kg/90 UTS as per existing yard standards
- As per min track structure in GCT Norms

**Signalling:**

- Provision of Signalling arrangements to be incorporated.

**OHE:**

- The proposed Siding must be equipped with convention type overhead equipment(OHE)
- Electrical isolation is required at the takeoff point, including a Circuit Breaker with High Speed section Insulator.
- Due to pollution concern, composite insulators should be used for the OHE electrification of the lines.

**In accordance with GCT Policy, the applicant must submit the Engineering Scale Plan (ESP) and project details within four weeks of receiving the IPA.**

(Dr.M. Sravan Kumar, IRTS )
Sr.Divisional Operations Manager
GUNTAKAL-S.C.Railway.

भारतीय गुणवत्ता परिषद्
QUALITY COUNCIL® OF INDIA
QCI Creating an Ecosystem for Quality

**Annexure- 16**

NABET

# National Accreditation Board for Education and Training

## Certificate of Accreditation

**JM EnviroNet Pvt. Ltd., Gurugram**

**Unit No. 1517, Tower-B, Emmar Digital Greens, Golf Course Ext. Road, Sector – 61, Gurugram-122011**

*The organization is accredited as **Category-A** under the QCI-NABET **Scheme for Accreditation of EIA Consultant Organization, Version 3**: for preparing EIA/EMP reports in the following Sectors*

| S. No | Sector Description | Sector (as per) | | Cat. |
|---|---|---|---|---|
| | | NABET | MoEFCC | |
| 1. | Mining of minerals including Open cast/ Underground mining | 1 | 1 (a) (i) | A |
| 2. | River Valley Projects | 3 | 1 (c) | A |
| 3. | Thermal power plants | 4 | 1 (d) | A |
| 4. | Mineral beneficiation including pelletisation | 7 | 2 (b) | A |
| 5. | Metallurgical industries (ferrous & non-ferrous) | 8 | 3 (a) | A |
| 6. | Cement Plants | 9 | 3(b) | A |
| 7. | Coke oven plants | 11 | 4(b) | A |
| 8. | Chlor-alkali industry | 13 | 4 (d) | A |
| 9. | Chemical Fertilizers | 16 | 5 (a) | A |
| 10. | Petro-chemical complexes | 18 | 5 (c) | A |
| 11. | Manmade fibers manufacturing | 19 | 5 (d) | A |
| 12. | Petrochemical based processing | 20 | 5 (e) | A |
| 13. | Synthetic organic chemicals industry | 21 | 5 (f) | A |
| 14. | Distilleries | 22 | 5 (g) | A |
| 15. | Pulp & paper industry excluding manufacturing of paper from wastepaper and manufacture of paper from ready pulp without bleaching | 24 | 5 (i) | A |
| 16. | Sugar Industry | 25 | 5 (j) | B |
| 17. | Industrial estates/ parks/ complexes/ Areas, export processing zones (EPZs), Special economic zones (SEZs), Biotech parks, Leather complexes | 31 | 7 (c) | A |
| 18. | Ports, harbours, break waters and dredging | 33 | 7 (e) | A |
| 19. | Common Municipal Solid Waste Management Facility (CMSWMF) | 37 | 7 (i) | B |
| 20. | Building and construction projects | 38 | 8 (a) | B |
| 21. | Townships and Area Development projects | 39 | 8 (b) | B |

***Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in RAAC minutes dated October 20, 2023 posted on QCI-NABET website.***

*The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no QCI/NABET/ENV/ACO/23/3044 dated Nov 29, 2023. The accreditation needs to be renewed before the expiry date by JM EnviroNet Pvt. Ltd., Gurugram following due process of assessment.*

**Issue Date**
**Nov 29, 2023**

**Mr. Ajay Kumar Jha**
**Sr. Director, NABET**

**Certificate No.**
**NABET/EIA/23-26/RA 0308**

**Valid up to**
**August 07, 2026**

**Prof (Dr) Varinder S Kanwar**
**(CEO NABET)**

*For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to QCI-NABET website.*