CIN: U24296UP2005PTC029629

SUBHAM POLYCHEM PVT. LTD.

Fact:-Plot No. 23, Khasra No. 1261 Sa
and Khasra no.1262 Sa
Vill.Goyala, Near Chinhut Industrieal Area
Deva Road,LUCKNOW-226019

Courier address
Off:-217,KALPANA MARKET,15-16 AMINABAD PARK
LUCKNOW-226018, PH/FAX-0522-4044600
Email-sppllko@gmail.com
GSTIN:09AAICS8816P1ZF
VIKAS RASTOGI MOBILE 7607727700 & 9415093070
VIPIN GUPTA 7607717700

To,

15/12/2023

Additional Director/Scientist E
Expert Appraisal Committee, Industry III,
Ministry of Environment, Forest and Climate Change
Indira Paryavaran Bhawan, 3rd Floor, Vayu Wing
Jor Bagh Road, New Delhi-110003

Sub: Expansion of formaldehyde manufacturing capacity in existing facility from 2100 MTPM to 7500 MTPM located at Village Goyala, Mohana, Deva Road, Lucknow, Uttar Pradesh by M/s Subham Polychem Pvt. Ltd. – Warning-reg.

REF: (i) Proposal No. IA/UP/IND3/246935/2021, Dated: 25th Jan 2023 and Letter from MoEF&CC vide letter no. F. No. IA-J-11011/43/2021-IA-II(I) dated 7 November, 2023

Respected Sir,

With reference to above referred subject and Letter under reference we would like to submit that we have engaged Ind Tech House Consult (Accredited Consultant from NABET). Ind Tech House consult has owned the EIA report and prepared an addendum to EIA with respect to Chapter 2, Chapter 3 with 1 month additional baseline monitoring report, Chapter 4 and Chapter 10.

As no ADS is generated online, so Following documents are attached for your kind consideration.

1. Engagement letter with Ind Tech House Consult (Accredited Consultant from NABET).
2. Undertaking regarding owning of Documents by Ind Tech House Consult.
3. Copy of addendum to EIA in Chapter 2, Chapter 3 with 1 month additional baseline monitoring report, Chapter 4 and Chapter 10.

You are requested to kindly accept our reply and Grant the Environment Clearance.

Thanking You,

Yours Sincerely,

For M/s Subham Polychem Pvt. Ltd.

TABLE OF CONTENT

ANNEXURE 1

Engagement letter with lnd Tech House Consult (Accredited Consultant from NABET).

CIN: U24296UP2005PTC029629

SUBHAM POLYCHEM PVT. LTD.

Fact:-Plot No. 23, Khasra No. 1261 Sa
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GSTIN:09AAICS8816P1ZF
VIKAS RASTOGI MOBILE 7607727700 & 9415093070
VIPIN GUPTA 7607717700

Dated:- 22/11/2023

To
The Additional Director/Scientist E
Expert Appraisal Committee, Industry III,
Ministry of Environment, Forest and Climate Change
Indira Paryavaran Bhawan, 3rd Floor, Vayu Wing
Jor Bagh Road, New Delhi-110003

Subject: Engagement of Accredited Environment Consultant from NABET "Ind Tech House Consult" for Expansion of formaldehyde manufacturing capacity in existing facility from 2100 MTPM to 7500 MTPM located at Village Goyala, Mohana, Deva Road, Lucknow, Uttar Pradesh by M/s Subham Polychem Pvt. Ltd.

Dear Sir,

We, M/s Subham Polychem Pvt. Ltd, has appointed M/s Ind Tech House Consult having its registered office at G- 8/6, Ground Floor, Rohini Sector 11, New Delhi as Environment Consultant for our project as mentioned above. Ind Tech House Consult will update and validate the existing EIA/EMP report submitted vide proposal no. Proposal No. IA/UP/IND3/246935/2021 and further submission/reply/presentation regarding Environment Clearance before EAC, MoEF&CC.

Thanking You

Authorized Signatory
M/s Subham Polychem Pvt. Ltd.

ANNEXURE 2

Undertaking regarding owning of Documents by lnd Tech House Consult.

Ind Tech House Consult

(An NABET Accredited Environmental Consultancy Organization)

Date 22/11/2023

To
The Member Secretary,
Expert Appraisal Committee, Industry III,
Ministry of Environment, Forest and Climate Change
Indira Paryavaran Bhawan, 3rd Floor, Vayu Wing
Jor Bagh Road, New Delhi-110003

Subject: Owning of EIA report and all other documents submitted to MoEF&CC for grant of EC for the Proposed Expansion of Formaldehyde Manufacturing capacity in existing facility from 2100 MTPM to 7500 MTPM located at Village Goyala, Mohana, Deva Road, Lucknow, Uttar Pradesh by M/s Subham Polychem Pvt. Ltd.

Reference: Project Proposal No IA/UP/IND3/246935/2021 & MoEF&CC letter no. F. No. IA-J-11011/43/2021-IA-II(I) dated 07.11.2023

Dear Sir,

M/s Subham Polychem Pvt. Ltd. has proposed for Expansion of formaldehyde manufacturing capacity in existing facility from 2100 MTPM to 7500 MTPM located at Village Goyala, Mohana, Deva Road, Lucknow, Uttar Pradesh. Standard **Terms of Reference (TOR)** was issued) vide **MoEF letter** No.IA-J-11011/43/2021-IA-II(I) Dated **09th Feb 2021.**

Public hearing for the project was conducted on 20.10.2021 and EIA report along with TOR Compliance was submitted on Parivesh portal.

The subject proposal was recommended by the EAC (Industry- III) in its 47thEAC Meeting held on 15 th-17th February, 2023. Later M/s SD ENGINEERING SERVICES PVT. LTD made a complaint vide letter dated 10.3.2023 that the EIA/EMP report was submitted by the PP in their name, although they were not involved in its preparation.

As per the proceedings of personal hearing conducted by the MoEF&CC in this regard on 04/08/2023, M/s Subham Polychem Pvt. Ltd. approached to M/s Ind Tech House Consult for taking up the project further for submission of reply and to obtain environmental clearance.

M/s Ind Tech House Consult have gone through the report as submitted earlier to MoEF&CC. Ltd. We have visited the project site and has conducted baseline monitoring for one month in October 2023 with respect to ambient air quality, ambient noise, groundwater, surface water and soil quality in the study area. Project details were discussed with the project proponent and accordingly has amended the EIA report to certain extent that we foresee require necessary change/ addition of information in the EIA report. Chapter 2, 3, 4 and 10 has been revised/recompiled by us (M/s Ind Tech House Consult) based on the site visit, baseline monitoring results, discussion with the client and all the replies/presentation submitted to the EAC. The remaining part of the report remains same.

Thanking You,

Yours Sincerely,

Ind Tech House Consult Delhi

Supriti Guha
Authorized Signatory
Ind Tech House Consult

PAN No: AACFI2679F
GST No: 07AACFI2679F1ZD
MSME Reg. UAM No: DL06D0013164

G-8/6, Ground Floor, Sector 11,
Rohini, Delhi – 110 085
Tel: +91 11 46570361
Email: ithconsult@hotmail.com

ANNEXURE 3

Copy of addendum to EIA in Chapter 2, Chapter 3 with 1 month additional baseline monitoring report, Chapter 4 and Chapter 10

ADDENDUM TO THE FINAL EIA REPORT
FOR
PROPOSED EXPANSION OF FORMALDEHYDE MANUFACTURING CAPACITY IN EXISTING FACILITY FROM b2100 MT/MONTH TO 7500 MT/MONTH

AT KHASRA NO. 1261 & 1262 SA, PLOT NO. 23, VILL- GOYALA, PARGANA- MOHANA, TAL. BAKSI KA TALAB, DEVA ROAD, LUCKNOW, UTTAR PRADESH

BY SUBHAM POLYCHEM PVT. LTD.

•

Proposal No. IA/UP/IND3/246935/2021
File No. IA-J-11011/43/2021-IA-II(I)

ENVIRONMENTAL CONSULTANT

IND TECH HOUSE CONSULT
G-8/6, Ground Floor, Sector 11, Rohini, Delhi – 110 085
Tel: +91 11 2757 1410, 6460 7252, Fax: +91 11 2757 2241
(NABET/EIA/2023/SA 0174 VALID TILL 30-01-2024

December 2023

Background to the Addendum

M/s Subham Polychem Pvt. Ltd. has proposed for expansion of Formaldehyde Manufacturing Capacity in Existing facility from 2100 MT/Month to 7500 MT/Month at Khasra No. 1261 & 1262 SA, Plot no. 23, Vill-Goyala, Pargana- Mohana, Tal. Baksi Ka Talab, Deva Road, Lucknow, Uttar Pradesh.

Standard Terms of Reference (TOR) was issued vide MoEF&CC vide letter No. IA-J-11011/43/2021-IA-II(I) dated 09th February 2021. Public hearing for the project was conducted on 20.10.2021.

EIA report along with TOR Compliance was submitted to the EAC, MoEF&CC with the name of the EIA consultant M/s SD Engineering Services Pvt. Ltd. The subject proposal was recommended by the EAC (Industry- III) in its 47thEAC Meeting held on 15 th-17 th February, 2023. Later M/s SD ENGINEERING SERVICES PVT. LTD made a complaint vide letter dated 10.3.2023 that the EIA/EMP report was submitted by the PP in their name, although they were not involved in its preparation.

In this regard, a personal hearing was held on 04.08.2023 under the Chairmanship of Dr. Sujit Kumar Bajpayee, Joint Secretary, MoEF&CC at Indira Paryavaran Bhawan. In reference to the proceedings of the hearing, M/s Subham Polyvhem Pvt. Ltd. approached M/s Ind Tech House Consult to update and validate the existing EIA/EMP report and to obtain environmental clearance.

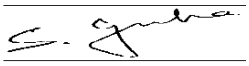
We, M/s Ind Tech House Consult have gone through the report as submitted by M/s SD Engineering Services Pvt. Ltd. We have visited the project site and has conducted baseline monitoring for one month in October 2023 with respect to ambient air quality, ambient noise, groundwater, surface water and soil quality in the study area. Project details were discussed with the project proponent and accordingly has amended the EIA report to certain extent that we foresee require necessary change/ addition of information in the EIA report. Chapter 2, 3, 4 and 10 has been revised/recompiled by us (M/s Ind Tech House Consult) based on the site visit, baseline monitoring results, discussion with the client and all the replies/presentation submitted to the EAC. The remaining part of the report remains same.

DECLARATION BY EXPERTS

Declaration by Experts Contributing to the report prepared for *Addendum to the Final EIA Report with respect to chapter 2, 3, 4 and 10 for proposed for expansion of Formaldehyde Manufacturing Capacity in Existing facility from 2100 MT/Month to 7500 MT/Month at Khasra No. 1261 & 1262 SA, Plot no. 23, Vill- Goyala, Pargana- Mohana, Tal. Baksi Ka Talab, Deva Road, Lucknow, Uttar Pradesh."*
I, hereby, certify that I was a part of the EIA team in the following capacity that developed the above Report.

EIA coordinator: Mrs. Supriti Guha

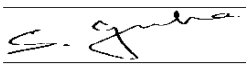
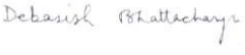
Signature and Date: 15/12/2023

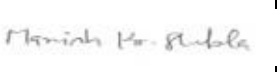
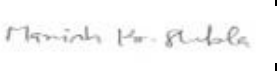
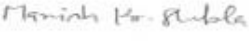


Period of Involvement: August -2023 to till date

Contact Information: 011-46570361

Functional Area Experts:

S. No.	Functional areas	Name of the expert/s	Involvement (Period and task**)	Signature and date
1	AP	Mr. Suman Banerjee	**August -2023 to till date** Study about Air pollution source, impacts, mitigation measures and management	
2	WP	Mrs. Supriti Guha	**August -2023 to till date** Study about Water Pollution source, usage, impacts, mitigation measures, anagement, Water quality, water conservation	
3	SHW	Mrs. Supriti Guha	**August -2023 to till date** Study about classification of solid waste, treatment method, disposal technics etc.	
4	SE	Dr. Debashish Bhttacharya (FAE)	**August -2023 to till date** Study about Socio-economic survey, demographic of study area etc.	

5	**EB**	Dr. Sameer Desh Pandey (FAE)	**August -2023 to till date** Study about ecologically sensitive area of study area, existing flora/fauna, national park & wildlife sanctuaries etc.	
6	**HG**	Mr. Manish Shukla (FAE)	**August -2023 to till date** Study of drainage pattern, surface runoff, topography of the area, impacts and mitigation measures etc.	
7	**GEO**	Mr. Manish Shukla (FAE)	**August -2023 to till date** Study about Geology, Lithology, and conservation measures.	
8	**SC**	Dr. Bideh Shukla (FAE)	**August -2023 to till date** Study about soil characterstic, conservation measures, impacts on land and mitigation measures etc.	
9	**AQ**	Mr. Suman Chattaraj (FAE)	**August -2023 to till date** Study about Meteorology, air quality modelling, and prediction, impacts and mitigation measures etc.	
10	**NV**	Mr. Suman Chattaraj (FAE)	**August -2023 to till date** Study about ambient noise quality, source, impacts, mitigation measures, traffic survey etc.	
11	**LU**	Mr. Manish Shukla (FAE)	**August -2023 to till date** Study about existing land use of the study area as per Master Plan, , impacts and mitigation measures etc.	
12	**RH**	Mr. Soumya Dwivedi (FAE)	**August -2023 to till date** Study about Risk and hazard management, impacts and mitigation measures etc.	

Part B: Declaration by Head of the ACO / authorized person

I, Suman Banerjee, Managing Partner of Ind Tech House Consult do hereby confirm that the below mentioned experts prepared the report for Addendum to the Final EIA Report with respect to chapter 2, 3, 4 and 10 for proposed for expansion of Formaldehyde Manufacturing Capacity in Existing facility from 2100 MT/Month to 7500 MT/Month at Khasra No. 1261 & 1262 SA, Plot no. 23, Vill- Goyala, Pargana- Mohana, Tal. Baksi Ka Talab, Deva Road, Lucknow, Uttar Pradesh by M/s Subham Polychem Pvt. Ltd. and EIA Coordinator (EC) is fully aware of the content. The consultant organization shall be fully accountable for any mis-leading information. It is also certified that Report has been analysed by the system for plagiarism check using https://www.duplichecker.com software in accordance with good scientific practice. No unethical practices have been carried out and external data / text has not been used without proper acknowledgement, while preparing this report.

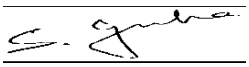
Certificate of Plagiarism check	
Title of EIA Report:	Addendum to the Final EIA Report with respect to chapter 2, 3, 4 and 10 for proposed for expansion of Formaldehyde Manufacturing Capacity in Existing facility from 2100 MT/Month to 7500 MT/Month at Khasra No. 1261 & 1262 SA, Plot no. 23, Vill- Goyala, Pargana- Mohana, Tal. Baksi Ka Talab, Deva Road, Lucknow, Uttar Pradesh
Name of Accredited Organisation:	Ind Tech House Consult
Unique Identification Number:	ITHC/PRJ/23-24/EIA/67/Rev.01
Name of EIA Co-ordinator:	Mrs Supriti Guha
Name of the Software:	https://www.duplichecker.com
Date of Check:	14/12/2023
Time of Check:	**11.18**

Date and Sign of EIA Co-ordinator- 15/12/2023

Name: Mrs. Supriti Guha

Designation Signature

EIA Coordinator



Date and Sign of Head of ACO / authorised person: 15/12/2023

Name: Mr. Suman Banerjee

Designation: **Signature**

Managing Partner

Name of the EIA consultant organization: Ind Tech House Consult

NABET Certificate validity extension letter No. & valid till: QCI/NABET/ENV/ACO/23/3012 Valid up to 30.01.2024

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CHAPTER 2: PROJECT DESCRIPTION

This chapter provides information on project and capacity; need for the project; location; size or magnitude of operation; technology and process description; maps showing project layout, component of projects etc.

2.1 Type of Project

Subham Polychem Pvt. Ltd. is a private limited company incorporated in 2005 and registered at Registrar of Companies, Kanpur. The company has its existing unit manufacturing Formaldehyde located at Khasra No. 1261 & 1262 SA, Plot no. 23, Vill- Goyala, Pargana- Mohana, Tal. Baksi Ka Talab, Deva Road, Lucknow in Uttar Pradesh. The existing unit is operating since 2005 with formaldehyde production capacity of 2100 MT/month.

The company has planned now for expansion by increase of Formaldehyde [37%] production capacity from 2100 MT/month to 7500 MT/month within the existing unit premises. Main raw material used to manufacture Formaldehyde is Methanol.

S. No.	Product Details	Existing Production MT/month	Proposed Expansion MT/month	Post Expansion [Total] MT/month
1	Formaldehyde	2100	5400	7500

Product Users: Formaldehyde is used by plywood and mica laminated sheets manufacturers, who make adhesives like Urea Formaldehyde and Phenol Formaldehyde resins.

The project activity falls under Project/Activity 5(f) i.e., Synthetic Organic Chemicals Industry as per EIA Notification S.O. No. 1533 issued on 14th September, 2006 and its subsequent amendments. The project is located on private land and therefore shall be considered as Category A project.

2.2 Need for the project

The end use of this product is mainly for Resins, disinfectant & other industrial uses. Formaldehyde is majorly used to manufacture adhesives like Urea Formaldehyde, Phenol Formaldehyde, and Melamine Formaldehyde resins which are mainly used to manufacture Laminated Sheets. Plywood Boards and mica sheets manufacturing industries are growing very fast in India. The market is expected to continue to grow at the minimum rate of 10 to 15% per year. During the last decade, India has built a very strong position as mica sheets and ply wood boards for domestic consumption and for exports to South Asian countries & Middle East.

In view of the growing market demand of Formaldehyde, the company has planned to increase the production capacity of Formaldehyde by setting up of new plant within the existing premises.

Demand – Supply Gap

The Indian Formaldehyde market is dominated by domestic production. In the coming years, increased residential and commercial construction due to increase in population is predicted to lead an increase in demand of different resins like PF resin, UF resin, MF resins. These resins are also used in paints and coatings due to their exceptional durability. The future of Formaldehyde will be positive in our country due to growing consumption of formaldehyde by multiple end user industries. The market is expected to continue to grow at the minimum rate of 10 to 15% per year which makes the sufficient possibility to fulfill the domestic market demand. The Domestic supplies of the company will indirectly contribute to the growth of our nation

Imports vs. Indigenous Production

The global Formaldehyde market demand stood at 23 million tonnes in 2022 and is expected to grow at a CAGR of 3.39% during the forecast period until 2032. There is surplus supply in the domestic market, even at yielding rates ranging between 60-65%. Indian exports of Formaldehyde have grown at a CAGR of about 12%. It is the only chemical market where demand and production have increased at an identical rate of 5%.

Currently, Nepal is the biggest importer of Indian Formaldehyde, importing more than half of the total quantity exported from India. Sri Lanka, Kenya, Bhutan and UAE hold the remainder of the export share. India, however needs to further expand its percentage of exports and increase the production up to its full capacity so as to enhance the export market.

Company's current business is based on domestic market demand. However, possibilities for export would also be explored. In all, there is good market demand of Formaldehyde – both in India & abroad.

2.3 Location (maps showing general location, specific location, project boundary & project site layout)

The existing site is spread over an area of 2788 m^2 and located on North of NH 27 at an aerial distance of 1.9 Km at Khasra No. 1261 & 1262 SA, Plot no. 23, Vill- Goyala, Tal. Baksi Ka Talab, Deva Road, Lucknow. The site is located in a Non-Notified Industrial Area i.e. in private Land, with large, medium and small scale industries scattered around. The land is under possession of the company. New plant for expansion of manufacturing capacity will be installed in the vacant space within the existing premises.

The site is having good connectivity through road and rail. The site is located on the outskirt of the State capital and district headquarter Lucknow City on NE. Nearest village Papnamow is at a distance of 1.5 Km on East of project site and Village Anora Kala is situated at a distance of 1.3 Km on SE. Project site surroundings are as follows –

- ✓ North – Rama Warehouse, India Pesticide Limited and UPSIDC Area

- ✓ South – RV Industries and other automobile industries
- ✓ East –Adjacent Road and Singh & Sons Industries, Bony Polymers
- ✓ West – Automobile yard and vacant land

Project site location, specific location showing boundary on Google Earth Imagery with site coordinates, 500m buffer map on Google image are shown as **Figure 2.1, 2.2 and 2.3.** Sensitivity Map of 10 Km Radius on Geo-referenced Topo-sheet and 10 km radius Study Area map are shown as **Figure 2.4 and 2.5.** Project layout plan is given in **Figure 2.6** and Components of the project layout plan is given in **Table 2.2** below:

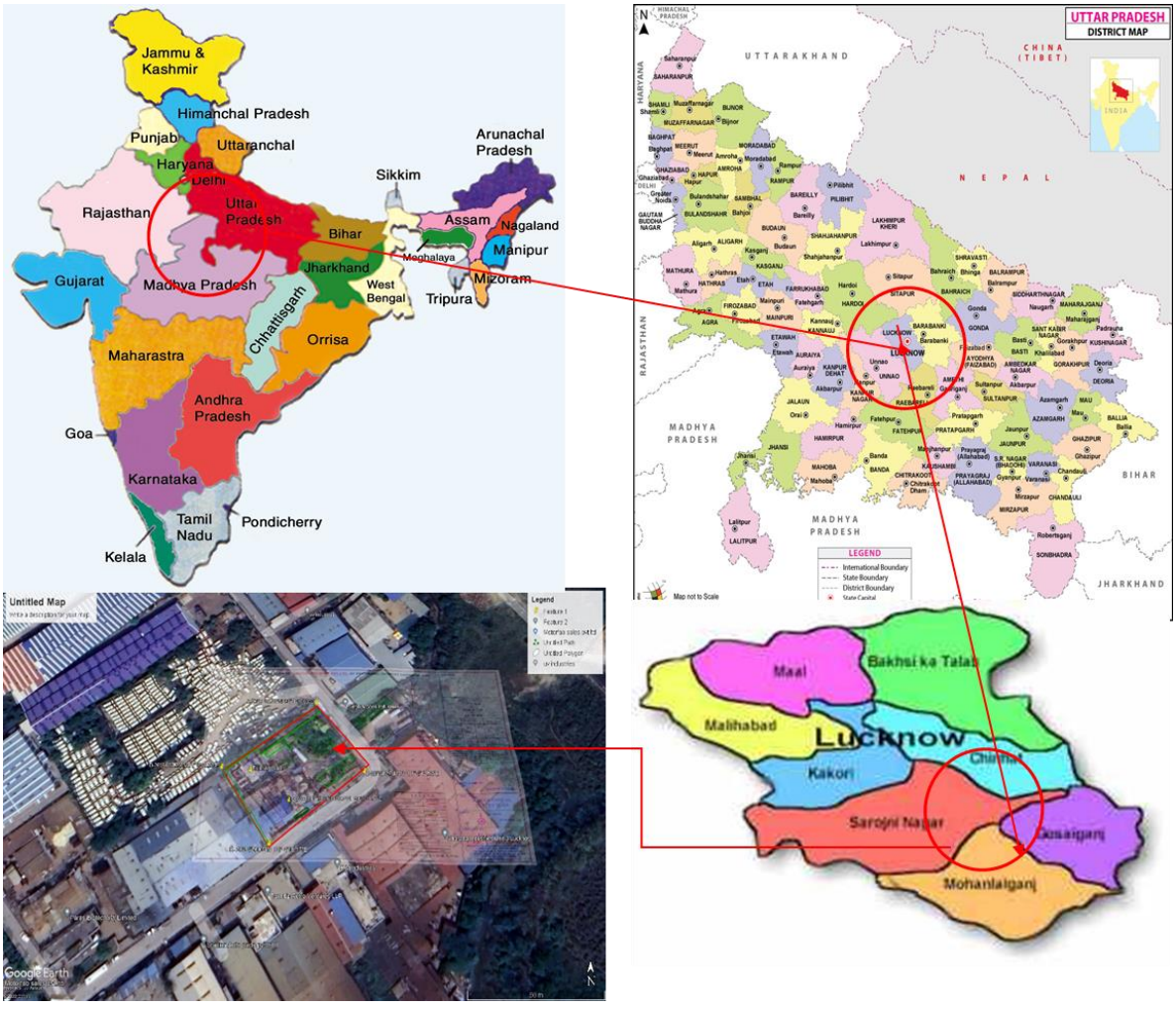


Figure 2. 1Project Site Location

Figure 2.2: Project Site on Google Earth showing Site Boundary

Table 2. 1 Coordinates of All Corner Points of Existing Premises

Corners	Latitude	Longitude
A.	26°54’38.43”N	81°04’17.03” E
B.	26°54’37.18”N	81°04’17.92” E
C.	26°54’36.02” N	81°04’16.17” E
D.	26°54’37.26”N	81°04’15.23” E

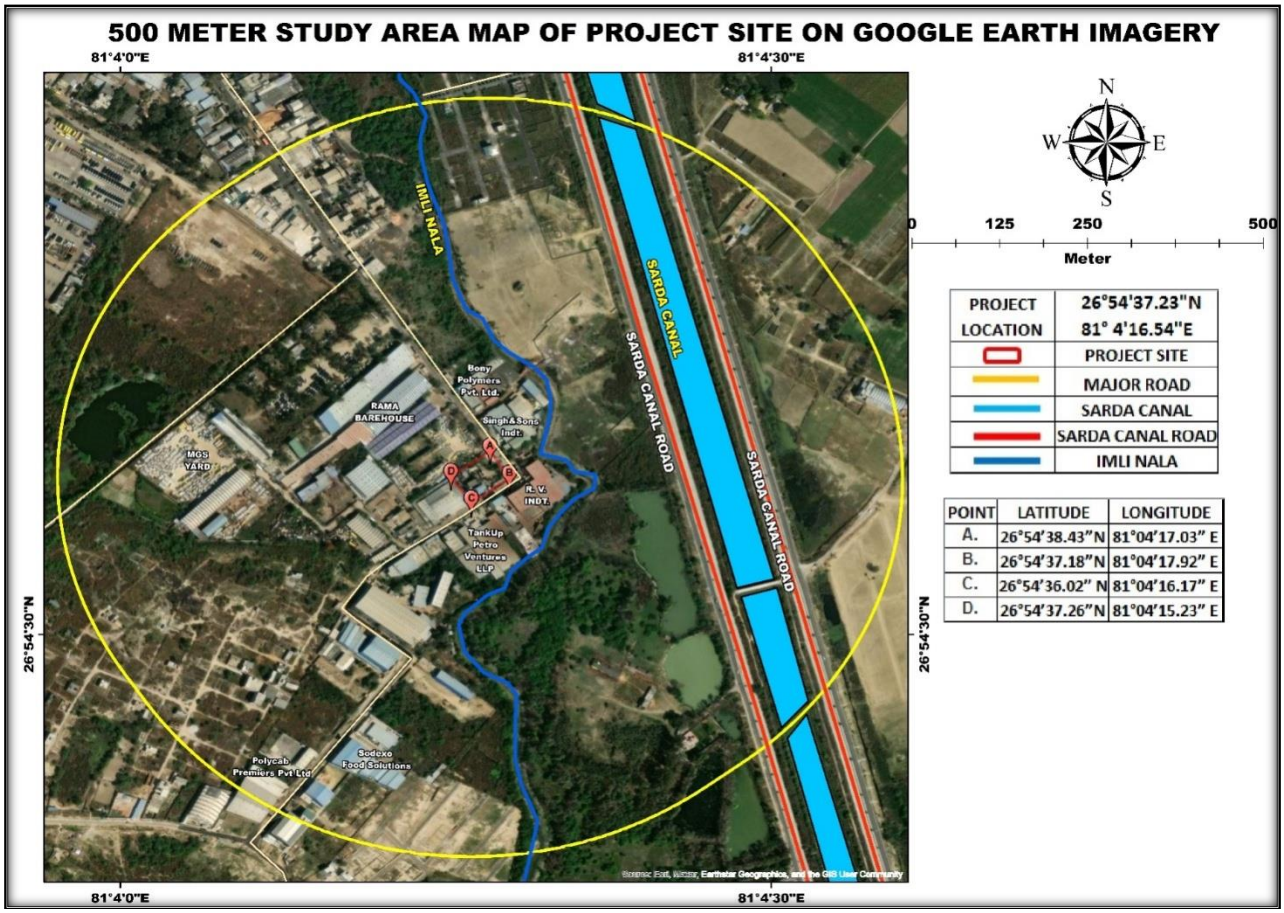


Figure 2. 3 Project Site Location on Google Image with 500m buffer map

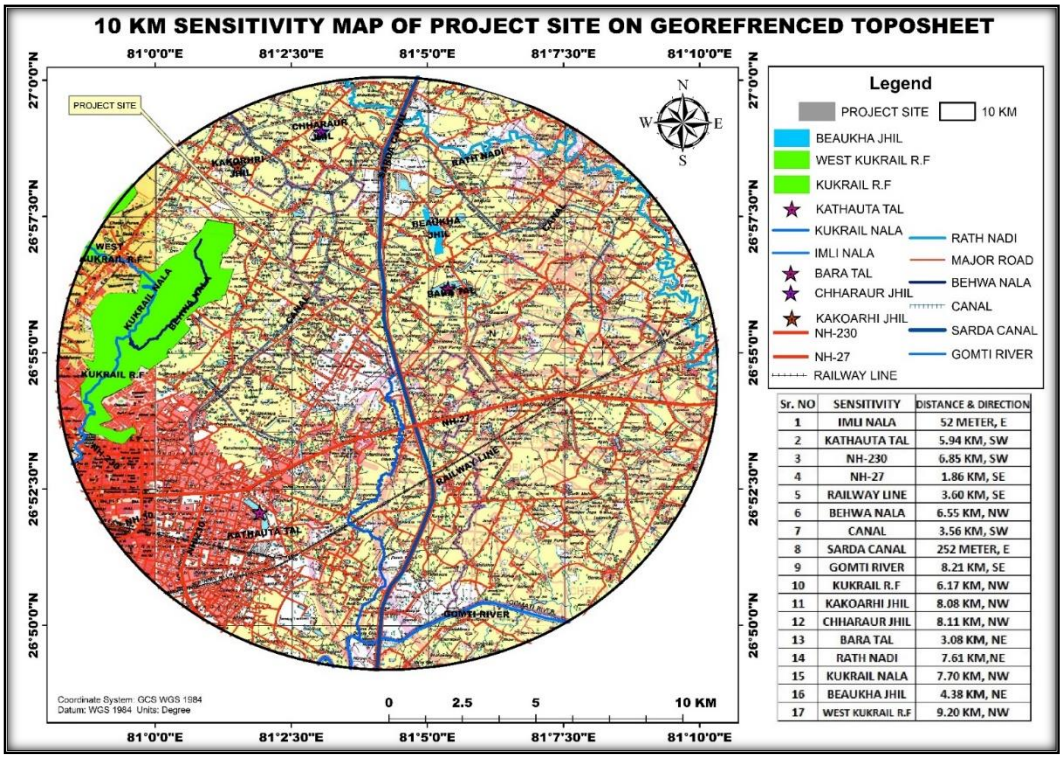


Figure 2.4: Sensitivity Map of 10 Km Radius around the Project on Geo-referenced Topo sheet

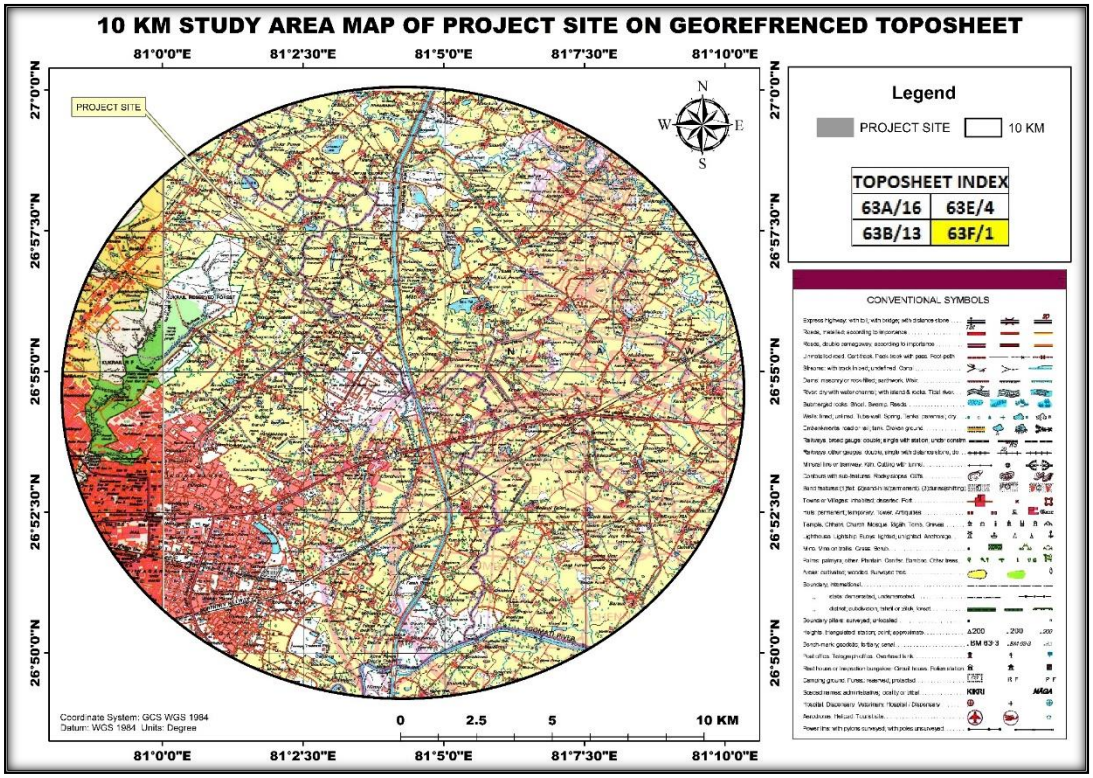
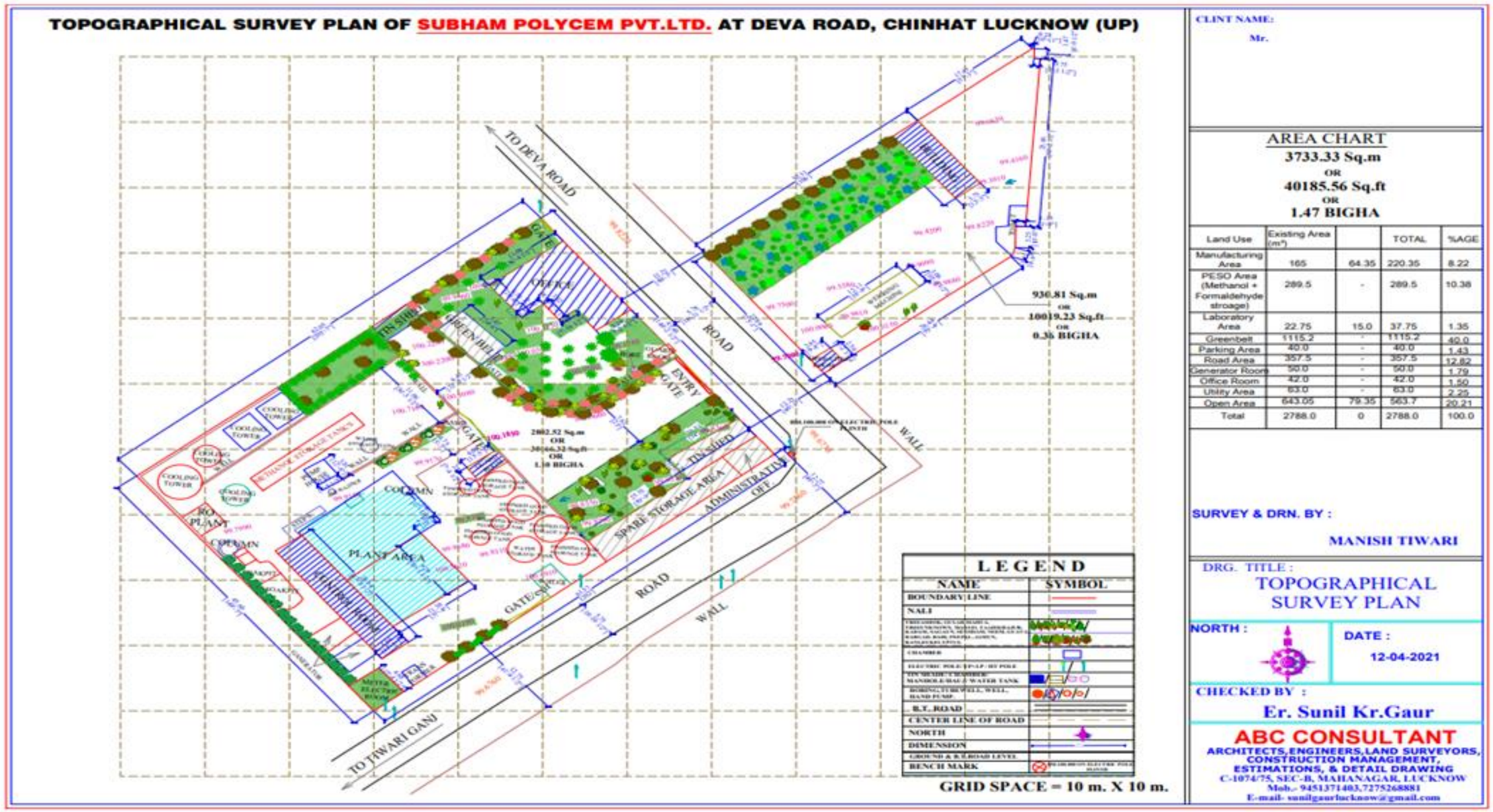


Figure 2. 5: 10 km Study Area Map surrounding the Project Site



Land Use	Existing Area (m²)		TOTAL	%AGE
Manufacturing Area	165	64.35	220.35	8.22
PESO Area (Methanol + Formaldehyde stroage)	289.5	-	289.5	10.38
Laboratory Area	22.75	15.0	37.75	1.35
Greenbelt	1115.2	-	1115.2	40.0
Parking Area	40.0	-	40.0	1.43
Road Area	357.5	-	357.5	12.82
Generator Room	50.0	-	50.0	1.79
Office Room	42.0	-	42.0	1.50
Utility Area	63.0	-	63.0	2.25
Open Area	643.05	79.35	563.7	20.21
Total	2788.0	0	2788.0	100.0

Figure 2. 6 Project Site Layout Plan showing Existing and Proposed Expansion Area

Table 2. 2 Project Components and Land Utilization Statement of the project site

S. No	Land Use	Existing Area	Proposed Area	Total	Area %
1	Manufacturing area	165	64.35	229.35	8.22
2	Methanol & Formaldehyde Storage Area	289.5	-	289.5	10.38
3	Laboratory area	22.75	15.0	37.75	1.35
4	Greenbelt	1115.2	-	1115.2	40.0
5	Parking area	40.0	-	40	1.43
6	Road Area	357.5	-	357.5	12.82
7	Generator Room	50.0	-	50.0	1.79
8	Office Room	42.0	-	42.0	1.50
9	Utility area	63.0	-	63.0	2.25
10	Open area	643.05	-79.35	563.7	20.21
	Total	**2788.00**	**0**	**2788.0**	**100.0**

- An area of 1115.2 m^2 [40% of plot area] has been earmarked as green area with existing plantation of 254 trees of different species.
- The existing green belt is developed around 35% i.e., around 980 m^2 and remaining 135.2 m^2 area shall be developed further.
- Additional plantation with 164 nos. of trees will be done at the site.

2.4 Site Analysis

Topography -The existing site is almost flat with gentle slope from North to South of the site. Average elevation of the project site is 140 m MSL. The land is classified as industrial and no forest land is involved in the project site.

Seismicity –The projects site falls in Zone III (Moderate Risk Zone) of seismicity.

Drainage – No planned drainage network exists outside the project site.

Fresh Water Availability - Onsite bore-well provisionally approved by the Ground Water Department. Final approval will be obtained. No centralized water supply system is available.

Social Infrastructure –

- **Rail Connectivity:** Malhaur Railway station is located at aerial distance of approx. 6.9Km on SW.
  Gomtinagar Rly Station is located at aerial distance of approx. 8.5 Km on SW.
- **Road Connectivity:** NH 27 is passes on South of the project site at a distance of 1.9 Km.
  NH-230 (Amar Shaheed Path) - aerial distance of 6.85 Km on SW.
- **Nearest Airport:** CCS Airport, Amausi, Lucknow is at aerial distance of 24 km on SW.

Major Industries nearby: The existing unit is located in a certified industrial land and some of the nearby industries are Singh & Sons Industries, Boly Polymers, India Pesticides Limited, UPSIDC etc.

Sr. No.	Name of Industry	Distance from Project site	Direction from project site
1	Singh & Sons Industries	0.03 KM	NE
2	R C CEE	0.08 KM	NW
3	Bony Polymers Pvt. Ltd.	0.12 KM	NW
4	R.V. Industries	0.05 KM	SW
5	Sharada Industries Unit 3 Lucknow	0.08 KM	S
6	Climb Tech India Pvt.	0.05 KM	SW
7	Mahaveer Enterprises	0.14 KM	NE
8	Motorfab Sales Pvt. Ltd.	0.14 KM	NE
9	JMAG Automotive Industries	0.21 KM	SW
10	New Vanshika Bio Agro Industries	0.21 KM	SW

Details of nearby school, hospital, temple etc. are as follows -

S. No.	Particulars	Distance and Direction wrt project site
1.	Mahatma Gandhi Health Center	5.3 Km, SW
	Dr. Ram Monohar Lohia Institute of Medical Sciences	8.2 Km, SW
	Chandan Hospital	6.3 Km, SW
	Baba Hospital and College of Nursing	3.9 Km, SW
2.	Diamond Primary School	1.9 Km, SW
	Lucknow International Academy	1.3 Km, SE
	Dr. Asha Smriti Mahavidyalaya	1.5 Km, NW
	Samarpan Institute of Nursing & Paramedical Sciences	1.8 Km, NW
	Ramswaroop College of Engineering	2 Km, South
	City Group of College, Lucknow	2.25 Km, SW
3.	Omkareshwar Shiv Hindu temple	560 m, East
	Imlibandh Baba Mandir	830 m, South
	Hanuman Ji Temple	1.7 Km, SW

Eco-sensitive Areas around the project site: No national park/ wildlife sanctuary/ biosphere reserve/ tiger reserve/ elephant reserve etc. are present within 15 km area of the project site.

Reserved Forests and Protected Forests present in Buffer Zone–

- Kukrail R.F is situated at an aerial distance of 6.17 Km, NW Direction.
- West Kukrail R.F is situated at an aerial distance of 9.20 Km, NW Direction.
- Musabagh P.F is situated at an aerial distance of 10.41 Km, NE Direction.

List of the Water bodies present in Buffer Zone-

- ImliNala is situated at an aerial distance of 50 Meter, E direction.
- Kathauta Tal is situated at an aerial distance of 5.94 Km, SW direction.
- BehwaNala is situated at an aerial distance of 6.55 Km, NW direction.
- Canal is situated at an aerial distance of 3.56 Km, SW direction.
- Sarda Canal is situated at an aerial distance of 252 Meter, E direction.
- Gomti River is situated at an aerial distance of 8.21 Km, SE direction.
- KakoarhiJhil is situated at an aerial distance of 8.08 Km, NW direction.
- ChharaurJhil is situated at an aerial distance of 8.11 Km, NW direction.
- Bara Tal is situated at an aerial distance of 3.08 Km, NE direction.
- RathNadi is situated at an aerial distance of 7.61 Km, NE direction.
- KukrailNala is situated at an aerial distance of 7.70 Km, NW direction.
- BeaukhaJhil is situated at an aerial distance of 4.38 Km, NE direction.
- JamurJhil is situated at an aerial distance of 11.77 Km, SE direction.
- Barahun Tal is situated at an aerial distance of 11.51 Km, SE direction.
- Sajan Tal is situated at an aerial distance of 12.78 Km, S direction.
- Khalar Tal is situated at an aerial distance of 13.03 Km, S direction.

2.5 Site History

The land was purchased in 2005 abutting to well-connected road near Goyla Industrial Area, Deva Road in Lucknow City. The project had obtained CTE from UPPCB for establishment of industrial unit on this land. In 2005, the installation of machineries and building was completed, hence applied for CTO and it was accorded in 2005. The existing activities of formaldehyde manufacturing were started since 10/10/2005 before EIA notification 2006. There is no show cause notice from UPPCB in last three years.

2.6 Present Status of Existing Unit and Proposed Expansion

No construction activity is carried out for proposed expansion unit. The company is presently operating its existing Formaldehyde unit. Last CTO was granted by the UPPCB vide letter no:70285/UPPCB/LUCKNOW(UPPCBRO)/CTO/water/LUCKNOW/2019 Valid till 31/12/2021 and letter no. 70280/UPPCB/LUCKNOW(UPPCBRO)/CTO/air/LUCKNOW /2019 Valid till 31/12/2021.

2.7 Size or magnitude of operation (include associated activities required by or for the project)

Total plot area of the existing site is 2788 m^2. Proposed expansion will be carried out within the existing premises by installation of new process plant. Existing infrastructure and utilities will be used. The project will employ around 9 people during post expansion operation phase. The plant will work in 2 shifts round the clock. Estimated project cost for the proposed expansion project is INR 352 Lakh. Salient Features of the project long with comparative statement with respect to the existing project scenario are as below-

Table 2. 3: Salient Features of the Project [Post Expansion]

SN	Description	Proposed Project Details
1.	Name of Project	Addition of Formaldehyde production capacity in Existing Formaldehyde Manufacturing Facility by Subham Polychem Pvt. Ltd.
2.	Existing landuse of Project Site	Industrial
3.	Project Category	5(f) - Category A
4.	Project Cost	INR 450 Lakhs [Existing- 98 Lakhs + Proposed Expansion - 352 Lakhs]
5.	Production Capacity	Existing: 2100 MT/month of formaldehyde Proposed Expansion: 5400 MT/month of formaldehyde Post Expansion : 7500 MT/month of Formaldehyde
6.	Major Raw Materials	Methanol and water
7.	**Resource Requirement**	
(i)	Land	2788.00 m^2[Existing premises]
(ii)	Water	**Operation phase:** Total fresh water requirement for the project including Domestic and Green area requirement : 250 KLD [Existing 46 + Proposed 204 KLD] **Source:** Onsite bore-well
(iii)	Power Requirement	93.24 KW [Post Expansion] Source : Uttar Pradesh Power Corporation Ltd.
(iv)	Backup Power	Existing - 1 DG set of capacity 125 KVA. Proposed – 1 DG set of capacity 480 KVA
(v)	Fuel	HSD for boiler and DG sets
(vi)	Man power	Construction Phase: 4 Nos. Operation phase: 10
vii)	Utility	Existing Boiler – 0.5 TPH [HSD based] Proposed – Nil. Existing boiler would be sufficient to cater the proposed expansion.
8	Source of Pollution	
(i)	Wastewater Generation	Domestic Sewage – 0.4 KLD; disposed through septic tank & soak pit. Industrial – • RO Reject – 70 KLD; sent to softener plant and used in cooling tower. • Cooling Tower blow down – 2 KLD; reused in cooling tower after treatment through sand bed media followed by softener plant • Weekly Regeneration of Softener Plant – 1 KL; sent to single stage evaporator. **No liquid effluent discharge from the process. There will not be any industrial effluent discharge to outside.**
(ii)	Air Emission	Point Sources – 1) Boiler [HSD fired/capacity 0.5 TPH] 2) D.G. Sets [125 KVA + 480 KVA] 3) Manufacturing Process - Tail gas vent after absorption column

(iii)	Hazardous Waste	Used Oil – 0.01 KL/annum [post Expansion] – sold to authorized recycler.
9	Treatment Facility	
(i)	Wastewater	No industrial effluent will be discharged to outside.
(ii)	Air Emission	Boiler is provided with stack of height 12m from ground level. DG sets will be provided with individual stacks of height 11 m above GL. Tail gas from the process is released through vent provided after absorption column at a height of 12 m from ground level.
(iii)	Solid Waste	Municipal Solid Wastes will be disposed as per local norms.
10	Resource Recovery	
(i)	Water	Blow down water from cooling tower will be reused.

Table 2. 3Comparative Statement - Existing Unit and Proposed Expansion

S. No	Particulars	Existing	Additional due to Expansion	Post Expansion	Unit	Remarks
1	Plot Area	2788	Nil	2788	m^2	-
2	Plant Area	165	64.35	229.35	m^2	
3	Green Area	1115.2	0	1115.2 [40%]	m^2	-
4	Formaldehyde Production	2100	5400	7500	MT/ month	-
5	Major Raw Material - Methanol	1050	2700	3750	MT/ month	-
6	Boiler	0.5 TPH	Nil	0.5 TPH	TPH	HSD is used as fuel in existing boiler.
7	Power Demand	120	100	220	KVA	Sourced through UPPCL supply.
8	DG Sets [No. & capacity]	1 no. [125 KVA]	1 No. [480 KVA]	2 Nos. [125 + 480 KVA]	KVA	DG sets are provided with individual stacks of height 11m from GL
9	Fresh Water Demand[Industrial]	46	200	246	KLD	
10	Fresh water demand [Domestic]	0.5	0	0.5	KLD	
11	Fresh water demand [Green area]	3.5	0	3.5	KLD	
12	Total Fresh Water Demand	50	200	250	KLD	Fresh water is sourced through onsite tube-well.
13	Wastewater [Domestic]	0.4	0	0.4	KLD	Disposed through septic tank and soak pit
14	Wastewater [industrial]	1	2	3 [cooling tower blow down + Softener Regenerati	KLD	*It is a Zero industrial Liquid Discharge plant.* *No process effluent generation. Industrial effluent is generated from equipment washing once in 3-4 months*

				on		*during shut down and discharge from utility units like RO rejects & cooling tower blow down.*
15	Municipal Solid waste [@200 g/ person/day]	2	-	2	Kg/day	Disposed through authorized agency as per local norms.
16	Used Oil [Hazardous Waste]	0.01	0.09	0.1	Kl/yr	Sold to SPCB authorized recyclers.
17	Manpower	8	1	9	Nos.	-
18	Project Cost[INR]	98	352	450	Lakh	-

2.7.1 Raw Materials

Major raw materials required for manufacturing formaldehyde are Methanol, Water and silver catalyst. Methanol is sourced from the importers and transported from Kandla Port, Gujarat by road. Silver catalyst is Sourced from local market and transported via road network. Groundwater after treatment through RO unit is used in process. Average raw material consumption is shown below -

Table 2. 4Raw Material Consumption [Post Expansion]

Sl. No.	Name	Requirement	CAS No.	Mode of Transportation	Source
1.	Methanol	3750 MT/Month [125 MT/Day]	67-56-1	Road	Sourced from importer and transported from Kandla Port, Gujarat
2.	Water	175 KLD	-	-	Onsite Ground Water abstraction
3.	Silver Granular	270 kg used for 1 complete production cycle till breakdown	7440-22-4	Road	Sourced from local market and transported via road network

2.7.2 Water Requirement

Estimated fresh water requirement during the post expansion operation phase will be approx. 246.5 KLD [domestic 0.5 KLD + green area 1 KLD + industrial 245 KLD] which will be sourced through onsite existing bore-well. A provisional NOC from the Ground Water Department for 240 KLD groundwater withdrawal has been obtained. Final approval will be obtained after submission of ground water impact assessment report which is under process.

The raw water will be treated through RO unit for use in industrial purpose. A substantial part of daily water requirement will be fulfilled through recycling of the RO reject water in cooling tower. Besides, cooling tower blow down water along with softener plant backwash water will be treated in proposed ETP and recycled in green area. The detail water balance is given below -

Table 2. 5: Estimated Fresh Water Demand and Effluent Generation (in KLD)

SN	Uses	Existing Demand	Proposed Additional	Total after Expansion [KLD]	Domestic Effluent [KLD]
1	Domestic uses [drinking, sanitation]	0.5	Nil	0.5	0.4
2	Gardening	3.5	Nil	3.5 [Fresh water 1 KLD + recycled treated water from ETP & STP 2.5 KLD]	0
3	RO Treatment ▪ RO treated water for Process ▪ RO treated water for Boiler feed ▪ RO reject used as cooling tower make up	 35 0.1 10	 140 Nil 60	 175 0.1 70	• Cooling Tower blow down – 2 KLD • Softener plant backwash – 0.3 KLD • RO reject will be passed through softener plant for use as cooling tower make up. • Boiler blow down is sent to ETP and recycled in green area] • Softener plant backwash will be treated in ETP and recycled in green area.
	Industrial Total	45.1	200	~ 245.1	74 KLD
	Total Fresh water	49	200	246.5	-
	Total Water Consumption	49	200	249	ETP and STP is proposed and treated effluent will be recycled
	Equipment Washing during shut down once in 3-4 months	1	1 Kl	2 KL	Treated in ETP and recycled in cooling tower

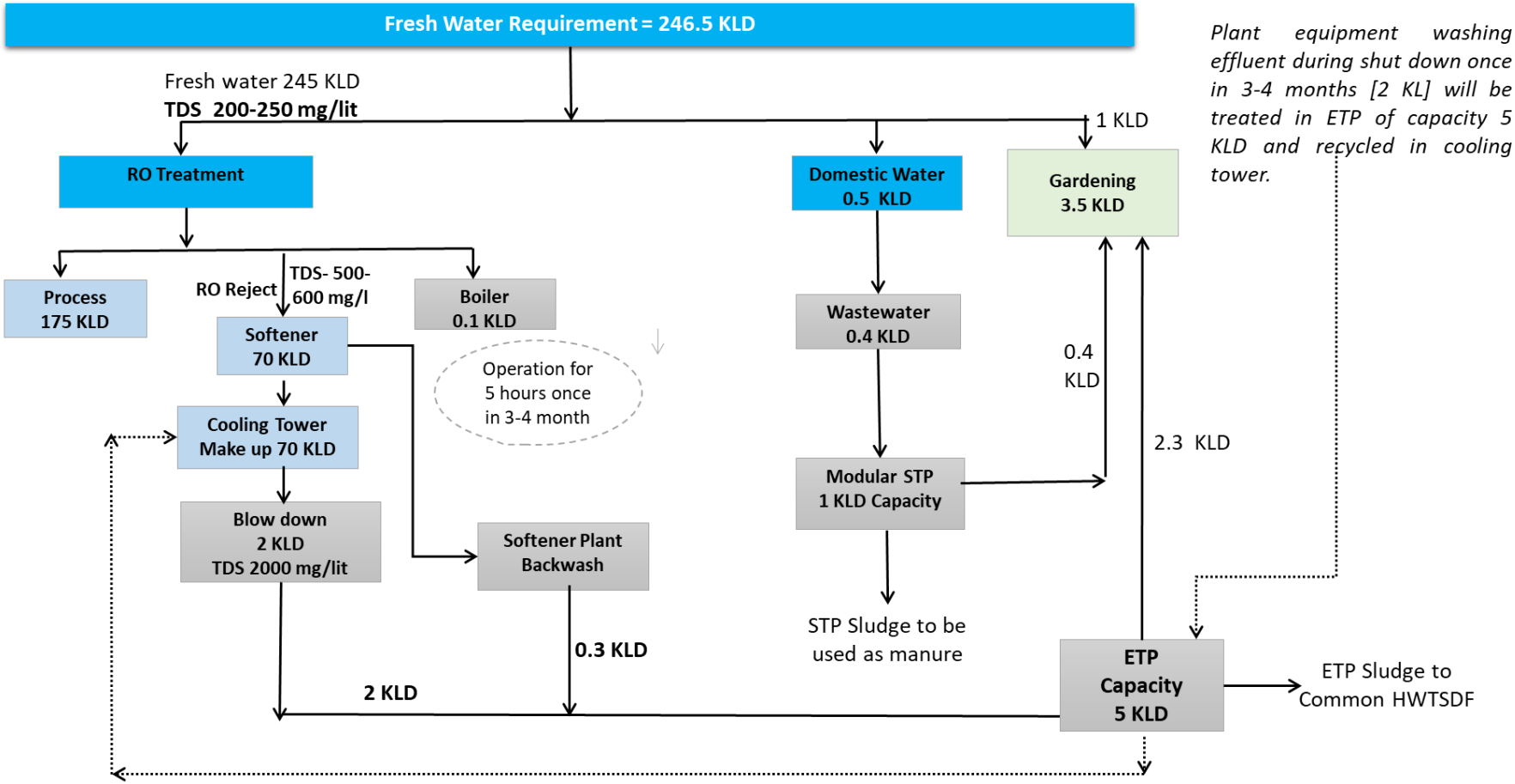
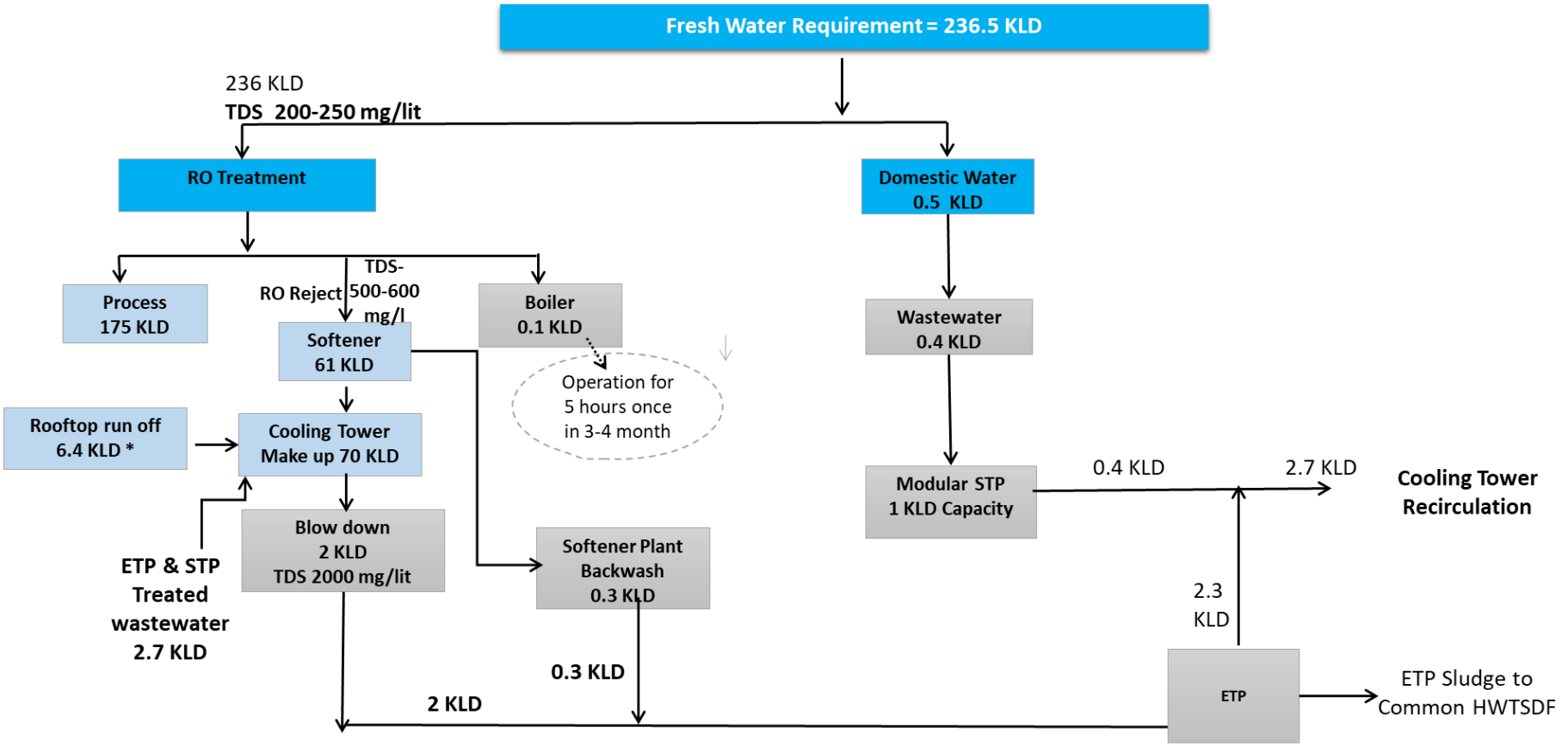


Figure 2. 7 Water Balance Diagram [Lean Period]



**Rooftop run off will be collected and reused in industrial purposes. Calculation is based on total annual rooftop runoff potential of 278 cum and considering 43.8 rainy days in a year.*

Figure 2. 8{a): Water Balance Diagram [Rainy Days]

2.7.3 Raw Water Treatment Unit

The fresh water will be sourced through onsite existing bore-well. Fresh water will be stored in main above ground storage reservoir and directly used for domestic and green area purposes. Raw water is treated through RO unit for making it fit for process use. The unit has a softener plant to treat the RO rejects for use in cooling tower.

2.7.4 Fuel & Power Requirement

Steam would be required to start the reaction cycle only. For that purpose, the existing unit has 1 no. HSD based boiler of capacity 500 Kg/hour which is operated only 4-5 hours in one reaction cycle of 3-4 months.

During post expansion operation phase, the unit will have connected power load of 225 KVA sourced through State Electricity Board. Existing unit has one DG set of 125 KVA and proposed to install another DG set of 480 KVA as back up during power cut. Approximate fuel consumption will be as follows -

Table 2. 6 Fuel Consumption

SN	Description	Lit/hr
1	Generator Sets	42
2	Boiler [operated for 4-5 hours in one reaction cycle of 3-4 months]	

2.7.5 Skilled and Trained Manpower

The proposed unit will run in two shifts throughout the year. As estimated, total manpower required for the project during post expansion period will be 9 through direct employment. During construction phase approx. 04 persons will be required.

2.7.6 Storage and Handling of Hazardous Chemicals

The manufacturing process activity involves storage and handling of Methanol and Formaldehyde which are hazardous chemicals and their storage and handling will be in compliance with MSIHC rules 1989. Methanol is stored in designated area inside the factory premises complying with applicable PESO norms. Existing Methanol storage capacity of 200 KL as approved by the PESO will be sufficient to cater the proposed expansion. Existing Formaldehyde bulk storage is of capacity approx. 393 KL. The unit has proposed to install additional two intermediate tanks of Formaldehyde of capacity 12 KL each. Approval from the Fire department as applicable is in place.

SN	Chemicals	Chemical Classification	Each Tank Capacity [KL]	No of Tanks
Existing				
1	Methanol	PESO Class A	50	4

2	Formaldehyde	PESO approval not required	78.5	5
			12	2
Additional due to Proposed Expansion				
3	Formaldehyde	PESO approval not required	78.5	2

2.7.7 In House Laboratory

Existing plant is already having a well-equipped laboratory where quality assurance is done in the form of chemical analysis, with day-to-day quality control at all stages of processing and quality evaluation of outgoing products. The existing laboratory set up is sufficient to cater the proposed expansion project. No wastewater is generated from the laboratory.

2.8 Proposed Schedule for Approval and Implementation

- New manufacturing unit will be set up within the existing premises and no major new utility units are required for the proposed expansion project.
- The industry will take necessary approvals from the concerned authority before start of production activity.
- The proposed project will require Consent to establish and Consent to Operate from SBPCB.
- Approval from the Fire Department will be updated.
- Any other clearances required for the proposed project will be identified and necessary action would be initiated.
- The project construction work is likely to be started after obtaining the Environment Clearance, Consent to Establish and other necessary approvals. It is expected to start operation after 6-12 months from obtaining the Environment Clearance.

2.9 Technology & Process Description

Formaldehyde is produced by the catalytic oxidation and dehydrogenation of methanol using silver catalyst.

Raw Materials :

1. Methanol {CH3OH}
2. Silver (Ag)
3. Water {H2O from tube well}
4. Oxygen {O2 from atmosphere}

Finished Product: Formaldehyde {HCHO}

Plant & Machinery (Main): Evaporator, Mixing Tank, Super Heater, Reactor, Condenser, Absorption column, heat exchanger, pumps, pipe line.

Process: Methanol is converted into formaldehyde by oxidation process with Oxygen using Silveras catalyst & water at a temperature of 650°C to 700°C. It is an exothermic reaction.

$CH_3OH + 1/2\ O_2 \rightarrow CH_2O + H_2O$ dH = −159 kJ/mol

Step I: Methanol is pumped from the underground storage tanks to a mixing tank where water is added to dilute the solution.

Step II: Diluted Methanol solution is then taken into evaporator where it is evaporated to proper stage at 700°C. Air is also passed through the blower and steam is applied. The mixture of vapour (Air+Methanol+Water) is passed to the reactor through silver bed where methanol is converted into formaldehyde gas at 670°C (approx.)

Step III: The temperature of formaldehyde gas is lowered down upto 110° C through condensers [to avoid unwanted side reactions] and then passed through absorption column to absorb the gases in water. Formaldehyde solution is circulated till desired quality of formaldehyde liquid is achieved and then the product is transferred to the storage tank. After testing the quality, product is dispatched.

This is a continuous chemical process. The reactor is run adiabatically in this process. Normally, the ratio of methanol and formaldehyde is approx.1:2.1; we get 2.1 kg of formaldehyde by 1 kg of methanol, if the quantity of raw material & product is OK. It depends on temperature, plant pressure and atmosphere climate also. On the demand of buyer, formaldehyde of different grades are produced also. The ratio of methanol and formaldehyde varies depends on the specification desired by the party. Catalytic oxidation process is an optimized production method. It is a simple process as per the stoichiometric reaction steps along with material balance shown below–

1. Oxidation of methanol with oxygen present in air. One mole of water is formed.

$$CH_3OH + 1/2\ O_2 \rightarrow CH_2O + H_2O \quad dH = -159\ kJ/mol$$
$$(32) \qquad (16) \qquad (30) \quad (18)$$

2. Alternatively:

$$CH_3OH \rightarrow HCHO + H_2 \quad dH = +84\ kJ/mol \text{ (Endothermic reaction)}$$
$$(32) \qquad (30) \quad (2)$$

$$H_2 + 1/2\ O_2 \rightarrow H_2O \quad dH = -243\ kJ/mol \text{ (Exothermic reaction)}$$

The thermal energy released in this reaction maintains the temperature of the reactor

3. Parallel to the above main reactions, some side reactions are carried out, reducing the efficiency of the process.

$$HCHO \rightarrow CO + H_2$$

$$CH_3OH + 3/2\ O_2 \rightarrow 2H_2O + CO_2$$

In this process, no use of off-gases is included. HSD is purchased for the generation of steam, and external electric energy is required for the methanol conversion process.

Material Balance: Formaldehyde production

2 Moles CH3OH + 1 Mole 02→ 2 Moles HCHO + 2 Mole H2O
(64) (32) (60) (36)

Concentration of HCHO solution formed during reaction - 96 grams of HCHO solution is having 36 grams of water. So concentration of HCHO = (60/96) x 100 = 62.5%.

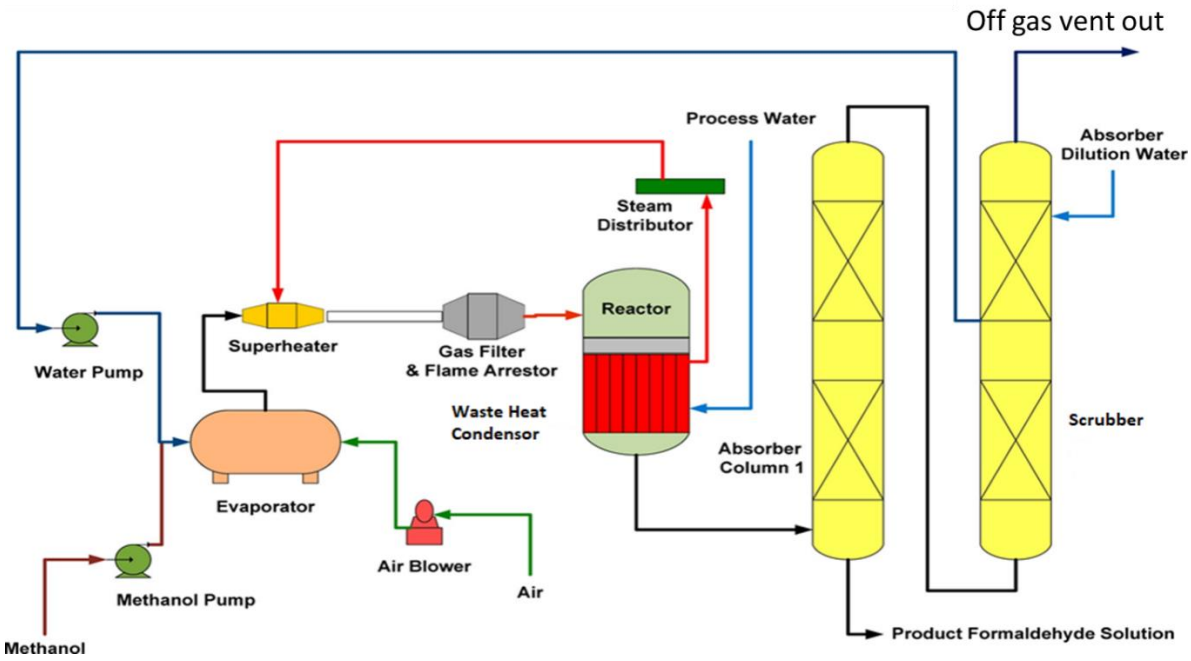


Figure 2. 9: Production Process Flow Diagram

Table 2. 7 Major Equipment and Machineries Required for the Project

Sr. No.	Description	Existing	Proposed
1.	Mixing Receiver	2	2
2.	Evaporator-I	1	1
3.	Methanol filter	4	4
4.	Methanol Separator	1	1
5.	Reactor SS	1	1
6.	Steam Separator	2	2
7.	Water Tanks	4	4
8.	Absorption Columns	5	5

9.	Air Washer	1	1
10.	SS Tank	5	6
11.	MS Tank	3	3
12.	Twin Lobe Blower	2	2
13.	Water Pump (process)	2	2
14.	Circulations Pumps [Formaldehyde]	11	11
15.	Methanol Pumps	3	3
16.	Evaporator-II [Standby]	1	1
17.	Formaldehyde Transfer Pump	2	2
18.	Cooling Tower Pump	6	6
19,	Boiler Water Pump	1	1
20.	Formaldehyde Tanks	2	2
21.	Flow Meter	48	48
22.	Transformer	1	0

2.10 Description of mitigation measures incorporated into the project to meet environmental standards, environmental operating conditions

2.10.1 Effluent and Sewage Management

The project proponent has proposed to adopt zero liquid discharge system. No industrial effluent will be discharged outside.

This is a Chemical Industry, RWH pits are not recommended to recharge the ground water by using the storm water inside the premises. One underground tank of size 27 cum (3m x 3 m x 3 m) will be constructed to store the single storm water generated from rooftop area to reuse.

Domestic Effluent (Sewage) Management– Sewage generated during post expansion (approx. 0.4 KLD) will be treated in proposed STP of capacity 1 KLD and treated wastewater is used in green area.

Industrial Effluent–No process effluent is generated. Industrial effluent will be as follows –

- RO rejects [70 KLD] will be passed through softener plant and used in cooling tower.
- Cooling tower blow down [2 KLD] will be treated in proposed STP of capacity 5 KLD and recycled in green area.
- Softener plant regeneration wastewater [1 KL once in a week] will be sent to ETP and recycle din green area.
- Wastewater generated [approx. 2 KL] from washing operations during shut down once in 3-4 months will be treated in ETP and recycled in cooling tower.

2.10.2 Air Pollution Management

The project will use HSD in the boiler and generator sets. Stacks of adequate height will be provided.

Table 2. 8 Air Pollution Sources and Management

SN	Air Pollution Source	Fuel Used	Emission Limit	Stack Height
Existing				
1	Process Emission [tail gas] from existing plant	Not applicable	-	Process vent at a height 12 m from GL
2	One Boiler Capacity – 0.5 TPH	HSD	PM <150 mg/Nm^3	12 m from GL
3	DG set [125 KVA]	HSD	PM < 150 mg/Nm^3	11 m from GL
Proposed Expansion				
4	Process Emission [tail gas] from proposed plant	Not applicable	-	Process vent at a height 12 m from GL
5	DG set [480 KVA]	HSD	PM < 150 mg/Nm^3	11 from GL

2.10.3 Solid and Hazardous Waste Management

- Municipal solid wastes generated from the unit during post expansion operation phase of approx. 2 kg/day [@200g/person]will be disposed through agency as per local norms.
- Hazardous wastes from the proposed project will be stored safely at site and disposed through Common HWTSDF in the state except used oil which will be sold to authorized recyclers.

Table 2. 9 Hazardous Waste Management

Waste Detail	Category as per HW Rule 2016	Quantity Generation	Utilization/Disposal
ETP Sludge	35.3	Approx. 0.01 MT/year	Will be stored onsite at a secured place and disposed through authorized common HWTSDF
Empty barrels /liners/ containers contaminated with hazardous chemicals	33.1	10 nos./year	
Used Oil	5.1	Approx. 0.1 KL/year	Sold to authorized recyclers

2.10.4 Energy Conservation

a) Proposed project shall be optimized in terms of energy consumption and utilization of heat generated due to exothermic reaction.
b) Compact Fluorescent Lamps, energy efficient pumps, refrigerators and air-conditioners.
c) Solar PV cells of 18 KW has been already installed at the premises.

Table 2. 10 Details of Pollution Control Systems /Mitigation Measures

Unit Operation/Activities	Pollution Control Equipment /Mitigation measures
Earth cutting and filling during construction activity, unloading and handling of construction materials	Water sprinkling system, barricading the site, close construction materials storage area, covering sand and aggregates
Manufacturing Process	Closed reactor, dedicated pipeline for transfer of liquid chemicals, mechanical seals for the reactors. Off gases from manufacturing process will be vented out after absorption column. Plantation has been done to offset equivalent CO2 emission.
Hazardous Chemical Storage	Dyke wall and spill collection system
Cooling Towers	Close circuit cooling
HSD fired boiler and generators	Stack of adequate height
Process emissions	Vent after absorption column at a height 12 m from ground level.
RO Plant	RO rejects will be treated in softener plant for use in cooling tower. The plant will adopt zero industrial liquid discharge system and treated wastewater will be completely recycled.
Domestic effluent	Will be treated in proposed STP and treated effluent will be recycled in green area.
Industrial effluent	• Cooling tower blow down will be sent to ETP and treated wastewater is recycled in green area. • Weekly regeneration effluent from softener plant will be sent to ETP and recycled in green area. • Plant equipment washing effluent during shut down once in 3-4 months is treated in ETP and recycled in cooling tower.
Storm water [during rainfall]	Storm water from the rooftop area will be collected in a tank and reused for industrial purposes. Run off from other areas will be channelized to separate covered storm water drains and discharged to outside adjacent storm water drain.
Hazardous Wastes	ETP sludge will be sent to Common HWTSDF
Used oil and Lubricants	Collected in drums, stored in an earmarked place and sold to authorized re-processors.
Municipal Solid Waste generation	Will be disposed through agency as per local norms.

2.11 Estimated Project Cost

The project cost as estimated is INR 450 Lakh [Existing – 98 lakh + Proposed Expansion – 352 lakh], which include modification in building and civil work, plant and machinery purchase, new DG set, Environment Management System and others. Break-up of project cost is given below-

Table 2. 11 Estimated Project Cost (Existing + Proposed)

S. No	Total Fixed Cost	Cost (INR In Lakh)
1	Land and Civil Cost	89.00
2	Plant & Machinery	302.00
3.	Shed Office +Labour Quarter	09.00
4.	EMP	50.00
	Total	**450.00**

2.12 Assessment of new and untested technology for the risk of technological failure

Not Applicable

CHAPTER 3 – DESCRIPTION OF ENVIRONMENT

3.1Introduction

For the purpose of validating the earlier baseline study, monitoring with respect to ambient air quality, ambient noise, groundwater, surface water and soil was conducted by Ind Tech House Consultant through Ind Research & Development House Pvt. Ltd. [NABL accredited laboratory]. Monitoring was conducted in the month of October 2023. Site Specific Monitoring report is enclosed as **Annexure A**. Project area has been considered as the core zone and area outside the project upto 10 km radius was considered as buffer zone.

3.2Methodology

CPCB / MOEFCC approved methodology were followed in the EIA study. The ambient air sampling locations were selected on the basis of the predominant wind directions recorded by the India Meteorological Dept. (IMD) Lucknow.

3.3 Ambient Air Quality

Ambient air quality monitoring was conducted in the month of October 2023 [post monsoon season] at eight (8) locations. The monitoring locations are given in **Table 3.1** and **Figure 3.1**. The baseline study of air quality within the project-influenced area of 10 km has been carried out by selecting the monitoring locations based on the following criteria:

1. Meteorological condition on a synoptic scale
2. Topography of the project influenced area
3. Representation of the regional background levels
4. Representation of the site
5. Influence of the existing sources
6. Major human settlement in the project influenced area

Table 3. 1 Name of Monitoring Locations

Location Code	Location	Co-ordinated	Distance & Direction wrt the site
AQ1	Project site	26°54'37.42"N81° 4'16.98"E	-
AQ2	Near R K Marriage Hall	26°54'36.24"N81° 5'18.85"E	1.7 km & E
AQ3	Near Tata Profile	26°54'35.87"N81° 3'2.09"E	2.0 km & W
AQ4	Near Nishat institute of Paramedical Institute	26°53'58.31"N81° 6'23.42"E	3.7 km & EES
AQ5	Near Babu Banarasi Das University	26°53'15.12"N81° 4'2.00"E	2.6 km & SSW
AQ6	Near Alahpur	26°54'25.48"N81°10'14.69"E	9.8 km & EES
AQ7	Near Goila village	26°55'12.49"N81° 2'24.84"E	3.3 km & WWN
AQ8	Naubasta Kala	26°54'26.11"N81° 2'7.73"E	3.6 km & WWS

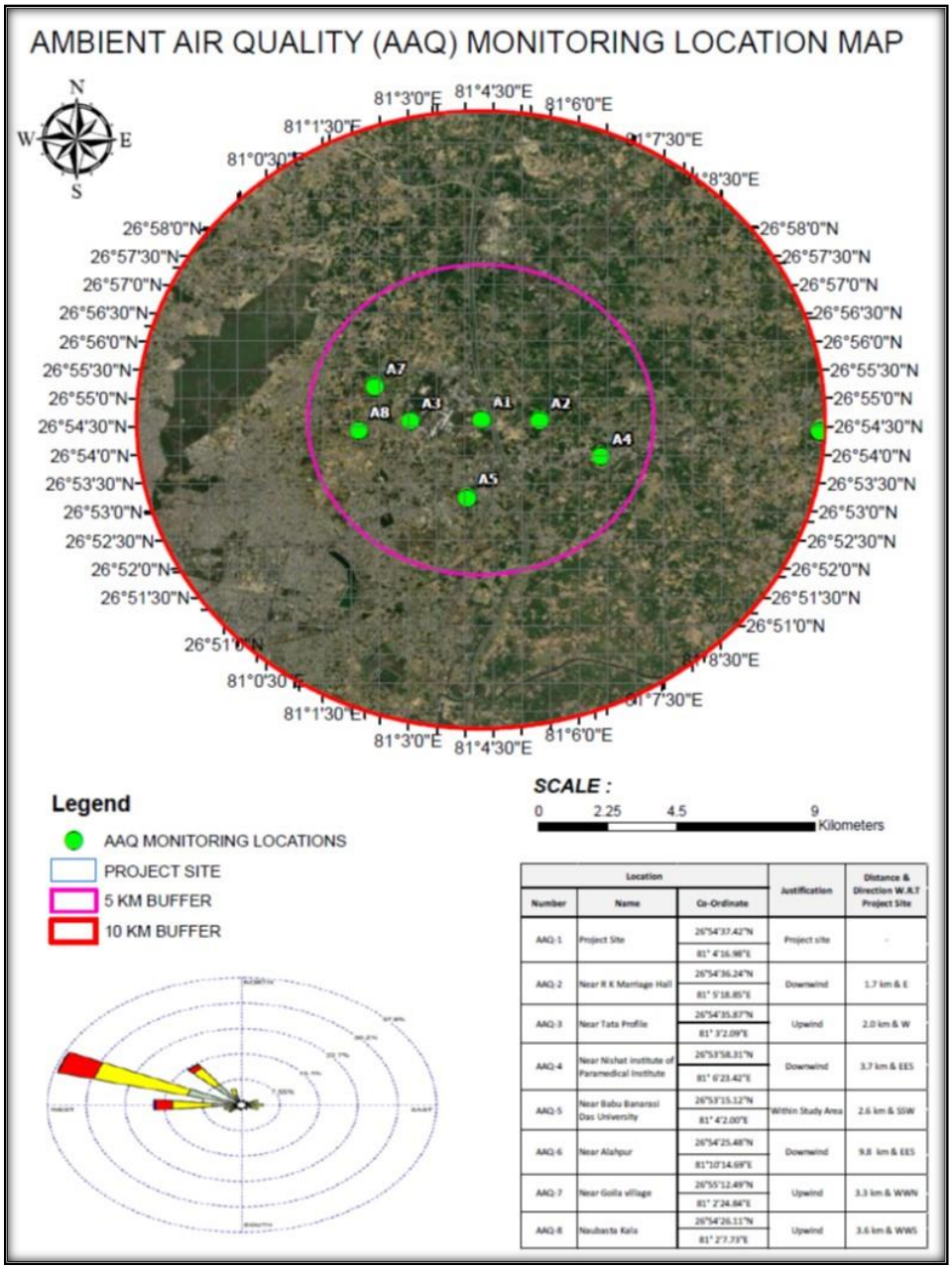


Figure 3. 1 Map Showing Ambient Air Monitoring Locations

The levels of PM10, PM2.5, Sulphur Dioxide (SO2), Nitrogen Dioxide (NO_2) and CO were monitored. The results are summarized below and the detail results are given in Annexure.

Table 3. 2 Summary of Ambient Air Quality Monitoring Results

Code	Location	Description	PM_{10} (μg /m^3)	$PM_{2.5}$ (μg /m^3)	SO_2 (μg /m^3)	NO_2 (μg /m^3)	CO (mg/m^3)
AAQ-1	Project site	Minimum	75.00	44.00	6.30	16.40	0.71
		Maximum	181.00	94.00	10.10	25.10	0.96
		Average	139.13	74.00	8.23	20.41	0.84
		98^{th}Percentile	179.18	93.16	10.04	24.81	0.96
AAQ-2	Near R K Marriage Hall	Minimum	80.00	48.00	6.60	17.10	0.74
		Maximum	189.00	98.00	10.50	26.20	1.00
		Average	149.35	78.54	8.59	21.31	0.87
		98^{th}Percentile	187.03	97.24	10.48	25.89	1.00
AAQ-3	Near Tata Profile	Minimum	69.00	42.00	6.40	16.60	0.72
		Maximum	183.00	95.00	10.20	25.40	0.97
		Average	143.97	75.71	8.34	20.69	0.85
		98^{th}Percentile	181.65	94.45	10.18	25.15	0.97
AAQ-4	Near Nishat institute of Paramedical Institute	Minimum	73.00	45.00	6.40	16.80	0.73
		Maximum	185.00	96.00	10.30	25.70	0.98
		Average	145.80	76.79	8.42	20.90	0.86
		98^{th}Percentile	183.44	95.38	10.28	25.40	0.98
AAQ-5	Near Babu Banarasi Das University	Minimum	62.00	39.00	6.00	15.70	0.68
		Maximum	174.00	90.00	9.70	24.10	0.92
		Average	135.94	71.61	7.90	19.60	0.80
		98^{th}Percentile	172.05	89.45	9.64	23.82	0.92
AAQ-6	Near Alahpur	Minimum	78.00	46.00	6.50	17.00	0.73
		Maximum	187.00	97.00	10.40	25.90	0.99
		Average	147.70	77.60	8.50	21.10	0.87
		98^{th}Percentile	185.24	96.31	10.38	25.64	0.99
AAQ-7	Near Goyala village	Minimum	68.00	45.00	6.10	16.30	0.71
		Maximum	179.00	93.00	10.00	25.00	0.95
		Average	140.69	74.44	8.16	20.29	0.83
		98^{th}Percentile	177.42	92.25	9.99	24.66	0.95
AAQ-8	Naubasta Kala	Minimum	64.00	42.00	6.20	16.00	0.69
		Maximum	177.00	92.00	9.90	24.50	0.94

Code	Location	Description	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	CO (mg/m^3)
		Average	138.32	73.10	8.03	19.93	0.82
		98^{th}Percentile	174.92	90.94	9.80	24.22	0.93
NAAQ Standard			100 (24 hrs)	60 (24 hrs)	80 (24 hrs)	80 (24 hrs)	2 mg/m^3 [8 hrly]

3.3.1 Observations on Primary Data:

1. PM10 concentration in the study area varied from 62 to 189 µg/m3
2. PM2.5 concentrations in the study area varied from 39 to 98 µg/m3
3. SO2 concentration in the study area varied from 6 to 10.5 µg/m3
4. NO2 concentration in the study area varied from 15.7 to 26.2 µg/m3
5. CO concentration in the study area was observed to be 0.68 to 1.00 mg/m3

It is observed that average concentration of PM 10 and PM 2.5 exceeded at all monitored locations and its continuous exposure to human being can have health impacts. All other parameters like SO2, NO2 and CO were found well within the NAAQS, 2009 limits as specified by CPCB.

3.3.2 Inference

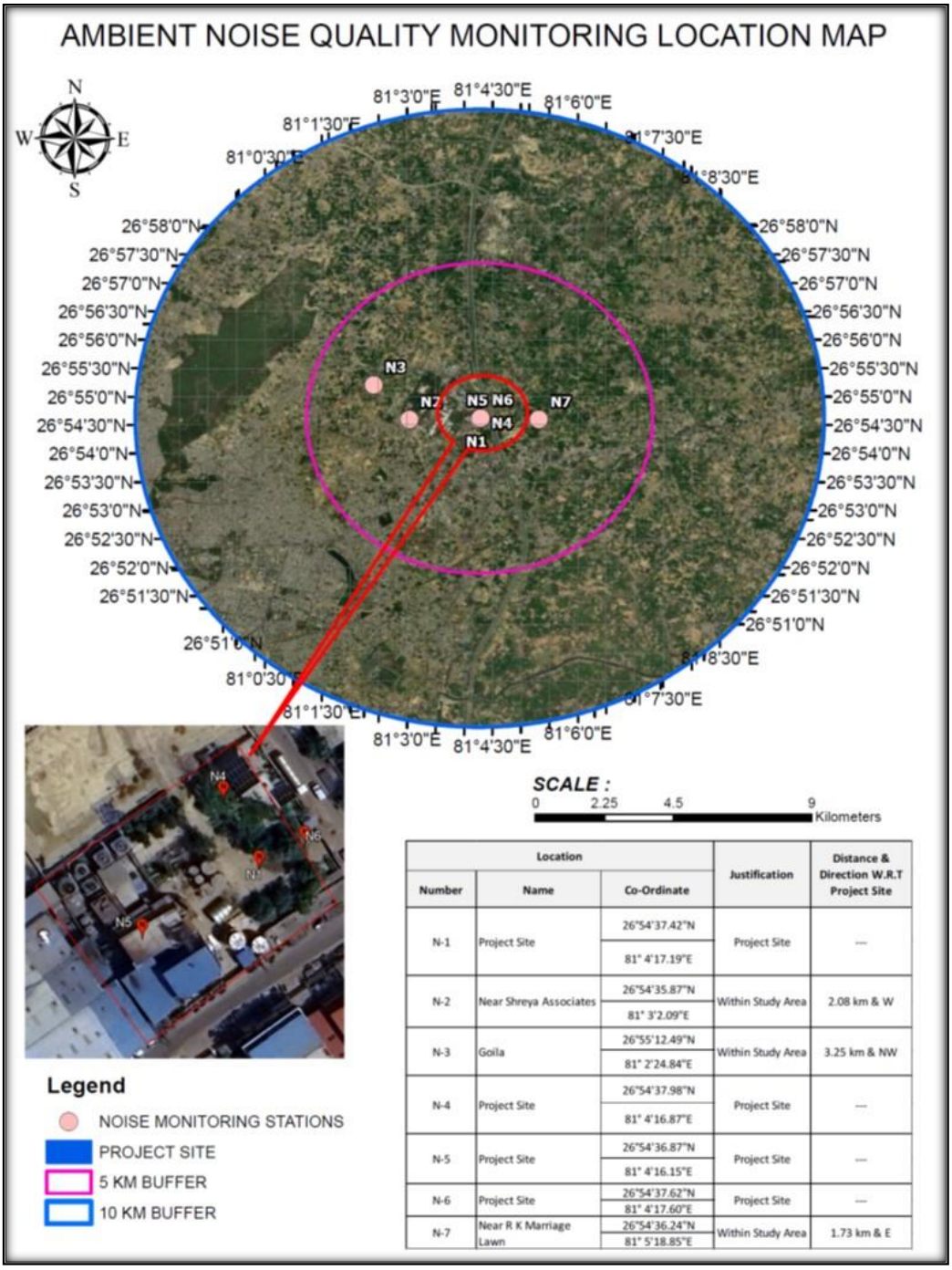
PM 10 and PM 2.5 parameters of ambient air quality is higher in the entire region due to presence of many industrial units nearby and vehicular movement on nearby NH 27 and other roads.

3.4 Noise Environment

Ambient noise level monitoring was carried out at the 8 monitoring locations; at the same locations where ambient air quality monitoring was done. The locations of noise monitoring are given below. Noise level monitoring results are given in **Table 3.4.**

Table 3. 3 Ambient Noise Quality Monitoring Location

Location Code	Location	Co-ordinated	Distance & Direction wrt the site
NQ1	Project site	26°54'37.42"N81° 4'17.19"E	-
NQ2	Near Shreya Associates	26°54'35.87"N 81° 3'2.09"E	2.08 km & W
NQ3	Goyala	26°55'12.49"N81° 2'24.84"E	3.25 km & NW
NQ4	Project Site	26°54'37.98"N81° 4'16.87"E	-
NQ5	Project Site	26°54'36.87"N81° 4'16.15"E	-
NQ6	Project Site	26°54'37.62"N81° 4'17.60"E	-
NQ7	Near R K Marriage Lawn	26°54'36.24"N81° 5'18.85"E	1.73 km & E



Location			Justification	Distance & Direction W.R.T Project Site
Number	Name	Co-Ordinate		
N-1	Project Site	26°54'37.42"N 81° 4'17.19"E	Project Site	---
N-2	Near Shreya Associates	26°54'35.87"N 81° 3'2.09"E	Within Study Area	2.08 km & W
N-3	Goila	26°55'12.49"N 81° 2'24.84"E	Within Study Area	3.25 km & NW
N-4	Project Site	26°54'37.98"N 81° 4'16.87"E	Project Site	---
N-5	Project Site	26°54'36.87"N 81° 4'16.15"E	Project Site	---
N-6	Project Site	26°54'37.62"N 81° 4'17.60"E	Project Site	---
N-7	Near R K Marriage Lawn	26°54'36.24"N 81° 5'18.85"E	Within Study Area	1.73 km & E

Figure 3. 2 Map showing Ambient Noise Quality Monitoring Locations

Table 3. 4 Ambient Noise Level Monitoring Results

SN	Location	Category	Day Time	Standard	Night time	Standard
NQ1	Project site	Industrial	50.5	75	41.8	70
NQ2	Near Shreya Associates	Residential	53.5	55	42.3	45
NQ3	Goyala	Residential	52.9	55	42.6	45
NQ4	Project Site	Industrial	52.2	75	41.8	70
NQ5	Project Site	Industrial	57.1	75	45.4	70
NQ6	Project Site	Industrial	57.5	75	45.8	70
NQ7	Near R K Marriage Lawn	Residential	52.6	55	42.1	45

3.4.1 Observations

The study area represents mixed landuse, urban, industrial and rural environment. Day time noise level (6 am to 10 pm) was found between 50.5 to 57.5 dB(A). Night-time (10 pm to 6 am) noise levels was found between 41.8 to 45.8 dB(A). The noise level was found well within the national standards in all the eight locations.

3.4.2 Inference

In overall, the noise quality of the study area conforms to the ambient noise standard set by CPCB for both residential and industrial.

3.5 Water Environment

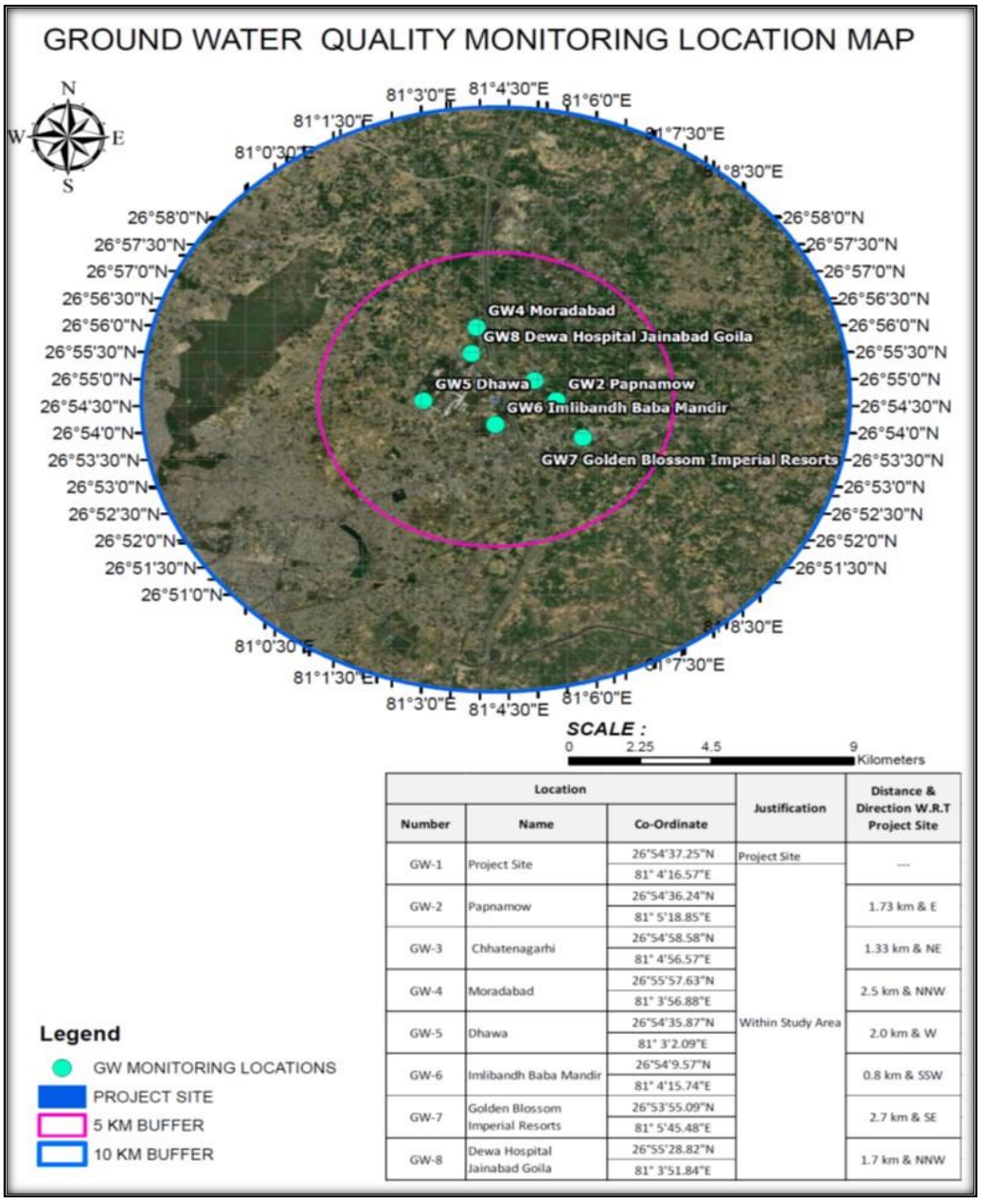
In order to depict the baseline groundwater quality samples [8 nos.] from bore-well/hand pumps were collected from project site and nearby villages and analyzed for basic physico-chemical parameters (pH, Conductivity, TDS, TSS, Alkalinity/Acidity, Total Hardness, sulphate, chloride, nitrate, phosphate, fluoride, calcium, magnesium, iron, manganese, copper, zinc, toxic metals (As, Ni, Pb, Hg, Cr. Cd) and coliform count. Surface water samples [4 nos.] were taken from nearby nala and Sharda Canal near the project site. One grab sample was taken from each location for analysis during the study period.

Ground water monitoring locations are given in below. Surface water monitoring locations are given in the following table and figure.

Table 3. 5 Groundwater Sampling Locations

Location Code	Location	Co-ordinated	Distance & Direction wrt the site
GW1	Project Site	26°54'37.25"N 81°4'16.57"E	-
GW2	Papnamow	26°54'36.24"N 81° 5'18.85"E	1.73 km & E
GW3	Chhatenagarhi	26°54'58.58"N 81° 4'56.57"E	1.33 km & NE

GW4	Moradabad	26°55'57.63"N 81° 3'56.88"E	2.5 km & NNW
GW5	Dhawa	26°54'35.87"N 81° 3'2.09"E	2.0 km & W
GW6	Imlibandh Baba Mandir	26°54'9.57"N 81° 4'15.74"E	0.8 km & SSW
GW7	Golden Blossom Imperial Resorts	26°53'55.09"N 81° 5'45.48"E	2.7 km & SE
GW8	Dewa Hospital Jainabad Goyala	26°55'28.82"N 81° 3'51.84"E	1.7 km & NNW

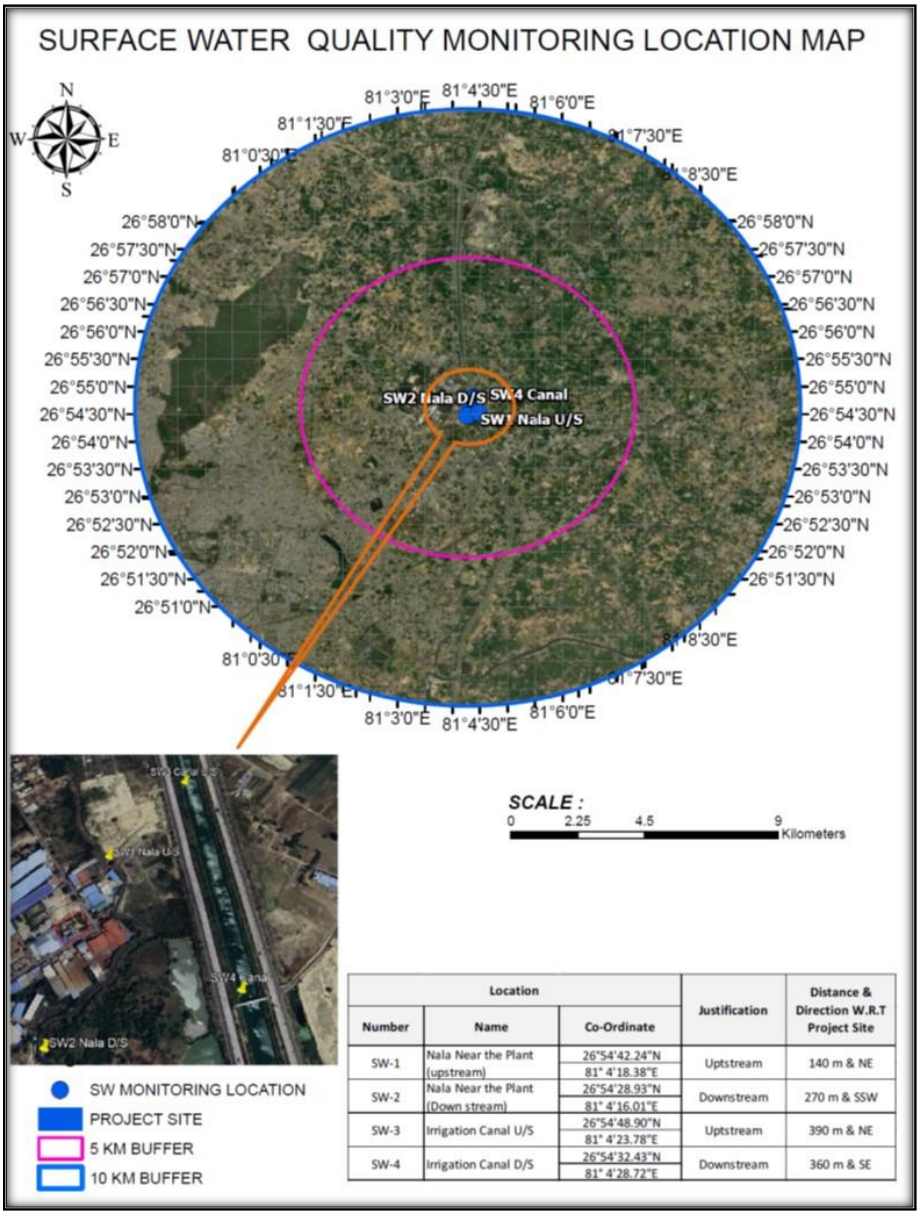


Location			Justification	Distance & Direction W.R.T Project Site
Number	Name	Co-Ordinate		
GW-1	Project Site	26°54'37.25"N 81° 4'16.57"E	Project Site	---
GW-2	Papnamow	26°54'36.24"N 81° 5'18.85"E	Within Study Area	1.73 km & E
GW-3	Chhatenagarhi	26°54'58.58"N 81° 4'56.57"E		1.33 km & NE
GW-4	Moradabad	26°55'57.63"N 81° 3'56.88"E		2.5 km & NNW
GW-5	Dhawa	26°54'35.87"N 81° 3'2.09"E		2.0 km & W
GW-6	Imlibandh Baba Mandir	26°54'9.57"N 81° 4'15.74"E		0.8 km & SSW
GW-7	Golden Blossom Imperial Resorts	26°53'55.09"N 81° 5'45.48"E		2.7 km & SE
GW-8	Dewa Hospital Jainabad Goila	26°55'28.82"N 81° 3'51.84"E		1.7 km & NNW

Figure 3. 3 Map showing Groundwater Sampling Locations

Table 3. 6 Surface Water Sampling Locations

SN	Location	Co-ordinated	Distance & Direction wrt the site
SW1	Nala Near the Plant (upstream)	26°54'42.24"N 81° 4'18.38"E	140 m & NE
SW2	Nala Near the Plant (Downstream)	26°54'28.93"N 81° 4'16.01"E	270 m & SSW
SW3	Irrigation Canal U/S	26°54'48.90"N 81° 4'23.78"E	390 m & NE
SW4	Irrigation Canal D/S	26°54'32.43"N 81° 4'28.72"E	360 m & SE



Location			Justification	Distance & Direction W.R.T Project Site
Number	Name	Co-Ordinate		
SW-1	Nala Near the Plant (upstream)	26°54'42.24"N 81° 4'18.38"E	Uptstream	140 m & NE
SW-2	Nala Near the Plant (Down stream)	26°54'28.93"N 81° 4'16.01"E	Downstream	270 m & SSW
SW-3	Irrigation Canal U/S	26°54'48.90"N 81° 4'23.78"E	Uptstream	390 m & NE
SW-4	Irrigation Canal D/S	26°54'32.43"N 81° 4'28.72"E	Downstream	360 m & SE

Figure 3. 4 Map showing Surface water Sampling Locations

3.5.1Observations (Groundwater Quality)

The ground water quality results were compared with the IS-10500 2012 standards. Analysis results of ground water reveal the following-

➢pH varies from to 7.50 to 7.62

➢ Total Dissolved Solids varies from 476 to 530 mg/l.

➢ Total Hardness varies from 256 to 356.4 mg/l.

➢ Calcium varies from 52.8 to 72.0 mg/l

➢ Magnesium varies from 17.49 to 39.85 mg/l

➢ Chloride varies from 72.0 to 89.33 mg/l

➢ Fluoride varies from 0.37 to 0.50 mg/l

➢ Nitrates varies from 4.0 to 6.2 mg/l

➢Sulphates varies from 24.1 to 42.2 mg/l

➢ Toxic Metals: <0.01 mg/l and Total Coliform: Absent

Result show that metals such as Copper, Lead, Zinc, Arsenic, Mercury, Phenolic compound are well within both Acceptable and Permissible limit of BIS Specification IS 10500-2012. Total Hardness, Alkalinity and Total Dissolved Solid are found beyond Acceptable limit but within permissible limit.

3.5.2 Conclusion [Groundwater quality]

In all the locations the monitored values are well within the acceptable limit of IS 10500-2012. However, the values of parameters Total hardness, TDS, Ca, Mg, Total alkalinity and Chloride exceeds the acceptable limit of IS 10500-2012 but the same are within the permissible limit of the drinking water standard (IS 10500-2012). The groundwater can be used in the proposed project with adequate treatment.

Table 3. 7 Groundwater Quality Monitoring Result

SN	Parameter	Test Protocol	WQ_1	WQ_2	WQ_3	WQ_4	WQ_5	WQ_6	WQ_7	WQ_8	Unit	Requirements as per IS 10500- 2012	
												Acceptable limit(Max)	Permissible limit(Max)
1.	pH	IS 3025 P-11 1983	7.52	7.56	7.62	7.54	7.52	7.50	7.58	7.51	--	6.5-8.5	No Relaxation
2.	Turbidity	IS 3025 P-10 (1984)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	NTU	1	5
3.	Total Hardness	IS 3025 P-21 (2009)	245.0	259.2	356.4	256.0	308.0	324.0	300.0	264.0	mg/l	200	600
4.	Total Dissolved Solids (TDS)	IS 3025 P-16(1984)	484.0	490.0	524.0	482.0	476.0	490.0	530.0	478.0	mg/l	500	2000
5.	Calcium as Ca	IS 3025 P-40 (1991)	69.12	70.56	92.16	70.4	57.6	52.8	61.0	72.0	mg/l	75	200
6.	Magnesium as Mg	IS 3025 P-46 (1994)	17.49	20.12	30.61	19.44	39.85	39.0	36.0	20.41	mg/l	30	100
7.	Total Alkalinity as $CaCO_3$	IS 3025 P-23 (1986)	240.0	252.0	270.0	240.0	264.0	270.0	288.0	260.0	mg/l	200	600
8.	Chloride as Cl	IS 3025 P-32 (1988)	83.37	87.34	89.33	87.34	81.39	85.36	81.4	72.0	mg/l	250	1000
9.	Barium as Ba	Annex F of IS:13428	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/l	0.7	No Relaxation
10.	Ammonia as N	IS 3025 P-34 (1988)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/l	0.5	No Relaxation
11.	Sulphate as SO_4	IS 3025 P-24 (1986)	24.1	30.2	42.2	26.5	30.2	38.0	40.2	36.2	mg/l	200	400
12.	Nitrate as NO_3	IS 3025 P-34 (1988)	4.6	4.0	5.2	5.8	5.5	4.8	6.2	4.8	mg/l	45	No Relaxation
13.	Fluoride as F	APHA,22nd Edition	0.38	0.40	0.43	0.50	0.46	0.42	0.46	0.37	mg/l	1	1.5
14.	Iron as Fe	IS 3025 P-53 (2003)	0.10	0.13	0.15	0.14	0.12	0.11	0.14	0.11	mg/l	1.0	No Relaxation
15.	Aluminium as Al	IS 3025 P-55(2003)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	0.03	0.2
16.	Anionic Detergent	Annex K of IS:13428	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/l	0.2	1
17.	Phenolic Compounds	IS 3025 P-43 (1992)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	mg/l	0.001	0.002
18.	Boron as B	IS 3025 P-57 (2005)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/l	0.5	2.4
19.	Chromium as Cr	IS 3025 P-52(2003)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	0.05	No Relaxation
20.	Lead as Pb	IS 3025 P47 (1994)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	0.01	No Relaxation
21.	Copper as Cu	IS 3025 P42 (1992)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	0.05	1.5
22.	Mercury as Hg	IS 3025 P-48 (1994)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	mg/l	0.001	No

													Relaxation
23.	Manganese as Mn	IS 3025 P-59 (2006)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	0.1	0.3
24.	Zinc as Zn	IS 3025 P-49 (1994)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	5	15
25.	Arsenic as As	IS 3025 P-37 (1988)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	0.01	No Relaxation
26.	Nickel as Ni	IS 3025 P-54 (2003)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	0.02	No Relaxation
27.	Cadmium as Cd	IS 3025 P-41 (1992)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	mg/l	0.003	No Relaxation
28.	Total coliform	IS: 1622:1981 (Reaffirmed 2014)	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Present or Absent/ 100ml	Should not be detected in 100 ml	
29.	E. coli	IS: 1622:1981 (Reaffirmed 2014)	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Present or Absent /100ml	Should not be detected in 100 ml	

Table 3. 8 Surface Water Quality Monitoring Result

SN	Parameter	Test Method	RESULTS				Units
			SW_1	SW_2	SW_3	SW_4	
1.	pH	IS 3025 P-11 1983	6.88	6.90	7.35	7.40	-
2.	Conductivity	IS 3025 P-14 1984	442.0	464.0	428.0	448.0	µs/cm
3.	Turbidity	IS 3025 P-10 (1984)	106.0	118.0	56.0	60.0	NTU
4.	Free Residual Chlorine	IS 3025 P-26 (1986)	<0.1	<0.1	<0.1	<0.1	mg/l
5.	Total Hardness	IS 3025 P-21 (2009)	180	192	132.0	140.0	mg/l
6.	Total Dissolved Solids (TDS)	IS 3025 P-16(1984)	276.0	290.0	268.0	282.0	mg/l
7.	Calcium as Ca	IS 3025 P-40 (1991)	30.4	32.0	22.4	24.0	mg/l
8.	Magnesium as Mg	IS 3025 P-46 (1994)	25.27	27.21	18.46	19.44	mg/l
9.	Total Alkalinity as $CaCO_3$	IS 3025 P-23 (1986)	196.0	206.0	160.0	164.0	mg/l
10.	Chloride as Cl	IS 3025 P-32 (1988)	26.0	36.0	42.0	46.0	mg/l
11.	Barium as Ba	Annex F ofIS:13428	<0.05	<0.05	<0.05	<0.05	mg/l
12.	Ammonia as N	IS 3025 P-34 (1988)	<0.1	<0.1	<0.1	<0.1	mg/l
13.	Sulphate as SO_4	IS 3025 P-24 (1986)	11.2	13.5	8.5	9.2	mg/l

14.	Nitrate as NO_3	IS 3025 P-34 (1988)	5.6	6.2	1.2	1.5	mg/l
15.	Fluoride as F	APHA 4500F$^-$(D)	<0.1	0.11	0.13	0.11	mg/l
16.	Iron as Fe	IS 3025 P-53 (2003)	<0.1	0.13	0.11	0.13	mg/l
17.	Chemical Oxygen Demand(COD)	IS 3025 P-58 2006	54.0	60.0	30.0	36.0	mg/l
18.	Biochemical Oxygen Demand(BOD)at 27° C for 3 days	IS 3025 P-44 1993	11.0	13.0	4.4	5.4	mg/l
19.	Dissolve Oxygen	IS 3025 P-38 1989	3.6	3.2	5.7	5.1	mg/l
20.	Aluminium as Al	IS 3025 P-55(2003)	<0.01	<0.01	<0.01	<0.01	mg/l
21.	Anionic Detergent	Annex K of IS:13428	<0.05	<0.05	<0.05	<0.05	mg/l
22.	Phenolic Compounds	IS 3025 P-43 (1992)	<0.001	<0.001	<0.001	<0.001	mg/l
23.	Boron as B	IS 3025 P-57 (2005)	<0.1	<0.1	<0.1	<0.1	mg/l
24.	Chromium as Cr	IS 3025 P-52 (2003)	<0.01	<0.01	<0.01	<0.01	mg/l
25.	Lead as Pb	IS 3025 P47 (1994)	<0.01	<0.01	<0.01	<0.01	mg/l
26.	Copper as Cu	IS 3025 P42 (1992)	<0.01	<0.01	<0.01	<0.01	mg/l
27.	Mercury as Hg	IS 3025 P-48 (1994)	<0.001	<0.001	<0.001	<0.001	mg/l
28.	Manganese as Mn	IS 3025 P-59 (2006)	<0.01	<0.01	<0.01	<0.01	mg/l
29.	Zinc as Zn	IS 3025 P-49 (1994)	<0.01	<0.01	<0.01	<0.01	mg/l
30.	Arsenic as As	IS 3025 P-37 (1988)	<0.01	<0.01	<0.01	<0.01	mg/l
31.	Nickel as Ni	IS 3025 P-54 (2003)	<0.01	<0.01	<0.01	<0.01	mg/l
32.	Cadmium as Cd	IS 3025 P-41 (1992)	<0.001	<0.001	<0.001	<0.001	mg/l
33.	Total coliform	IS: 1622:1981 (Reaffirmed 2014)	$14x10^2$	$68x10^2$	$54x10^2$	$46x10^2$	CFU/100ml
34.	E.coli	IS: 1622:1981 (Reaffirmed 2014)	220	300	280	170	MPN/100ml

3.5.3 Observation [Surface water Quality]

Surface water quality of Nala – The analysis results indicate that

- pH value –6.88-6.90 - which is well within the specified standard of 6.5 to 8.5;
- Total Dissolved Solids –276-290 mg/l;
- Chlorides and sulphates were found as 26-36 mg/l and 11.2-13.5mg/l respectively.
- BOD –11-13 mg/l
- COD –54-60 mg/l
- Dissolved Oxygen -3.2-3.6 mg/l.

Surface water quality of canal - Analysis results indicate the following: -

- pH varies from to 7.35-7.40
- Dissolved Oxygen varies from 5.1-5.7 mg/l.
- BOD varies from 4.4-5.4 mg/l
- COD varies from 30-36 mg/l
- Ammonia less than 0.1 mg/lit.
- Total Dissolved Solids varies from 268 to 282 mg/l.
- Total coliform varies from 46 x 10^2 to 54 x 10^2MPN/100 mg/l

3.5.4 Conclusion {Surface water Quality)

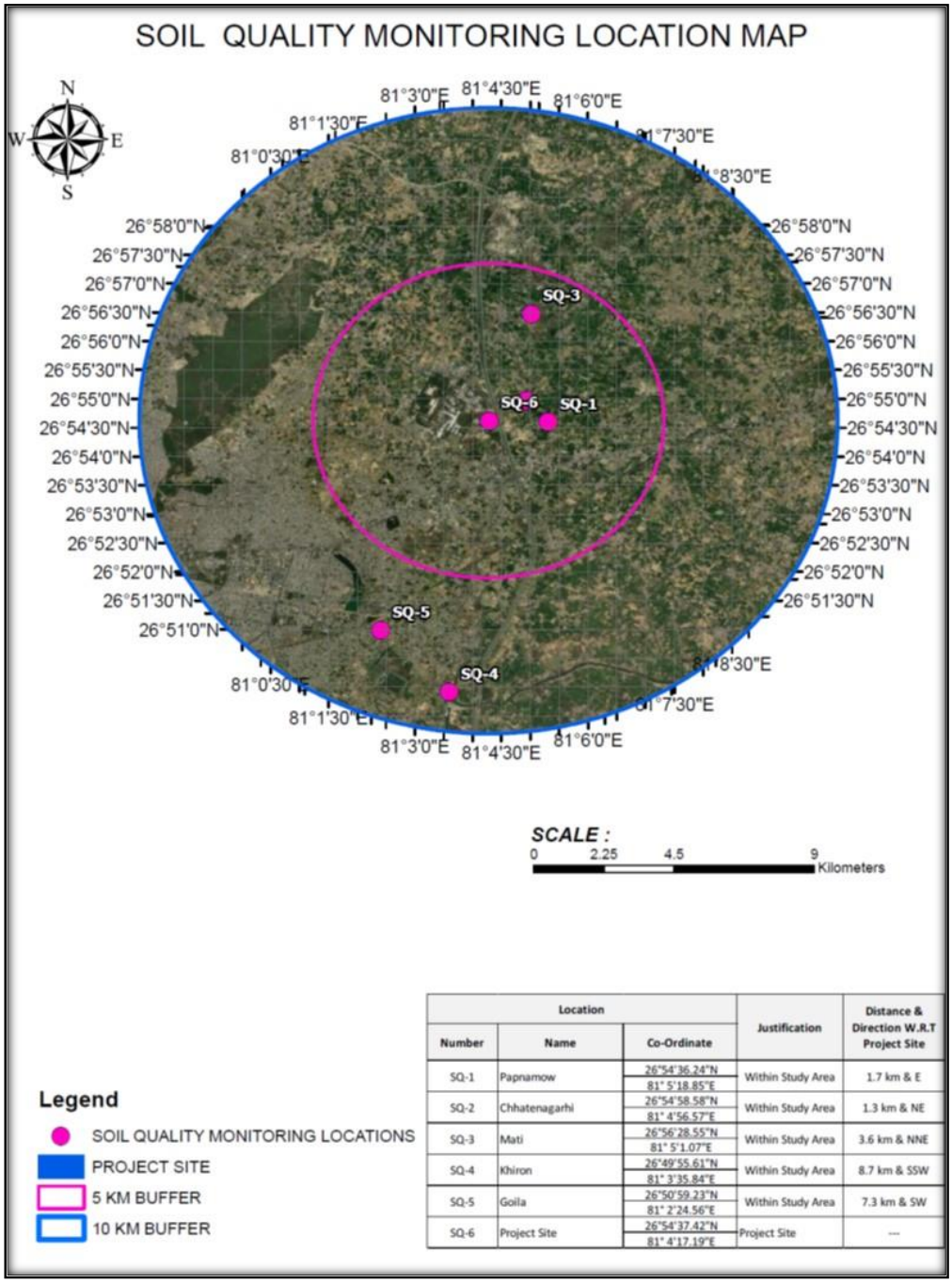
The above parameters indicate that the canal water quality falls under class-E [for Irrigation, Industrial Cooling purpose] as per CPCB water Quality criteria. Coliform presence was seen in all the surface water samples. This was mainly due to bathing of cattle, open defecation, surface runoff discharge etc.

3.6 Soil Quality

Six (6) soil samples were collected from the fields of nearby areas. The samples were collected by ramming a core-cutter into the soil up to a depth of 90 cm in 3 sections of 30 cm each. The samples were homogenized using quartering and conning technique. The soil sampling locations are given in Table 3.10 and in Figure 3.6 (a). Analysis results are given in Table 3.13.

Table 3. 9 Soil Sampling Locations

Code	Location	Co-ordinates	Distance & Direction wrt the site
SQ1	Papnamow	26°54'36.24"N81° 5'18.85"E	1.7 km & E
SQ2	Chhatenagarhi	26°54'58.58"N 81° 4'56.57"E	1.3 km & NE
SQ3	Mati	26°56'28.55"N81° 5'1.07"E	3.6 km & NNE
SQ4	Khiron	26°49'55.61"N81° 3'35.84"E	8.7 km & SSW
SQ5	Goyala	26°50'59.23"N81° 2'24.56"E	7.3 km & SW
SQ6	Project Site	26°54'37.42"N 81° 4'17.19"E	-



Location			Justification	Distance & Direction W.R.T Project Site
Number	Name	Co-Ordinate		
SQ-1	Papnamow	26°54'36.24"N 81° 5'18.85"E	Within Study Area	1.7 km & E
SQ-2	Chhatenagarhi	26°54'58.58"N 81° 4'56.57"E	Within Study Area	1.3 km & NE
SQ-3	Mati	26°56'28.55"N 81° 5'1.07"E	Within Study Area	3.6 km & NNE
SQ-4	Khiron	26°49'55.61"N 81° 3'35.84"E	Within Study Area	8.7 km & SSW
SQ-5	Goila	26°50'59.23"N 81° 2'24.56"E	Within Study Area	7.3 km & SW
SQ-6	Project Site	26°54'37.42"N 81° 4'17.19"E	Project Site	---

Figure 3. 5 Map showing Soil Sampling Locations

Table 3. 10Soil Analysis Result

SN	Parameter	Test Method	SL_1	SL_2	SL_3	SL_4	SL_5	SL_6	Unit
1.	pH	IS 2720 P-26 (1987)	7.66	7.60	7.62	7.94	7.98	8.01	--
2.	Conductivity	IS 14767 (RA 2016)	288.0	260.0	274.0	262.0	274.0	282.0	µS/cm
3.	Moisture	IS 2720 P-25 (1972)	11.5	13.0	12.6	11.5	12.0	13.5	% by mass
4.	Water holding capacity	IRDH/SOP-SL/07	18.5	20.6	19.2	18.2	20.4	21.0	%
5.	Specific Gravity	IS 2720 P-3 (1980)	1.94	1.92	1.94	1.92	1.95	1.96	-

6.	Bulk density	IRDH/SOP-SL/06	1.41	1.40	1.41	1.40	1.41	1.42	gm/cc
7.	Chloride	IRDH/SOP-SL/14	212.0	182.0	196.0	202.0	219.0	224.0	mg/kg
8.	Calcium	IRDH/SOP-SL/17	1340.0	1306.0	1322.0	1318.0	1340.0	1362.0	mg/kg
9.	Sodium	IRDH/SOP-SL/11	112.0	96.0	102.0	96.0	115.0	126.0	mg/kg
10.	Potassium	IRDH/SOP-SL/12	62.50	52.0	58.2	52.0	55.2	60.4	mg/kg
11.	Magnesium	IRDH/SOP-SL/16	195.0	172.0	184.0	174.0	180.0	198.0	mg/kg
12.	Organic matter	IS 2720 P-22 (1972)	0.64	0.56	0.60	0.52	0.58	0.62	% by mass
13.	Cation Exchange Capacity(CEC)	IRDH/SOP-SL/09	15.1	14.2	14.7	13.5	14.2	14.5	meq/100g
14.	Available nitrogen	IS 14684(1999)	38.0	32.0	36.2	42.0	46.4	49.2	mg/kg
15.	Available Phosphorous	IRDH/SOP-SL/10	8.20	7.75	8.02	7.76	8.12	8.30	mg/kg
16.	Iron as Fe	IRDH/SOP-SL/22	1035.0	1006.0	1014.0	1020.0	1032.0	1056.0	mg/kg
17.	Copper as Cu	IRDH/SOP-SL/21	19.0	16.0	17.2	16.2	18.0	19.5	mg/kg
18.	Zinc as Zn	IRDH/SOP-SL/20	28.0	24.0	26.0	21.2	23.0	28.0	mg/kg
19.	Texture	IRDH/SOP-SL/08							% by mass
	Sand		53.3	54.2	52.8	53.9	54.1	56.2	
	Clay		18.8	19.9	19.1	19.2	20.1	19.5	
	Silt		27.9	25.9	28.1	26.9	25.8	24.3	
20.	Sodium Absorption Ratio(SAR)	IRDH/SOP-SL/13	0.75	0.66	0.69	0.65	0.78	0.84	By calculation

3.6.1Observations on Soil quality:

Physical Characteristics:

pH of all the soil samples taken range between 7.60-8.01 showing that soil is alkaline in nature.

The texture class of soil sample collected reveals that soils are sandy clay in nature.

Bulk density of soil sample is observed between 1.40-1.42 gm/cc which confirm moderately fine texture of soil of area under study area.

Chemical Characteristics:

The EC of soil samples was observed between 260 -288 µS/cm which falls under average category. The organic matter of soil samples was observed between 0.52- 0.64% which is average sufficient. The available nitrogen was observed between 32-49.2 mg/kg which falls under healthy category, Phosphorous content was recorded between 7.75-8.3 mg/kg which falls under less category.

The potassium content was observed between 52.0-62.5 mg/kg which falls under average category.

The calcium content was observed between 1306-1362 mg/kg. The magnesium content was observed between 172-198 mg/kg while exchangeable cation is observed between 13.5-15.1meq/100 gm for the sample.

3.6.2 Conclusion

Soils of study area are sandy loam by nature. Specific Conductivity and pH are in normal range. Organic matter content is sufficient. The concentration of Nitrogen, Phosphorus and Potassium were medium. Soil quality in the study area in terms of fertility is good and it is fit for cultivation.

CHAPTER 4 – ANTICIPATED IMPACTS AND MITIGATION MEASURES

4.1 Introduction

This chapter presents identification and appraisal of various impacts related to the proposed project due to the activities during construction and operation phase in the study area. Prediction of impacts is the most important component in the Environmental Impact Assessment studies and it helps in minimizing adverse impacts on environmental quality during pre and post project execution.

This section of the EIA report will delineate the impacts due to this project activity on each of the environmental attributes. The impact assessment matrix is given below -

Table 4. 1Environmental Impact Assessment Matrix

No.	Activities	Environmental Attribute						
		Air	Noise	Water	Land & Soil	Socio -eco	Ecology	Aesthetics
Construction Phase								
1	Earthwork & excavation	√	√		√			
2	Storage of Construction Materials	√		√	√			√
3	Transportation of materials and equipment	√	√			√		
4	Operation of construction machineries	√	√					
5	Civil work	√	√		√			√
6	Erection of plant & machineries	√	√		√		√	√
7	Operation of diesel engines	√	√		√			
8	Disposal of domestic wastes and effluent			√	√		√	
9	Employment generation (positive impact}					√		
Operation Phase								
1	Storage of raw materials & products	√		√	√			
2	Transportation of Raw materials and products	√	√					
3	Increase in vehicular movement	√	√				√	
4	Operation of equipment and machinery	√	√					
5	Fuel combustion in boiler and DG	√					√	
6	Process reactions [off gas generation]	√					√	

7	Withdrawal of groundwater			√				
8	Effluent generation and discharge			√	√		√	
9	Solid waste generation and disposal			√	√		√	√
10	Hazardous waste generation and disposal			√	√		√	
11	Development of greenbelt (all positive impact)	√	√	√	√		√	√
12	Employment generation (positive impact)					√		

4.2 Identification of Environment Attributes

There are various types of impacts arise due to the proposed activities which will be evaluated considering the following environment parameters in construction and operational phase:

- Impact on Air Environment
- Impact on Water Environment
- Impact on Noise Environment
- Impact on Land Environment (Hazardous/solid waste generation)
- Impact on Biological Environment
- Impact on Socio-Economic Environment

4.3 Impacts & Mitigation Measures

4.3.1 Air Environment

A) Construction Phase:

Impacts:

- The construction required for the proposed expansion project and installation of new plant is expected to be completed within 3-6 months after start of construction activities.
- The expansion project is proposed within the existing unit premises which is already developed. Therefore, site clearance, levelling and other associated infrastructure work like internal road, boundary wall construction etc. are not required. No major demolition work is required.
- Only civil foundation work will be done at site. The proposed chemical plant will be pre-fabricated by the project consultant and transported at site to be assembled and installed. This will take less tome for installation of plant and will have negligible impact around the site.
- However following impact on air quality is anticipated during construction period¬
  - Civil foundation work activities will lead to fugitive dust and debris generation. This will increase the dust pollution level in the nearby area.
  - In addition, combustion of diesel/petrol fuel by internal combustion engines (vehicles, generators, construction equipment, etc.) would generate local emissions of PM, NOX, CO, volatile organic compounds (VOCs), and SO2 throughout the construction period.
  - The workers working with loose materials like sand, cement and concrete are likely to get exposed to the dust which will lead to affect lungs.

The impacts as mentioned above would be temporary and restricted to the construction phase. The total amount of these emissions would be small and would result in minimal off-site impact. Further, since the existing premises is surrounded by other industries, the impact on the habitation is expected to be minimal. Overall impact on air quality due to construction activity will be reversible, marginal and temporary in nature.

Mitigation Measures

- To control the fugitive emission during construction phase adequate water sprinkling system will be developed in construction area.
- All vehicles/machineries used for construction should have PUC.
- All the loose construction material will be transported in covered vehicles.
- Proper storage of dust generating construction materials (like aggregates, sand, earth, etc. with covers and wind breaker) will minimize the fugitive emission
- Regular maintenance of all the construction equipment to minimize the impact.
- Existing DG set at the site will be used only during the power cut which is already provided with adequate stack.
- Adequate greenbelt with plantation has been already developed at the site by the project proponent which will also act as barrier for air and noise pollution.
- All workers will be provided with mask to reduce inhaling of dust at the work place.

B) Operation Phase

The main sources of air pollution envisaged from the proposed project are as follows -

- Fugitive emissions / diffuse emission from material storage & handling
- Process emission
- Stack emission from utility units [Boiler and Generator sets]
- Vehicular Transportation

1) Fugitive Emissions

Fugitive emissions are emissions expected from material handling, storage, transferring, while diffuse emissions are anticipated from unit operations. The storage of volatile chemicals may also lead to diffuse emissions unless adequate mitigation measures like safety relief valves rupture disc, breather valves are adopted. All these emissions impact air quality negatively, resulting in health impacts indirectly.

The manufacturing process activities of the proposed expansion project will be same as existing operation. The process is continuous and one cycle of operation is completed in 3-4 months period. The process of mixing, heating, cooling are carried out in closed system where no fugitive emission/ diffuse emission is anticipated.

2) Process Emissions

During the manufacturing process reactions in the reactor, some side reactions occur and CO_2, CO and H_2 will be generated. No use of off gases is considered. Therefore, off gases containing CO_2, H_2,

N_2, CO etc. in trace quantity will be vented out after absorption column at a height of approx. 12m from ground level. As per available literature regarding formaldehyde manufacturing process using silver catalyst, in total, 89 kg of CO2 are created and emitted per ton of products (formaldehyde in 37% concentration) manufactured [Source: Article on Process of Formaldehyde and Volatile Organic Compounds' Removal from Waste Gases by Jozsef Mursics, Danijela Urbancl and Darko Goricanec, Faculty of Chemistry and Chemical Engineering, University of Maribor, Smetanova Ulica 17, 2000 Maribor, Slovenia; jozsef.mursics@student.um.si (J.M.); darko.goricanec@um.si (D.G.) Published on 8 July 2020 by Applied Sciences, an international, open access journal on all aspects of applied natural sciences].

No use of off-gases is considered. To achieve maximum yield from the process and also to prevent loss of formaldehyde vapour and unreacted methanol, the existing manufacturing unit has installed five absorption columns in series before releasing off gases into the atmosphere. Therefore, emission of methanol and formaldehyde through the vent is not envisaged.

3) Stack Emissions from utility units

The main sources of emission from utility units are one HSD fired baby boiler of capacity 500 Kg/hr and one DG set of 125 KVA operated during power cut only. Boiler is operated for only 4-5 hours in one reaction cycle of 3-4 months. No new boiler is proposed in the expansion project. One additional DG set of capacity 480 KVA will be provided during post expansion. Since boiler and DG sets will not operate on regular basis, the impact on air environment due to utility emission would be very little.

Mitigation Measures to control fugitive and stack emissions

- Boiler and DG sets will be provided with stack of adequate height and will comply with applicable emission norms.
- Closed loop system will be adopted to reduce the workers exposure to hazardous chemicals during manufacturing process.
- Mechanical seals will be provided in the reactors.
- Handling & transportation of the raw material and product as per norms.
- Sprinkling of water to control fugitive dust emission within the site due to vehicular movement.
- Speed of vehicles inside the factory premises will be controlled.
- Paved internal roads to reduce dust emission.
- Greenbelt will be maintained to attenuate the air pollution.
- Proper personal protective equipment will be provided to the workers.
- Raw material unloading and product loading will be done by mechanized system.

Impact on Ambient Air Quality

Existing sources of air emission and control devices are listed below –

Table 4. 2: Sources of Emission and Air Pollution Control Systems during Post Expansion

Stack No.	Details	Stack Height (m)	Stack Dia (m)	Flue Gas velocity	Flue gas Temperature (°K)	Emission Details (g/s)				
						PM_{10}	$PM_{2.5}$	SO_2	NO_2	CO
1	DG set 125 KVA	11	0.30	16	538°K	0.0089	0.0053	0.035	0.143	0.0854
2	DG set 480 KVA	11	0.350	16	538°K	0.034	0.020	0.134	0.55	0.213
3	Boiler of capacity 500 kg/hr	12	0.71	16	413°K	-	-	0.041	-	-

Air Quality Modelling

The ground level concentrations (GLCs) of the pollutants from the stack are computed using numerical simulation model & software packages, namely ISC-AERMOD View (version 9.7.0) which is an interface for the U.S. EPA ISCST3, ISC-PRIME and AERMOD. This package was developed by Lakes Environmental, Canada. The Industrial Source Complex - Short Term regulatory air dispersion model (ISCST3) is a Gaussian plume model and is widely used to assess pollution concentration and/or deposition flux on receptors, from a wide variety of sources. The Industrial Source Complex - Plume Rise Model Enhancements (ISCPRIME) dispersion model is similar to the ISCST3 model but contains enhanced building downwash analysis. AERMOD is the next generation air dispersion model which incorporates planetary boundary layer concepts. The model can be considered as a comprehensive approach for computation of the ground level concentrations (GLCs) of a pollutant (for a specified period of time) over a predefined area due to emission from the stack. This calculation is done on the basis of the site-specific micrometeorological data obtained by field monitoring during the period under consideration. The methodology of using the numerical simulation model is adopted as per the U.S. EPA guideline.

Model Input Data The model needs following sets of data:

(i) Meteorological Data
(ii) Source Data
(iii) Project Data

i) Meteorological Data

The meteorological data required for the model are:

- Hourly Wind direction.
- Hourly Wind speed.
- Hourly Dry bulb temperature
- Cloud cover
- Cloud ceiling height

Secondary Data from IMD was considered for the period of October 22 to December 2022. Also the IMD data of IMD station Lucknow was referred for confirmation.

Table 4. 3MET Data of Lucknow (1991-2020)

जलवायवी सारणी १९९१-२०२० CLIMATOLOGICAL TABLE 1991-2020

स्टेशन : लखनऊ STATION : LUCKNOW; अक्षांश LAT. 26° 45'; देशांतर LONG. 80° 53'; माध्य समुद्र तल से ऊंचाई HEIGHT ABOVE M.S.L. 127.71 मीटर METRES; प्रेक्षणों पर आधारित BASED ON OBSERVATIONS 1991-2020

माह MONTH		स्टेशन का सतह दाब STATION LEVEL PRESSURE (hPa)	वायु तापमान AIR TEMPERATURE – माध्य MEAN: शुष्क बल्ब DRY BULB (°C)	नम बल्ब WET BULB (°C)	दैनिक अधिकतम DAILY MAX (°C)	दैनिक न्यूनतम DAILY MIN (°C)	माह में उच्चतम HIGHEST IN THE MONTH (°C)	माह में निम्नतम LOWEST IN THE MONTH (°C)	चरम EXTREMES: उच्चतम HIGHEST (°C)	दिनांक और वर्ष DATE AND YEAR	निम्नतम LOWEST (°C)	दिनांक और वर्ष DATE AND YEAR	आर्द्रता HUMIDITY: सापेक्ष आर्द्रता RELATIVE HUMIDITY (%)	वाष्प दाब VAPOUR PRESSURE (hPa)	मेघ की मात्रा CLOUD AMOUNTS (Oktas of sky): समस्त मेघ ALL CLOUDS	निम्न मेघ LOW CLOUDS	RAINFALL: मासिक योग MONTHLY TOTAL (mm)	वर्षा के दिनों की संख्या NO. OF DAYS	वर्षसहित सबसे नम महीने का योग TOTAL IN WETTEST MONTH WITH YEAR (mm)	सबसे शुष्क महीने का योग TOTAL IN DRIEST MONTH WITH YEAR (mm)	24 घंटे की सबसे भारी वर्षा HEAVIEST FALL IN 24 HOURS (mm)	दिनांक और वर्ष DATE AND YEAR	माध्य पवन गति MEAN WIND SPEED (Kmph)
जनवरी JAN	I	1002.8	10.6	9.6	21.4	7.8	27.0	3.4	31.6	1	-1.0	31	87	11.3	3.7	2.5	21.6	1.7	98.4	0.0	65.0	2	3.4
	II	1000.2	18.3	14.1						1992		1964	61	12.8	2.6	0.9			2020			1980	
फरवरी FEB	I	1000.6	14.8	12.8	26.2	11.0	31.2	6.6	35.9	25	0.0	2	78	13.4	2.3	1.1	14.0	1.4	144.6	0.0	54.7	6	4.1
	II	997.8	23.5	16.9						2006		1964	49	14.1	2.3	0.8			2013			2013	
मार्च MAR	I	997.4	21.1	16.7	32.2	15.4	37.6	10.5	41.1	30	5.4	10	62	15.6	2.0	0.6	11.0	1.1	76.5	0.0	42.5	25	4.2
	II	994.1	29.5	19.4						2017		1979	35	14.4	2.2	0.7			2015			1982	
अप्रैल APR	I	993.6	28.0	19.9	38.2	21.0	42.3	16.0	45.0	30	10.9	1	45	16.9	1.8	0.6	5.5	0.7	83.4	0.0	70.0	2	4.9
	II	989.5	35.7	21.8						1999		1968	26	15.2	2.1	0.7			1971			1971	
मई MAY	I	989.3	31.2	23.5	39.9	24.8	44.3	20.3	46.5	31	17.0	2	51	22.7	1.9	0.8	24.5	2.0	114.5	0.0	58.6	31	5.4
	II	985.1	37.6	24.6						1995		2012	32	20.8	1.6	0.8			2000			2020	
जून JUN	I	985.7	31.4	25.9	38.3	26.7	43.6	22.4	47.7	9	19.2	9	65	29.2	3.9	2.1	107.4	5.1	412.0	0.0	182.4	26	5.1
	II	981.9	35.9	26.6						1966		2016	49	27.4	4.0	2.4			1975			1971	
जुलाई JUL	I	985.3	29.3	26.9	34.2	26.0	38.6	23.2	44.2	6	21.5	28	83	33.7	6.1	3.8	238.5	11.8	761.7	2.5	272.4	9	4.5
	II	982.2	31.6	27.6						1982		2007	73	33.7	6.1	4.0			1960	1952		1960	
अगस्त AUG	I	987.3	28.8	26.9	33.4	25.6	36.4	23.2	40.4	3	21.3	11	85	33.9	6.0	3.8	241.6	10.6	654.2	19.8	250.0	30	4.1
	II	984.4	30.7	27.5						1972		2014	77	34.0	6.1	4.2			1967	2019		2000	
सितम्बर SEP	I	991.4	28.2	25.9	33.4	24.4	36.2	21.8	40.1	18	17.2	29	83	31.7	4.3	2.6	162.1	7.2	698.2	5.7	177.1	14	3.3
	II	988.1	30.4	26.5						1958		1950	73	31.5	4.8	3.3			1985	2015		1985	
अक्तूबर OCT	I	997.3	24.7	21.7	32.8	19.5	35.6	14.7	38.7	11	10.0	31	75	23.8	1.4	0.7	27.9	1.4	345.6	0.0	199.8	10	2.0
	II	993.9	28.6	23.3						2015		1984	62	24.5	1.9	1.1			1985			1985	
नवम्बर NOV	I	1001.0	18.0	15.7	29.0	13.3	32.2	9.2	38.0	8	3.9	29	77	16.3	1.2	0.4	2.5	0.4	61.2	0.0	38.5	26	2.0
	II	997.7	23.9	18.8						1963		1952	59	17.7	1.3	0.3			1997			1997	
दिसम्बर DEC	I	1003.0	12.3	11.0	23.6	8.9	28.1	4.6	29.9	4	0.5	30	85	12.3	2.5	1.5	4.7	0.5	95.9	0.0	49.2	9	2.2
	II	1000.0	19.4	15.2						1976		1973	63	14.1	1.8	0.4			1997			1997	
वार्षिक योग या माध्य ANNUAL TOTAL OR MEAN	I	994.5	23.2	19.7	31.9	18.7	44.7	2.9	47.7	9	-1.0	31	73	21.7	3.1	1.7	861.4	43.8	2143.0	112.4	272.4	9	3.7
	II	991.2	28.7	21.8					6	1966	1	1964	55	21.7	3.1	1.6			1980	2019	7	1960	

भारत मौसम विज्ञान विभाग 226 INDIA METEOROLOGICAL DEPARTMENT

Table 4. 4MET Data of Lucknow (1991-2020)

जलवायवी सारणी १९९१-२०२० CLIMATOLOGICAL TABLE 1991-2020

स्टेशन : लखनऊ STATION : LUCKNOW; राज्य : केंद्र शासित प्रदेश STATE : UTTAR PRADESH; सूचकांक : INDEX NO. : 42369

Column groups: मौसम परिघटना WEATHER PHENOMENA – के साथ दिनों की संख्या No. OF DAYS WITH; पवन WIND – पवन की गति (कि.मी.प्र.घं.) का माह में दिनों की संख्या NO. OF DAYS WITH WIND SPEED (Kmph); पवन की दिशा के दिनों की संख्या का प्रतिशत PERCENTAGE NO. OF DAYS WIND FROM; मेघ CLOUD – मेघ मात्रा (सभी मेघ) सहित दिनों की संख्या – अष्टमांश NO. OF DAYS WITH CLOUD AMOUNT (ALL CLOUDS) OKTAS; निम्न स्तरी मेघ मात्रा सहित दिनों की संख्या – अष्टमांश NO. OF DAYS WITH LOW CLOUD AMOUNT OKTAS; दृश्यता VISIBILITY – दृश्यता सहित दिनों की संख्या NO. OF DAYS WITH VISIBILITY

माह MONTH		वर्षण 0.3 मि.मी.या अधिक PPT 0.3 mm OR MORE	ओले HAIL	गर्जन THUNDER	कुहरा FOG	धूल भरी आँधी DUST STORM	चंड वात SQUALL	62 या अधिक 62 OR MORE	20-61	1-19	0	उ N	उपू NE	पू E	दपू SE	द S	दप SW	प W	उप NW	शांत CALM	0	1-2	3-5	6-7	8	0	1-2	3-5	6-7	8	कुहरा 8 FOG 8	1 कि.मी. तक UPTO 1 Km.	1-4 कि.मी. 1-4 Kms.	4-10 कि.मी. 4-10 Kms.	10-20 कि.मी. 10-21 Kms.	20 कि.मी. से अधिक OVER 20 Kms.
जनवरी JAN	I	2.6	0	1.6	18.4	0.1	0	0	0	20	11	2	2	6	2	0	2	25	12	49	12	2	5	4	8	19	1	4	1	6	0	13.6	16.6	0.8	0	0
	II							0	0	24	7	3	3	6	1	0	3	34	21	29	13	4	8	5	1	24	2	4	1	0	0	0.6	21.9	8.5	0	0
फरवरी FEB	I	2.8	0	2.3	5.8	0	0	0	0	19	9	3	1	9	3	0	4	29	12	39	14	3	6	3	2	21	2	4	0	1	0	2.6	21.6	3.8	0	0
	II							0	1	24	3	3	2	7	4	1	4	41	25	13	13	3	7	4	1	21	3	4	0	0	0	0	8.6	19.4	0	0
मार्च MAR	I	2.2	0.1	2.3	0.2	0.3	0	0	1	25	5	5	4	6	4	1	6	32	23	19	16	3	7	4	1	25	3	3	0	0	0	0	16.4	14.6	0	0
	II							0	2	28	1	5	2	5	2	1	3	38	40	4	15	4	7	5	0	23	4	4	0	0	0	0	2.9	28.1	0	0
अप्रैल APR	I	1.7	0	2.5	0	0.9	0	0	2	26	2	6	6	20	9	3	7	21	18	10	16	4	7	3	0	24	3	3	0	0	0	0	8.5	21.5	0	0
	II							0	3	26	1	12	5	9	2	0	1	20	47	4	15	4	7	4	0	22	4	4	0	0	0	0	2.3	27.7	0	0
मई MAY	I	3.3	0.2	5	0	1.9	0.2	0	2	28	1	6	6	37	14	2	5	12	13	5	17	4	7	3	0	22	4	5	0	0	0	0	7.3	23.7	0	0
	II							0	3	27	1	14	10	21	4	1	1	13	32	4	17	5	7	2	0	21	5	5	0	0	0	0	3.3	27.7	0	0
जून JUN	I	8	0.1	7.4	0	1.1	0.1	0	3	25	2	4	8	36	13	4	3	14	11	7	7	2	9	9	3	13	5	11	1	0	0	0	7.5	22.5	0	0
	II							0	2	27	1	10	13	26	7	3	3	9	24	5	5	4	9	11	1	8	7	14	1	0	0	0	4.3	25.7	0	0
जुलाई JUL	I	17.9	0.1	11.8	0	0.1	0.1	0	2	26	3	1	6	42	11	5	7	13	4	11	0	1	6	17	7	2	4	20	5	0	0	0.1	10.3	20.6	0.1	0
	II							0	2	26	3	4	9	32	12	6	6	11	9	11	0	0	7	20	4	1	2	25	3	0	0	0.1	5.8	25.1	0.1	0
अगस्त AUG	I	16.2	0	9.9	0	0	0.1	0	2	26	3	1	8	39	12	3	5	14	5	13	0	1	7	16	7	3	4	20	4	0	0	0.1	10.1	20.9	0	0
	II							0	1	27	3	3	8	30	12	5	5	16	8	13	0	0	7	20	4	0	2	26	3	0	0	0.1	5.4	25.5	0	0
सितम्बर SEP	I	10.7	0	6.7	0.5	0.1	0.1	0	1	24	5	2	9	28	10	2	3	16	11	19	6	3	7	10	4	10	5	12	3	0	0	0	12.3	17.7	0	0
	II							0	1	25	4	6	8	23	8	2	4	13	19	17	2	3	10	13	2	4	5	18	3	0	0	0	3.5	26.5	0	0
अक्तूबर OCT	I	2.2	0	1.2	1.8	0	0	0	0	17	14	3	5	11	4	1	1	13	7	55	21	2	4	3	1	24	2	4	1	0	0	0.3	23.7	7	0	0
	II							0	0	19	12	4	4	10	3	0	1	9	15	54	15	4	9	3	0	20	5	6	0	0	0	0	8.5	22.5	0	0
नवम्बर NOV	I	0.9	0	0.4	7.8	0	0	0	0	14	16	2	1	3	0	0	1	16	8	69	21	2	4	2	1	26	1	2	0	1	0	3.6	25.7	0.7	0	0
	II							0	0	13	17	1	1	1	1	0	0	14	7	75	19	4	5	2	0	28	1	1	0	0	0	0	21.9	8.1	0	0
दिसम्बर DEC	I	1.1	0	0.4	17.4	0	0	0	0	15	16	1	2	2	1	0	2	16	9	67	17	3	4	2	5	23	1	2	1	4	0	13.5	17.4	0.1	0	0
	II							0	0	18	13	2	1	2	1	0	2	23	11	58	17	3	7	3	1	27	2	2	0	0	0	0.7	26.7	3.6	0	0
वार्षिक योग या माध्य ANNUAL TOTAL OR MEAN	I	69.6	0.4	51.6	51.9	4.5	0.5	0	13	265	87	3	5	20	7	2	4	18	11	30	151	30	73	73	38	213	35	88	17	12	0	33.8	180	151.1	0.1	0
	II							0	14	283	68	6	6	15	5	2	3	20	21	22	133	40	90	85	17	197	43	112	12	1	0	1.5	113.5	249.9	0.1	0

भारत मौसम विज्ञान विभाग 226 INDIA METEOROLOGICAL DEPARTMENT

Source *Climatological Tables of Observatories in India 1991-2020 issued by Climate Research and Services, Indian Meteorological Department, Pune 411005*

ii) Source Data

Source data required for the model are as follows:

- Stack height (m)
- Stack exit diameter (m)
- Flue gas exit velocity (m/s)
- Pollutant Emission rate (g/s)
- Exact location of the Emission Source (Latitude, Longitude)
- Flue gas temperature (deg. C)
- Project Data
- Building dimension
- Terrain category (Urban/Rural)
- Period of computation
- Pollutant
- Receptor distribution considering the location of the proposed stack and the nature of the area within a radius of 10 km.

This model has been used to estimate the predicted increase in GLC and its distribution due to the emission from the proposed stack. Thus, the background concentration has been considered as zero (0) during model run. The GLC has been computed for four major pollutants namely SO2, NOX, PM2.5 and PM10. Gaussian Plume Model is a conservative model i.e., no atmospheric decay / deposition of the pollutants has been considered. Thus, for same set of meteorological and other data, GLC at different receptors for the different pollutants emitted from the same source are solely dependent on the emission rate (in gm/s) of that pollutant. Here the software run has been done for SO2, NOx and PM10. The receptor location has been considered upto a maximum distance of 20 km. in either direction from the proposed stack. However, in order to represent the receptors suitably, they have been considered to be distributed over a rectangular grid area of 20 km x 20 km with the proposed stack at their centre. The receptors have been chosen at 1 km. interval along both the axes i.e., in total there are 441 (21 x 21) no. receptors for which the computation has been done.

iii) Project Data

The basic input data used in the dispersion modeling is represented below -

Table 4. 5Emission load from the plant

Stack No.	Details	Emission Details (g/s)				
		PM_{10}	$PM_{2.5}$	SO_2	NO_2	CO
1	DG set of capacity 125 KVA	0.0089	0.0053	0.035	0.143	0.0854
2	DG set of capacity 480 KVA	0.034	0.020	0.134	0.55	0.213
3	Boiler of capacity 500 kg/hr	-	-	0.041	-	-
		0.0429	0.0253	0.21	0.693	0.2984

** It is to be noted that emission from Boiler is negligible as it used once in 3-4 months.*

Maximum ground level concentration (GLC) based on Air quality Modelling is shown below -

Table 4. 6 Impact of Air Quality of the Study Area due to the Project (24-h avg in µg/m3)

Parameter	Predicted Max Incremental Ground Level Conc.	Unit
PM_{10}	0.119	µg/m^3
$PM_{2.5}$	0.071	µg/m^3
SO_2	0.533	µg/m^3
NO_X	1.91	µg/m^3
CO	0.00178	µg/m^3

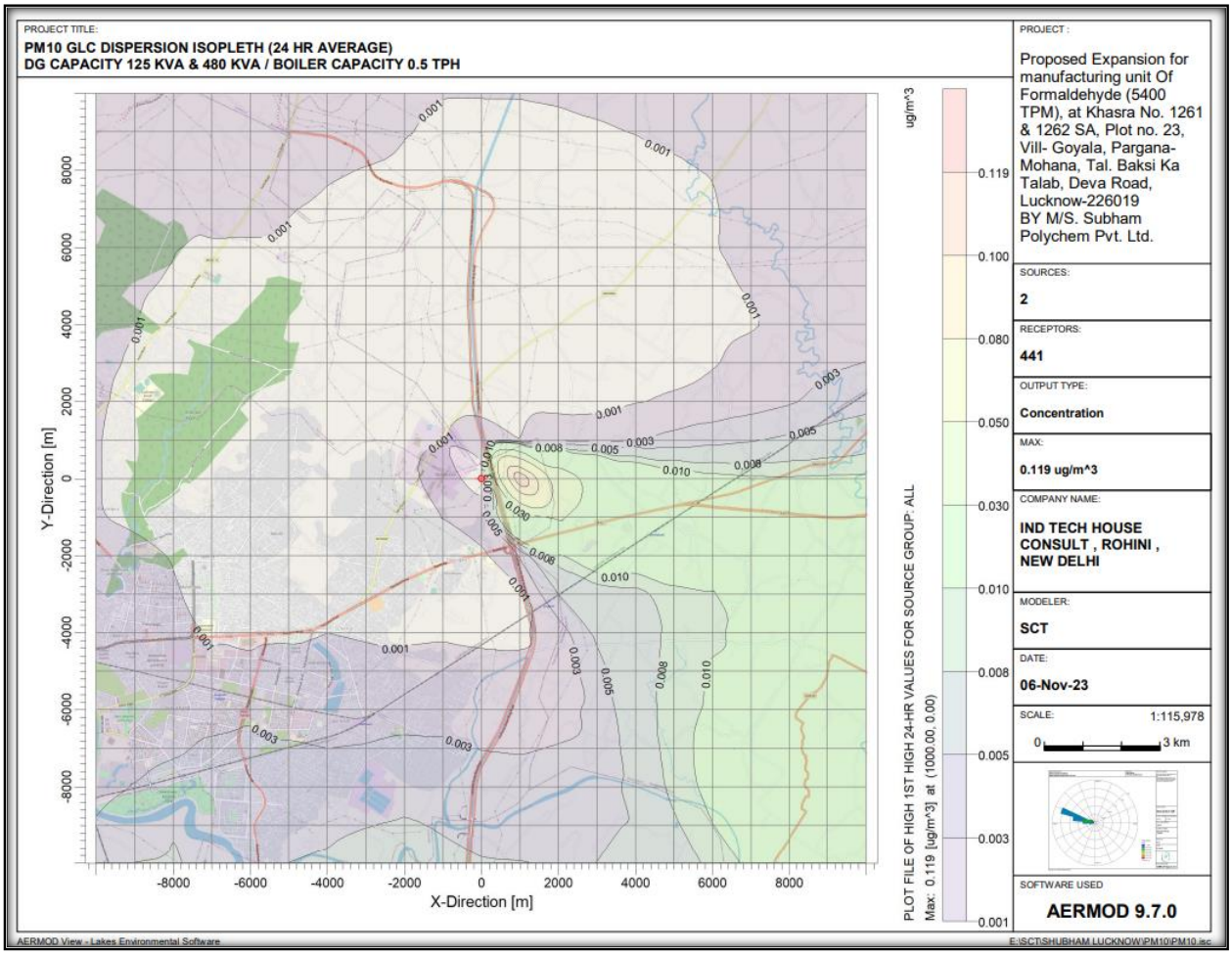


Figure 4. 1: GLC dispersion Isopleths of PM10 (24 hr. Average)

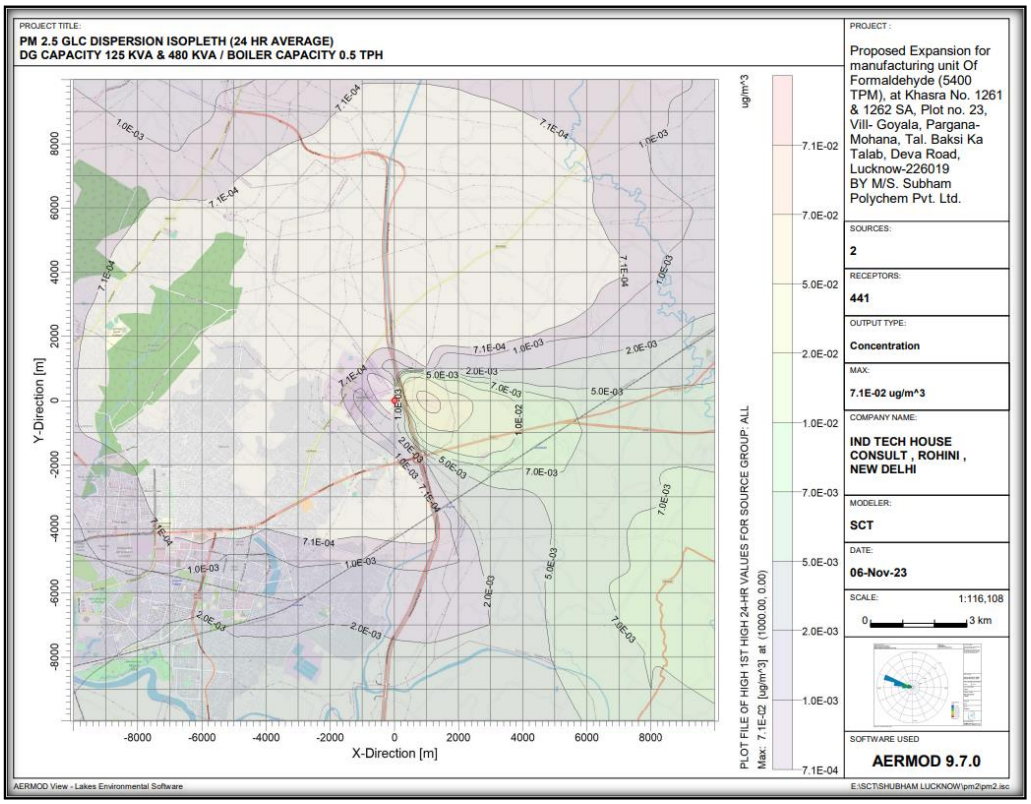


Figure 4. 2: GLC dispersion Isopleth of PM2.5 (24 hr. Average)

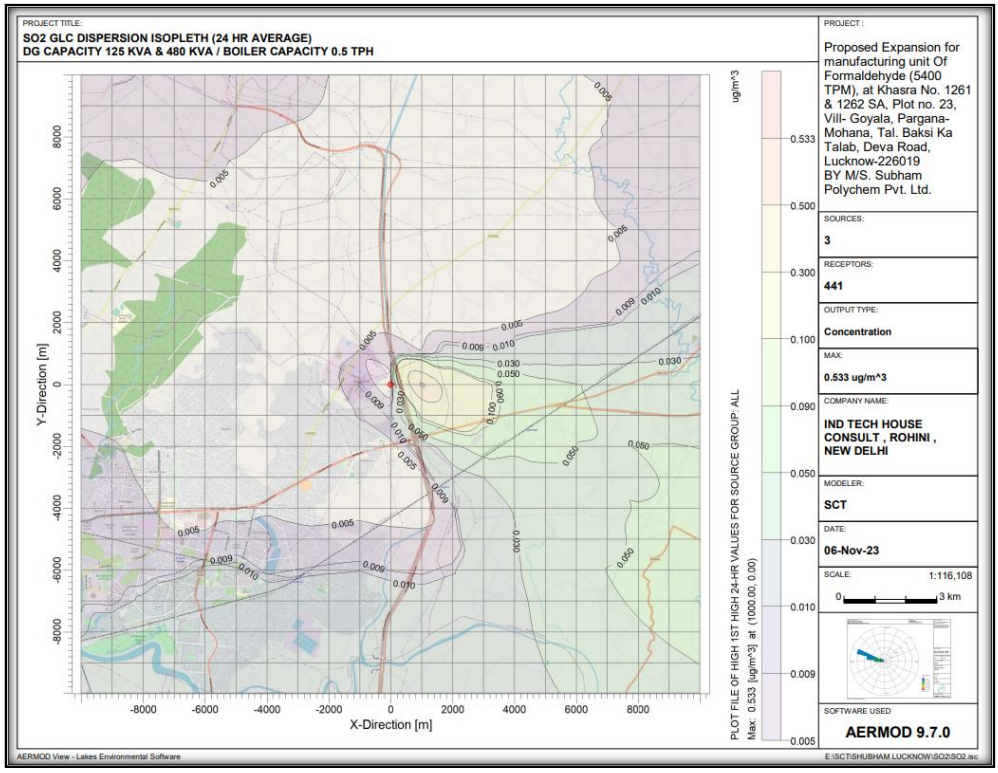


Figure 4. 3 GLC dispersion Isopleths of SO2 (24 hr. Average)

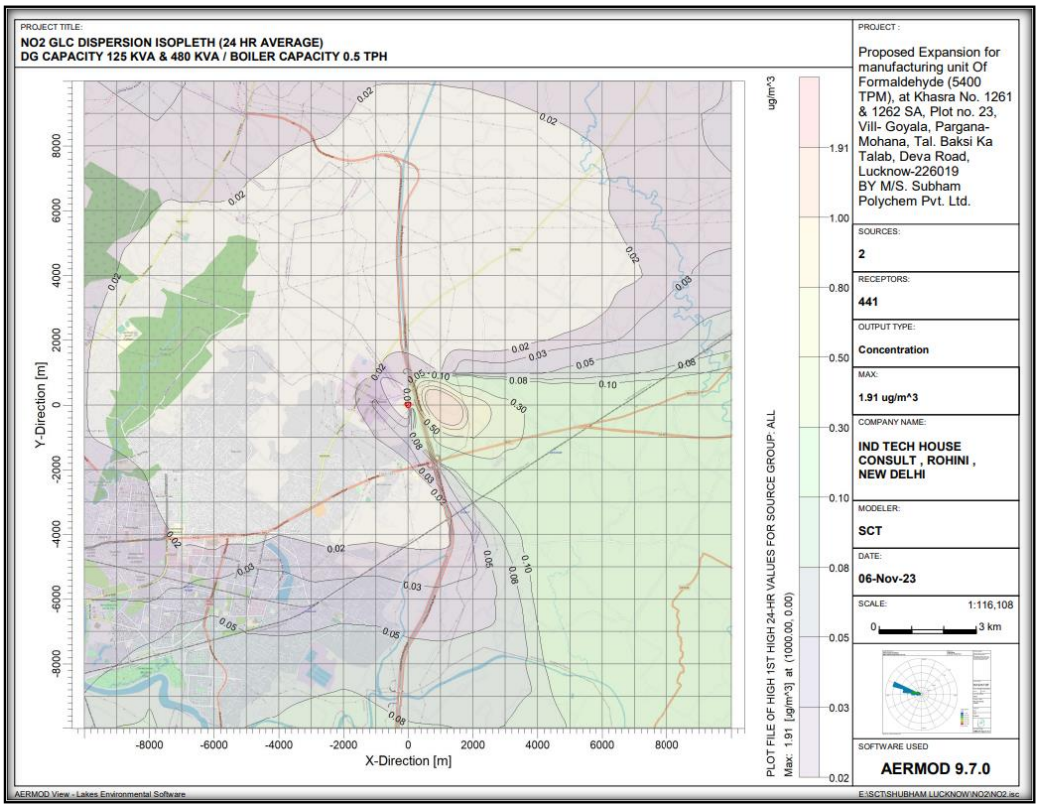


Figure 4. 4 GLC dispersion Isopleths of NO2 (24 hr. Average)

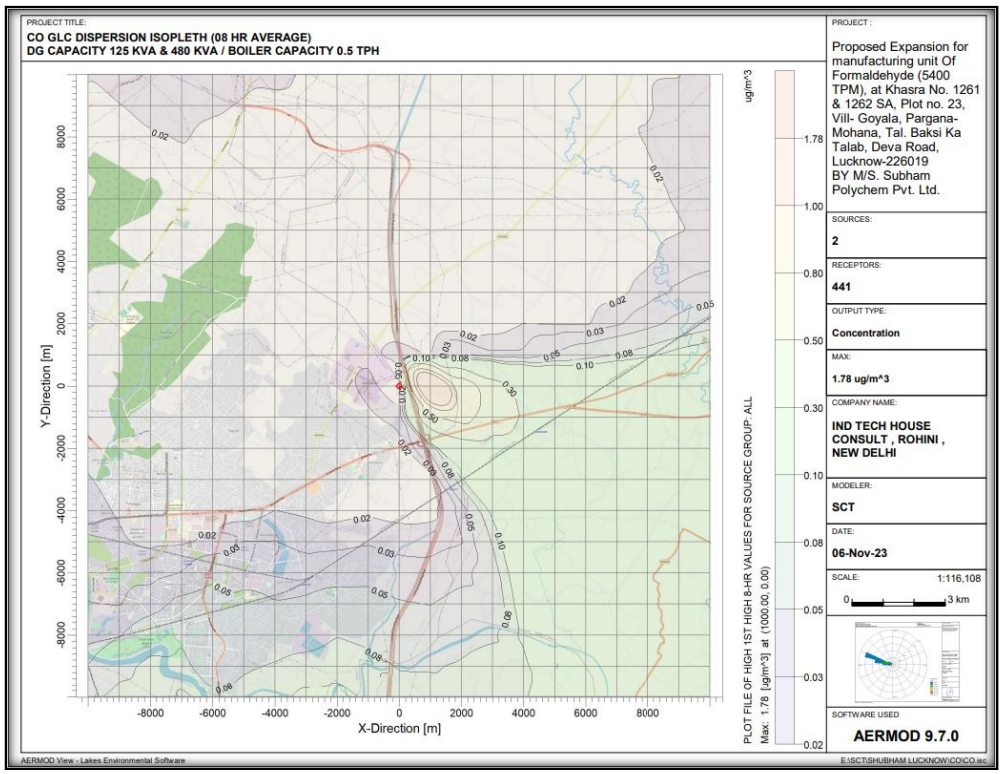


Figure 4. 5 GLC dispersion Isopleths of CO (08 hr. Average)

Conclusion:

The predicted GLC using mathematical modeling is 0.119 µg/m3 for PM_{10}, 0.071 µg /m3 for $PM_{2.5,}$ 0.533 µg /m3 for SO_2 and 0.1.91 µg /m3 for NO_2.

The isopleths of PM_{10}, SO_2 and NO_2 are shown Figures 4.1 to 4.5. The maximum GLC values are occurring at coordinate 1000, 0 area towards the East direction. From the above it can be concluded that the pollution load contribution to the environment is negligible.

4) Vehicular Emissions

The raw material and finished products will be transported through road. At present on an average 40 nos. of tankers are leaving or arriving the project site in a month. As estimated, maximum of 8Nos. of tankers per day [240 nos./month] will be required during post expansion operation phase.

Traffic Air Quality Modelling

- ISC Aermod Model has been used to estimate in increase in air pollution due to traffic movement. Line Area Source was considered for air quality modelling due to traffic generated due to the project.
- CO, NO2, PM10 & PM2.5 concentrations at the receptors were modelled.
- Resultant maximum incremental ground level concentration (GLC) wrt PM10, PM2.5, SO2 and NOX is shown in Table 4.7.

Table 4. 7: Impact of Air Quality on the Study Area due to Traffic (24-h avg in µg/m^3)

Parameter	Predicted Incremental Max Ground Level Conc.
CO	0.00705 mg/m^3
NO_X	2.70 µg/m^3
PM_{10}	0.346 µg/m^3
$PM_{2.5}$	0.202 µg/m^3

Conclusion:

The isopleths of PM10, PM2.5, NOx and CO are shown Figures 4.6 to 4.9. It can be concluded that the pollution load contribution to the environment is negligible. Also the impact due to traffic will be restricted only near the roads only.

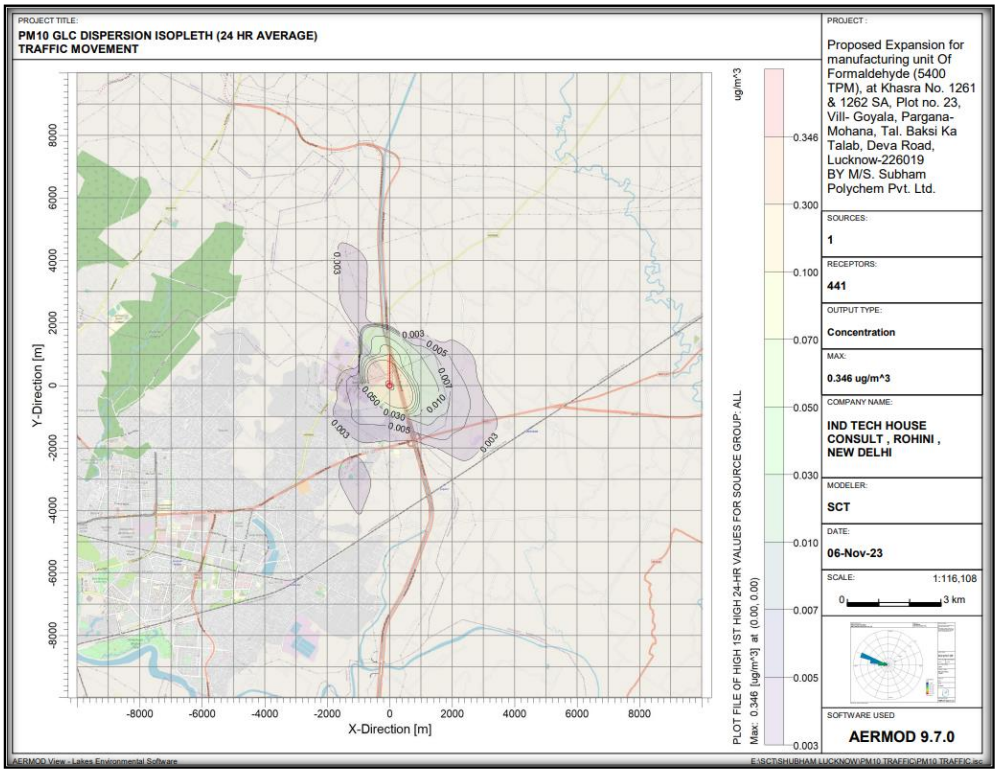


Figure 4. 6 GLC dispersion Isopleths of PM_{10} (24 hr. Average) due to Traffic

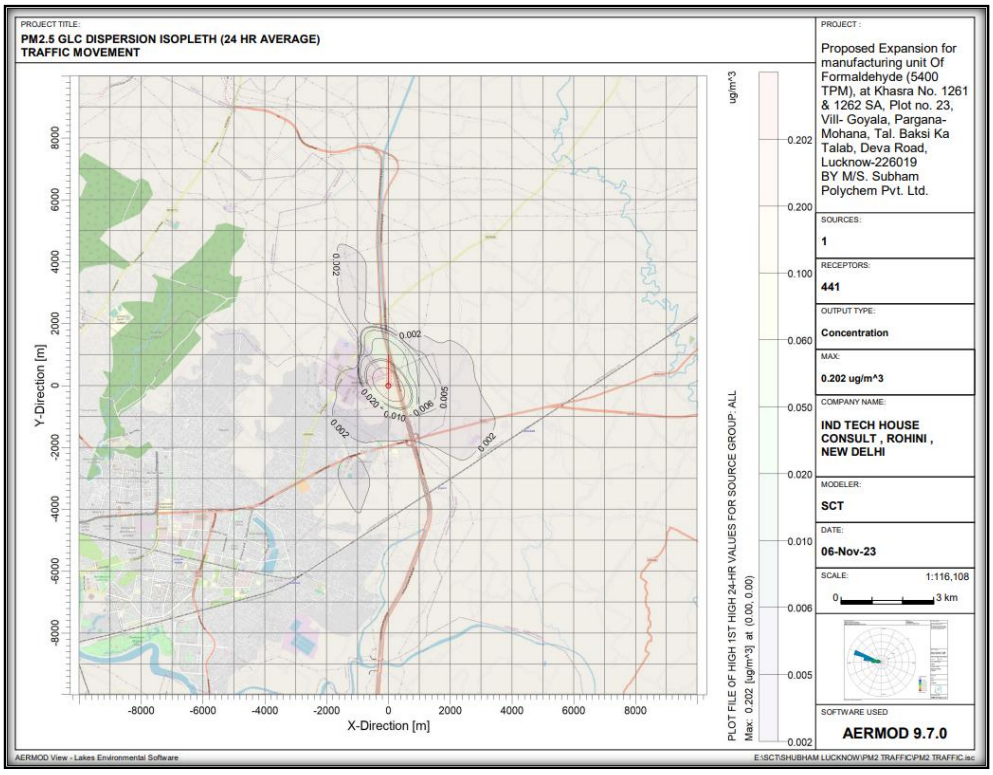


Figure 4. 7 GLC dispersion Isopleths of $PM_{2.5}$ (24 hr. Average) due to Traffic

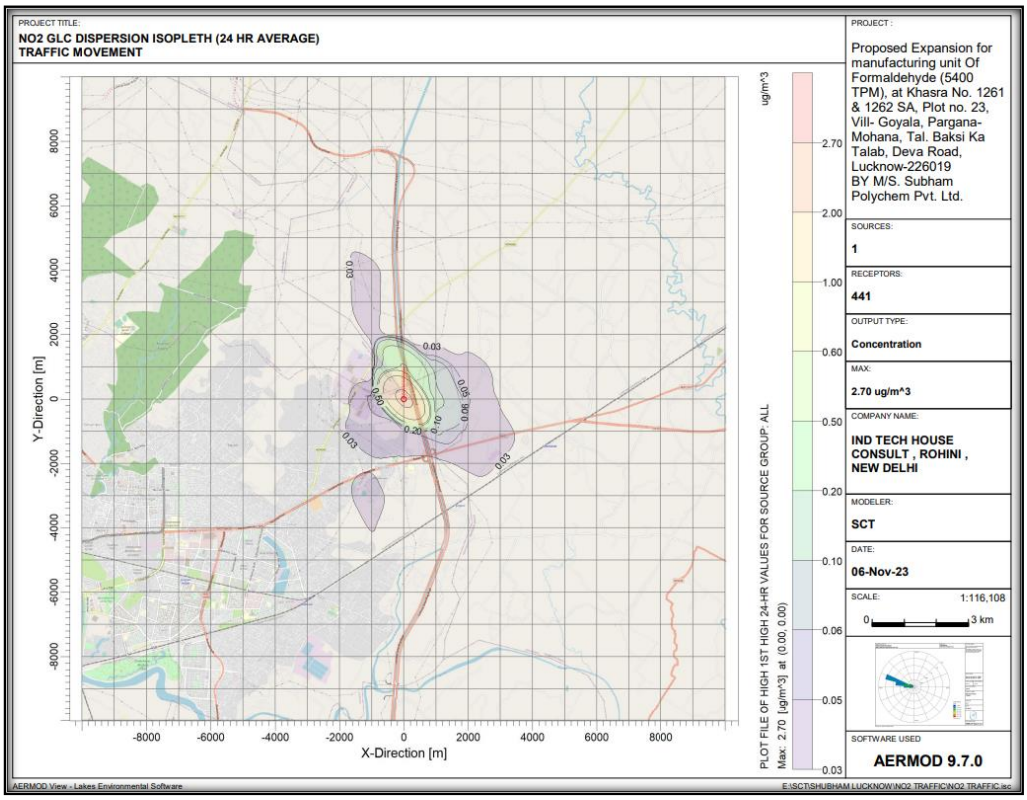


Figure 4. 8 GLC dispersion Isopleths of NO_2 (24 hr. Average)due to Traffic

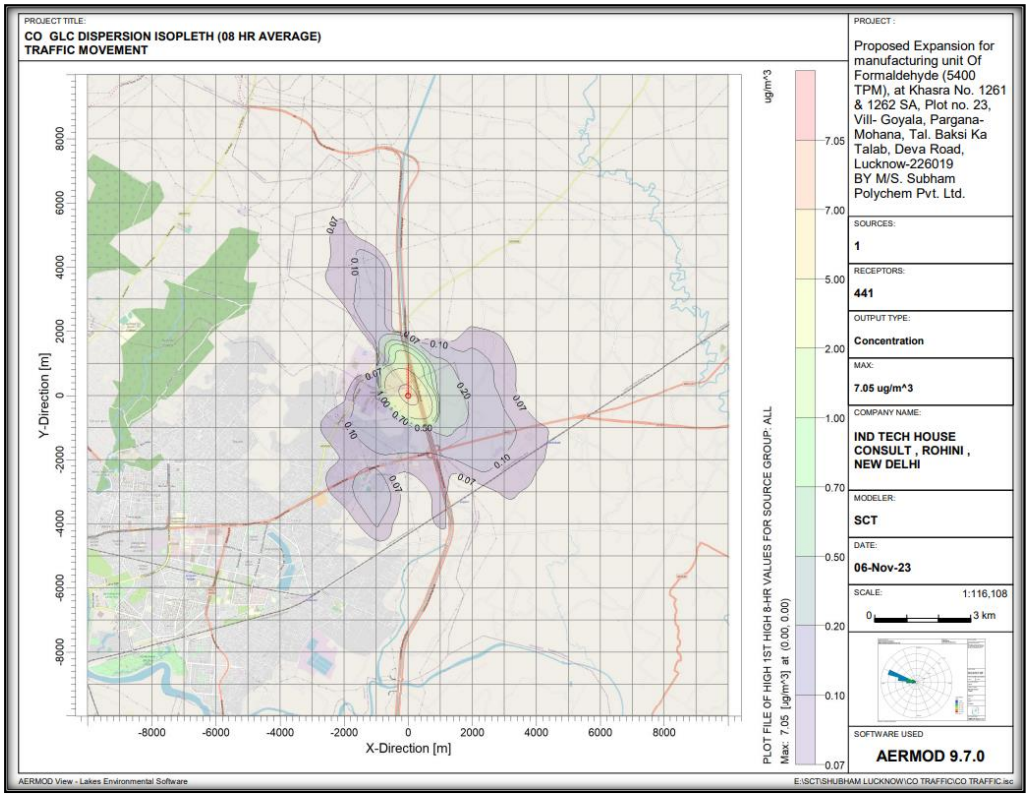


Figure 4. 9: GLC dispersion Isopleths of CO (08 hr. Average) due to Traffic

4.3.2 Ambient Noise

Impact

Industry in general consists of several sources of noise in clusters or single. Increase in ambient noise levels may be expected due to the operation of plant and machinery, utility units and due to the movement of vehicles transporting materials in and out of the factory.

The sound pressure level generated by noise sources decreases with increasing distance from the source due to wave divergence. Additional decrease also occurs due to atmospheric effects and interaction with objects in the transmission paths, like enclosure around the manufacturing area, boundary wall, greenbelt, etc.

The noise levels at the source for similar type of units will be in the range of 55-65 dB(A). The same has been observed during project site ambient noise monitoring done for baseline study.

However, for noise modeling purpose, the Lmax value of 90 dBA was considered. Noise generation is assumed at 2 m above ground level and spreading on a flat terrain devoid of any barriers. The maximum noise level at the nearest human settlement measured is 48.8 dB (A), which has been considered as background noise level. Noise attenuation effects due to barriers like grasses, shrubs, bushes and trees, air absorption, effect of wind, temperature and humidity, dense greenbelt were not considered for modeling. Figure 4.4 shows the noise levels at distance 100 m, 200 m, 300 m, 400 m, and 500 m. Therefore, noise impact will become insignificant at the plant boundary and will further decrease at nearest human settlements outside the premises. The noise level will remain at 48.8 dBA at nearest habitation, which is within the prescribed National Standards.

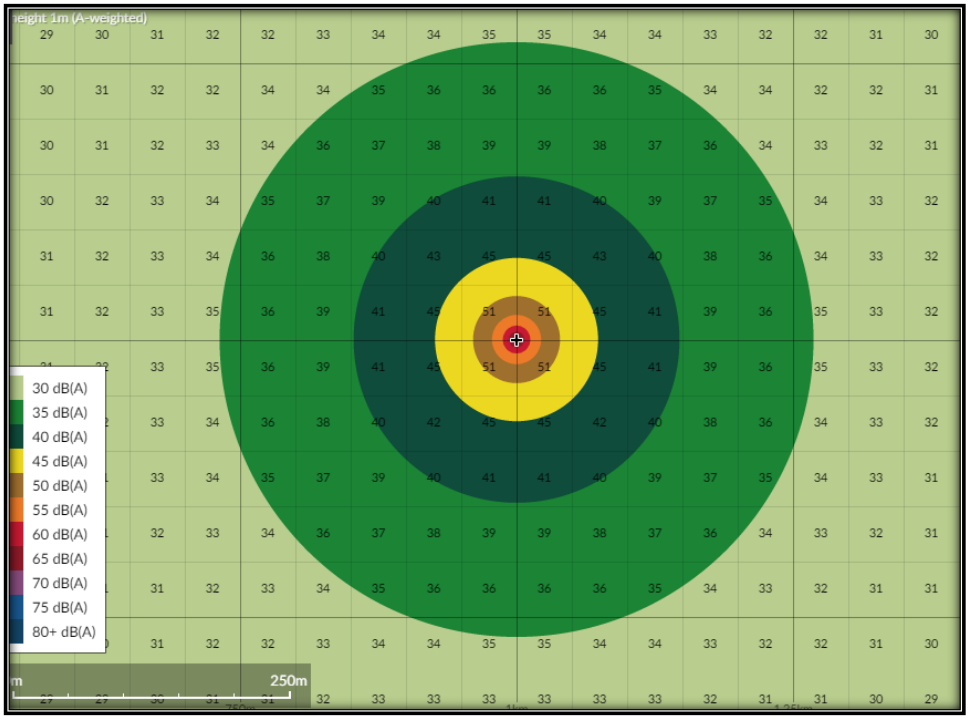


Figure 4. 10 Standard Noise Contours from 90dB Source (Sourcehttps://noisetools.net/dbmap)

Major Sources of Noise& Vibration: Material handling systems, mechanical equipment, pressure water pumps, and vehicle movement within the plant area.

Mitigation Measures

- Regular maintenance of machines and equipment, provision of PPEs.
- Provide acoustic enclosure for DG sets.
- Restricting vehicular movement during night.
- Adequate greenbelt development along the boundary of the site.
- Regular noise level monitoring.
- use of ear muff/ ear plug wherever required
- Employee training on noise exposure hazards and enforcement of use of protective devices.

4.3.3 Water Environment

A) Construction Phase:

Impact on Water Resources and Mitigation Measures

There is no significant impact on water resources due to project construction activity as it will be for a very short period and construction water will be required only for civil foundation structure which is very less. As estimated, average 4-5 nos. of workers would be required during construction phase. Water requirement during construction phase would be sourced through existing onsite tube-well. Existing toilets and sanitation facilities will be used by the workers during construction phase. Therefore, no mitigation measures are suggested.

B) Operation Phase:

Impact on Water Resources and Mitigation Measures

Water is a major raw material in the proposed manufacturing process. The main impact on water resources will be due to withdrawal of fresh groundwater during operation phase. As estimated, total fresh water requirement during post expansion operation phase will be approx. 246.5 KLD including domestic, green area and industrial purposes. Fresh water would be sourced through onsite existing bore-well duly approved by the concerned authority. No onsite groundwater recharge system is proposed as it is a chemical plant. One underground tank of capacity 27 cum will be provided to collect rooftop runoff to use in for industrial purpose during rainy days.

Effluent Management and Disposal: No process effluent will be generated from the manufacturing plant. Main sources of industrial wastewater generation are from –

- RO rejects [70 KLD]
- Softener plant regeneration [once/twice in a week] effluent [1 KLD]
- Cooling tower blow down [2 KLD]
- Equipment washing 2 KL during shut down & maintenance of the plant before end of one operation cycle once in 3-4 months.

All industrial effluent will be recycled within the premises after proper treatment. Details of treatment method suggested for industrial effluent is given in section 2.10.1 in Chapter 2. The schematic diagram of ETP based on physic-chemical treatment is given below –

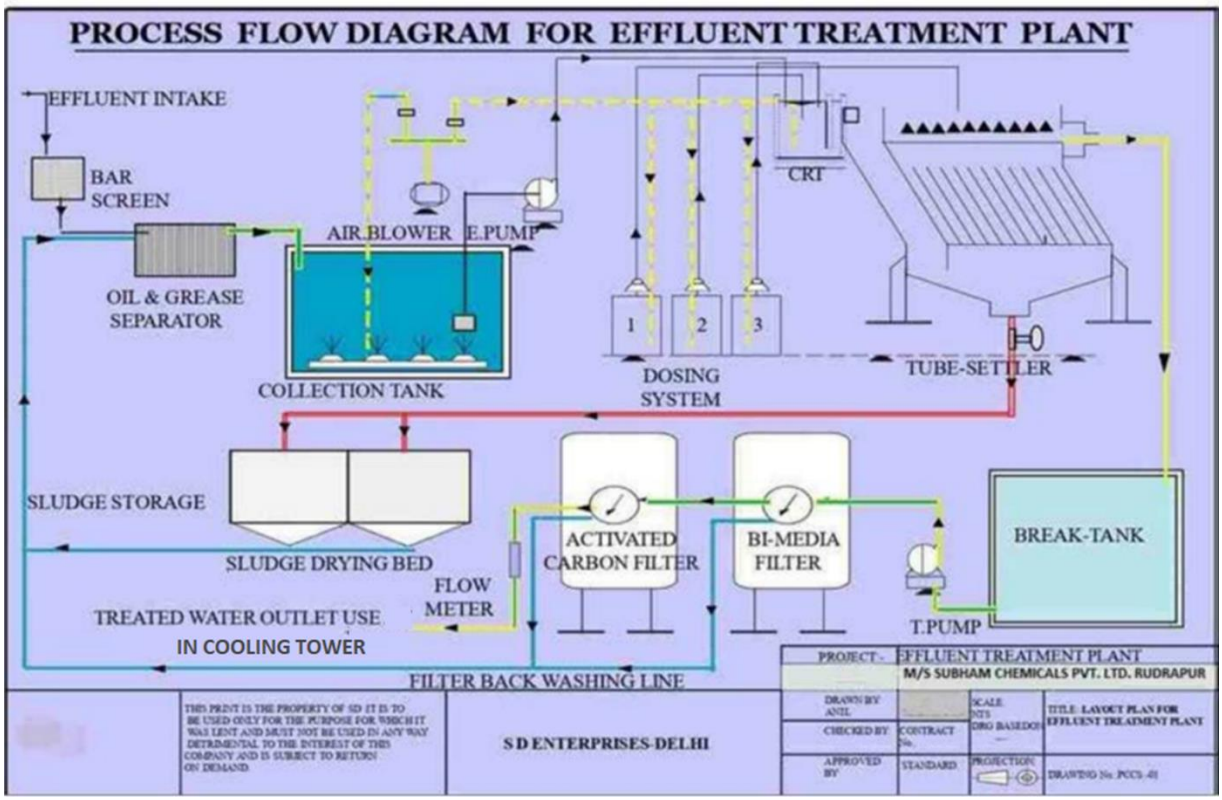


Figure 4. 11: Proposed ETP Schematic Flow Diagram

Besides, a small quantity of wastewater [approx. 0.4 KLD] will be generated from domestic usages during post expansion phase which will be treated in proposed small STP of capacity 1 KLD and used in green area. The schematic diagram of STP is given below –

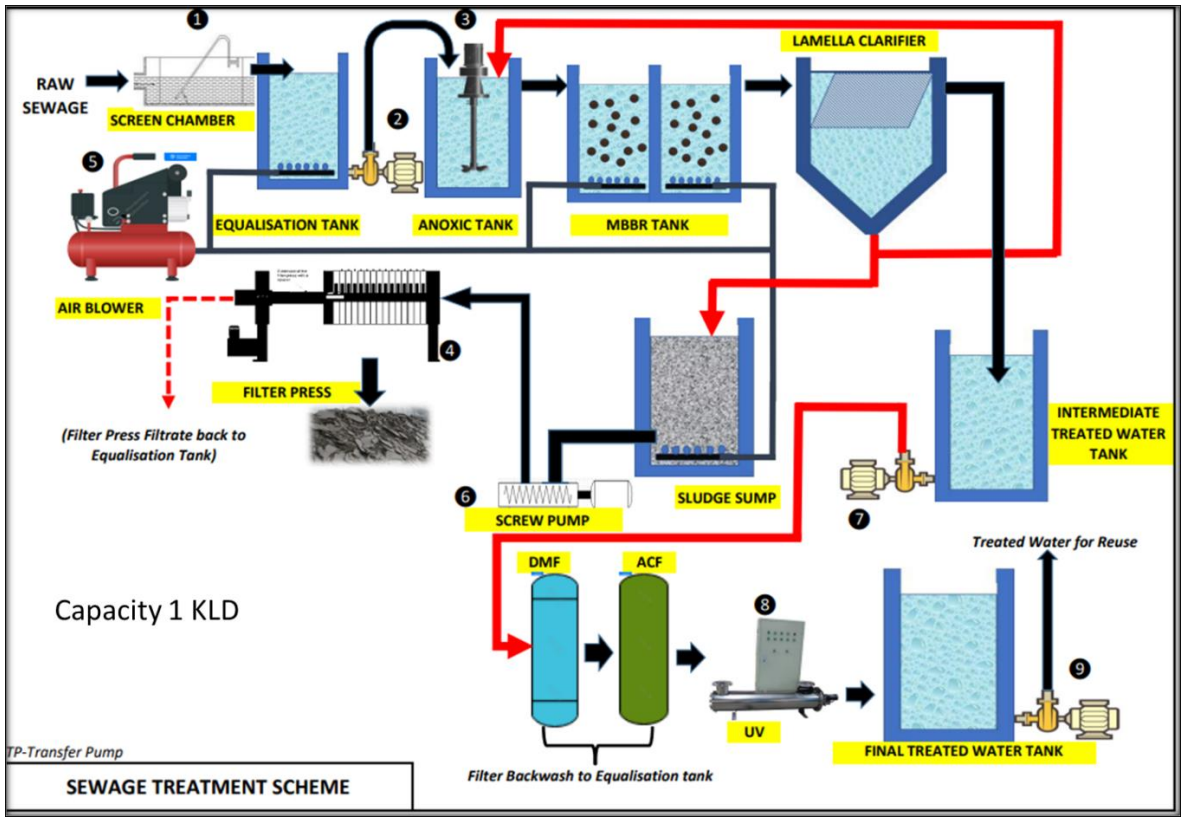


Figure 4. 12: Proposed STP Schematic Flow Diagram

Separate storm water and industrial waste water drains to will be provided to eliminate chances of mixing of rainwater with wastewater. Being a chemical unit, it is recommended to provide drainage in the process plant area treat the effluent generated if any in the ETP during any accidental or unprecedented shut down of the plant.

By implementing the above, no significant adverse impact on the surface and ground water or soil quality is envisaged.

4.3.4 Impact due to Solid Waste Disposal

A) Construction Phase

Construction phase waste generation will be less as no major construction at site will be undertaken. Construction waste will be categorized into recyclable and non-recyclable wastes and will be disposed accordingly.

B) Operation Phase

Municipal solid wastes will be generated which is very limited in quantity [approx. 2 kg/day] and disposed as per local norms.

Hazardous Waste Generation and Disposal – Very little quantity of hazardous waste like ETP Sludge, empty barrels of hazardous chemicals and used oil will be generated. Details of hazardous waste generation and mode disposal from the existing unit and proposed project are given in

section 2.10.3 in Chapter 2. The unit will obtain HW authorization from State Pollution Control Board. Agreement with the Common HWTSDF has been made for safe disposal of hazardous wastes. The groundwater quality will be regularly monitored around the site. No impact is envisaged if all the procedure related storage and disposal of wastes are followed.

However, in case of any accidental spillage or disposal of hazardous wastes, there will be possible groundwater and soil contamination. Adequate spill control mechanism will be followed.

4.3.5 Impact on Biodiversity and Mitigation Measures

A) Construction Phase

The proposed expansion activity does not require any tree cutting. The study zone does not have any ecologically sensitive location. Also, no major construction activities will be carried at site except civil foundation structures. Hence, there will not be any impact on the ecology and biodiversity.

B) Operation Phase

During operation phase, there is possibility that flora and fauna of nearby area get affected by transportation of raw materials, work force and finished goods, operation of plant and machinery leading to increase in noise level at the site. Biodiversity and ecology may also get impacted due to handling and storage of chemicals, accidental leakage of chemicals.

The area is devoid of any kind of vulnerable, endangered and critically endangered flora and fauna. Apart from that the study area within 10 km of the project site is devoid of any national parks, sanctuaries, Biosphere reserves, wild life corridors, tiger/elephant reserves etc.

The unit is using HSD in existing utility units which will be continued during post expansion period. No additional boiler is proposed. The stack emissions from the project will be maintained as per the prescribed standards. As no additional boiler is proposed for the expansion project and that also will be operated once in a production cycle for 4-5 hours, incremental GLC of pollutants due to the operation of boiler and DG units will be very less. Therefore, there will be negligible impact on the biodiversity of surrounding areas.

Mitigation Measures

- All industrial effluent will be recycled back, No wastewater will be discharged outside except the domestic sewage which will be disposed through septic tank and soak pit.
- Solid wastes will be scientifically managed and disposed as per provisions of the applicable norms.
- Adequate green area [40%] has been earmarked within the premises which is more than the requirement. It will also attract local species of avifauna and fauna of that area that would be beneficial for ecology and biodiversity of the area.
- Already developed green area within the premises is on 980 $m^2$with approx. 254 trees. Some of the tree species planted at the site are Ficus, Neem, Ashok, Gulmohar, Areca Palm etc.
- Further 135.2 m^2 area shall be developed. Additional plantation with 164 nos. of trees will be done at the site.

- The project is not going to cause any fragmentation of habitat or disruption of food cycles or destruction of breeding grounds or blockade of migratory routes.
- Evergreen, native and fast-growing tree species with large and round canopy will be maintained. Native species will be selected to adapt natural condition and requires less care and maintenance.
- Toxic and hazardous chemical will be stored in closed and leak proof tanks at designated separate place having spill control system complying with norms.
- Wastewater will be properly treated and entire quantity will be recycled.
- Proper and on time servicing of transportation vehicle and machinery will be ensured to keep the noise level and emission within level.

4.3.5.1 Carbon Sequestration Estimation

Existing Plantation –

Overall carbon sequestration potential of 23 different plant species in the existing greenbelt of the premises is given below -

SN	tree name	Avg. Height [ft.]	Avg. Dia D [inch]	CO2 sequestration/Tree	No. of Tree	Total CO_2 Kg
1	ARECA PALM	8	1.91	5.28	157	829.14
2	Areca palm in vase	5	0.96	0.83	14	11.55
3	NEEM	16	2.87	23.77	4	95.06
4	Guava	19	4.94	83.70	6	502.23
5	Gulmohar	30	11.46	427.77	1	427.77
6	Custard Apple	16	3.82	42.25	1	42.25
7	Chickoo sapota	22	7.64	232.37	1	232.37
8	Jack fruit	26	7.01	230.76	3	692.27
9	Mango	29	12.74	510.51	5	2552.55
10	Papaya	6.5	2.55	7.63	3	22.88
11	Lemon	6.5	2.39	6.70	4	26.82
12	Peepal (in vase)	3.25	0.48	0.13	5	0.67
13	Ashok	6.5	1.91	4.29	8	34.33
14	Kannair flower	9.5	2.71	12.59	4	50.34
15	Mehendi	6.5	2.23	5.84	1	5.84
16	Bottle palm	26	7.01	230.76	3	692.27
17	Tez Patta	6.5	1.91	4.29	1	4.29
18	Lasora	22	9.55	363.08	1	363.08
19	Pakhadh	26	27.07	2066.79	2	4133.58
20	Gudhal Flower	6.5	2.39	6.70	3	20.11
21	Lemon Grass	1.5	0.48	0.06	4	0.25
22	Basil	1.5	0.48	0.06	6	0.37
23	Others	10	6.27	71.02	17	1207.35
				Total	**254**	**11947.37**

Proposed Plantation –

For estimation of the projected carbon sequestration from the new plantation within the premises, base year with carbon sequestration value zero [0] has been considered as 2023 and projection has been made after 10 years in the year 2033. As estimated, total carbon sequestration from new plantation after 10 years will be 24.28 MT. Detail calculation is as follows –

SN	tree name	Avg. Height [ft.]	Avg. Dia D [inch]	CO2 sequestration/Tree	No. of Tree	Total CO_2 Kg
1	ARECA PALM	8	1.91	5.28	38	200.68
2	NEEM	16	2.87	23.77	30	712.95
3	Guava	19	4.94	83.70	5	418.52
4	Gulmohar	30	11.46	427.77	28	11977.60
5	Mango	29	12.74	510.51	10	5105.09
6	Ashok	6.5	1.91	4.29	28	120.15
7	Ficus	19.7	12.54	335.96	15	5039.34
8	Others	10	6.27	71.02	10	710.21
				Total	**164**	**24284.54**

4.3.6 Socio-economy

Impact

No resettlement and rehabilitation is involved in this project. Land is already under the possession of M/s Subham Polychem Pvt. Ltd. Impacts of proposed project during operation on demography and socio economic conditions would be overall positive. Some of them are as follows -

- Growth in industrial sector of local area
- Possibility of increase in employment due to increased business, trade and commerce.

Mitigation Measures

The overall project will have a long term benefit and hence no mitigation measure is required. As of now, no additional manpower is proposed. If required in future, preference to local people shall be given in employment as per skills.

4.3.7 Carbon Footprint

Carbon footprint has been calculated considering Scope 1 [direct] and Scope 2 emissions [indirect] considering the post expansion scenario.

Manufacturing Process –

Formaldehyde will be produced using Silver Catalyst Processes. The synthesis is carried out using catalytic oxidation and dehydration of methanol in contact with a silver catalyst. Several reactions take place during the conversion process:

$CH_3OH + 1/2\ O_2 \rightarrow CH_2O + H_2O$ dH = −159 kJ/mol (1)

Alternatively: $CH_3OH \rightarrow CH_2O + H_2$ dH = +84 kJ/mol (2)

$$H2 + 1/2\ O2 \rightarrow H2O\ dH = -243\ kJ/mol \qquad (3)$$

Reaction (3) is exothermic. The thermal energy released in this reaction maintains the temperature of the reactor and, at the same time, facilitates in reaction (2) the shift of the equilibrium to the right side. This increases the formation of formaldehyde. Parallel to the main reactions (1)–(3), some side reactions are carried out, reducing the efficiency of the process. The important side reactions are:

$$CH2O \rightarrow CO + H2 \qquad (4)$$

$$CH2O + 1/2\ O2 \rightarrow HCOOH \text{ and } CO + H2O \qquad (5)$$

$$CH2O + O2 \rightarrow CO2 + H2O \qquad (6)$$

No use of off-gases is considered. HSD is purchased for the generation of steam through a boiler of capacity 0.5 TPH and external electric energy is required for the operation of the plant.

1. Carbon Footprint Estimation –

This estimation of carbon emission includes Scope 1 [direct] and Scope 2 emissions [indirect] considering the post expansion scenario.

Scope 1 Emission - Emissions from operations that are owned or controlled by the project proponent (incl. owned vehicles, direct fugitive emissions and direct air emissions).

Scope 2 Emission - Emissions from the generation of purchased or acquired electricity, steam, heating, or cooling consumed by the company.

Table 4. 8: Estimated Equivalent CO2 Emission

Parameter	Quantity	CO_2 Emission Factor	Carbon Footprint/day [MT/day CO_2]	Carbon Footprint/year [MT/Annum CO_2]
Emissions from the Manufacturing Process [Scope 1]				
Formaldehyde Production Using silver catalyst process	250 MT/day	0.089 Ton/T of Formaldehyde production *	22.25	8010
Emissions due to fuel [HSD] consumption in utility units				
Fuel (HSD) for boiler [5-6 hr operation in one complete production cycle and DG sets [max. 2 Hrs/day run] Consideration: Diesel with specific energy of 38 MJ/lit]	800 lit/month	74100 Kg/TJ ** ~ 2.8158 Kg/lit of diesel	0.075	27.375
			Total	8037.375
Emissions estimated due to electricity consumption [Scope 2]				
Electricity	200 KWh ~ 4800 KW/day	0.71 Kg/KW h ***	3.4	1241
			Total Emission [Scope 1 & 2]	**9278.4**

Emission Factor Reference Sources:

* **Process Emission factor reference source:** An Article on Process of Formaldehyde and Volatile Organic Compounds' Removal from Waste Gases by Jozsef Mursics, Danijela Urbancl and Darko Goricanec, Faculty of Chemistry and Chemical Engineering, University of Maribor, Smetanova Ulica 17, 2000 Maribor, Slovenia; jozsef.mursics@student.um.si (J.M.); darko.goricanec@um.si (D.G.) Published on 8 July 2020 by Applied Sciences, an international, open access journal on all aspects of applied natural sciences.

** Default emission factors for stationary combustion in manufacturing industries and construction - 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Chapter 2 – Stationery Combustion.

*** CO2 baseline Database for the Indian Power Sector User Guide, Version 18.0, December 2022 by Central Electricity Authority, Ministry of Power, Govt. of India.

Conclusion: As calculated, approx. 9278 MT/Annum CO2 will be generated during post expansion operation phase considering the project operates with full production capacity round the year. To mitigate the same to some extent, greed belt within the premises will be developed in line with the MoEF&CC requirement of 2500 trees per ha of the green area. Moreover, the company has installed solar power plant of 18 KW within the premises.

CHAPTER 10– ENVIRONMENTAL MANAGEMENT PLAN

10.1Preamble

The Environmental Management Plan (EMP) is a site-specific plan developed to ensure that the project is implemented in an environmentally sustainable manner where all contractors and subcontractors, including consultants, understand the potential environmental risks arising from the proposed project and take appropriate actions to properly manage that risk. The Environmental management plan [EMP]can be effectively implemented to mitigate pollution levels by observing the measures like avoidance, source reduction, on site recycling and offsite recycling as first choice followed by treatment, release and disposal.

The plan outlines existing and potential problems that may adversely impact the environment and recommends corrective measures where required. Also, the plan outlines roles and responsibility of the key personnel and contractors who are responsible to manage the project site.

The key benefits of the EMP are that it provides the organization with means of managing its environmental performance thereby allowing it to contribute to improved environmental quality. The other benefits include cost control and improved relations with the stake holders.

- **Commitment & Policy:** The proposed project management will strive to provide and implement the Environmental Management Plan that incorporates all issues related to air, noise, land, and water.

- **Planning:** This includes identification of environmental impacts, legal requirements and setting environmental objectives.

- **Implementation:** This comprises of resources available to the developers, accountability of contractors, training of operational staff associated with environmental control facilities and documentation of measures to be taken.

- **Measurement & Evaluation:** This includes monitoring, corrective actions, and record keeping.

10.2 Environment Management Plan

No major construction activity is proposed for this project except structural foundation work at the site. Pre-fabricated plant will be installed at site. Thereby, no major adverse impact on the surrounding environment is anticipated and no EMP is proposed. However, barricading the construction area, keeping the sand, aggregate, cement under cover, water sprinkling at site will keep the air environment clean.

Table 10. 1 Summarized Environment Management Plan during Operation Phase

Particulars	Mitigation Measures	Responsibility
Air Environment	<u>Fugitive Emission / Diffuse Emission</u> • Closed transfer of Methanol [raw material] and Formaldehyde [product] from respective storage to reactors and vice versa. • Mechanical seals will be provided in the reactors. • Good House Keeping Practices & Predictive Preventive Maintenance to ensure that emissions, leakages & spillages are contained. • Personal Protective Equipment (PPE) will be provided to workers. • Periodic proactive maintenance to be conducted. • The plant will be installed under a shed with all sides open and thereby providing adequate natural ventilation in the work zone. <u>Point Source of Emissions</u> • No additional point source of utility emission due to the proposed project except one additional DG set of capacity 480 KVA. Existing boiler would be sufficient to cater the proposed expansion. • Liquid fuel HSD will be used in existing boiler and generator sets. • Diesel generator sets will be used as back up during power cut. • Boiler and DG set are already provided with individual stacks of adequate height as per norms. The unit has already developed adequate green area of approx. 980 m^2 [35%] within the premises. Additional 135.2 m^2 area will be further developed within the premises making the green area as 40% of plot area.	Env. Management Dept.
Water Environment	• Industrial wastewater like RO rejects would be passed through softener plant and used in cooling tower make up. • Cooling tower blow down would be would be treated in ETP and recycled in green area. • Softener regeneration effluent will be would be treated in ETP and recycled in green area. • Equipment washings during shut down once process cycle is completed would be treated in ETP and recycled in cooling tower. • Domestic wastewater will be disposed through proposed STP of capacity 1 KLD and treated effluent would be recycled in green area. • No industrial effluent will be discharged outside. • Underground tank of capacity 27 cum will be constructed to collect single storm water runoff from rooftop area for reuse. • Proper collection, segregation and disposal of solid wastes. • Proper storage and disposal of hazardous wastes. • Ensure prompt cleaning up of accidental spillages, if any.	Env. Management Dept.

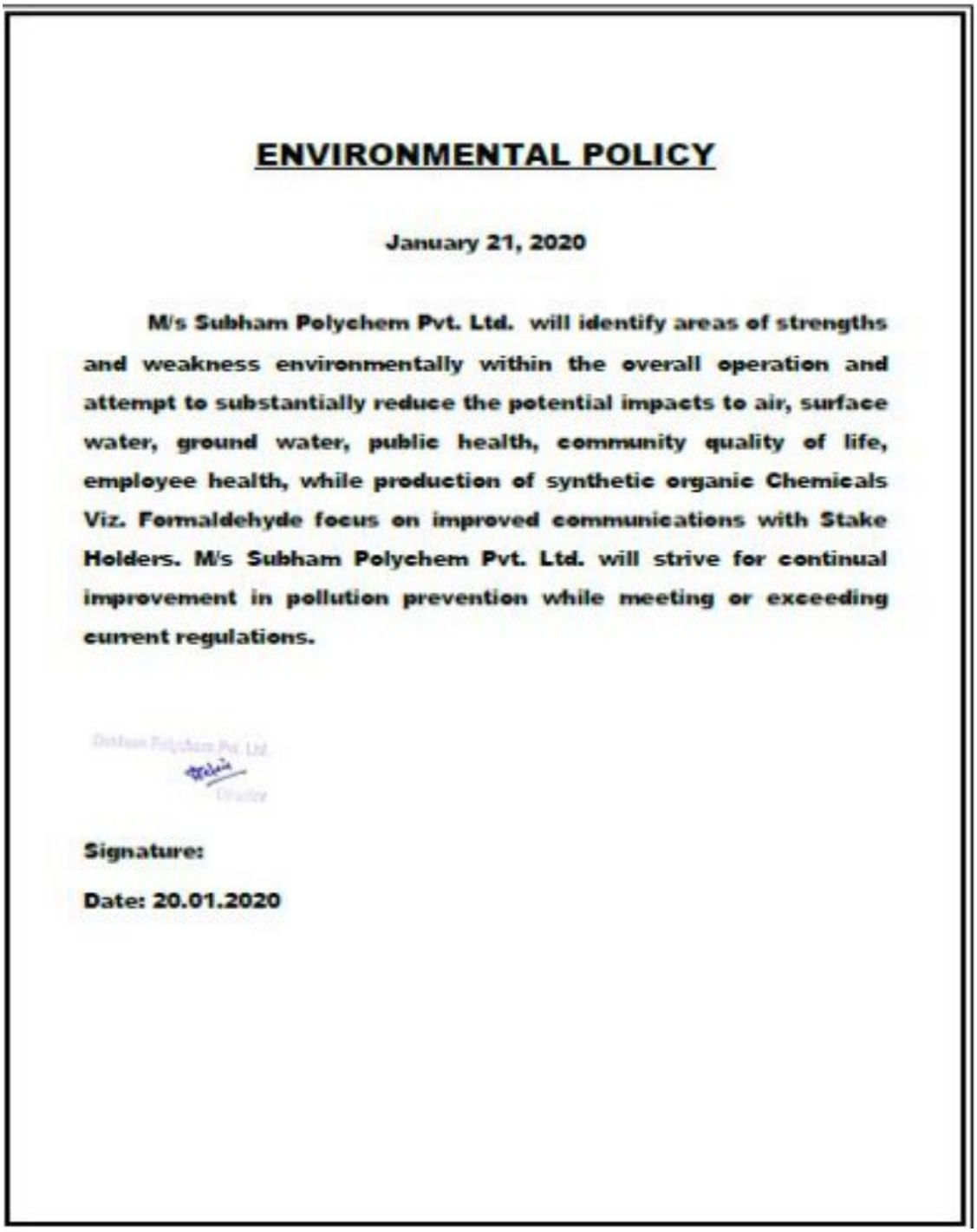
Solid Waste	• Little quantities of hazardous wastes will be generated from the existing as well proposed plant which will be stored onsite at a secured place and disposed in compliance with the HW Rules 2016. • HW Authorization will be obtained from the SPCB. • Record keeping and submission of returns to be continued as existing as per rules. • MSW– to be disposed as per local body norms.	Env. Management Dept
Noise Environment	• Regular equipment maintenance and better work habits will be adopted. • Generator sets will be provided with acoustic enclosure. • Necessary safety and personal protective equipment such as ear plugs, ear muffs etc. will be provided to the workers as per requirement. • Maintaining the green belt within the premises to reduce the noise level.	Env. Management Dept
Occupational Health of Employees	• First aid facility shall be provided at the site. Serious cases will be referred to nearby Hospital depending on the need. • Pre-employment and periodic medical examination of all employees. • Provision of masks and ear-muff / ear plugs, helmets to workers. • Periodic monitoring of work place ambient air quality. • Annual report of health status of workers with special reference to Occupational Health and Safety will be prepared.	HR
Traffic Management	• Marginal increase in ground level concentration of AAQ parameters due to post expansion vehicular traffic movement will be controlled by water sprinkling on the internal roads. • Adequate parking place and paved internal road are already existing within the premises. Vehicles will be parked strictly within premises. • Provision of rest room with toilets.	HR and security
Greenbelt Development	• 40% [1115.2 m^2] area earmarked as green area within the premises. • Existing old plantation of 254 trees of different species. • As per MoEF&CC norms, additional plantation with 164 nos. of trees will be done at the site • Fast growing perennial, evergreen and ornamental plants of local species have been selected in green belt.	Management

Safety and Risk Mitigation	• Standard recommended separate storage of hazardous chemical with fire proof arrangement and hydrocarbon detector. • Standard recommended risk mitigation measures for reducing spillages, fire, burns, injury, and avoiding accidents etc. during operation phase of the project shall be implemented. • Comprehensive DMP shall be prepared before commencement of plant operation. • Mock drills shall be done on regular basis. • Safety data sheets of the chemicals will be displayed at specific locations (near the storage and handling areas). • Fire fighting facilities will be established as per Fire approval. The existing approval from the Fire Department will be updated. • Personnel involved in handling of the hazardous chemicals will be properly trained and made aware of the safety data and related first-aid measures.	Plant Incharge
Monitoring the pollution levels, data keeping, transmitting and reporting	As described in the chapter Monitoring Plan	Management

10.3Institutional Set up for Environment Management

10.3.1 Environmental Policy of the Company

The management of Subham Polychem commits to operate its unit in an environment friendly sustainable manner. The management is committed to prevention of pollution, injury and ill-health to its employees. The Environmental policy adopted by the company is given below –



ENVIRONMENTAL POLICY

January 21, 2020

M/s Subham Polychem Pvt. Ltd. will identify areas of strengths and weakness environmentally within the overall operation and attempt to substantially reduce the potential impacts to air, surface water, ground water, public health, community quality of life, employee health, while production of synthetic organic Chemicals Viz. Formaldehyde focus on improved communications with Stake Holders. M/s Subham Polychem Pvt. Ltd. will strive for continual improvement in pollution prevention while meeting or exceeding current regulations.

Signature:

Date: 20.01.2020

Figure 10. 1 Environmental Policy of Subham Polychem Pvt. Ltd.

A detail Standard Operating Procedure and EMS will be prepared before commencement of the proposed project considering the environmental and safety norms. EMS also guides regarding any deviation/violation of the norms & such reports are submitted in the management review meeting.

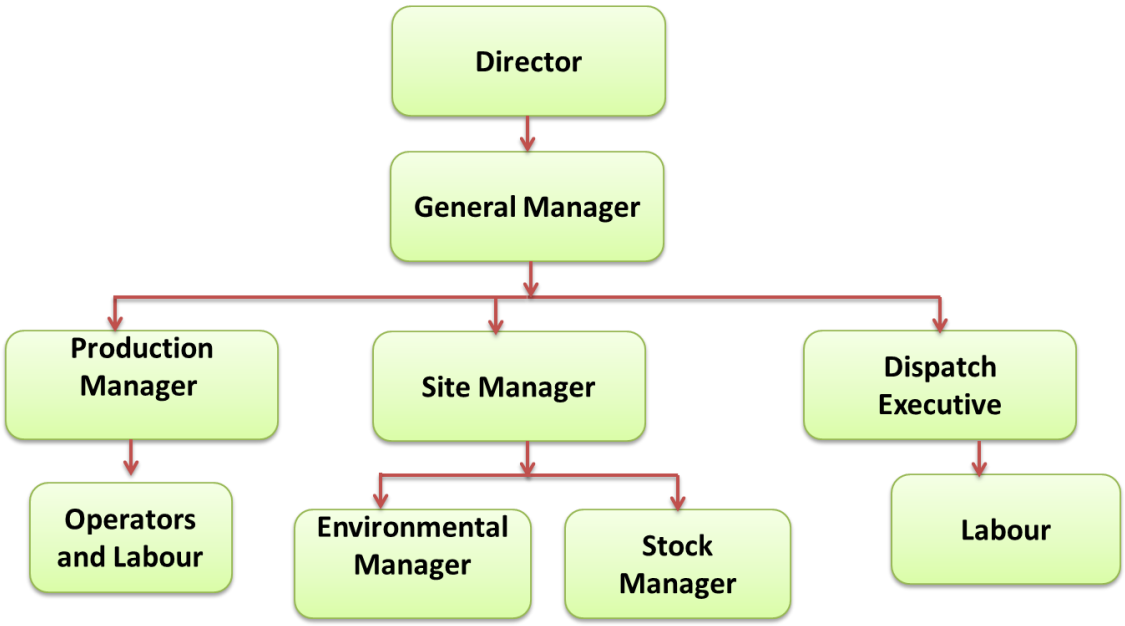
10.3.2 Environment Management Team

To facilitate the Environment Management System, one of the most important aspects is form an Environment Management Cell [EMC]. Qualified and experienced person in the field of

Environment either B. Tech or B. Sc will be appointed for overall responsibility for the management of all the issues related to Environment, Health and Safety within the plant. In consultation with in-charge of the plant, he will directly report to the Senior Management (Director) of the company for issues related to the Environment Management System of the unit. Responsibility of EMC is as under –

- Implementation of the recommendations made under Environment Management Plan.
- Collect information from regular monitoring and create a database.
- Analyze the data and decide the critical areas for immediate attention and corrective actions.
- Measurement of various parameters suggested in environmental monitoring program as per suggested schedule either internally or through external agency.
- Ensuring compliance with all conditions stipulated in Environmental Clearance and CTO.
- Prepare budget for environment management program and proper allocation of the funds.
- Ensure compliances to all statutory guidelines under Environmental Laws.
- To rectify the problem areas in the EMS, if any and provide necessary assistance in the form of replacement of any equipment or by improving performance of the same.
- Seeking expert guidance, as and when required.

The Directors of this company will check and verify the records once in a month. In case any specialized technical services/ audits are required, the same can be obtained from any external professionals/ companies. The company hierarchy structure is mentioned below:



10.1.1 Audit and Review

The Environmental Management Team would consist of Site Manager, Environment Manager and supporting staff reporting to the Directors. During the installation of the proposed plant and machineries, it will be ensured that all pollution control measures identified are implemented in a coordinated manner, linking the overall project implementation plans.

Once the installation is complete, monthly Operation Review Team (ORT) meetings for the project will be held. In these meetings in addition to routine Operation and Maintenance (O&M) problems, issues related to environment will also be discussed. Dedicated team for operation & maintenance of treatment and recycling of treated, Hazardous Waste storage &disposal etc. shall be formed. The issues related to the compliance of environmental norms including problems associated with the mitigation measures identified will be included in the agenda for quarterly review meetings, wherein action plan for remedial measures will be drawn and monitored.

Audit: A system of auditing will be undertaken at each proposed plant operations and includes the use of trained internal auditor. In addition, auditing should be undertaken to ensure compliance with all the applicable legislations. The results of monitoring and auditing shall be regularly reported through the senior management team to ensure that action items are addressed.

Audit Type Frequency:
Internal – once in a year
External – independent expert every 12 months, if needed.
Non-conformity, Corrective Action and Preventive Action: The Site Manager will look after all environmental issues and ensure compliance with Environmental Clearance conditions/SPCB norms. The Site Manager will report to the designated partner for EHS in the firm and discuss the non-compliance, if so any. An immediate solution will be arrived at to ensure compliance with norms. Detail procedure will be laid before commencement of operation. The key elements of the process include:

1) Identification of Non-conformance and /or Non-compliance
2) Recording of Non-conformance and/or Non-compliance
3) Evaluation of the Non-conformance and/or Non-compliance to determine specific corrective and Preventive actions
4) Corrective and preventive actions to be assigned to responsible persons and
5) Management Review of corrective actions to ensure the status and effectiveness of the actions

10.4 Greenbelt Development Plan

The main objective of the greenbelt is to provide a barrier between the plant and the surrounding areas. Greenbelt is thus a set of rows of trees planted in such a way that they form an effective barrier between the plant and the surroundings. The greenbelt absorbs both gaseous and particulate pollutant in the air and forming sink for pollutants. It also helps to attenuate the noise generated in the plant apart from improving the aesthetics of the plant site. Greenbelt also enhances and improve the biological resources and thereby benefit the socio-economic status of the local community. In order to control the industrial pollutants, dense tree plantations are necessary.

- As per new revised plan, an area of 1115.2sq m [40% of the plot area] has been earmarked as green area. Existing green area of 980 m^2 [35%] is already developed with 254 trees of different species. Additional plantation will be done with 164 trees.

- Total 16 species have been identified as per the CPCB guideline for green belt development and through secondary sources for mitigating air pollution impacts.
- Layout plan showing old existing plant species and new plantation is shown in **Figure 10.2**.
- New plantation details with species name and no. of each species planted are as below –

Table 10. 2 Greenbelt Development Program

S. No.	Components	No. of Trees			Total Budget (in INR)
		Existing	Proposed	Total	
1.	No. of Trees	254	164	418	167200/- (418*400)
2.	Maintenance of Greenbelt	100,000	100,000	200,000	200,000
				Total	**367200/- ~ 3.6 lakh**

Table 10. 3: Details of Greenbelt Development within the Premises

S. No.	Existing Tree Name	No. of Trees	Proposed Tree	No. of Trees
1	Areca Palm	157	Areca Palm	38
2	Areca palm in vase	14	Neem	30
3	NEEM	4	Gulmohar	28
4	Guava	6	Ashok	28
5	Gulmohar	1	Guava	5
6	Custard Apple	1	Ficus	15
7	Chickoo sapota	1	Mango	10
8	Jack fruit	3	Others	10
9	Mango	5		
10	Papaya	3		
11	Lemon	4		
12	Peepal (in vase)	5		
13	Ashok	8		
14	Kannair flower	4		
15	Mehendi	1		
16	Bottle palm	3		
17	Tez Patta	1		
18	Lasora	1		
19	Pakhadh	2		
20	Gudhal Flower	3		
21	Lemon Grass	4		
22	Basil	6		
23	Others	17		
	Total Existing	**254**	**Total Proposed**	**164**

Figure 10. 2: Existing Plantation Photographs

Following activities will be carried out for maintaining the greenbelt area:

- Annual planning for tree plantation with specific number of trees to be planted will be prepared and fulfillment of the plan will be monitored by the EMC every six months.
- A plan for post plantation care will be reviewed in the monthly meetings. Any abnormal death rate of planted trees will be investigated and acted upon immediately.
- Watering of the plants, weeding, hoeing will be carried out on regular basis.

10.5 Occupational Health Management Plan

Direct exposure to chemicals may affect health of employees. Methanol used for process is handled in closed handling facilities. Personal Protective Equipment (PPE)i.e., hand gloves, safety goggles, safety shoes, safety helmets, respiratory masks etc. will be provided to all the workers as per requirement.

Worker exposure to chemicals can occur during manufacturing in case of accidental spill, leak or discharge from the process system and contaminate areas where workers are present. Health and safety hazards may be controlled by strictly following the SOP and implementing appropriate control measures (e.g., process modifications, engineering controls, administrative practices, personal and respiratory protective equipment).

Subham Polychem Pvt. Ltd. will follow a medical program of pre-employment screening, periodic medical examination, emergency treatment and record keeping and review. The pre-employment screening and periodic medical examination shall follow the guidelines of factories act. The pre-

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

All employees have to undergo yearly medical checkups. The medical histories of all the employees shall be maintained in a standard format. The format contains Sl.No. Date, Name, Code, Dept, Age, Sex, Height, Weight, Vision, Pulse rate, BP, audiometry, Blood Group, RH Typing, Routine Blood Sugar Test, Spirometry, Chemical Allergy. Annual Report of health status of workers shall be prepared.

A detail procedure will be laid before commencement of operation of the plant. HR would ensure the following –

- Yearly medical plan for employee would be executed.
- Maintain the record of health checkup for all permanent employees as per requirement.
- Update the management if some deviation or recurring health problem appears in employee.
- Check the medical report of new employee & ensure fitness before joining the work.

As per present plan, Fund Allocation for Occupation Health & Safety of workers will be as follows -

Particulars	Frequency	Capital Cost [INR]
Medical Check-ups	Yearly	100,000.00
PPEs and Other Safety Items	As per requirement	60,000.00
First Aid Box	-	10,000.00
Work Zone monitoring	Six Monthly	25,000.00
Safety Training	Quarterly	45,000.00
Miscellaneous	-	60,000.00
	Total	**INR 300,000.00**

10.6 Resource Conservation

Waste minimization audit, optimizing water intake in the process and handling of recycled waste materials forms part of resource conservation plan. The management along with the production team shall constantly evaluate various options of reduce, reuse and recycle for water conservation, reduction in wastewater generation, leakage/spillage control, avoidance of overflow and contamination. All industrial effluent will be recycled after suitable processing. The company shall implement the measures in order to:

- Reduce the usage of all raw materials by achieving more yield.
- Regularly review of new developments in the process technology and for the implementation of any suitable ones with an improved environmental profile.
- Subham Polychem shall have quality-assurance procedures to check the quality of raw materials.

10.6.1 Rainwater Harvesting

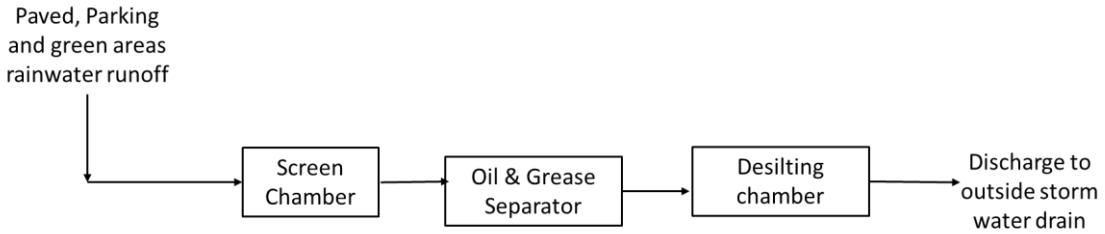
This is a Chemical Industry, RWH pits are not recommended to recharge the ground water by using the storm water inside the premises. One underground tank of capacity 27 cum will be provided to collect the single storm water generated from rooftop area only to reuse it in the cooling tower (peak hourly collection from rooftop will be 14.5 cum only).

Considering average 44 rainy days in a year and annual average rainfall of 861.4 mm, rainwater runoff potential has been estimated as below –

Rain Water Harvesting			
PARTICULARS	**Road/Paved/Parking Area**	**Green Area**	**ROOF TOP AREA**
Area (Sq m)	1313.7	1115.2	359
Runoff coefficient	0.8	0.2	0.9
Rainfall (m)	0.045	0.045	0.045
Peak hourly rainfall (cum)	47.29	10.04	**14.54**
15 min Volume	11.82	2.51	3.63
Total potential in 15 min	17.97		
Storage Vol. of Collection tank	27.00		
Average annual rainfall	0.8614	0.8614	0.8614
No. of days of rainfall in a year	43.8	43.8	43.8
Annual Runoff Potential	905.30	192.13	278.32
Total Annual Runoff Potential	1375.74		

Rainwater runoff from paved, parking and green areas will be directed to the covered storm water drainage network and after treatment will be discharged to outside storm water drain of adjacent to Highway.

Treatment Scheme of Rainwater Runoff before discharge to Outside Drain



10.6.2 Waste Minimization

Waste minimization is defined simply as: “a systematic approach to the reduction of waste at source, by understanding and changing processes and activities to prevent and reduce waste”. A variety of techniques can be classified under the term waste minimization, from basic housekeeping through statistical measurement, to application of clean technologies. A consequence of waste minimization will be the reduction of gaseous, liquid and solid emissions. The management will always explore the possible ways of waste minimization and it will be continuous throughout the project life cycle.

The message "reduce water consumption" will also be spread amongst the operating Staff. To reduce water consumption, following measures are recommended to be adopted -

- Installation of water meter to monitor consumption, rejects/effluent generation and recycle.
- Drip irrigation in the green area.
- Timely detection and repair of all leakages
- Avoid use of running water while washing hands

10.6.3 Energy Conservation

The plant will be installed under a shed with all sides open. Therefore, natural light and ventilation will be adequate. The project shall be optimized in terms of energy consumption and utilization.

- LED lights, energy efficient refrigerator and air-conditioners in the office building have been considered in this project.
- The existing unit has already installed solar power plant of 18 KW within the premises.

10.7 EMP Budget

Table 10. 4: EMP Budget during operational phase

Environment Budget (operational phase)		
Component	**Capital Cost (in INR lakh)**	**Recurring Cost (in INR Lakh/ Annum)**
Water Pollution control [Evaporator, segregation of effluent, ETP, STP, RWH tank etc.]	22	01
Solid waste Management [Non-hazardous, haz. and MSW]	6.0	0.5
Plantation and maintenance of greenbelt	5.0	2.0
Occupational Health	3.0	0.5
Plant Safety and Risk mitigation measures	12.0	1.0
Environment Management Dept. Staff, furniture, computers and printers	2.0	3.5
Environment Monitoring through external agency	Nil	1.5
Total	**50.0**	**10.0**

Table 10. 5: CER Fund Allocation
[Finalised after Public Hearing procedure]

As per OM 1st May 2018, 2% of project cost (4.50 Cr) i.e. 9.0 Lakh INR should be allocated under CER activities. However, proponent has allocated INR 11.16 Lakh for CER activities to be completed in next three years.

S. No.	CER Activities	Cost (Lakhs)
1.	Infrastructure for Drinking Water (RO) in Goyala village	**1.90**
2.	Installation of Solar PV light in School of village Goyala	**3.06**

3.	Plantation near project area	**3.50**
4.	Sanitation, health, education and skill development	**2.70**
	Total	**11.16**

SUMMARY & CONCLUSION

The earlier Final EIA report submitted by Subham Polychem Pvt. Ltd. and appraised by the EAC, MoEF&CC has been verified.

Chapter 2, 3, 4 and 10 has been revised/recompiled by us (M/s Ind Tech House Consult) based on the site visit, baseline monitoring results, discussion with the client and all the replies/presentation submitted to the EAC. The remaining part of the report remains same.

Chapter 2 Findings – The tail gas emission due to side reactions in the process was not mentioned in the report which has been included now.

ETP of capacity 5 KLD and STP of capacity 1 KLD have been proposed. Treated wastewater will be fully recycled within the premises. During rainy days, rooftop runoff will be collected and utilized in cooling tower. Accordingly, water balance with treatment and utilization scheme of effluent has been provided.

Chapter 3 Findings –As per the baseline monitoring conducted for one month, baseline ambient air quality was found higher than the same in the earlier report. It is observed that average concentration of parameters like SO2, NO2 and CO were found well within the NAAQS, 2009 limits as specified by CPCB except PM 10 and PM 2.5 which exceeded the standard at all monitored locations.

Chapter 4 Findings – Air quality modeling due to utility operations and vehicular emissions has been done fresh by Ind Tech House Consult and findings are provided in Chapter 4.

Carbon footprint has been estimated again considering Scope 1 and Scope 2 Emissions and found 9278.4 MT/annum of CO_2 which is slightly higher that earlier value reported. Solar PV plant of 18 KW already installed by the PP was also not mentioned in earlier report.

Chapter 10 Findings– Environmental Management Plan has been recompiled based on all submissions made earlier to EAC, MoEF&CC to avoid any ambiguity in future.

ANNEXURE A

One Month baseline Report October 2023

IND RESEARCH & DEVELOPMENT HOUSE PVT. LTD.

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TEST REPORT
(Ambient Air)

Report No. :	IRDH-1023-EIA-AAQ-909-01
Date of Reporting	03/11/2023
Name and Address	M/s Ind Tech House Consult, G-8/6, Ground Floor, Sector-11, Rohini, Delhi-110085
Project Name	Proposed Expansion for Manufacturing unit Of Formaldehyde At Khasra No. 1261 & 1262 SA, Plot no. 23, Vill- Goyala, Pargana- Mohana, Tal. Baksi Ka Talab, Deva Road, Lucknow-226019 by M/s Subham Polychem Pvt. Ltd.
Location	Project site- AAQ 1 (26°54'37.42"N 81° 4'16.98"E)
Month of Sampling	October 2023
Type of Monitoring	Ambient Air Monitoring (24 hourly)
Parameters to be sampled	PM2.5, PM10, SO2, NO2, CO
Method of sampling	As per standard Method
Sampled by	IR&DH Team

RESULTS

S. No.	Date	Project site- AAQ 1				
		$PM_{10}(\mu g/m^3)$	$PM_{2.5}(\mu g/m^3)$	$SO_2(\mu g/m^3)$	$NO_2(\mu g/m^3)$	CO (mg/m^3)
1	03/10/2023	75	44	6.3	16.4	0.71
2	06/10/2023	147	76	8.0	19.3	0.83
3	09/10/2023	132	70	7.1	18.8	0.80
4	13/10/2023	164	86	9.2	22.7	0.94
5	17/10/2023	126	65	6.9	17.4	0.78
6	20/10/2023	150	77	8.5	20.6	0.83
7	23/10/2023	181	94	10.1	25.1	0.96
8	27/10/2023	168	88	9.7	23.0	0.85
Minimum Value		75.00	44.00	6.30	16.40	0.71
Maximum Value		181.00	94.00	10.10	25.10	0.96
98th Percentile		179.18	93.16	10.04	24.81	0.96
Average Value		142.88	75.00	8.23	20.41	0.84

NAAQ Standards*

S. No.	Parameters	Industrial /Residential Area	Ecologically /Sensitive Area
01.	PM_{10} ($\mu g/m^3$)	100	100
02.	$PM_{2.5}$ ($\mu g/m^3$)	60	60
03.	SO_2 ($\mu g/m^3$)	80	80
04.	NO_2 ($\mu g/m^3$)	80	80
05.	CO (mg/m^3), 8 hourly	02	02

End of Test Report

Dr. SNA Rizvi
Authorized Signatory

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TEST REPORT
(Ambient Air)

Report No. :	IRDH-1023-EIA-AAQ-909-02
Date of Reporting	03/11/2023
Name and Address	M/s Ind Tech House Consult, G-8/6, Ground Floor, Sector-11, Rohini, Delhi-110085
Project Name	Proposed Expansion for Manufacturing unit Of Formaldehyde At Khasra No. 1261 & 1262 SA, Plot no. 23, Vill- Goyala, Pargana- Mohana, Tal. Baksi Ka Talab, Deva Road, Lucknow-226019 by M/s Subham Polychem Pvt. Ltd.
Location	Near R K Marriage Hall- AAQ 2(26°54'36.24"N 81° 5'18.85"E)
Month of Sampling	October 2023
Type of Monitoring	Ambient Air Monitoring (24 hourly)
Parameters to be sampled	PM2.5, PM10, SO2, NO2, CO
Method of sampling	As per standard Method
Sampled by	IR&DH Team

RESULTS

S. No.	Date	Near R K Marriage Hall- AAQ 2				
		$PM_{10}(\mu g/m^3)$	$PM_{2.5}(\mu g/m^3)$	$SO_2(\mu g/m^3)$	$NO_2(\mu g/m^3)$	CO (mg/m^3)
1	03/10/2023	80	48	6.6	17.1	0.74
2	06/10/2023	153	79	8.4	20.1	0.87
3	09/10/2023	140	73	7.4	19.6	0.84
4	13/10/2023	171	90	9.6	23.7	0.98
5	17/10/2023	135	68	7.2	18.2	0.81
6	20/10/2023	157	80	8.9	21.5	0.87
7	23/10/2023	190	98	10.5	26.2	1.00
8	27/10/2023	175	92	10.1	24.0	0.89
Minimum Value		80.00	48.00	6.60	17.10	0.74
Maximum Value		190.00	98.00	10.50	26.20	1.00
98^{th} Percentile		187.95	97.24	10.48	25.89	1.00
Average Value		150.19	78.54	8.59	21.31	0.87

NAAQ Standards*

S. No.	Parameters	Industrial /Residential Area	Ecologically /Sensitive Area
01.	PM_{10} ($\mu g/m^3$)	100	100
02.	$PM_{2.5}$ ($\mu g/m^3$)	60	60
03.	SO_2 ($\mu g/m^3$)	80	80
04.	NO_2 ($\mu g/m^3$)	80	80
05.	CO (mg/m^3), 8 hourly	02	02

End of Test Report

Dr. SNA Rizvi
Authorized Signatory

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TEST REPORT
(Ambient Air)

Report No. :	IRDH-1023-EIA-AAQ-909-03
Date of Reporting	03/11/2023
Name and Address	M/s Ind Tech House Consult, G-8/6, Ground Floor, Sector-11, Rohini, Delhi-110085
Project Name	Proposed Expansion for Manufacturing unit Of Formaldehyde At Khasra No. 1261 & 1262 SA, Plot no. 23, Vill- Goyala, Pargana- Mohana, Tal. Baksi Ka Talab, Deva Road, Lucknow-226019 by M/s Subham Polychem Pvt. Ltd.
Location	Near Tata Profile- AAQ 3 (26°54'35.87"N 81° 3'2.09"E)
Month of Sampling	October 2023
Type of Monitoring	Ambient Air Monitoring (24 hourly)
Parameters to be sampled	PM2.5, PM10, SO2, NO2, CO
Method of sampling	As per standard Method
Sampled by	IR&DH Team

RESULTS

S. No.	Date	Near Tata Profile- AAQ 3				
		$PM_{10}(\mu g/m^3)$	$PM_{2.5}(\mu g/m^3)$	$SO_2(\mu g/m^3)$	$NO_2(\mu g/m^3)$	CO (mg/m^3)
1	03/10/2023	68	45	6.1	16.3	0.71
2	06/10/2023	146	75	8.0	19.2	0.83
3	09/10/2023	131	69	7.1	18.7	0.80
4	13/10/2023	162	85	9.1	22.6	0.93
5	17/10/2023	125	64	6.9	17.3	0.78
6	20/10/2023	149	76	8.5	20.5	0.83
7	23/10/2023	179	93	10.0	25.0	0.95
8	27/10/2023	166	87	9.6	22.9	0.85
Minimum Value		68.00	45.00	6.10	16.30	0.71
Maximum Value		179.00	93.00	10.00	25.00	0.95
98^{th} Percentile		177.42	92.25	9.99	24.66	0.95
Average Value		140.69	74.44	8.16	20.29	0.83

NAAQ Standards*

S. No.	Parameters	Industrial /Residential Area	Ecologically /Sensitive Area
01.	PM_{10} ($\mu g/m^3$)	100	100
02.	$PM_{2.5}$ ($\mu g/m^3$)	60	60
03.	SO_2 ($\mu g/m^3$)	80	80
04.	NO_2 ($\mu g/m^3$)	80	80
05.	CO (mg/m^3), 8 hourly	02	02

End of Test Report

Dr. SNA Rizvi
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TEST REPORT
(Ambient Air)

Report No. :	IRDH-1023-EIA-AAQ-909-04
Date of Reporting	03/11/2023
Name and Address	M/s Ind Tech House Consult, G-8/6, Ground Floor, Sector-11, Rohini, Delhi-110085
Project Name	Proposed Expansion for Manufacturing unit Of Formaldehyde At Khasra No. 1261 & 1262 SA, Plot no. 23, Vill- Goyala, Pargana- Mohana, Tal. Baksi Ka Talab, Deva Road, Lucknow-226019 by M/s Subham Polychem Pvt. Ltd.
Location	Near Nishat Institute of Paramedical Institute- AAQ 4 (26°53'58.31"N 81° 6'23.42"E)
Month of Sampling	October 2023
Type of Monitoring	Ambient Air Monitoring (24 hourly)
Parameters to be sampled	PM2.5, PM10, SO2, NO2, CO
Method of sampling	As per standard Method
Sampled by	IR&DH Team

RESULTS

S. No.	Date	Near Nishat Institute of Paramedical Institute- AAQ 4				
		$PM_{10}(\mu g/m^3)$	$PM_{2.5}(\mu g/m^3)$	$SO_2(\mu g/m^3)$	$NO_2(\mu g/m^3)$	CO (mg/m^3)
1	03/10/2023	73	45	6.4	16.8	0.73
2	06/10/2023	160	78	8.2	19.8	0.85
3	09/10/2023	137	72	7.3	19.2	0.82
4	13/10/2023	167	88	9.4	23.2	0.96
5	17/10/2023	129	67	7.1	17.8	0.80
6	20/10/2023	161	79	8.7	21.1	0.85
7	23/10/2023	185	96	10.3	25.7	0.98
8	27/10/2023	170	90	9.9	23.5	0.87
Minimum Value		73.00	45.00	6.40	16.80	0.73
Maximum Value		185.00	96.00	10.30	25.70	0.98
98th Percentile		183.16	95.38	10.28	25.40	0.98
Average Value		147.79	76.79	8.42	20.90	0.86

NAAQ Standards*

S. No.	Parameters	Industrial /Residential Area	Ecologically /Sensitive Area
01.	PM_{10} ($\mu g/m^3$)	100	100
02.	$PM_{2.5}$ ($\mu g/m^3$)	60	60
03.	SO_2 ($\mu g/m^3$)	80	80
04.	NO_2 ($\mu g/m^3$)	80	80
05.	CO (mg/m^3), 8 hourly	02	02

End of Test Report

Dr. SNA Rizvi
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TEST REPORT
(Ambient Air)

Report No. :	IRDH-1023-EIA-AAQ-909-05
Date of Reporting	03/11/2023
Name and Address	M/s Ind Tech House Consult, G-8/6, Ground Floor, Sector-11, Rohini, Delhi-110085
Project Name	Proposed Expansion for Manufacturing unit Of Formaldehyde At Khasra No. 1261 & 1262 SA, Plot no. 23, Vill- Goyala, Pargana- Mohana, Tal. Baksi Ka Talab, Deva Road, Lucknow-226019 by M/s Subham Polychem Pvt. Ltd.
Location	Near Babu Banarasi Das University- AAQ 5 (26°53'15.12"N 81° 4'2.00"E)
Month of Sampling	October 2023
Type of Monitoring	Ambient Air Monitoring (24 hourly)
Parameters to be sampled	PM2.5, PM10, SO2, NO2, CO
Method of sampling	As per standard Method
Sampled by	IR&DH Team

RESULTS

S. No.	Date	Near Babu Banarasi Das University- AAQ 5				
		$PM_{10}(\mu g/m^3)$	$PM_{2.5}(\mu g/m^3)$	$SO_2(\mu g/m^3)$	$NO_2(\mu g/m^3)$	CO (mg/m^3)
1	04/10/2023	78	46	6.5	17.0	0.73
2	07/10/2023	152	79	8.3	20.0	0.86
3	10/10/2023	136	72	7.3	19.4	0.83
4	14/10/2023	170	89	9.5	23.5	0.97
5	18/10/2023	130	67	7.1	18.0	0.81
6	21/10/2023	155	80	8.8	21.3	0.86
7	25/10/2023	187	97	10.4	25.9	0.99
8	28/10/2023	174	91	10.0	23.8	0.88
Minimum Value		78.00	46.00	6.50	17.00	0.73
Maximum Value		187.00	97.00	10.40	25.90	0.99
98^{th} Percentile		185.24	96.31	10.38	25.64	0.99
Average Value		145.56	77.60	8.50	21.10	0.87

NAAQ Standards*

S. No.	Parameters	Industrial /Residential Area	Ecologically /Sensitive Area
01.	PM_{10} ($\mu g/m^3$)	100	100
02.	$PM_{2.5}$ ($\mu g/m^3$)	60	60
03.	SO_2 ($\mu g/m^3$)	80	80
04.	NO_2 ($\mu g/m^3$)	80	80
05.	CO (mg/m^3), 8 hourly	02	02

End of Test Report

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TEST REPORT
(Ambient Air)

Report No. :	IRDH-1023-EIA-AAQ-909-06
Date of Reporting	03/11/2023
Name and Address	M/s Ind Tech House Consult, G-8/6, Ground Floor, Sector-11, Rohini, Delhi-110085
Project Name	Proposed Expansion for Manufacturing unit Of Formaldehyde At Khasra No. 1261 & 1262 SA, Plot no. 23, Vill- Goyala, Pargana- Mohana, Tal. Baksi Ka Talab, Deva Road, Lucknow-226019 by M/s Subham Polychem Pvt. Ltd.
Location	Near Alaphur- AAQ 6(26°54'25.48"N 81°10'14.69"E)
Month of Sampling	October 2023
Type of Monitoring	Ambient Air Monitoring (24 hourly)
Parameters to be sampled	PM2.5, PM10, SO2, NO2, CO
Method of sampling	As per standard Method
Sampled by	IR&DH Team

RESULTS

S. No.	Date	Near Alaphur - AAQ 6				
		$PM_{10}(\mu g/m^3)$	$PM_{2.5}(\mu g/m^3)$	$SO_2(\mu g/m^3)$	$NO_2(\mu g/m^3)$	CO (mg/m^3)
1	04/10/2023	69	42	6.4	16.6	0.72
2	07/10/2023	149	77	8.1	19.6	0.84
3	10/10/2023	134	71	7.2	19.1	0.81
4	14/10/2023	166	87	9.3	23.0	0.95
5	18/10/2023	128	66	7.0	17.6	0.79
6	21/10/2023	152	78	8.6	20.9	0.84
7	25/10/2023	183	95	10.2	25.4	0.97
8	28/10/2023	170	89	9.8	23.3	0.86
Minimum Value		69.00	42.00	6.40	16.60	0.72
Maximum Value		69.00	42.00	6.40	16.60	0.72
98^{th} Percentile		181.65	94.45	10.18	25.15	0.97
Average Value		143.97	75.71	8.34	20.69	0.85

NAAQ Standards*

S. No.	Parameters	Industrial /Residential Area	Ecologically /Sensitive Area
01.	PM_{10} ($\mu g/m^3$)	100	100
02.	$PM_{2.5}$ ($\mu g/m^3$)	60	60
03.	SO_2 ($\mu g/m^3$)	80	80
04.	NO_2 ($\mu g/m^3$)	80	80
05.	CO (mg/m^3), 8 hourly	02	02

End of Test Report

Dr. SNA Rizvi
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TEST REPORT
(Ambient Air)

Report No. :	IRDH-1023-EIA-AAQ-909-07
Date of Reporting	03/11/2023
Name and Address	M/s Ind Tech House Consult, G-8/6, Ground Floor, Sector-11, Rohini, Delhi-110085
Project Name	Proposed Expansion for Manufacturing unit Of Formaldehyde At Khasra No. 1261 & 1262 SA, Plot no. 23, Vill- Goyala, Pargana- Mohana, Tal. Baksi Ka Talab, Deva Road, Lucknow-226019 by M/s Subham Polychem Pvt. Ltd.
Location	Near Goila Village- AAQ 7 (26°55'12.49"N 81° 2'24.84"E)
Month of Sampling	October 2023
Type of Monitoring	Ambient Air Monitoring (24 hourly)
Parameters to be sampled	PM2.5, PM10, SO2, NO2, CO
Method of sampling	As per standard Method
Sampled by	IR&DH Team

RESULTS

S. No.	Date	Near Goila Village- AAQ 7				
		$PM_{10}(\mu g/m^3)$	$PM_{2.5}(\mu g/m^3)$	$SO_2(\mu g/m^3)$	$NO_2(\mu g/m^3)$	CO (mg/m^3)
1	04/10/2023	62	39	6.0	15.7	0.68
2	07/10/2023	141	73	7.7	18.5	0.80
3	10/10/2023	127	67	6.8	18.1	0.77
4	14/10/2023	157	83	8.8	21.8	0.90
5	18/10/2023	121	62	6.6	16.7	0.75
6	21/10/2023	144	74	8.2	19.8	0.80
7	25/10/2023	174	90	9.7	24.1	0.92
8	28/10/2023	161	84	9.3	22.1	0.82
Minimum Value		62.00	39.00	6.00	15.70	0.68
Maximum Value		174.00	90.00	9.70	24.10	0.92
98^{th} Percentile		172.05	89.45	9.64	23.82	0.92
Average Value		135.94	71.61	7.90	19.60	0.80

NAAQ Standards*

S. No.	Parameters	Industrial /Residential Area	Ecologically /Sensitive Area
01.	PM_{10} ($\mu g/m^3$)	100	100
02.	$PM_{2.5}$ ($\mu g/m^3$)	60	60
03.	SO_2 ($\mu g/m^3$)	80	80
04.	NO_2 ($\mu g/m^3$)	80	80
05.	CO (mg/m^3), 8 hourly	02	02

End of Test Report

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TEST REPORT
(Ambient Air)

Report No. :	IRDH-1023-EIA-AAQ-909-08
Date of Reporting	03/11/2023
Name and Address	M/s Ind Tech House Consult, G-8/6, Ground Floor, Sector-11, Rohini, Delhi-110085
Project Name	Proposed Expansion for Manufacturing unit Of Formaldehyde At Khasra No. 1261 & 1262 SA, Plot no. 23, Vill- Goyala, Pargana- Mohana, Tal. Baksi Ka Talab, Deva Road, Lucknow-226019 by M/s Subham Polychem Pvt. Ltd.
Location	Naubasta Kala - AAQ 8 (26°54'26.11"N 81° 2'7.73"E)
Month of Sampling	October 2023
Type of Monitoring	Ambient Air Monitoring (24 hourly)
Parameters to be sampled	PM2.5, PM10, SO2, NO2, CO
Method of sampling	As per standard Method
Sampled by	IR&DH Team

RESULTS

S. No.	Date	Naubasta Kala - AAQ 8				
		$PM_{10}(\mu g/m^3)$	$PM_{2.5}(\mu g/m^3)$	$SO_2(\mu g/m^3)$	$NO_2(\mu g/m^3)$	CO (mg/m^3)
1	04/10/2023	64	42	6.2	16.0	0.69
2	07/10/2023	144	74	7.8	18.8	0.81
3	10/10/2023	129	68	6.9	18.4	0.78
4	14/10/2023	160	84	9.0	22.2	0.92
5	18/10/2023	123	63	6.7	17.0	0.76
6	21/10/2023	146	75	8.3	20.1	0.81
7	25/10/2023	177	92	9.9	24.5	0.94
8	28/10/2023	164	86	9.5	22.5	0.83
Minimum Value		64.00	42.00	6.20	16.00	0.69
Maximum Value		64.00	42.00	6.20	16.00	0.69
98th Percentile		174.92	90.94	9.80	24.22	0.93
Average Value		138.32	73.10	8.03	19.93	0.82

NAAQ Standards*

S. No.	Parameters	Industrial /Residential Area	Ecologically /Sensitive Area
01.	PM_{10} ($\mu g/m^3$)	100	100
02.	$PM_{2.5}$ ($\mu g/m^3$)	60	60
03.	SO_2 ($\mu g/m^3$)	80	80
04.	NO_2 ($\mu g/m^3$)	80	80
05.	CO (mg/m^3), 8 hourly	02	02

End of Test Report

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Authorized Signatory

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C-10, 2nd Floor, Sector-6, Noida-201301 (U.P.), Tel.: +91 120 4215489

TEST REPORT
(AMBIENT NOISE)

Report No. :	IRDH-1023-EIA-ANQ-909(1)
Date of Reporting	03/11/2023
Name and Address	M/s Ind Tech House Consult, G-8/6, Ground Floor, Sector-11, Rohini, Delhi-110085
Project Name	Proposed Expansion for Manufacturing unit Of Formaldehyde At Khasra No. 1261 & 1262 SA, Plot no. 23, Vill- Goyala, Pargana- Mohana, Tal. Baksi Ka Talab, Deva Road, Lucknow-226019 by M/s Subham Polychem Pvt. Ltd.
Location	Project site **ANQ1** (26°54'37.42"N 81° 4'17.19"E), Near Shreya Associates **ANQ2** (26°54'35.87"N 81° 3'2.09"E), Goila **ANQ3** (26°55'12.49"N 81° 2'24.84"E), Project Site **ANQ4** (26°54'37.98"N 81° 4'16.87"E)
Type of Monitoring	Hourly Reading for One time (24 hours)
Date of Sampling	ANQ 1 & ANQ 2-(03/10/2023 to 04/10/2023), ANQ 3 & ANQ 4-(06/10/2023-07/10/2023)
Method of sampling	As per standard Method
Sampling Protocol	IRDH/SOP-NS/22
Sampled by	IR&DH Team

RESULTS All Values in dB (A)

Time (Hrs.)	Leq. Day Time			
	ANQ1- (Project Site)	ANQ2- (Near Shreya Associates)	ANQ3- (Goila)	ANQ4- (Project Site)
06:00 - 07:00 AM	46.9	48.1	47.6	47.1
07:00 - 08:00 AM	48.5	50.7	50.1	49.6
08:00 - 09:00 AM	51.1	52.3	51.6	52.3
09:00 - 10:00 AM	53.4	54.5	53.9	54.5
10:00 - 11:00 AM	54.6	55.7	55.0	55.5
11:00 - 12:00 PM	55.3	54.9	54.3	56.7
12:00 - 13:00 PM	53.7	56.8	56.1	55.4
13:00 - 14:00 PM	52.1	55.4	54.8	53.6
14:00 - 15:00 PM	54.4	54.6	54.0	54.5
15:00 - 16:00 PM	55.8	57.0	56.3	55.0
16:00 - 17:00 PM	53.3	55.4	54.8	54.2
17:00 - 18:00 PM	54.5	54.5	53.9	53.4
18:00 - 19:00 PM	52.6	53.9	53.3	52.6
19:00 - 20:00 PM	50.3	52.6	51.9	50.3
20:00 - 21:00 PM	49.0	51.0	50.4	49.9
21:00 - 22:00 PM	47.9	48.4	47.9	47.5
Lday	**52.1**	**53.5**	**52.9**	**52.6**

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Report No. : IRDH-1023-EIA-ANQ-909(1)

Time (Hrs.)	Leq. Night Time			
	ANQ1- (Project Site)	ANQ2- (Near Shreya Associates)	ANQ3- (Goila)	ANQ4- (Project Site)
22:00 - 23:00 PM	44.8	44.6	45.3	44.7
23:00 - 24:00 PM	42.3	42.9	43.8	42.5
24:00 - 01:00 AM	40.9	41.5	42.5	40.2
01:00 - 02:00 AM	38.5	40.7	39.3	39.6
02:00 - 03:00 AM	39.0	39.0	38.7	38.4
03:00 - 04:00 AM	41.4	41.4	42.2	40.9
04:00 - 05:00 AM	42.6	43.5	43.6	42.5
05:00 - 06:00 AM	44.9	45.1	45.4	45.3
Lnight	**41.8**	**42.3**	**42.6**	**41.8**

All Values in dB(A)

CPCB Limits			
Sr. No		*Day Time*	*Night Time*
1.	*Industrial area*	*75*	*70*
2.	*Commercial area*	*65*	*55*
3.	*Residential area*	*55*	*45*
4.	*Silence Zone*	*50*	*40*

NOTE: Day reckon- 6:00 AM- 10:00 PM
Night reckon- 10:00 PM- 06:00 AM

End of Test Report

Dr. SNA Rizvi
Authorized Signatory

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TEST REPORT
(AMBIENT NOISE)

Report No. :	IRDH-1023-EIA-ANQ-909(2)
Date of Reporting	03/11/2023
Name and Address	M/s Ind Tech House Consult, G-8/6, Ground Floor, Sector-11, Rohini, Delhi-110085
Project Name	Proposed Expansion for Manufacturing unit Of Formaldehyde At Khasra No. 1261 & 1262 SA, Plot no. 23, Vill- Goyala, Pargana- Mohana, Tal. Baksi Ka Talab, Deva Road, Lucknow-226019 by M/s Subham Polychem Pvt. Ltd.
Location	Near Project Site **ANQ5** (26°54'36.87"N 81° 4'16.15"E), Near Project Site **ANQ6** (26°54'37.62"N 81° 4'17.60"E), Near R K Marriage Lawn **ANQ7** (26°54'36.24"N 81° 5'18.85"E)
Type of Monitoring	Hourly Reading for One time (24 hours)
Date of Sampling	ANQ 5, ANQ 6 & ANQ 7-(04/10/2023 to 05/10/2023)
Method of sampling	As per standard Method
Sampling Protocol	IRDH/SOP-NS/22
Sampled by	IR&DH Team

RESULTS All Values in dB (A)

Time (Hrs.)	Leq. Day Time		
	ANQ5- (Near Project Site)	ANQ6- (Near Project Site)	ANQ7- (Near R K Marriage Lawn)
06:00 - 07:00 AM	50.6	49.3	47.3
07:00 - 08:00 AM	53.1	52.9	49.8
08:00 - 09:00 AM	55.8	54.5	51.4
09:00 - 10:00 AM	57.0	57.7	53.6
10:00 - 11:00 AM	58.2	59.9	54.8
11:00 - 12:00 PM	61.4	60.1	54.0
12:00 - 13:00 PM	59.3	58.0	55.8
13:00 - 14:00 PM	60.9	61.6	54.5
14:00 - 15:00 PM	58.6	59.8	53.7
15:00 - 16:00 PM	57.5	58.2	56.0
16:00 - 17:00 PM	56.9	57.6	54.5
17:00 - 18:00 PM	58.0	59.7	53.6
18:00 - 19:00 PM	57.4	60.4	53.0
19:00 - 20:00 PM	59.0	58.8	51.7
20:00 - 21:00 PM	56.6	57.2	50.1
21:00 - 22:00 PM	53.8	54.6	47.6
Lday	**57.1**	**57.5**	**52.6**

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Report No. : IRDH-1023-EIA-ANQ-909(2)

Time (Hrs.)	Leq. Night Time		
	ANQ5- (Near Project Site)	ANQ6- (Near Project Site)	ANQ7- (Near R K Marriage Lawn)
22:00 - 23:00 PM	50.2	51.7	44.6
23:00 - 24:00 PM	47.6	48.2	43.3
24:00 - 01:00 AM	45.0	46.5	41.9
01:00 - 02:00 AM	43.1	44.7	39.5
02:00 - 03:00 AM	41.5	40.9	38.8
03:00 - 04:00 AM	42.8	43.4	40.4
04:00 - 05:00 AM	45.7	44.6	42.7
05:00 - 06:00 AM	47.3	46.7	45.8
Lnight	**45.4**	**45.8**	**42.1**

All Values in dB(A)

CPCB Limits			
Sr. No		*Day Time*	*Night Time*
1.	*Industrial area*	*75*	*70*
2.	*Commercial area*	*65*	*55*
3.	*Residential area*	*55*	*45*
4.	*Silence Zone*	*50*	*40*

NOTE: Day reckon- 6:00 AM- 10:00 PM
Night reckon- 10:00 PM- 06:00 AM

End of Test Report

Dr. SNA Rizvi
Authorized Signatory

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TEST REPORT
(Soil)

Report No. :	IRDH-1023-EIA-SL-909-01
Date of Reporting	03/11/2023
Issued to	M/s Ind Tech House Consult, G-8/6, Ground Floor, Sector-11, Rohini, Delhi-110085
Project Name	Proposed Expansion for Manufacturing unit Of Formaldehyde At Khasra No. 1261 & 1262 SA, Plot no. 23, Vill- Goyala, Pargana- Mohana, Tal. Baksi Ka Talab, Deva Road, Lucknow-226019 by M/s Subham Polychem Pvt. Ltd.
Nature of Sample	Soil
Identification of Sample	Soil sample collected from Papnamow Village **SL_1** (26°54'36.24"N 81°5'18.85"E), ChhatenaGarhi Village **SL_2** (26°54'58.58"N 81° 4'56.57"E), Mati Village **SL_3** (26°56'28.55"N 81° 5'1.07"E)
Date of Sampling	05/10/2023
Method of sampling	As per standard method
Date of testing:	05/10/2023 To 11/10/2023
Sampled by	IR&DH - Team

RESULTS

S. No.	Parameter	Test Method	SL_1	SL_2	SL_3	Unit
1.	pH	IS 2720 P-26 (1987)	7.66	7.60	7.62	--
2.	Conductivity	IS 14767 (RA 2016)	288.0	260.0	274.0	µS/cm
3.	Moisture	IS 2720 P-25 (1972)	11.5	13.0	12.6	% by mass
4.	Water Holding Capacity	IRDH/SOP-SL/07	18.5	20.6	19.2	%
5.	Specific Gravity	IS 2720 P-3 (1980)	1.94	1.92	1.94	-
6.	Bulk density	IRDH/SOP-SL/06	1.41	1.40	1.41	gm/cc
7.	Chloride	IRDH/SOP-SL/14	212.0	182.0	196.0	mg/kg
8.	Calcium	IRDH/SOP-SL/17	1340.0	1306.0	1322.0	mg/kg
9.	Sodium	IRDH/SOP-SL/11	112.0	96.0	102.0	mg/kg
10.	Potassium	IRDH/SOP-SL/12	62.50	52.0	58.2	mg/kg
11.	Magnesium	IRDH/SOP-SL/16	195.0	172.0	184.0	mg/kg
12.	Organic matter	IS 2720 P-22 (1972)	0.64	0.56	0.60	% by mass
13.	Cation Exchange Capacity(CEC)	IRDH/SOP-SL/09	15.1	14.2	14.7	meq/100gm
14.	Available nitrogen	IS 14684(1999)	38.0	32.0	36.2	mg/kg
15.	Available Phosphorous	IRDH/SOP-SL/10	8.20	7.75	8.02	mg/kg

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S. No.	Parameter	Test Method	SL_1	SL_2	SL_3	Unit
16.	Iron as Fe	IRDH/SOP-SL/22	1035.0	1006.0	1014.0	mg/kg
17.	Copper as Cu	IRDH/SOP-SL/21	19.0	16.0	17.2	mg/kg
18.	Zinc as Zn	IRDH/SOP-SL/20	28.0	24.0	26.0	mg/kg
19.	Texture	IRDH/SOP-SL/08				% by mass
	Sand		53.3	54.2	52.8	
	Clay		18.8	19.9	19.1	
	Silt		27.9	25.9	28.1	
20.	Sodium Absorption Ratio(SAR)	IRDH/SOP-SL/13	0.75	0.66	0.69	By calculation

End of Report

Dr. SNA Rizvi
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TEST REPORT
(Soil)

Report No. :	IRDH-1023-EIA-SL-909-02
Date of Reporting	03/11/2023
Issued to	M/s Ind Tech House Consult, G-8/6, Ground Floor, Sector-11, Rohini, Delhi-110085
Project Name	Proposed Expansion for Manufacturing unit Of Formaldehyde At Khasra No. 1261 & 1262 SA, Plot no. 23, Vill- Goyala, Pargana- Mohana, Tal. Baksi Ka Talab, Deva Road, Lucknow-226019 by M/s Subham Polychem Pvt. Ltd.
Nature of Sample	Soil
Identification of Sample	Soil sample collected from Khiron Village **SL_4** (26°49'55.61"N 81°3'35.84"E), Golia **SL_5** (26°50'59.23"N 81°2'24.56"E),Project Site **SL_6** (26°54'37.42"N 81° 4'17.19"E)
Date of Sampling	05/10/2023
Method of sampling	As per standard method
Date of testing:	05/10/2023 To 11/10/2023
Sampled by	IR&DH - Team

RESULTS

S. No.	Parameter	Test Method	SL_4	SL_5	SL_6	Unit
1.	pH	IS 2720 P-26 (1987)	7.94	7.98	8.01	--
2.	Conductivity	IS 14767 (RA 2016)	262.0	274.0	282.0	µS/cm
3.	Moisture	IS 2720 P-25 (1972)	11.5	12.0	13.5	% by mass
4.	Water Holding Capacity	IRDH/SOP-SL/07	18.2	20.4	21.0	%
5.	Specific Gravity	IS 2720 P-3 (1980)	1.92	1.95	1.96	-
6.	Bulk density	IRDH/SOP-SL/06	1.40	1.41	1.42	gm/cc
7.	Chloride	IRDH/SOP-SL/14	202.0	219.0	224.0	mg/kg
8.	Calcium	IRDH/SOP-SL/17	1318.0	1340.0	1362.0	mg/kg
9.	Sodium	IRDH/SOP-SL/11	96.0	115.0	126.0	mg/kg
10.	Potassium	IRDH/SOP-SL/12	52.0	55.2	60.4	mg/kg
11.	Magnesium	IRDH/SOP-SL/16	174.0	180.0	198.0	mg/kg
12.	Organic matter	IS 2720 P-22 (1972)	0.52	0.58	0.62	% by mass
13.	Cation Exchange Capacity(CEC)	IRDH/SOP-SL/09	13.5	14.2	14.5	meq/100gm
14.	Available nitrogen	IS 14684(1999)	42.0	46.4	49.2	mg/kg
15.	Available Phosphorous	IRDH/SOP-SL/10	7.76	8.12	8.30	mg/kg

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S. No.	Parameter	Test Method	SL_4	SL_5	SL_6	Unit
16.	Iron as Fe	IRDH/SOP-SL/22	1020.0	1032.0	1056.0	mg/kg
17.	Copper as Cu	IRDH/SOP-SL/21	16.2	18.0	19.5	mg/kg
18.	Zinc as Zn	IRDH/SOP-SL/20	21.2	23.0	28.0	mg/kg
19.	Texture	IRDH/SOP-SL/08				% by mass
	Sand		53.9	54.1	56.2	
	Clay		19.2	20.1	19.5	
	Silt		26.9	25.8	24.3	
20.	Sodium Absorption Ratio(SAR)	IRDH/SOP-SL/13	0.65	0.78	0.84	By calculation

End of Report

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TEST REPORT

(Water)

Report No. :	IRDH-1023-EIA-WQ-909-01
Date of Reporting	03/11/2023
Issued to	M/s Ind Tech House Consult, G-8/6, Ground Floor, Sector-11, Rohini, Delhi-110085
Project Name	Proposed Expansion for Manufacturing unit Of Formaldehyde At Khasra No. 1261 & 1262 SA, Plot no. 23, Vill- Goyala, Pargana- Mohana, Tal. Baksi Ka Talab, Deva Road, Lucknow-226019 by M/s Subham Polychem Pvt. Ltd.
Nature of Sample	Ground Water
Identification of Sample	Water collected from Project Site WQ_1(26°54'37.25"N)(81° 4'16.57"E), Papnamow WQ_2 (26°54'36.24"N)(81°5'18.85"E), ChhatenaGarhi WQ_3 (26°54'58.58"N)(81°4'56.57"E)
Date of Sampling	05/10/2023
Method of sampling	As per standard method
Date of testing:	05/10/2023 To 11/10/2023
Sampled by	IR&DH – Team

RESULTS

S No.	Parameter	Test Protocol	WQ_1	WQ_2	WQ_3	Unit	Requirements as per IS 10500- 2012	
							Acceptable limits (Max)	Permissible limits(Max)
1.	pH	IS 3025 P-11 1983	7.52	7.56	7.62	--	6.5-8.5	No Relaxation
2.	Turbidity	IS 3025 P-10 (1984)	<0.5	<0.5	<0.5	NTU	1	5
3.	Total Hardness	IS 3025 P-21 (2009)	245.0	259.2	356.4	mg/l	200	600
4.	Total Dissolved Solids (TDS)	IS 3025 P-16(1984)	484.0	490.0	524.0	mg/l	500	2000
5.	Calcium as Ca	IS 3025 P-40 (1991)	69.12	70.56	92.16	mg/l	75	200
6.	Magnesium as Mg	IS 3025 P-46 (1994)	17.49	20.12	30.61	mg/l	30	100
7.	Total Alkalinity as $CaCO_3$	IS 3025 P-23 (1986)	240.0	252.0	270.0	mg/l	200	600
8.	Chloride as Cl	IS 3025 P-32 (1988)	83.37	87.34	89.33	mg/l	250	1000
9.	Barium as Ba	Annex F of IS:13428	<0.05	<0.05	<0.05	mg/l	0.7	No Relaxation
10.	Ammonia as N	IS 3025 P-34 (1988)	<0.1	<0.1	<0.1	mg/l	0.5	No Relaxation
11.	Sulphate as SO_4	IS 3025 P-24 (1986)	24.1	30.2	42.2	mg/l	200	400
12.	Nitrate as NO_3	IS 3025 P-34 (1988)	4.6	4.0	5.2	mg/l	45	No Relaxation

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Report No. - IRDH-1023-EIA-WQ-909-01

S No.	Parameter	Test Protocol	WQ_1	WQ_2	WQ_3	Unit	Requirements as per IS 10500- 2012	
							Acceptable limits (Max)	Permissible limits(Max)
13.	Fluoride as F	APHA,23rd Edition	0.38	0.40	0.43	mg/l	1	1.5
14.	Iron as Fe	IS 3025 P-53 (2003)	0.10	0.13	0.15	mg/l	1.0	No Relaxation
15.	Aluminium as Al	IS 3025 P-55(2003)	<0.01	<0.01	<0.01	mg/l	0.03	0.2
16.	Anionic Detergent	Annex K of IS:13428	<0.05	<0.05	<0.05	mg/l	0.2	1
17.	Phenolic Compounds	IS 3025 P-43 (1992)	<0.001	<0.001	<0.001	mg/l	0.001	0.002
18.	Boron as B	IS 3025 P-57 (2005)	<0.1	<0.1	<0.1	mg/l	0.5	2.4
19.	Chromium as Cr	IS 3025 P-52(2003)	<0.01	<0.01	<0.01	mg/l	0.05	No Relaxation
20.	Lead as Pb	IS 3025 P47 (1994)	<0.01	<0.01	<0.01	mg/l	0.01	No Relaxation
21.	Copper as Cu	IS 3025 P42 (1992)	<0.01	<0.01	<0.01	mg/l	0.05	1.5
22.	Mercury as Hg	IS 3025 P-48 (1994)	<0.001	<0.001	<0.001	mg/l	0.001	No Relaxation
23.	Manganese as Mn	IS 3025 P-59 (2006)	<0.01	<0.01	<0.01	mg/l	0.1	0.3
24.	Zinc as Zn	IS 3025 P-49 (1994)	<0.01	<0.01	<0.01	mg/l	5	15
25.	Arsenic as As	IS 3025 P-37 (1988)	<0.01	<0.01	<0.01	mg/l	0.01	No Relaxation
26.	Nickel as Ni	IS 3025 P-54 (2003)	<0.01	<0.01	<0.01	mg/l	0.02	No Relaxation
27.	Cadmium as Cd	IS 3025 P-41 (1992)	<0.001	<0.001	<0.001	mg/l	0.003	No Relaxation

End of Report

Dr. SNA Rizvi
Authorized Signatory

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C-10, 2nd Floor, Sector-6, Noida-201301 (U.P.), Tel.: +91 120 4215489

TEST REPORT

(Water)

Report No. :	IRDH-1023-EIA-WQ-909-02
Date of Reporting	03/11/2023
Issued to	M/s Ind Tech House Consult, G-8/6, Ground Floor, Sector-11, Rohini, Delhi-110085
Project Name	Proposed Expansion for Manufacturing unit Of Formaldehyde At Khasra No. 1261 & 1262 SA, Plot no. 23, Vill- Goyala, Pargana- Mohana, Tal. Baksi Ka Talab, Deva Road, Lucknow-226019 by M/s Subham Polychem Pvt. Ltd.
Nature of Sample	Ground Water
Identification of Sample	Water collected from Moradabad WQ_4(26°55'57.63"N) (81°3'56.88"E), Dhawa WQ_5 (26°54'35.87"N)(81°3'2.09"E), Imlibandh Baba Mandir WQ_6 (26°54'9.57"N)(81°4'15.74"E)
Date of Sampling	05/10/2023
Method of sampling	As per standard method
Date of testing:	05/10/2023 To 11/10/2023
Sampled by	IR&DH – Team

RESULTS

S No.	Parameter	Test Protocol	WQ_4	WQ_5	WQ_6	Unit	Requirements as per IS 10500- 2012	
							Acceptable limits (Max)	Permissible limits(Max)
1.	pH	IS 3025 P-11 1983	7.54	7.52	7.50	--	6.5-8.5	No Relaxation
2.	Turbidity	IS 3025 P-10 (1984)	<0.5	<0.5	<0.5	NTU	1	5
3.	Total Hardness	IS 3025 P-21 (2009)	256.0	308.0	324.0	mg/l	200	600
4.	Total Dissolved Solids (TDS)	IS 3025 P-16(1984)	482.0	476.0	490.0	mg/l	500	2000
5.	Calcium as Ca	IS 3025 P-40 (1991)	70.4	57.6	52.8	mg/l	75	200
6.	Magnesium as Mg	IS 3025 P-46 (1994)	19.44	39.85	39.0	mg/l	30	100
7.	Total Alkalinity as $CaCO_3$	IS 3025 P-23 (1986)	240.0	264.0	270.0	mg/l	200	600
8.	Chloride as Cl	IS 3025 P-32 (1988)	87.34	81.39	85.36	mg/l	250	1000
9.	Barium as Ba	Annex F of IS:13428	<0.05	<0.05	<0.05	mg/l	0.7	No Relaxation
10.	Ammonia as N	IS 3025 P-34 (1988)	<0.1	<0.1	<0.1	mg/l	0.5	No Relaxation
11.	Sulphate as SO_4	IS 3025 P-24 (1986)	26.5	30.2	38.0	mg/l	200	400
12.	Nitrate as NO_3	IS 3025 P-34 (1988)	5.8	5.5	4.8	mg/l	45	No Relaxation

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Report No. - IRDH-1023-EIA-WQ-909-02

S No.	Parameter	Test Protocol	WQ_4	WQ_5	WQ_6	Unit	Requirements as per IS 10500- 2012	
							Acceptable limits (Max)	Permissible limits(Max)
13.	Fluoride as F	APHA,23rd Edition	0.50	0.46	0.42	mg/l	1	1.5
14.	Iron as Fe	IS 3025 P-53 (2003)	0.14	0.12	0.11	mg/l	1.0	No Relaxation
15.	Aluminium as Al	IS 3025 P-55(2003)	<0.01	<0.01	<0.01	mg/l	0.03	0.2
16.	Anionic Detergent	Annex K of IS:13428	<0.05	<0.05	<0.05	mg/l	0.2	1
17.	Phenolic Compounds	IS 3025 P-43 (1992)	<0.001	<0.001	<0.001	mg/l	0.001	0.002
18.	Boron as B	IS 3025 P-57 (2005)	<0.1	<0.1	<0.1	mg/l	0.5	2.4
19.	Chromium as Cr	IS 3025 P-52(2003)	<0.01	<0.01	<0.01	mg/l	0.05	No Relaxation
20.	Lead as Pb	IS 3025 P47 (1994)	<0.01	<0.01	<0.01	mg/l	0.01	No Relaxation
21.	Copper as Cu	IS 3025 P42 (1992)	<0.01	<0.01	<0.01	mg/l	0.05	1.5
22.	Mercury as Hg	IS 3025 P-48 (1994)	<0.001	<0.001	<0.001	mg/l	0.001	No Relaxation
23.	Manganese as Mn	IS 3025 P-59 (2006)	<0.01	<0.01	<0.01	mg/l	0.1	0.3
24.	Zinc as Zn	IS 3025 P-49 (1994)	<0.01	<0.01	<0.01	mg/l	5	15
25.	Arsenic as As	IS 3025 P-37 (1988)	<0.01	<0.01	<0.01	mg/l	0.01	No Relaxation
26.	Nickel as Ni	IS 3025 P-54 (2003)	<0.01	<0.01	<0.01	mg/l	0.02	No Relaxation
27.	Cadmium as Cd	IS 3025 P-41 (1992)	<0.001	<0.001	<0.001	mg/l	0.003	No Relaxation

End of Report

Dr. SNA Rizvi
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TEST REPORT

(Water)

Report No. :	IRDH-1023-EIA-WQ-909-03
Date of Reporting	03/11/2023
Issued to	M/s Ind Tech House Consult, G-8/6, Ground Floor, Sector-11, Rohini, Delhi-110085
Project Name	Proposed Expansion for Manufacturing unit Of Formaldehyde At Khasra No. 1261 & 1262 SA, Plot no. 23, Vill- Goyala, Pargana- Mohana, Tal. Baksi Ka Talab, Deva Road, Lucknow-226019 by M/s Subham Polychem Pvt. Ltd.
Nature of Sample	Ground Water
Identification of Sample	Water collected from Golden Blossom Impiral Resort WQ_7(26°53'55.09"N) (81° 5'45.48"E), Dewa hospital Jainabad Goila WQ_8 (26°55'28.82"N) (81°3'51.84"E)
Date of Sampling	05/10/2023
Method of sampling	As per standard method
Date of testing:	05/10/2023 To 11/10/2023
Sampled by	IR&DH – Team

RESULTS

S No.	Parameter	Test Protocol	WQ_7	WQ_8	Unit	Requirements as per IS 10500- 2012	
						Acceptable limits (Max)	Permissible limits(Max)
1.	pH	IS 3025 P-11 1983	7.58	7.51	--	6.5-8.5	No Relaxation
2.	Turbidity	IS 3025 P-10 (1984)	<0.5	<0.5	NTU	1	5
3.	Total Hardness	IS 3025 P-21 (2009)	300.0	264.0	mg/l	200	600
4.	Total Dissolved Solids (TDS)	IS 3025 P-16(1984)	530.0	478.0	mg/l	500	2000
5.	Calcium as Ca	IS 3025 P-40 (1991)	61.0	72.0	mg/l	75	200
6.	Magnesium as Mg	IS 3025 P-46 (1994)	36.0	20.41	mg/l	30	100
7.	Total Alkalinity as $CaCO_3$	IS 3025 P-23 (1986)	288.0	260.0	mg/l	200	600
8.	Chloride as Cl	IS 3025 P-32 (1988)	81.4	72.0	mg/l	250	1000
9.	Barium as Ba	Annex F of IS:13428	<0.05	<0.05	mg/l	0.7	No Relaxation
10.	Ammonia as N	IS 3025 P-34 (1988)	<0.1	<0.1	mg/l	0.5	No Relaxation
11.	Sulphate as SO_4	IS 3025 P-24 (1986)	40.2	36.2	mg/l	200	400
12.	Nitrate as NO_3	IS 3025 P-34 (1988)	6.2	4.8	mg/l	45	No Relaxation

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S No.	Parameter	Test Protocol	WQ_7	WQ_8	Unit	Requirements as per IS 10500- 2012	
						Acceptable limits (Max)	Permissible limits(Max)
13.	Fluoride as F	APHA,23rd Edition	0.46	0.37	mg/l	1	1.5
14.	Iron as Fe	IS 3025 P-53 (2003)	0.14	0.11	mg/l	1.0	No Relaxation
15.	Aluminium as Al	IS 3025 P-55(2003)	<0.01	<0.01	mg/l	0.03	0.2
16.	Anionic Detergent	Annex K of IS:13428	<0.05	<0.05	mg/l	0.2	1
17.	Phenolic Compounds	IS 3025 P-43 (1992)	<0.001	<0.001	mg/l	0.001	0.002
18.	Boron as B	IS 3025 P-57 (2005)	<0.1	<0.1	mg/l	0.5	2.4
19.	Chromium as Cr	IS 3025 P-52(2003)	<0.01	<0.01	mg/l	0.05	No Relaxation
20.	Lead as Pb	IS 3025 P47 (1994)	<0.01	<0.01	mg/l	0.01	No Relaxation
21.	Copper as Cu	IS 3025 P42 (1992)	<0.01	<0.01	mg/l	0.05	1.5
22.	Mercury as Hg	IS 3025 P-48 (1994)	<0.001	<0.001	mg/l	0.001	No Relaxation
23.	Manganese as Mn	IS 3025 P-59 (2006)	<0.01	<0.01	mg/l	0.1	0.3
24.	Zinc as Zn	IS 3025 P-49 (1994)	<0.01	<0.01	mg/l	5	15
25.	Arsenic as As	IS 3025 P-37 (1988)	<0.01	<0.01	mg/l	0.01	No Relaxation
26.	Nickel as Ni	IS 3025 P-54 (2003)	<0.01	<0.01	mg/l	0.02	No Relaxation
27.	Cadmium as Cd	IS 3025 P-41 (1992)	<0.001	<0.001	mg/l	0.003	No Relaxation

End of Report

Dr. SNA Rizvi
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TEST REPORT

(Water)

Report No.	IRDH-1023-EIA-SWQ-909 -01
Date of Reporting	03/11/2023
Issued to	M/s Ind Tech House Consult, G-8/6, Ground Floor, Sector-11, Rohini, Delhi-110085,
Project Name	Proposed Expansion for Manufacturing unit Of Formaldehyde At Khasra No. 1261 & 1262 SA, Plot no. 23, Vill- Goyala, Pargana- Mohana, Tal. Baksi Ka Talab, Deva Road, Lucknow-226019 by M/s Subham Polychem Pvt. Ltd.
Nature of Sample	Surface Water
Identification of Sample	Surface Water collected from Nala Near The Plant, Up Stream (SWQ_1) (26°54'42.24"N 81° 4'18.38"E), Nala Near The Plant, Down Stream (SWQ_2) (26°54'28.93"N 81° 4'16.01"E)
Date of Sampling	05/10/2023
Method of sampling	As per standard method
Date of testing:	05/10/2023 To 11/10/2023
Sampled by	IR&DH-Team

RESULTS

S.NO.	Parameter	Test Method	SWQ_1	SWQ_2	Units
1.	pH	IS 3025 P-11 1983	6.88	6.90	-
2.	Conductivity	IS 3025 P-14 1984	442.0	464.0	µs/cm
3.	Total Suspended Solid(TSS)	IS 3025 P-17 (1984)	106.0	118.0	mg/l
4.	Free Residual Chlorine	IS 3025 P-26 (1986)	<0.1	<0.1	mg/l
5.	Total Hardness	IS 3025 P-21 (2009)	180.0	192.0	mg/l
6.	Total Dissolved Solids (TDS)	IS 3025 P-16(1984)	276.0	290.0	mg/l
7.	Calcium as Ca	IS 3025 P-40 (1991)	30.4	32.0	mg/l
8.	Magnesium as Mg	IS 3025 P-46 (1994)	25.27	27.21	mg/l
9.	Total Alkalinity as $CaCO_3$	IS 3025 P-23 (1986)	196.0	206.0	mg/l
10.	Chloride as Cl	IS 3025 P-32 (1988)	26.0	36.0	mg/l
11.	Barium as Ba	Annex F of IS:13428	<0.05	<0.05	mg/l
12.	Ammonia as N	IS 3025 P-34 (1988)	<0.1	<0.1	mg/l
13.	Sulphate as SO_4	IS 3025 P-24 (1986)	11.2	13.5	mg/l

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Report No- IRDH-1023-EIA-SWQ-909-01

S No.	Parameter	Test Method	SWQ_1	SWQ_2	Unit
14.	Nitrate as NO_3	IS 3025 P-34 (1988)	5.6	6.2	mg/l
15.	Fluoride as F	APHA,23rd Edition	<0.1	0.11	mg/l
16.	Iron as Fe	IS 3025 P-53 (2003)	<0.1	0.13	mg/l
17.	Chemical Oxygen Demand(COD)	IS 3025 P-58 2006	54.0	60.0	mg/l
18.	Biochemical Oxygen Demand(BOD)at 27° C for 3 days	IS 3025 P-44 1993	11.0	13.0	mg/l
19.	Dissolve Oxygen	IS 3025 P-38 1989	3.6	3.2	mg/l
20.	Aluminium as Al	IS 3025 P-55(2003)	<0.01	<0.01	mg/l
21.	Anionic Detergent	Annex K oIS:13428	<0.05	<0.05	mg/l
22.	Phenolic Compounds	IS 3025 P-43 (1992)	<0.001	<0.001	mg/l
23.	Boron as B	IS 3025 P-57 (2005)	<0.1	<0.1	mg/l
24.	Chromium as Cr	IS 3025 P-52 (2003)	<0.01	<0.01	mg/l
25.	Lead as Pb	IS 3025 P47 (1994)	<0.01	<0.01	mg/l
26.	Copper as Cu	IS 3025 P42 (1992)	<0.01	<0.01	mg/l
27.	Mercury as Hg	IS 3025 P-48 (1994)	<0.001	<0.001	mg/l
28.	Manganese as Mn	IS 3025 P-59 (2006)	<0.01	<0.01	mg/l
29.	Zinc as Zn	IS 3025 P-49 (1994)	<0.01	<0.01	mg/l
30.	Arsenic as As	IS 3025 P-37 (1988)	<0.01	<0.01	mg/l
31.	Nickel as Ni	IS 3025 P-54 (2003)	<0.01	<0.01	mg/l
32.	Cadmium as Cd	IS 3025 P-41 (1992)	<0.001	<0.001	mg/l

End of Report

Dr. SNA Rizvi
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TEST REPORT

(Water)

Report No.	IRDH-1023-EIA-SWQ-909 -02
Date of Reporting	03/11/2023
Issued to	M/s Ind Tech House Consult, G-8/6, Ground Floor, Sector-11, Rohini, Delhi-110085,
Project Name	Proposed Expansion for Manufacturing unit Of Formaldehyde At Khasra No. 1261 & 1262 SA, Plot no. 23, Vill- Goyala, Pargana- Mohana, Tal. Baksi Ka Talab, Deva Road, Lucknow-226019 by M/s Subham Polychem Pvt. Ltd.
Nature of Sample	Surface Water
Identification of Sample	Surface Water collected from Irrigation Canal, Up Stream (SWQ_3)(26°54'48.90"N 81°4'23.78"E),Irrigation Canal, Down Stream (SWQ_4) (26°54'32.43"N 81°4'28.72"E)
Date of Sampling	05/10/2023
Method of sampling	As per standard method
Date of testing:	05/10/2023 To 11/10/2023
Sampled by	IR&DH-Team

RESULTS

S.NO.	Parameter	Test Method	SWQ_3	SWQ_4	Units
1.	pH	IS 3025 P-11 1983	7.35	7.40	-
2.	Conductivity	IS 3025 P-14 1984	428.0	448.0	µs/cm
3.	Total Suspended Solid(TSS)	IS 3025 P-17 (1984)	56.0	60.0	mg/l
4.	Free Residual Chlorine	IS 3025 P-26 (1986)	<0.1	<0.1	mg/l
5.	Total Hardness	IS 3025 P-21 (2009)	132.0	140.0	mg/l
6.	Total Dissolved Solids (TDS)	IS 3025 P-16(1984)	268.0	282.0	mg/l
7.	Calcium as Ca	IS 3025 P-40 (1991)	22.4	24.0	mg/l
8.	Magnesium as Mg	IS 3025 P-46 (1994)	18.46	19.44	mg/l
9.	Total Alkalinity as $CaCO_3$	IS 3025 P-23 (1986)	160.0	164.0	mg/l
10.	Chloride as Cl	IS 3025 P-32 (1988)	42.0	46.0	mg/l
11.	Barium as Ba	Annex F of IS:13428	<0.05	<0.05	mg/l
12.	Ammonia as N	IS 3025 P-34 (1988)	<0.1	<0.1	mg/l
13.	Sulphate as SO_4	IS 3025 P-24 (1986)	8.5	9.2	mg/l

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Ind Research & Development House Pvt. Ltd. Quality Manager Noida

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Report No- IRDH-1023-EIA-SWQ-909-02

S No.	Parameter	Test Method	SWQ_3	SWQ_4	Unit
14.	Nitrate as NO_3	IS 3025 P-34 (1988)	1.2	1.5	mg/l
15.	Fluoride as F	APHA,23rd Edition	0.13	0.11	mg/l
16.	Iron as Fe	IS 3025 P-53 (2003)	0.11	0.13	mg/l
17.	Chemical Oxygen Demand(COD)	IS 3025 P-58 2006	16.0	20.0	mg/l
18.	Biochemical Oxygen Demand(BOD)at 27° C for 3 days	IS 3025 P-44 1993	2.3	3.0	mg/l
19.	Dissolve Oxygen	IS 3025 P-38 1989	5.7	5.4	mg/l
20.	Aluminium as Al	IS 3025 P-55(2003)	<0.01	<0.01	mg/l
21.	Anionic Detergent	Annex K of IS:13428	<0.05	<0.05	mg/l
22.	Phenolic Compounds	IS 3025 P-43 (1992)	<0.001	<0.001	mg/l
23.	Boron as B	IS 3025 P-57 (2005)	<0.1	<0.1	mg/l
24.	Chromium as Cr	IS 3025 P-52 (2003)	<0.01	<0.01	mg/l
25.	Lead as Pb	IS 3025 P47 (1994)	<0.01	<0.01	mg/l
26.	Copper as Cu	IS 3025 P42 (1992)	<0.01	<0.01	mg/l
27.	Mercury as Hg	IS 3025 P-48 (1994)	<0.001	<0.001	mg/l
28.	Manganese as Mn	IS 3025 P-59 (2006)	<0.01	<0.01	mg/l
29.	Zinc as Zn	IS 3025 P-49 (1994)	<0.01	<0.01	mg/l
30.	Arsenic as As	IS 3025 P-37 (1988)	<0.01	<0.01	mg/l
31.	Nickel as Ni	IS 3025 P-54 (2003)	<0.01	<0.01	mg/l
32.	Cadmium as Cd	IS 3025 P-41 (1992)	<0.001	<0.001	mg/l

End of Report

Dr. SNA Rizvi
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TEST REPORT

(MICROBIOLOGY)

Report No. :	**IRDH-1023-EIA-WQ-909 (1)**
Date of Reporting:	**03/11/2023**
Issued To:	**M/s. Ind Tech House Consult, G-8/6, Ground Floor, Sector-11, Rohini, Delhi-110085**
Project Name:	**Proposed Expansion for Manufacturing unit Of Formaldehyde At Khasra No. 1261 & 1262 SA, Plot no. 23, Vill- Goyala, Pargana- Mohana, Tal. Baksi Ka Talab, Deva Road, Lucknow-226019 by M/s Subham Polychem Pvt. Ltd.**
Nature of Sample:	**Ground Water**
Sample Description:	**Water sample without suspended particles collected in sterilized 250 ml PVC bottle from Project Site (WQ1) (26°54'37.25"N 81° 4'16.57"E) , Papnamow (WQ2) (26°54'36.24"N 81° 5'18.85"E) Chhatena Garhi (WQ3), (26°54'58.58"N 81° 4'56.57"E), Moradabad (WQ4) (26°55'57.63"N 81° 3'56.88"E)**
Date of Sampling:	**05/10/2023**
Method of sampling:	**IS 1622:1981**
Sample Received on:	**06/10/2023**
Date of testing:	**06/10/2023 To 09/10/2023**
Sample Drawn by:	**IR&DH – Team**

RESULTS

S. No.	Parameter	Test Method	Results				Unit	Requirements as per IS 10500:2012
			WQ1	WQ2	WQ3	WQ4		
1.	Total coliform	IS 15185:2016	Absent	Absent	Absent	Absent	Present or Absent/ 100ml	Should not be detected in 100 ml
2.	E.coli	IS 15185:2016	Absent	Absent	Absent	Absent	Present or Absent/100ml	Should not be detected in 100 ml

****End of Report****

Vandana Gupta
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TEST REPORT

(MICROBIOLOGY)

Report No. :	**IRDH-1023-EIA-WQ-909(2)**
Date of Reporting:	**03/11/2023**
Issued To:	**M/s. Ind Tech House Consult, G-8/6, Ground Floor, Sector-11, Rohini, Delhi-110085**
Project Name:	**Proposed Expansion for Manufacturing unit Of Formaldehyde At Khasra No. 1261 & 1262 SA, Plot no. 23, Vill- Goyala, Pargana- Mohana, Tal. Baksi Ka Talab, Deva Road, Lucknow-226019 by M/s Subham Polychem Pvt. Ltd.**
Nature of Sample:	**Ground Water**
Sample Description:	**Water sample without suspended particles collected in sterilized 250 ml PVC bottle from Dhawa (WQ5) (26°54'35.87"N 81° 3'2.09"E), Imlibandh Baba Mandir (WQ6) (26°54'9.57"N 81° 4'15.74"E), Golden Blossom Imperial Resorts (WQ7) (26°53'55.09"N 81° 5'45.48"E), Dewa hospital jainabad Golia (WQ8) (26°55'28.82"N 81° 3'51.84"E)**
Date of Sampling:	**05/10/2023**
Method of sampling:	**IS 1622:1981**
Sample Received on:	**06/10/2023**
Date of testing:	**06/10/2023 To 09/10/2023**
Sample Drawn by:	**IR&DH – Team**

RESULTS

S. No.	Parameter	Test Method	Results				Unit	Requirements as per IS 10500:2012
			WQ5	WQ6	WQ7	WQ8		
1.	Total coliform	IS 15185:2016	Absent	Absent	Absent	Absent	Present or Absent/ 100ml	Should not be detected in 100 ml
2.	E.coli	IS 15185:2016	Absent	Absent	Absent	Absent	Present or Absent/100ml	Should not be detected in 100 ml

****End of Report****

Vandana Gupta
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TEST REPORT

(MICROBIOLOGY)

Report No. :	**IRDH-1023-EIA-SWQ-909**
Date of Reporting:	**03/11/2023**
Issued To:	**M/s. Ind Tech House Consult, G-8/6, Ground Floor, Sector-11, Rohini, Delhi-110085**
Project Name:	**Proposed Expansion for Manufacturing unit Of Formaldehyde At Khasra No. 1261 & 1262 SA, Plot no. 23, Vill- Goyala, Pargana- Mohana, Tal. Baksi Ka Talab, Deva Road, Lucknow-226019 by M/s Subham Polychem Pvt. Ltd.**
Nature of Sample:	**Surface Water**
Sample Description:	**Water sample with suspended particles collected in sterilized 250 ml PVC bottle from Nala near the plant (Up Stream) (SW1)(26°54'42.24"N 81° 4'18.38"E), Nala near the plant (Down Stream) (SW2) (26°54'28.93"N 81° 4'16.01"E) , Irrigation Canal (Up Stream) (SW3) (26°54'48.90"N 81° 4'23.78"E), Irrigation Canal (Down Stream) (SW4) (26°54'32.43"N 81° 4'28.72"E)**
Date of Sampling:	**05/10/2023**
Method of sampling:	**IS 1622:1981**
Sample Received on:	**06/10/2023**
Date of testing:	**06/10/2023 To 11/10/2023**
Sample Drawn by:	**IR&DH – Team**

RESULTS

S. No.	Parameter	Test Method	Results				Unit
			SW1	SW2	SW3	SW4	
1.	Total coliform	IS 15185:2016	$14x10^2$	$68x10^2$	$54x10^2$	$46x10^2$	CFU/100ml
2.	Faecal coliform	APHA23rd Ed. 2017	220	300	280	170	MPN/100ml

CFU*- Colony Forming Unit

MPN*- Most Probable Number

****End of Report****

Vandana Gupta
Authorized Signatory

Note:-

1- Test Report results are limited to the invoice raised/ item tested.
2-Test Report cannot be reproduced in a part or as whole in court without laboratory permission.
3- Samples shall be retained for 4 weeks after test report submitted