



**M/S ASIAN PAINTS LIMITED**

**EIA Report for Proposed Expansion of  
Integrated Paint Manufacturing Plant  
Located at Plot No.1, Sector-30B,  
HSIIDC, IMT Rohtak, Haryana**

**FEBRUARY 2025**



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**Kadam**

Environmental Consultants  
[www.kadamenviro.com](http://www.kadamenviro.com)

**Environment for Development**

E: [kadamenviro@kadamenviro.com](mailto:kadamenviro@kadamenviro.com); T: +91-265-6131000

**ACCREDITATION DETAILS**

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**M/S ASIAN PAINTS LIMITED****EIA Report for Proposed Expansion of Integrated Paint Manufacturing Plant Located at Plot No-1, Sector 30-B, HSIIDC, IMT Rohtak, Haryana**

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Description of images on the front page:

- |                     |                  |
|---------------------|------------------|
| 1. Plant Entry Gate | 2. Powder Silos  |
| 3. Process Plant    | 4. Storage Tanks |

**DECLARATION BY EXPERTS CONTRIBUTING TO THIS REPORT**

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

EIA Sector Number as per NABET	23	Name of Sector as per NABET	Integrated Paint Industry	Category	B
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**EIA COORDINATOR**

Name	Parul Patel
Signature & Date	<i>Parul Patel</i>
Period of involvement	December 2022 to till date
Contact Information	Address: 871/B/3, GIDC Makarpura, Vadodara-39000, Gujarat, India Landline No.: 02656131000






**FUNCTIONAL AREA EXPERTS**

S. No.	Functional Areas	Name of the Expert	Involvement		Signature & Date
			Period	Task	
1	Air Pollution Prevention, Monitoring & Control (AP)	Parul Patel	December 2022 to May 2023; March- July, 2024	Site Visit, selection of Monitoring locations, conducting AAQM, Evaluation of meteorological data with secondary data. Identification of impacts and suggesting mitigation measures	<i>Parul Patel</i>
2	Water Pollution Prevention, Control & Prediction of Impacts (WP)	Anand Kunte	December 2022 to May 2023; March- July 2024	Site visit, selection of sampling locations for SW, preparation of water balance diagrams & ETP Schemes. Identification of impacts and suggesting mitigation measures with EMP	<i>Anand Kunte</i>
3	Solid waste and Hazardous Waste Management (SHW)	Anand Kunte	December, 2022 to May, 2023; March- July, 2024	Adequacy check of solid & Hazardous waste management plan and suggesting disposal plan Identification of Impacts and suggesting mitigation measures	<i>Anand Kunte</i>
4	Socio-Economics (SE)	Sangram Kadam	December, 2022 to May, 2023; March- July, 2024	Site visit in core villages for primary database, Evaluation of SE status based on the secondary data, Listing possible ESC activities with approximate budget	<i>Sangram Kadam</i> 14.10.2024
5	Ecology and Biodiversity (EB)	Dr Deepali Gangwar	December, 2022 to May, 2023; March- July, 2024	Site visit for ecological data, collection of secondary data for identification of local flora and fauna. Assessment of the impacts and development of green belt management plan.	<i>Deepali Gangwar</i> 18.07.2024
6	Hydrogeology, ground water and Water Conservation (HG)	Aamil Saiyed	December, 2022 to May, 2023; March- July, 2024	Finalization of GW sampling location Assessment of sampling result with secondary data to interpret current conditions. Identification of impact and suggesting mitigation measures	<i>Aamil Saiyed</i>

S. No.	Functional Areas	Name of the Expert	Involvement		Signature & Date
			Period	Task	
7	Geology (GEO)	Aamir Saiyed	December, 2022 to May, 2023; March- July, 2024	Site visit to study site specific geological and hydrological conditions includes lithology, drainage pattern, water bodies, ground water condition. Identifying possible impacts to the environmental setting due to proposed project and suggesting mitigation measures	<i>H. Saiyed</i> 22/7/2024
8	Soil Conservation (SC)	Dr B.K. Patel	December, 2022 to May, 2023; March- July, 2024	Site visit and soil analysis based on the secondary analysis data selection of soil monitoring locations analysis of data collected contribution to EIA documentation.	<i>B.K. Patel</i>
9	Meteorology, Air Quality Modelling & Prediction (AQ)	Parul Patel	December, 2022 to May, 2023; March- July, 2024	Site visit to verify baseline AAQ in Industrial estate, Evaluation of measures AAQM with secondary data; Air dispersion modelling, Identification of impacts and suggesting mitigation measures	<i>Parul Patel</i>
10	Noise (N)	Mahendra Jadhav	December, 2022 to May, 2023; March- July, 2024	Site visit, Selection of monitoring locations. Identifying noise generating equipment and assessment of noise level, Identification of Impact and suggesting mitigation measures with EMP	<i>M. Jadhav</i>
11	Land Use (LU)	Sangran Kadam	December, 2022 to May, 2023; March- July, 2024	Ground truth survey of validate LULC map from satellite data Supervision in updating LULC map, Studying impact of the project.	<i>Sangran Kadam</i> 22-7-24
12	Risk Assessment & Hazard Management (RH)	Parul Patel	December, 2022 to May, 2023; March- July, 2024	Identification of RH, Interpreting of RA using PHAT, Suggesting measures for safe storage and handling of hazardous chemicals, preparation of DMP	<i>Parul Patel</i>



### EIA: FUNCTIONAL AREA EXPERT (CATEGORY B), FUNCTIONAL AREA ASSOCIATE AND TEAM MEMBERS

Name	Functional Area	Involvement		Signature
		Task	Under FAE	
Team Members				
Mahendra Jadhav	Meteorology, Air Quality Modelling & Prediction (AQ)	Site visit, secondary data collection, collection of site specific meteorological data, data collection from client for emission sources, emission rate calculation, supervision for air dispersion modeling and prediction, identification of impact and mitigations measures suggestions, contribution to the EIA documentation	Parul Patel	
Parul Patel	Water Pollution Prevention, Control & Prediction of Impacts (WP)	Assisting FAE for water quality monitoring, preparation of water balance based on process and other utilities area, suggesting the wastewater treatment facility with water conservation measures, identification of impacts, finalization of mitigation measures and contribution to draft FAE Report documentation	Anand Kunte	
Pratik Panchal	Risk Assessment & Hazard Management (RH)	Site visit, data collection for consequence and risk analysis, identification of modelling scenarios, consequence analysis using PHAST, finalization of DMP, contribution to RA/DMP & EIA documentations. Assisting in impact identification and mitigation measures, PHAST modelling	Parul Patel	
Aamil Saiyed	Land Use (LU)	Site Visit, Collection of secondary data, Site visit for ground truth survey, finalization of landuse map, Impact Identification, mitigation measures suggestion, contribution of the FA report and EIA report documents.	Sangram Kadam	
Hitendrasinh Parmar	Socio-Economics (SE)	Secondary data collection, evaluation of Socio-Economic status of the study area, assistance in assessment of the possible change to socio-economic issues arising out of the proposed project activity and in draft FAE Report documentation	Sangram Kadam	

**Declaration by the Head of the Accredited Consultant Organization / Authorised Person:**

I, Sangram A. Kadam, hereby, confirm that the above-mentioned experts prepared the EIA Report for Asian Paints Ltd for proposed expansion of integrated paint manufacturing plant at Plot No. 1, Sector 30-B, HSIIDC, IMT Rohtak, Haryana. I also confirm that Kadam Environmental Consultants shall be fully accountable for any misleading information mentioned in this statement.

Signature

:



Name

: Sangram A. Kadam

Designation

: Director (Consultancy Department)

Name of the EIA Consultant Organization : Kadam Environmental Consultants

NABET Certificate No. &amp; Issue Date

: NABET/EIA/2326/RA 0303, Issued on 11-10-2023,  
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# TABLE OF CONTENTS

<b>1</b>	<b>INTRODUCTION .....</b>	<b>34</b>
1.1	PURPOSE OF THE REPORT .....	34
1.2	IDENTIFICATION OF PROJECT AND PROJECT PROPONENT .....	34
1.2.1	<i>Identification of the project</i> .....	34
1.2.2	<i>Production Details</i> .....	35
1.2.3	<i>Identification of project proponent</i> .....	35
1.3	NEED FOR THE PROJECT .....	36
1.3.1	<i>Demand Supply Gap</i> .....	36
1.3.2	<i>Import vs. Indigenous Production</i> .....	36
1.3.3	<i>Export Possibility</i> .....	36
1.3.4	<i>Energy Security</i> .....	37
1.4	SIZE, LOCATION OF THE PROJECT & ITS IMPORTANCE TO THE REGION .....	37
1.4.1	<i>Brief Description of Nature and Size of Project</i> .....	37
1.4.2	<i>Cost of the Project</i> .....	37
1.4.3	<i>Employment Generation (Direct and Indirect) due to the Project</i> .....	37
1.4.4	<i>Regulatory Framework</i> .....	38
1.5	PREVIOUS ECs, CERTIFIED COMPLIANCE REPORT .....	38
1.6	SCOPE OF STUDY .....	39
1.6.1	<i>General scope</i> .....	39
1.6.2	<i>Terms of Reference</i> .....	39
<b>2</b>	<b>PROJECT DESCRIPTION .....</b>	<b>52</b>
2.1	TYPE OF PROJECT .....	52
2.1.1	<i>Demand- Supply Gap</i> .....	52
2.1.2	<i>Import vs. Indigenous Production</i> .....	52
2.1.3	<i>Domestic / Export Markets</i> .....	52
2.1.4	<i>Export Possibility</i> .....	52
2.2	LOCATION .....	52
2.2.1	<i>Immediate Neighbours</i> .....	60
2.2.2	<i>List of Industries</i> .....	60
2.3	APPROACH AND CONNECTIVITY TO PROJECT AREA .....	61
2.3.1	<i>By Road</i> .....	61
2.3.2	<i>By Rail</i> .....	61
2.3.3	<i>By Air</i> .....	61
2.3.4	<i>By Waterway</i> .....	61
2.4	SIZE OR MAGNITUDE OF OPERATION .....	61
2.4.1	<i>Size, Land Distribution at Site &amp; Project Site Layout</i> .....	61
2.4.2	<i>Production Capacity, Storage, Handling &amp; Mode of Transportation for Products &amp; Raw Material</i> .....	64
2.4.3	<i>Justification for selection of capacity</i> .....	66
2.5	PROPOSED SCHEDULE FOR APPROVAL AND IMPLEMENTATION .....	66
2.6	TECHNOLOGY AND PROCESS DESCRIPTION .....	66
2.6.1	<i>Water and Solvent Based Paints Manufacturing</i> .....	67

<b>2.6.2</b>	<b><i>Intermediate Manufacturing</i></b> .....	69
<b>2.6.3</b>	<b><i>Manufacturing of powder putty</i></b> .....	72
<b>2.6.4</b>	<b><i>List of Major Equipment's</i></b> .....	73
<b>2.7</b>	<b>PROJECT DESCRIPTION</b> .....	73
<b>2.7.1</b>	<b><i>Power &amp; Energy requirement</i></b> .....	73
<b>2.7.2</b>	<b><i>Infrastructure Facilities</i></b> .....	75
<b>2.7.3</b>	<b><i>Water Requirement –Source of water, water consumption, wastewater Generation &amp; Disposal details.</i></b> .....	75
<b>2.7.4</b>	<b><i>Details of Waste water treatment Facilities –Existing and proposed</i></b> .....	79
<b>2.7.5</b>	<b><i>Wastewater Characterization &amp; Effluent Treatment Scheme, its adequacy and efficacy</i></b> .....	79
<b>2.7.6</b>	<b><i>Performance Adequacy report of the existing ETP</i></b> .....	85
<b>2.7.7</b>	<b><i>Air Emission</i></b> .....	86
<b>2.7.8</b>	<b><i>Noise Generation</i></b> .....	91
<b>2.7.9</b>	<b><i>Solid/Hazardous waste management</i></b> .....	91
<b>2.7.10</b>	<b><i>Non-Hazardous Waste (Quantification, Source, Collection &amp; Treatment/Disposal)</i></b> ....	96
<b>2.7.11</b>	<b><i>Other Solid Wastes Identification &amp; Management</i></b> .....	96
<b>2.7.12</b>	<b><i>Storage and Handling of Solid and Hazardous waste</i></b> .....	97
<b>2.7.13</b>	<b><i>Methodology of de-contamination and disposal of discarded containers</i></b> .....	97
<b>2.7.14</b>	<b><i>Firefighting System</i></b> .....	98
<b>2.7.15</b>	<b><i>Greenbelt</i></b> .....	98
<b>2.7.16</b>	<b><i>Stromwater Management Plan</i></b> .....	100
<b>2.7.17</b>	<b><i>Rain water Harvesting System</i></b> .....	100
<b>2.7.18</b>	<b><i>Pollution Load Statement</i></b> .....	100
<b>2.7.19</b>	<b><i>Concept of Waste-Minimization, Recycle/Reuse/Recover Techniques, Energy Conservation &amp; Natural Resource Conservation</i></b> .....	101
<b>2.7.20</b>	<b><i>Action Plan for Odour Control</i></b> .....	102
<b>2.8</b>	<b>CARBON FOOTPRINT</b> .....	102
<b>2.8.1</b>	<b><i>About Carbon Footprint</i></b> .....	102
<b>2.8.2</b>	<b><i>Scope of GHG Emissions</i></b> .....	103
<b>2.8.3</b>	<b><i>Global Warming Potential</i></b> .....	103
<b>2.8.4</b>	<b><i>Inventory Analysis and Evaluation of Results</i></b> .....	105
<b>2.8.5</b>	<b><i>Scope - 1</i></b> .....	106
<b>2.8.6</b>	<b><i>Scope - 2</i></b> .....	108
<b>2.8.7</b>	<b><i>Overall Carbon Footprint</i></b> .....	112
<b>2.8.8</b>	<b><i>Mitigation Measures</i></b> .....	113
<b>2.8.9</b>	<b><i>Overall Reduction of CO<sub>2</sub> Emission due to Mitigation Measures</i></b> .....	115
<b>2.8.10</b>	<b><i>Mitigation Measures</i></b> .....	115
<b>2.8.11</b>	<b><i>Summary &amp; Conclusion</i></b> .....	116
<b>2.9</b>	<b>WATER FOOTPRINT</b> .....	116
<b>2.9.1</b>	<b><i>Concept</i></b> .....	116
<b>2.9.2</b>	<b><i>Components of Water Footprint</i></b> .....	116
<b>2.9.3</b>	<b><i>Water Footprint Components</i></b> .....	117
<b>2.9.4</b>	<b><i>Production Capacity</i></b> .....	117
<b>2.9.5</b>	<b><i>Water Consumption</i></b> .....	117

<b>2.9.6</b>	<b>Waste Water/ Effluent Generation</b>	118
<b>2.9.7</b>	<b>Computation of Run-off</b>	118
<b>2.9.8</b>	<b>Water Balance: Existing</b>	120
<b>2.9.9</b>	<b>Water Balance: Proposed</b>	121
<b>2.9.10</b>	<b>Water Footprint Assessment</b>	122
<b>2.9.11</b>	<b>Pie Chart for Water Footprint</b>	122
<b>2.10</b>	<b>IN-BUILT MITIGATION MEASURES</b>	123
<b>2.11</b>	<b>ASSESSMENT OF NEW &amp; UNTESTED TECHNOLOGY</b>	123
<b>3</b>	<b>DESCRIPTION OF THE ENVIRONMENT</b>	<b>124</b>
<b>3.1</b>	<b>INTRODUCTION</b>	124
<b>3.2</b>	<b>STUDY AREA</b>	124
<b>3.3</b>	<b>STUDY PERIOD</b>	124
<b>3.4</b>	<b>BASELINE ENVIRONMENT QUALITY</b>	124
<b>3.4.1</b>	<b>Secondary Data Collection</b>	124
<b>3.4.2</b>	<b>Primary Data Collection</b>	125
<b>3.4.3</b>	<b>Sensitive Ecological Features</b>	125
<b>3.5</b>	<b>LAND USE / LAND COVER</b>	126
<b>3.5.1</b>	<b>Classification of Land use and Land cover</b>	126
<b>3.5.2</b>	<b>Study Area</b>	126
<b>3.5.3</b>	<b>Study Methodology Adopted</b>	126
<b>3.5.4</b>	<b>Field Survey/Ground Truthing</b>	126
<b>3.5.5</b>	<b>Land use / Land cover pattern of Plant premises</b>	128
<b>3.5.6</b>	<b>Land use / Land cover pattern of Study Area</b>	128
<b>3.5.7</b>	<b>Class Wise Area Statistics</b>	130
<b>3.5.8</b>	<b>Final Map preparation</b>	130
<b>3.6</b>	<b>METEOROLOGY</b>	135
<b>3.6.1</b>	<b>Study Area &amp; Period</b>	135
	<b>Secondary Data Collection &amp; Review – Long-term Meteorology: Rohtak (Station ID: 42176)</b>	135
<b>3.6.2</b>	<b>Primary Data Collection &amp; Review – Site Specific Meteorology</b>	138
<b>3.7</b>	<b>AMBIENT AIR QUALITY</b>	142
<b>3.7.1</b>	<b>Selection of AAQ Monitoring Locations with Rationale</b>	142
<b>3.7.2</b>	<b>Ambient Air Monitoring Analysis Results</b>	148
<b>3.8</b>	<b>TRAFFIC SURVEY</b>	149
<b>3.8.1</b>	<b>General Study Methodology</b>	149
<b>3.8.2</b>	<b>Parameters/ Vehicle Classification</b>	150
<b>3.8.3</b>	<b>Road Identification for Traffic Survey</b>	150
<b>3.8.4</b>	<b>Traffic Survey – Methodology</b>	150
<b>3.8.5</b>	<b>Traffic Survey – Existing traffic density (Vehicles count)</b>	152
<b>3.9</b>	<b>NOISE &amp; VIBRATIONS</b>	154
<b>3.9.1</b>	<b>General Study Methodology</b>	154
<b>3.9.2</b>	<b>Methodology for Noise Level Analysis</b>	154
<b>3.9.3</b>	<b>Primary data collection &amp; Review – Noise Level Monitoring</b>	154
<b>3.9.4</b>	<b>Observation</b>	158



<b>3.10</b>	<b>SURFACE WATER QUALITY</b>	158
3.10.1	<i>Methodology Adopted</i>	158
3.10.2	<i>Justification of Sample Collection – Surface Water</i>	159
3.10.3	<i>Details of Surface Water Sampling Locations</i>	159
3.10.4	<i>Analysis Method Adopted</i>	162
3.10.5	<i>Observations of Surface Water Quality Analysis</i>	166
<b>3.11</b>	<b>GEOLOGY AND HYDROGEOLOGY</b>	166
3.11.1	<i>Geomorphology</i>	166
3.11.2	<i>Drainages</i>	168
3.11.3	<i>Seismicity &amp; Flood Hazards</i>	171
3.11.4	<i>Flood Hazards</i>	174
<b>3.12</b>	<b>GEOLOGY</b>	176
3.12.1	<i>Regional Geology</i>	176
3.12.2	<i>Local Geology</i>	176
3.12.3	<i>Minerals Availability</i>	176
<b>3.13</b>	<b>HYDROGEOLOGY</b>	178
3.13.1	<i>Regional Hydrogeology</i>	178
3.13.2	<i>Local Hydrogeology</i>	178
<b>3.14</b>	<b>GROUND WATER ENVIRONMENT</b>	178
3.14.1	<i>Occurrence &amp; Distribution of Ground Water</i>	178
3.14.2	<i>Regulatory Status</i>	178
3.14.3	<i>Water Development</i>	179
3.14.4	<i>Groundwater Environment</i>	179
3.14.5	<i>Secondary Ground Water Data</i>	181
3.14.6	<i>Primary data Collection</i>	184
3.14.7	<i>Field Visit &amp; Ground Water Sampling Photograph</i>	185
3.14.8	<i>Key Findings: Well Inventory</i>	186
3.14.9	<i>Ground Water Analysis Results</i>	188
3.14.10	<i>Inferences: Ground Water Analysis Results</i>	190
<b>3.15</b>	<b>SOIL ENVIRONMENT</b>	190
3.15.1	<i>Introduction</i>	190
3.15.2	<i>Objectives</i>	190
3.15.3	<i>Methodology</i>	191
3.15.4	<i>Soil Sampling Locations</i>	191
3.15.5	<i>Soil Quality Analysis</i>	195
3.15.6	<i>Observations on Soil Quality</i>	196
<b>3.16</b>	<b>ECOLOGY AND BIODIVERSITY</b>	196
3.16.1	<i>Period of the study and Study area</i>	196
3.16.2	<i>Scope, Aim and Objectives</i>	196
3.16.3	<i>Study Area</i>	197
3.16.4	<i>Methodology</i>	198
3.16.5	<i>Study Details</i>	199
3.16.6	<i>Baseline Status of Biodiversity</i>	199
3.16.7	<i>Agriculture Crops</i>	206
3.16.8	<i>Medicinal Plants</i>	206

<b>3.16.9 Faunal Biodiversity of the study area</b> .....	206
<b>3.17 SOCIO-ECONOMICS</b> .....	212
<b>3.17.1 Introduction</b> .....	212
<b>3.17.2 Objectives and Methodology</b> .....	212
<b>3.17.3 Work done</b> .....	214
<b>3.17.4 Sensitive Ecological Features</b> .....	214
<b>3.17.5 Socio-Economic Baseline</b> .....	214
<b>3.17.6 Social Profile</b> .....	218
<b>3.17.7 Literacy rate</b> .....	219
<b>4 ANTICIPATED ENVIRONMENTAL IMPACTS &amp; MITIGATION MEASURES</b> .....	<b>224</b>
<b>4.1 INTRODUCTION</b> .....	224
<b>4.2 METHODOLOGY OF IDENTIFICATION AND ASSESSMENT OF ENVIRONMENTAL IMPACTS</b> .....	224
<b>4.3 QUANTIFYING THE LIKELIHOOD OF OCCURRENCE OF THE IMPACT</b> .....	233
<b>4.4 QUANTIFYING ENVIRONMENTAL IMPACT SIGNIFICANCE EXCEPT FOR LAND USE LAND COVER COMPONENT</b> 233	
<b>4.5 QUANTIFYING ENVIRONMENTAL IMPACT SIGNIFICANCE FOR LAND USE LAND COVER COMPONENT</b> .....	233
<b>4.6 CATEGORISING ENVIRONMENTAL IMPACT SIGNIFICANCE</b> .....	234
<b>4.7 MITIGATION MEASURES</b> .....	234
<b>4.8 IDENTIFICATION OF IMPACTING ACTIVITIES FOR THE PROPOSED PROJECT</b> .....	234
<b>4.9 MEASURES FOR MINIMIZING AND / OR OFFSETTING ADVERSE IMPACTS IDENTIFIED</b> .....	243
<b>4.10 LAND USE (LU) AND LAND COVER (LC)</b> .....	243
<b>4.10.1 Identification of Impacting Activities</b> .....	243
<b>4.10.2 Impact Scoring</b> .....	244
<b>4.10.3 Mitigation Measures</b> .....	244
<b>4.11 AIR ENVIRONMENT</b> .....	246
<b>4.11.1 Impact Scoring – Air Environment</b> .....	247
<b>4.11.2 Dispersion modelling</b> .....	249
<b>4.11.3 Impact on Air Environment</b> .....	250
<b>4.11.4 Point Source Emission</b> .....	250
<b>4.11.5 Line Source Emission</b> .....	252
<b>4.11.6 Mitigation measures</b> .....	255
<b>4.12 TRAFFIC SURVEY &amp; INCREMENTAL TRAFFIC</b> .....	256
<b>4.12.1 Impact due to Road Transportation</b> .....	256
<b>4.12.2 Mitigation Measure</b> .....	257
<b>4.13 NOISE ENVIRONMENT</b> .....	257
<b>4.13.1 Impact Scoring – Noise Environment</b> .....	257
<b>4.13.2 Assessment of Noise using Sound Plan Modelling</b> .....	259
<b>4.13.3 Conclusion</b> .....	262
<b>4.13.4 Mitigation Measures</b> .....	262
<b>4.13.5 Vibrations</b> .....	263
<b>4.14 GEOLOGY, HYDROGEOLOGY &amp; GROUNDWATER</b> .....	264
<b>4.14.1 Impacts on Geology</b> .....	264
<b>4.14.2 Impacts on Hydrogeology, Ground Water and Water Conservation</b> .....	264
<b>4.14.3 Suggested Mitigation Measures</b> .....	267

<b>4.15</b>	<b>SURFACE WATER QUALITY</b>	269
4.15.1	<i>Impact Scoring – Surface Water</i>	269
4.15.2	<i>Mitigation Measures for Impact on Surface Water Quality</i>	269
<b>4.16</b>	<b>SOLID WASTE MANAGEMENT</b>	270
4.16.1	<i>Impact Scoring – Solid &amp; Hazardous Waste Management</i>	270
4.16.2	<i>Mitigation Measures for Solid and Hazardous Waste Management</i>	270
<b>4.17</b>	<b>SOIL ENVIRONMENT</b>	271
4.17.1	<i>Impact Scoring – Soil Environment</i>	271
4.17.2	<i>Mitigation Measures</i>	272
<b>4.18</b>	<b>ECOLOGY &amp; BIODIVERSITY</b>	272
4.18.1	<i>Likely Impacts on Ecological Components &amp; Mitigation Measures</i>	272
<b>4.19</b>	<b>SOCIO-ECONOMIC ENVIRONMENT</b>	276
4.19.1	<i>Impact Identification</i>	276
4.19.2	<i>Mitigation Measures</i>	276
4.19.3	<i>Impact Scoring</i>	276
4.19.4	<i>Key Issues and Needs – Focused Area</i>	278
<b>5</b>	<b>ANALYSIS OF ALTERNATIVES (TECHNOLOGY &amp; SITE)</b>	<b>282</b>
5.1	<b>ANALYSIS OF SITE ALTERNATIVE</b>	282
5.2	<b>ANALYSIS OF TECHNOLOGY ALTERNATIVE</b>	282
<b>6</b>	<b>ENVIRONMENTAL MONITORING PROGRAM</b>	<b>283</b>
6.1	<b>INTRODUCTION</b>	283
6.2	<b>THE OBJECTIVES OF MONITORING</b>	283
6.3	<b>ENVIRONMENT MONITORING PLAN</b>	283
6.4	<b>STATUTORY CLEARANCE AS OTHER PERMISSIONS</b>	286
<b>7</b>	<b>ADDITIONAL STUDIES</b>	<b>288</b>
7.1	<b>PUBLIC CONSULTATION</b>	288
7.2	<b>RISK ASSESSMENT (HAZARD IDENTIFICATION AND CONSEQUENCE ANALYSIS, ERP / DMP)</b>	288
7.2.1	<i>Methodology of Risk Assessment</i>	288
7.2.2	<i>Hazard Identification</i>	288
7.2.3	<i>Meteorology</i>	293
7.2.4	<i>Simulation of Release and Development of Contours</i>	294
7.2.5	<i>Conclusion of consequence analysis study</i>	299
7.2.6	<i>Estimate Risk</i>	300
7.2.7	<i>Conclusion of Risk Assessment</i>	302
7.3	<b>DISASTER MANAGEMENT PLAN</b>	302
7.3.1	<i>Objectives</i>	302
7.3.2	<i>Site Critical Emergencies</i>	302
7.3.3	<i>Emergency Control Centre</i>	303
7.3.4	<i>Identification of Hazards</i>	303
7.4	<b>EMERGENCY RESPONSE PROCEDURE</b>	304
7.4.1	<i>Fire /Explosion: (In case of explosion in Boiler, LPG bullet, SILO &amp; Tanker):</i>	304
7.4.2	<i>Major Spillage / Tanker Toppling / Monomer Spillage:</i>	305
7.4.3	<i>Emergency involving Styrene monomer</i>	307

<b>7.4.4 Emergency Response Procedure for Structure Collapse</b> .....	308
<b>7.5 KEY PERSONS AND THEIR RESPONSIBILITIES</b> .....	309
<b>7.5.1 Site Main Controller</b> .....	309
<b>7.5.2 Incident Controller</b> .....	309
<b>7.5.3 Administration Officer</b> .....	310
<b>7.5.4 Communication Officer</b> .....	310
<b>7.5.5 Site Controller</b> .....	310
<b>7.5.6 Fire Officer</b> .....	310
<b>7.5.7 Medical Officer</b> .....	310
<b>7.6 OFF-SITE EMERGENCY PLAN</b> .....	311
<b>7.6.1 Need for Off-Site Emergency Plan</b> .....	311
<b>8 PROJECT BENEFITS</b> .....	<b>312</b>
<b>8.1 IMPROVEMENTS IN THE PHYSICAL INFRASTRUCTURE</b> .....	312
<b>8.2 IMPROVEMENTS IN THE SOCIAL INFRASTRUCTURE</b> .....	312
<b>8.3 EMPLOYMENT POTENTIAL –SKILLED; SEMI-SKILLED AND UNSKILLED</b> .....	312
<b>8.4 OTHER TANGIBLE BENEFITS</b> .....	312
<b>9 ENVIRONMENTAL COST-BENEFIT ANALYSIS</b> .....	<b>313</b>
<b>9.1 ENVIRONMENTAL COST</b> .....	313
<b>9.2 ENVIRONMENTAL / HEALTH AND SAFETY BENEFITS</b> .....	313
<b>9.3 CONCLUSION</b> .....	314
<b>10 ENVIRONMENTAL MANAGEMENT PLAN (EMP)</b> .....	<b>315</b>
<b>10.1 INTRODUCTION</b> .....	315
<b>10.2 PURPOSE OF THE ENVIRONMENTAL MANAGEMENT PLAN</b> .....	315
<b>10.3 ENVIRONMENTAL MANAGEMENT PLAN</b> .....	315
<b>10.3.1 Air Quality Environment</b> .....	316
<b>10.3.2 Traffic Management Plan</b> .....	317
<b>10.3.3 Noise Quality Environment</b> .....	318
<b>10.3.4 Ground Water Quality Environment</b> .....	319
<b>10.3.5 Computation of Rain Water Harvesting Facility at Project Site</b> .....	319
<b>10.3.6 Rain Water Harvesting in the Study Area</b> .....	320
<b>10.3.7 Artificial Recharge through Existing Wells</b> .....	320
<b>10.3.8 Surface Water Quality Environment</b> .....	324
<b>10.3.9 Solid &amp; Hazardous Waste Management</b> .....	325
<b>10.3.10 Soil Quality Environment</b> .....	325
<b>10.3.11 Land Use and Land Cover</b> .....	326
<b>10.3.12 Ecology and Biodiversity</b> .....	327
<b>10.3.13 Conservation Plan for Schedule – I and Threatened Species</b> .....	333
<b>10.3.14 Rainwater Harvesting</b> .....	337
<b>10.3.15 Social Management Plan</b> .....	337
<b>10.4 ENVIRONMENT MANAGEMENT CELL</b> .....	340
<b>10.4.1 System of reporting of Non-compliance/ violation of environmental norms to the Board of Directors</b> .....	341
<b>10.5 EXPENDITURE ON ENVIRONMENTAL MATTERS</b> .....	341

<b>10.6</b>	<b>OCCUPATIONAL HEALTH MANAGEMENT PLAN &amp; FUND ALLOCATION .....</b>	<b>343</b>
<b>10.7</b>	<b>WORKPLACE MONITORING PROTOCOL .....</b>	<b>345</b>
<b>10.7.1</b>	<b><i>Fugitive Emission.....</i></b>	<b>345</b>
<b>10.7.2</b>	<b><i>Prevention and Control of Fugitive Air Emissions .....</i></b>	<b>345</b>
<b>10.7.3</b>	<b><i>Workplace Monitoring .....</i></b>	<b>345</b>
<b>10.7.4</b>	<b><i>Work Zone Monitoring for Hazardous Chemicals .....</i></b>	<b>346</b>
<b>10.7.5</b>	<b><i>Arrangements for ensuring Health &amp; Safety Of Workers engaged In Handling Of Toxic Materials.....</i></b>	<b>346</b>
<b>11</b>	<b>SUMMARY AND CONCLUSIONS .....</b>	<b>347</b>
<b>11.1</b>	<b>INTRODUCTION .....</b>	<b>347</b>
<b>11.2</b>	<b>PROJECT DESCRIPTION .....</b>	<b>347</b>
<b>11.2.1</b>	<b><i>Project Location.....</i></b>	<b>347</b>
<b>11.2.2</b>	<b><i>Land Distribution at Site.....</i></b>	<b>347</b>
<b>11.2.3</b>	<b><i>Production Capacity .....</i></b>	<b>347</b>
<b>11.2.4</b>	<b><i>Cost of the Project .....</i></b>	<b>348</b>
<b>11.2.5</b>	<b><i>Technology and Process Description. ....</i></b>	<b>348</b>
<b>11.2.6</b>	<b><i>Manpower Requirement .....</i></b>	<b>349</b>
<b>11.2.7</b>	<b><i>Power/Energy Requirement.....</i></b>	<b>350</b>
<b>11.2.8</b>	<b><i>Water Requirement, Wastewater Generation &amp; Management Details.....</i></b>	<b>350</b>
<b>11.2.9</b>	<b><i>Fuel Consumption.....</i></b>	<b>350</b>
<b>11.2.10</b>	<b><i>Air Emission.....</i></b>	<b>350</b>
<b>11.2.11</b>	<b><i>Noise generation.....</i></b>	<b>351</b>
<b>11.2.12</b>	<b><i>Solid and Hazardous Waste Management.....</i></b>	<b>351</b>
<b>11.2.13</b>	<b><i>Fire-Fighting System.....</i></b>	<b>352</b>
<b>11.2.14</b>	<b><i>Greenbelt.....</i></b>	<b>352</b>
<b>11.2.15</b>	<b><i>Rainwater Harvesting System .....</i></b>	<b>352</b>
<b>11.2.16</b>	<b><i>Concept of Waste-Minimization, Recycle/Reuse/Recover Techniques, Energy Conservation &amp; Natural Resource Conservation.....</i></b>	<b>352</b>
<b>11.2.17</b>	<b><i>Action Plan for Odour Control.....</i></b>	<b>352</b>
<b>11.2.18</b>	<b><i>Assessment of New &amp; untested technology.....</i></b>	<b>353</b>
<b>11.3</b>	<b>DESCRIPTION OF ENVIRONMENT .....</b>	<b>353</b>
<b>11.3.1</b>	<b><i>Study Area &amp; Study Period.....</i></b>	<b>353</b>
<b>11.3.2</b>	<b><i>Land Use and Land Cover .....</i></b>	<b>353</b>
<b>11.3.3</b>	<b><i>Meteorology/Climatology .....</i></b>	<b>355</b>
<b>11.3.4</b>	<b><i>Ambient Air Quality .....</i></b>	<b>355</b>
<b>11.3.5</b>	<b><i>Noise Quality.....</i></b>	<b>356</b>
<b>11.3.6</b>	<b><i>Surface Water Quality.....</i></b>	<b>356</b>
<b>11.3.7</b>	<b><i>Geology and Hydrogeology.....</i></b>	<b>356</b>
<b>11.3.8</b>	<b><i>Soil Quality.....</i></b>	<b>358</b>
<b>11.3.9</b>	<b><i>Ecology and Biodiversity.....</i></b>	<b>359</b>
<b>11.3.10</b>	<b><i>Socio-Economic Environment.....</i></b>	<b>359</b>
<b>11.4</b>	<b>ANTICIPATED ENVIRONMENTAL IMPACTS &amp; MITIGATION MEASURES .....</b>	<b>360</b>
<b>11.4.1</b>	<b><i>Land Use and Land Cover .....</i></b>	<b>360</b>
<b>11.4.2</b>	<b><i>Air Environment.....</i></b>	<b>361</b>



<b>11.4.3 Incremental Traffic</b> .....	362
<b>11.4.4 Noise Environment</b> .....	363
<b>11.4.5 Vibrations</b> .....	363
<b>11.4.6 Geology and Hydrogeology – Ground water Quality</b> .....	364
<b>11.4.7 Surface Water Quality</b> .....	364
<b>11.4.8 Solid &amp; Hazardous Waste Management</b> .....	365
<b>11.4.9 Soil Environment</b> .....	365
<b>11.4.10 Biological Environment – Ecology &amp; Biodiversity</b> .....	365
<b>11.4.11 Socio-Economic Environment</b> .....	365
<b>11.5 ANALYSIS OF ALTERNATIVES (TECHNOLOGY &amp; SITE)</b> .....	366
<b>11.6 ENVIRONMENTAL MONITORING PROGRAM</b> .....	366
<b>11.7 ADDITIONAL STUDIES</b> .....	366
<b>11.7.1 Public Consultation</b> .....	366
<b>11.7.2 Hazard Identification &amp; Risk Analysis</b> .....	366
<b>11.8 PROJECT BENEFITS</b> .....	366
<b>11.9 ENVIRONMENTAL COST BENEFIT ANALYSIS</b> .....	367
<b>11.10 ENVIRONMENT MANAGEMENT PLAN (EMP)</b> .....	367
<b>11.10.1 Conservation Plan for Schedule – I species</b> .....	367
<b>11.10.2 Social Management Plan</b> .....	367
<b>11.10.3 Environment Management Cell</b> .....	368
<b>11.10.4 Expenditure on Environmental Matter</b> .....	368
<b>11.10.5 Occupational Health Management Plan &amp; Fund Allocation</b> .....	368
<b>11.11 CONCLUSION</b> .....	369
<b>12 DISCLOSURE OF CONSULTANTS</b> .....	<b>370</b>
<b>12.1 BRIEF RESUME AND NATURE OF CONSULTANCY RENDERED BY KADAM ENVIRONMENTAL CONSULTANTS</b> 370	
<b>12.2 EIA TEAM MEMBERS</b> .....	371

## LIST OF ANNEXURES

<b>Annexure 1: ToR Letter from SEAC Haryana</b>	373
<b>Annexure 2: Certificate of Incorporation of the Company</b>	382
<b>Annexure 3: Land Allotment Letter</b>	383
<b>Annexure 4: Copy of Court Orders against pending litigation</b>	384
<b>Annexure 5: Copy of the Previous Environmental Clearances</b>	386
<b>Annexure 6: Certified EC Compliance Report (CCR) from MOEF&amp;CC, RO, Chandigarh</b>	392
<b>Annexure 7: Action Taken Report</b>	404
<b>Annexure 8: Consent to Operate from Haryana State Pollution Control Board (HSPCB)</b>	418
<b>Annexure 9: Status of CTO Compliance</b>	422
<b>Annexure 10: Water Supply Permission from HSIIDC, IMT Rohtak</b>	432
<b>Annexure 11: Membership Certificate of CSHW TDSF</b>	446
<b>Annexure 12: Membership Certificate for Bio-Medical Waste Safe disposal</b>	447
<b>Annexure 13: Authorization Letter from HSPCB for BMW Waste</b>	448
<b>Annexure 14: Properties of Raw Materials and Products.</b>	451
<b>Annexure 15: Long-term Climatological Table Published by IMD for Rohtak</b>	457
<b>Annexure 16: Detailed Result of Ambient Air Quality</b>	459
<b>Annexure 17: Air Quality Dispersion Modelling Results</b>	466
<b>Annexure 18: Workplace Monitoring Reports</b>	482
<b>Annexure 19: Detailed Traffic Survey Data</b>	500
<b>Annexure 20: Submission proof of Wildlife Conservation Plan for Schedule-I species.</b>	504
<b>Annexure 21: Specimen of Annual medical check-up reports</b>	505
<b>Annexure 22: Copy of Environment Policy</b>	506
<b>Annexure 23: Copy of analysis reports of product for Lead (as Pb) content &amp; photographs of products showing labelling regarding Lead contents.</b>	508
<b>Annexure 24: Criteria and Status of Polluted River stretches in India by CPCB.</b>	509
<b>Annexure 25: Undertakings by the Project Proponent</b>	525
<b>Annexure 26: Undertakings by the EIA Consultant</b>	526
<b>Annexure 27: NABET Accreditation Certificate of EIA Consultant</b>	527
<b>Annexure 28: NABL Accreditation Certificate of EIA Consultant</b>	530
<b>Annexure 29: Certificate of Plagiarism Check</b>	532

## LIST OF TABLES

<b>Table 1-1: Production Details (Existing &amp; Proposed)</b>	35
<b>Table 1-2: Brief Description of Proposed expansion project</b>	37
<b>Table 1-3: Compliance with the Terms of Reference (TOR)</b>	39
<b>Table 2-1: Coordinates of the proposed project site</b>	52
<b>Table 2-2: Immediate Neighbours</b>	60
<b>Table 2-3: Major List of Industries in study area</b>	60
<b>Table 2-4: Area Break up at Site</b>	61
<b>Table 2-5: Existing &amp; After Expansion Production Capacity</b>	64
<b>Table 2-6: Storage Detail of Products – Existing and after Expansion</b>	64
<b>Table 2-7: Mode of Transportation of Products</b>	64
<b>Table 2-8: Storage Detail of Raw materials – Existing &amp; after Expansion</b>	65
<b>Table 2-9: Mode of Transportation – Raw Materials</b>	65
<b>Table 2-10: Schedule for Project Approvals (Tentative)</b>	66
<b>Table 2-11: Schedule for Project Implementations (Tentative)</b>	66
<b>Table 2-12: Material balance for Paints</b>	67
<b>Table 2-13: Material Balance for Putty</b>	73
<b>Table 2-14: List of major Equipment (Specifically for Production)</b>	73
<b>Table 2-15: Fuel Consumption</b>	74
<b>Table 2-16 Details of Water consumption</b>	75
<b>Table 2-17: Details of Waste Water Generation and Management</b>	76
<b>Table 2-18: Existing Waste water Generation - Industrial</b>	79
<b>Table 2-19: Waste water Generation after proposed Expansion.</b>	79
<b>Table 2-20: Wastewater Characteristics of Process, Utilities and Domestic Sewage of existing premises</b>	79
<b>Table 2-21: Stage wise reduction of parameters in existing ETP – Performance Evaluation</b>	80
<b>Table 2-22: Details of units of Existing ETP</b>	80
<b>Table 2-23: Details of Flue Gas Stacks</b>	86
<b>Table 2-24: Details of Existing and Proposed Process vents along with APCM's.</b>	89
<b>Table 2-25: Other Stacks/Vents.</b>	89
<b>Table 2-26: Hazardous Waste Generation and Disposal/Management</b>	92
<b>Table 2-27: Non-Hazardous Solid Waste Generation &amp; management</b>	96
<b>Table 2-28: Generation of Bio-medical waste &amp; Management</b>	96
<b>Table 2-29: List of Existing Species of Green Belt</b>	98

<b>Table 2-30: Pollution Load Statement for proposed expansion -normal operation.....</b>	<b>100</b>
<b>Table 2-31: Inventory and inputs considered for evaluation of emissions from operation .....</b>	<b>106</b>
<b>Table 2-32: Global Warming Potential for emissions from operation .....</b>	<b>106</b>
<b>Table 2-33: Inventory and inputs considered for evaluation of emissions from operation .....</b>	<b>106</b>
<b>Table 2-34: Global Warming Potential for emissions from operation .....</b>	<b>106</b>
<b>Table 2-35: Inventory and inputs considered for evaluation of emissions from operation .....</b>	<b>107</b>
<b>Table 2-36: Global Warming Potential for emissions from operation .....</b>	<b>107</b>
<b>Table 2-37: Inventory and inputs considered for evaluation of emissions from Post expansion operation.....</b>	<b>107</b>
<b>Table 2-38: Global Warming Potential for emissions from Post expansion operation .....</b>	<b>107</b>
<b>Table 2-39: Inventory and inputs considered for evaluation of emissions from post-expansion operation.....</b>	<b>107</b>
<b>Table 2-40: Global Warming Potential for emissions from post-expansion operation .....</b>	<b>108</b>
<b>Table 2-41: Inventory and inputs considered for evaluation of emissions from post-expansion operation.....</b>	<b>108</b>
<b>Table 2-42: Global Warming Potential for emissions from post-expansion operation .....</b>	<b>108</b>
<b>Table 2-43: Inventory and Inputs for purchased electricity (Existing).....</b>	<b>108</b>
<b>Table 2-44: Global Warming Potential for emissions from purchased electricity (Existing).....</b>	<b>110</b>
<b>Table 2-45: Inventory and Inputs for purchased electricity (Post-expansion).....</b>	<b>110</b>
<b>Table 2-46: Global Warming Potential for emissions from purchased electricity .....</b>	<b>111</b>
<b>Table 2-47: Existing Carbon Footprint .....</b>	<b>112</b>
<b>Table 2-48: Carbon Footprint post-expansion .....</b>	<b>113</b>
<b>Table 2-49: Water Consumption Details and breakup.....</b>	<b>117</b>
<b>Table 2-50: Total Water Requirement (KL/Annum) .....</b>	<b>117</b>
<b>Table 2-51: Total Waste Water Generation (KLD) .....</b>	<b>118</b>
<b>Table 2-52: Total Waste Water Generation (KL/Annum).....</b>	<b>118</b>
<b>Table 2-53: Tentative Run-off Computation .....</b>	<b>119</b>
<b>Table 2-54: Operational Control at installation Stage .....</b>	<b>123</b>
<b>Table 3-1: Sensitive Ecological Features .....</b>	<b>125</b>
<b>Table 3-2: GPS Readings within Study Area .....</b>	<b>127</b>
<b>Table 3-3: Land use / Land cover categories within Plant Premises .....</b>	<b>128</b>
<b>Table 3-4: Synopsis of Land use / Land cover Classification Used for the Project .....</b>	<b>128</b>
<b>Table 3-5: Area Statistics for Land Use/ Land Cover Categories in the Study Area.....</b>	<b>130</b>
<b>Table 3-6: Predominant Wind Direction based on Long-term Data (IMD Rohtak; 1991-2020).....</b>	<b>136</b>
<b>Table 3-7: Average Meteorological condition at IMD Rohtak .....</b>	<b>138</b>

<b>Table 3-8: Monitoring Methodology for site-specific meteorological data collection .....</b>	<b>138</b>
<b>Table 3-9: Mean site specific meteorological data for Summer season 2023 .....</b>	<b>139</b>
<b>Table 3-10: Site Specific meteorological data summary for 2<sup>nd</sup> February 2023 to 10<sup>th</sup> May 2023 ..</b>	<b>139</b>
<b>Table 3-11: Average Mixing Height for 24 hrs period .....</b>	<b>140</b>
<b>Table 3-12: Collation of primary meteorological data with secondary data of IMD Rohtak .....</b>	<b>140</b>
<b>Table 3-13: Ambient air quality monitoring locations .....</b>	<b>142</b>
<b>Table 3-14: Methodology for Ambient Air Quality Monitoring .....</b>	<b>147</b>
<b>Table 3-15: Summary of Ambient Air Quality monitoring result.....</b>	<b>148</b>
<b>Table 3-16: Existing Traffic survey density over 24 hours duration (total vehicles count) – APL to IMT Chock.....</b>	<b>152</b>
<b>Table 3-17: Existing traffic in PCU/Hr for traffic flow to APL (Up) .....</b>	<b>152</b>
<b>Table 3-18: Existing traffic in PCU/Hr for traffic flow to IMT Chock (DOWN) .....</b>	<b>153</b>
<b>Table 3-19: Ambient Noise Level Monitoring Methodology .....</b>	<b>154</b>
<b>Table 3-20: Ambient Air Quality Standards in respect of Noise for Different Areas/Zones .....</b>	<b>154</b>
<b>Table 3-21: Ambient Noise monitoring Locations.....</b>	<b>154</b>
<b>Table 3-22: Ambient Noise Level Results .....</b>	<b>158</b>
<b>Table 3-23: Details of Surface Water Sampling Locations .....</b>	<b>159</b>
<b>Table 3-24: Analysis Methods Adopted for Surface Water Samples .....</b>	<b>162</b>
<b>Table 3-25: Analysis Result of Surface Water Samples .....</b>	<b>165</b>
<b>Table 3-26: Classification of River Water as per their Intended Use.....</b>	<b>166</b>
<b>Table 3-27: Stratigraphic Succession – District Rohtak, State Haryana .....</b>	<b>176</b>
<b>Table 3-28: Sensitive Ecological Features – Geology .....</b>	<b>176</b>
<b>Table 3-29: Types of Aquifer .....</b>	<b>178</b>
<b>Table 3-30: Categorization of Ground Water Assessment Unit of Study Area .....</b>	<b>178</b>
<b>Table 3-31: Ground Water Quality Testing Methodology .....</b>	<b>180</b>
<b>Table 3-32: Depth to Water Level from Central Department Board .....</b>	<b>182</b>
<b>Table 3-33: Last Decade Ground Water Level Data from State Department Board .....</b>	<b>182</b>
<b>Table 3-34: Well Depth and Water Quality Data .....</b>	<b>183</b>
<b>Table 3-35: Well-Inventory &amp; Ground Water Sampling Locations.....</b>	<b>184</b>
<b>Table 3-36: Sensitive Ecological Features – Hydrogeology.....</b>	<b>186</b>
<b>Table 3-37: Ground Water Analysis Results.....</b>	<b>188</b>
<b>Table 3-38: Methodology of Soil Sample analysis .....</b>	<b>191</b>
<b>Table 3-39: Soil Sampling Locations .....</b>	<b>191</b>
<b>Table 3-40: Soil Analysis Result.....</b>	<b>195</b>
<b>Table 3-41: Ecological Sensitive Areas within 15 km of the Project Site .....</b>	<b>197</b>



<b>Table 3-42: Details of Water Bodies in the Buffer Zone .....</b>	<b>198</b>
<b>Table 3-43: Shrubs, Herbs and Climbers observed from the project site .....</b>	<b>199</b>
<b>Table 3-44: List of floral diversity from project study area (Buffer Zone) .....</b>	<b>201</b>
<b>Table 3-45: Fauna Reported from Core Zone / Project Site .....</b>	<b>206</b>
<b>Table 3-46: Fauna in the study area .....</b>	<b>208</b>
<b>Table 3-47: Conservation status of Species classified under Schedule-I of Indian Wildlife (Protection) Amendment Act, 2022 &amp; IUCN .....</b>	<b>212</b>
<b>Table 3-48: Approach and Methodology for Conducting the Socio-economic Study .....</b>	<b>213</b>
<b>Table 3-49: Sensitive Ecological Features .....</b>	<b>214</b>
<b>Table 3-50: Demographic Profile of project District and Sub-District .....</b>	<b>217</b>
<b>Table 3-51: Villages in Study Area with Households and Population .....</b>	<b>217</b>
<b>Table 3-52: Population and Sex ratio details .....</b>	<b>218</b>
<b>Table 3-53: Schedule Caste and Schedule Tribe Population Distribution in Study Area .....</b>	<b>219</b>
<b>Table 3-54 Literacy Rate in Study Area .....</b>	<b>219</b>
<b>Table 3-55: Education Facility .....</b>	<b>220</b>
<b>Table 3-56: Medical Facility .....</b>	<b>220</b>
<b>Table 3-57: Water Facilities .....</b>	<b>222</b>
<b>Table 3-58: Communication Facilities .....</b>	<b>222</b>
<b>Table 3-59: Transportation facility .....</b>	<b>222</b>
<b>Table 3-60: Occupational Pattern .....</b>	<b>223</b>
<b>Table 4-1: Scoring System for Environmental Impacts due to the Proposed Project – Severity Assessment .....</b>	<b>227</b>
<b>Table 4-2: Likelihood of Occurrence .....</b>	<b>233</b>
<b>Table 4-3: Environmental Impact Significance Criteria .....</b>	<b>233</b>
<b>Table 4-4: Categorization of Impact Significance .....</b>	<b>234</b>
<b>Table 4-5: Impact Aspect Assessment .....</b>	<b>235</b>
<b>Table 4-6: Aspect – Impact Identification for Land Environment .....</b>	<b>243</b>
<b>Table 4-7: Impact Scoring – Land Use Land Cover .....</b>	<b>244</b>
<b>Table 4-8: Land use / Land cover categories within Plant Premises .....</b>	<b>245</b>
<b>Table 4-9: Impact Scoring – Air Environment .....</b>	<b>247</b>
<b>Table 4-10: Emission Rate of VOCs from Stack (Scrubber) .....</b>	<b>250</b>
<b>Table 4-11: Emission Rate of pollutants from Stack (GG Set) .....</b>	<b>250</b>
<b>Table 4-12: Emission Rate of PM from Process Stack .....</b>	<b>251</b>
<b>Table 4-13: Emission rate of Pollutants due to (Diesel-based) Vehicular Exhaust .....</b>	<b>252</b>
<b>Table 4-14: Emission rate of Pollutants due to (CNG-based) Vehicular Exhaust .....</b>	<b>252</b>

<b>Table 4-15: Hourly Average Incremental Increase in GLC .....</b>	<b>254</b>
<b>Table 4-16: Incremental Traffic flow in PCU/Hr due to the proposed project .....</b>	<b>256</b>
<b>Table 4-17: Final Scenario of Incremental Traffic due to the Proposed in Project &amp; Capacity of Roads .....</b>	<b>256</b>
<b>Table 4-18: Environmental Impact Scoring for Noise Environment .....</b>	<b>258</b>
<b>Table 4-19: Sources of noise with their Sound Pressure Levels .....</b>	<b>259</b>
<b>Table 4-20: Noise levels at receptor locations .....</b>	<b>262</b>
<b>Table 4-21: Impact Scoring – Ground Water .....</b>	<b>265</b>
<b>Table 4-22: Impact Scoring for Surface Water .....</b>	<b>269</b>
<b>Table 4-23: Impact Scoring for Solid &amp; Hazardous Waste Management.....</b>	<b>270</b>
<b>Table 4-24: Impact Scoring – Soil Environment .....</b>	<b>271</b>
<b>Table 4-25: Aspect – Impact Identification, Impact Scoring and Mitigation Measures – Ecology &amp; Biodiversity .....</b>	<b>274</b>
<b>Table 4-26: Impact Scoring – Socio-Economic Environment .....</b>	<b>276</b>
<b>Table 4-27: Suggested Activities .....</b>	<b>280</b>
<b>Table 6-1: Environmental Monitoring Plan.....</b>	<b>284</b>
<b>Table 6-2: List of Applicable EHS Legislation .....</b>	<b>286</b>
<b>Table 7-1: Important Hazardous Events .....</b>	<b>288</b>
<b>Table 7-2: Damage due to Radiation Intensity .....</b>	<b>289</b>
<b>Table 7-3: Overpressure Damage .....</b>	<b>289</b>
<b>Table 7-4: Hazardous Chemicals Selected for Simulation .....</b>	<b>292</b>
<b>Table 7-5: Scenario Selected for Simulation of Pipeline.....</b>	<b>293</b>
<b>Table 7-6: Broadly Accepted Frequency .....</b>	<b>293</b>
<b>Table 7-7: Pasquill parameters .....</b>	<b>294</b>
<b>Table 7-8: Relationship between Wind Speed and Atmospheric Stability.....</b>	<b>294</b>
<b>Table 7-9: Weather Condition Selected .....</b>	<b>294</b>
<b>Table 7-10: Summary of Consequence analysis results .....</b>	<b>296</b>
<b>Table 7-11: Possible Hazard events.....</b>	<b>303</b>
<b>Table 10-1 Environment Management Plan for Air Quality .....</b>	<b>316</b>
<b>Table 10-2: Traffic Management Plan .....</b>	<b>317</b>
<b>Table 10-3: Environment Management Plan for Noise Environment.....</b>	<b>318</b>
<b>Table 10-4: Consider Land Area Break-up.....</b>	<b>319</b>
<b>Table 10-5: Tentative Run-off Computation .....</b>	<b>319</b>
<b>Table 10-6: Summary of Rainwater Generation .....</b>	<b>319</b>
<b>Table 10-7: Environment Management Plan for Ground Water .....</b>	<b>321</b>

<b>Table 10-8: Environment Management Plan for Surface Water Quality .....</b>	<b>324</b>
<b>Table 10-9: Environment Management Plan for Solid &amp; Hazardous Waste Management .....</b>	<b>325</b>
<b>Table 10-10: Environment Management Plan for Soil Quality .....</b>	<b>325</b>
<b>Table 10-11: Environment Management Plan for Land use and Land cover .....</b>	<b>326</b>
<b>Table 10-12: Details of Proposed Green belt Plantation at Project Site .....</b>	<b>331</b>
<b>Table 10-13: Overhead for Proposed Greenbelt Development &amp; Annual Maintenance of Existing and proposed Greenbelt .....</b>	<b>332</b>
<b>Table 10-14: Conservation status of the Schedule I fauna present in study area .....</b>	<b>334</b>
<b>Table 10-15: Yearwise Quantity of rainwater reused in process .....</b>	<b>337</b>
<b>Table 10-16 : Budget for CER Activities for upcoming 5 years .....</b>	<b>339</b>
<b>Table 10-17: The amount released during 2021-2025 under CER .....</b>	<b>339</b>
<b>Table 10-18: Expenditure on Environmental Matters .....</b>	<b>341</b>
<b>Table 10-19: Workplace Monitoring .....</b>	<b>345</b>
<b>Table 10-20: Environment Monitoring – Operation Phase .....</b>	<b>345</b>
<b>Table 11-1: Point source GLC .....</b>	<b>362</b>
<b>Table 11-2: Line Source GLC .....</b>	<b>362</b>
<b>Table 12-1: Incremental GLC (<math>\mu\text{g}/\text{m}^3</math>) of Particulate Matter (<math>\text{PM}_{10}</math>) .....</b>	<b>467</b>
<b>Table 12-2: Incremental GLC (<math>\mu\text{g}/\text{m}^3</math>) of Sulphur Dioxide (<math>\text{SO}_2</math>) .....</b>	<b>469</b>
<b>Table 12-3: Incremental GLC (<math>\mu\text{g}/\text{m}^3</math>) of Oxides of Nitrogen (<math>\text{NO}_x</math>) .....</b>	<b>471</b>
<b>Table 12-4: Incremental GLC (<math>\mu\text{g}/\text{m}^3</math>) of Volatile Organic Compound (VOC) .....</b>	<b>473</b>
<b>Table 12-5: Incremental GLC (<math>\mu\text{g}/\text{m}^3</math>) of Particulate Matter (<math>\text{PM}_{10}</math>) .....</b>	<b>475</b>
<b>Table 12-6: Incremental GLC (<math>\mu\text{g}/\text{m}^3</math>) of Oxides of Nitrogen (<math>\text{NO}_x</math>) .....</b>	<b>477</b>
<b>Table 12-7: Incremental GLC (<math>\mu\text{g}/\text{m}^3</math>) of Carbon Monoxide (<math>\text{CO}</math>) .....</b>	<b>479</b>
<b>Table 12-8: Incremental GLC (<math>\mu\text{g}/\text{m}^3</math>) of Hydro Carbons (HC) .....</b>	<b>481</b>

## LIST OF FIGURES

<b>Figure 2-1: Pie chart – Total area distribution in percentage at site</b> .....	62
<b>Figure 2-2: Schematic flow diagram for Waterbase Paints Manufacturing</b> .....	69
<b>Figure 2-3: Schematic flow diagram for Polymer Manufacturing</b> .....	71
<b>Figure 2-4: Schematic flow diagram of Manufacturing Process for Putty</b> .....	72
<b>Figure 2-5: Existing Water Balance Diagram</b> .....	77
<b>Figure 2-6: Water Balance Diagram after proposed expansion</b> .....	78
<b>Figure 2-7: Process Flow Diagram of Existing ETP</b> .....	84
<b>Figure 2-8: Existing Carbon Emissions from Scope-1&amp;2.</b> .....	112
<b>Figure 2-9: Carbon Emissions from Scope-1&amp;2. (Post Expansion)</b> .....	113
<b>Figure 2-10: Carbon Sequestration</b> .....	115
<b>Figure 3-1: Pie Chart of LULC classes within Plant Premises</b> .....	128
<b>Figure 3-2 Pie Chart of LULC classes in the study area</b> .....	131
<b>Figure 3-3: Season wise wind-rose diagrams – Long-term climatological tables</b> .....	137
<b>Figure 3-4: Wind Rose Diagram for site-specific meteorological conditions during baseline monitoring</b> .....	141
<b>Figure 3-5: Pie Chart of LULC classes in the study area</b> .....	159
<b>Figure 4-1: Pie Chart of LULC classes within Plant Premises</b> .....	246
<b>Figure 4-2: Data flow in AERMOD modelling system</b> .....	249
<b>Figure 4-3: Isopleth for Incremental Noise Generated during Day Time</b> .....	260
<b>Figure 4-4: Isopleth for Incremental Noise Generated during Night Time</b> .....	261
<b>Figure 7-1: Jet fire effective distances due to leak</b> .....	297
<b>Figure 7-2: Pool fire effective distances due to catastrophic rupture of tank</b> .....	298
<b>Figure 7-3: Iso-Risk Contour for Individual Risk of APL Rohtak Site.</b> .....	300
<b>Figure 7-4: FN Curve for Societal Risk (Using HK standard from Societal Risk Estimation, Hall and Floyd)</b> .....	301
<b>Figure 10-1: Organogram of Plant Environment Management Cell</b> .....	341
<b>Figure 12-1: Isopleth for Concentration of PM<sub>10</sub></b> .....	466
<b>Figure 12-2: Isopleth for Concentration of Sulphur Dioxide (SO<sub>2</sub>)</b> .....	468
<b>Figure 12-3: Isopleth for Concentration of Oxides of Nitrogen (NO<sub>x</sub>)</b> .....	470
<b>Figure 12-4: Isopleth for Concentration of Volatile Organic Compounds (VOC)</b> .....	472
<b>Figure 12-5: Isopleth for Concentration of PM<sub>10</sub></b> .....	474
<b>Figure 12-6: Isopleth for Concentration of Oxides of Nitrogen (NO<sub>x</sub>)</b> .....	476
<b>Figure 12-7: Isopleth for Concentration of Carbon Monoxide (CO)</b> .....	478

<b>Figure 12-8: Isopleth for Concentration of Hydro Carbons (HC)</b> .....	480
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## LIST OF PHOTOGRAPHS

<b>Photographs 2-1: Photographic documentation of Plant, Process area, Storage, Stacks, and Hazardous waste storage area.</b> .....	62
<b>Photographs 2-2: Photos of On-site Hazardous waste storage area.</b> .....	91
<b>Photographs 3-1: Landuse Site Visit</b> .....	131
<b>Photographs 3-2: Photographs showing Meteorological Station installed at site</b> .....	138
<b>Photographs 3-3: Ambient Air Quality Monitoring</b> .....	144
<b>Photographs 3-4: Traffic Survey at IMT Entrance Road Sector 30-B Rohtak</b> .....	152
<b>Photographs 3-5: Photograph of Noise Monitoring</b> .....	155
<b>Photographs 3-6: Surface Water Sampling</b> .....	161
<b>Photographs 3-7: Soil Sampling Photographs</b> .....	192
<b>Photographs 3-8 : Photographs of the flora found in the study area</b> .....	205
<b>Photographs 3-9: Photographs of Faunal species recorded from the study area.</b> .....	210
<b>Photographs 3-10: Photographs of Focused Group Discussion (FGD)</b> .....	216
<b>Photographs 10-1: Existing Greenbelt at Site</b> .....	328
<b>Photographs 10-2: Photographs of Existing CSR Activities</b> .....	339
<b>Photographs 12-1: Products showing labelling regarding Lead content. (All the products shows lead content below 90 ppm)</b> .....	524



## LIST OF MAPS

<b>Map 2-1: Project Site Location Map</b> .....	54
<b>Map 2-2: Project Location on Toposheet /Open Series Map (OSM) of SoI</b> .....	55
<b>Map 2-3: Study Area Map on Google Earth Imagery with Project Site</b> .....	55
<b>Map 2-4: HSIIDC Layout Plan Map of IMT, Rohtak</b> .....	57
<b>Map 2-5: Project Site Boundary Map with Geo-coordinates</b> .....	58
<b>Map 2-6: Project Site Layout Plan</b> .....	59
<b>Map 3-1: Land Use Map of 10 Kms Radius of Study Area</b> .....	133
<b>Map 3-2 Map Showing Industries in 10 km study area map</b> .....	134
<b>Map 3-3: Ambient Air Sampling Location Map</b> .....	146
<b>Map 3-4: Noise Sampling Location Map</b> .....	157
<b>Map 3-5: Surface water sampling locations map</b> .....	164
<b>Map 3-6: Elevation Profile using Google Earth Engine</b> .....	167
<b>Map 3-7: Project Site Overlay on Drainage map with distance from polluted river stretch as per CPCB.</b> .....	169
<b>Map 3-8: Drainage Order Map – 10km &amp; 5km Radius to the Project Site</b> .....	170
<b>Map 3-9: Earthquake Hazard Map</b> .....	172
<b>Map 3-10: Seismic Intensity Map</b> .....	173
<b>Map 3-11: Flood Hazard Map</b> .....	175
<b>Map 3-12: District Resource Map – Geology and Minerals</b> .....	177
<b>Map 3-13: Ground water sampling location map</b> .....	187
<b>Map 3-14: Soil Sampling Location Map</b> .....	194
<b>Map 3-15 Study Area Map for Socio-economics Studies</b> .....	215

## ABBREVIATIONS AND ACRONYMS

AAQM	:	Ambient Air Quality Monitoring
APL	:	Asian Paints Limited
BLEVE	:	Boiling Liquid Evaporating Vapour Explosion
BOD	:	Biochemical Oxygen Demand
CFCs	:	Chlorofluorocarbons
CHWTSDF	:	Common Hazardous Waste Treatment, Storage and Disposal Facility
CO	:	Carbon Monoxide
COD	:	Chemical Oxygen Demand
CPCB	:	Central Pollution Control Board
dB (A)	:	Decibel
DG	:	Diesel Generator
DMP	:	Disaster Management Plan
EB	:	Ecology & Biodiversity
EC	:	Environmental Clearance
EC (Soil)	:	Electrical Conductivity
ECC	:	Emergency Control Centre
EHS	:	Environmental Health & Safety
EIA	:	Environmental Impact Assessment
EMP	:	Environmental Management Plan
EPRG	:	Emergency Response Planning Guidelines
ESP	:	Exchangeable Sodium Percentage
ETP	:	Effluent Treatment Plan
FAE	:	Functional Area Expert
FMECA	:	Failure Modes Effects and Criticality Analysis
GIS	:	Geological Survey of India
GLC	:	Ground Level Concentration
GoI	:	Government of India
GWP	:	Global Warming Potential
HAZOP	:	Hazard and Operability Study
HC	:	Hydrocarbons
HSD	:	High Speed Diesel
HSIIDC	:	Haryana State Industrial & Infrastructure Development Corporation
HSPCB	:	Haryana State Pollution Control Board
IATF	:	International Automotive Task Force
IDLH	:	Immediately Dangerous to Life or Health
IMD	:	Indian Meteorological Department
IMT	:	Industrial Model Township
IPCC	:	Intergovernmental Panel on Climate Change
IUCN	:	International Union for Conservation of Nature
IWPA 1972	:	Indian Wild Life Protection Act, 1972
KEC	:	Kadam Environmental Consultants
KLD	:	Kilolitre per Day
kW	:	Kilo Watt
KWh	:	kilo Watt hour
LEL	:	Lower Flammability Limits
LIZ	:	Likely Impact Zone

LULC	:	Land use and Land cover
MCA	:	Maximum Credible Accident
MCLs'	:	Maximum Credible Loss Scenarios
MoEF&CC	:	Ministry of Environment, Forest & Climate Change
MSDS	:	Material Safety Data Sheet
MSIHC Rules	:	Manufacture, Storage, Import & Hazardous Chemical Rules
MTPA	:	Metric Ton Per Annum
NABET	:	National Accreditation Board for Education and Training
NBSS & LUP	:	National Bureau of Soil Survey and Land Use Planning
NDT	:	Non Destructive Testing
NH3	:	Ammonia
NIOSH	:	National Institute for Occupational Safety and Health
NOX	:	Nitrogen Oxides
NRSA	:	National Remote Sensing Agency
NS	:	Not Specified
ODP	:	Ozone Depletion Potential
OSHA	:	Occupational Safety and Health Administration
PEL	:	Permissible Exposure Limits
PM	:	Particulate Matter
PPE	:	Personal Protection Equipment
RJF	:	Reverse Jet Filter
SAR	:	Sodium Adsorption Ratio
SC	:	Soil Conservation
SEAC	:	State Expert Appraisal Committee
SEIAA	:	State Environmental Impact Assessment Authority
SO2	:	Sulphur Di-oxide
SPL	:	Sound Pressure Level
SS	:	Suspended Solid
STEL	:	Short Time Exposure Limit
STP	:	Sewage Treatment Plant
TDS	:	Total Dissolved Solids
TFAU	:	Terrestrial Fauna
TFLO	:	Terrestrial Flora
TLV	:	Threshold Limit Value
TOR	:	Terms of Reference
TSDF	:	Treatment, Storage and Disposal Facility
TSS	:	Total Suspended Solids
UFL	:	Upper Flammable Limits
UNECE	:	United Nations Economic Commission for Europe
USEPA	:	United States Environment Protection Agency
VOC	:	Volatile Organic Compounds
WHC	:	Water Holding Capacity
WMO	:	World Meteorological Organisation

## GLOSSARY OF TERMS USED

**PAINT:** Paint is a suspension of finely separated pigment particles in a liquid that when spread over a surface in a thin layer will form a solid, cohesive, and adherent film. The change to a solid state may result through solvent evaporation, by chemical reaction or by a combination of these processes.

**PAINT INDUSTRY:** A Paint industry is defined as an industry, which is involved in not only formulation (physical mixing of ingredients) of paints, but also in manufacturing of ingredients such as resins, lacquers, varnishes, etc. Paint industry manufactures a number of products such as paint, varnish, lacquers, enamels, synthetic resins, water-based paints, etc.

**BINDERS:** Binders form a continuous phase, hold the pigment in dry film and cause it to adhere to the surface to be coated. The majority of binders in paint films are composed of resins and drying oils, which are largely responsible for the protective and general mechanical properties of the film. Resins provide characteristics such as durability and flexibility. Alkydes, acrylics and vinyls are the three commonly used resins.

**SOLVENTS:** Solvents are used to keep paints in liquid form so that they can be easily applied and evaporate completely. It is used to transfer the pigment mixture to a surface in a thin, uniform film and plays no role in film formation. Materials used as solvents are aromatic and aliphatic hydrocarbons, alcohols, ketones and esters. Water is the solvent in water-based and Water Based Polymer paints.

**PIGMENTS:** Pigments provide the coating with colour, opacity and degree of durability to the paints. Pigments are either organic or inorganic. The major pigment used is titanium dioxide or Titan. This is white in colour and has a high refractive index (bends light and adds to hiding power).

**EXTENDERS:** These are mainly used to modify the gloss level of paints as, the more pigment in a paint film, the flatter the sheen will be. Extenders are used to lower the sheen or gloss. These are also used to add body to paint and to increase its filling properties. The main extenders are calcium carbonate, talc, barytes and diatomaceous earth.

**THINNING (LETDOWN):** Material let-down, or thinning, is the process by which a completed mill base dispersion is let down or reduced with solvent and/or binder to give a coating which is designed to provide a durable, serviceable film that is easily applied to the substrate. The volume of paint may increase significantly at this point depending on the final product specifications.

**TINTING:** Tinting is the process of adjusting the colour of completed mill base dispersions. Normally, an operator will collect a sample of paint once it exits the milling equipment. This sample will be taken to the laboratory and compared to the desired colour standard. Various combinations of pigments, solvents, resins, and pastes are added to the material to meet colour requirements.

**BLENDING:** Blending operations occur once the necessary additions have been made to completed mill base dispersion. Blending is the process of incorporating the additions into material in order to meet the desired product specifications. In case of batch operations, blending may simply consist of additional milling in a ball mill or added mixing and dispersing in a portable mix tank/high-speed disperser set-up. In other cases, the mill base dispersion is transferred to fixed agitated blend tanks or additional mix tank/disperser operations. In each case, material adjustments for thinning and tinting are added through top openings, agitated, and gravity fed or pumped out bottom or side spigots for filling operations.

**Source:** Technical EIA Guidance Manual for Integrated Paint Industry by IL & FS Eco smart Limited, Hyderabad, September 2010.

## GLOSSARY OF TERMS USED – RISK ASSESSMENT & DISASTER MANAGEMENT

**ACCIDENT:** An accident may be defined as “an undesirable and unplanned event with or without or major or minor damage consequence to life and/or property.”

**ALARP (AS LOW AS REASONABLY PRACTICABLE):** ALARP is the recommended standards for FAR acceptable levels in various human activities as issued by the Health and Safety Executive (UK). These are used for comparing the achieved FAR levels to determine acceptability or otherwise of the safety level of the activity. It is indicator of Fatality risk to employees.

**BLEVE:** Boiling Liquid Expanding Vapour Explosion (BLEVE): This is a type of explosion that can occur when a vessel containing a pressurized liquid is ruptured. Such explosions can be extremely hazardous.

**CONSEQUENCE:** Magnitude or size of the damage or loss. In terms of health and safety, it is the degree of harm that could be caused to the people exposed to hazard, the potential severity of injuries or ill health, and/or the number of people who could be potentially affected. Consequence of hazard need not only be in terms of human safety criteria, but could also be in terms of a financial loss due to production and incurred costs due to repairs/replacement, environmental impacts as well as public outrage.

**DISASTER:** Disaster is a catastrophic consequence of a major emergency/accident that leads to, not only extensive damage to life and property but also disrupts all normal human activity for a pretty long time and requires a major national and international effort for rescue and rehabilitation of those affected.

**EMERGENCY:** Emergency is a situation of process deviation that if uncontrolled may lead to a major accident/disaster with potential short term and/or long term risk damage consequence to life and property in and/or around the factory.

**EXPLOSION:** An explosion is a sudden increase in volume and release of energy in an extreme manner, usually with the generation of high temperatures and the release of gases.

**FLAMMABLE LIMIT:** Flammable limits refer to the conditions under which a mixture of a flammable material and air may catch fire or explode. When vapours of a flammable or combustible liquid are mixed with air in the proper proportions in the presence of a source of ignition, rapid combustion or an explosion can occur. The proper proportion is called the flammable range and is also often referred to as the explosive range. The flammable range includes all concentrations of flammable vapour or gas in air, in which a flash will occur or a flame will travel if the mixture is ignited.

**FAR (FATALITY ACCIDENT RATE):** FAR, is the risk of fatality of an individual exposed to a given hazard for a period of 108 hours of exposure which comes to about 11,000 years is also approximately equivalent to the period 1000 people are likely to be exposed to work hazard during an active work life of 40 years of 300 work days covering a single shift of 8-hours ( $1000 \times 300 \times 8 \times 40 = 0.96 \times 10^8 \gg 108$ ).

**FATALITY ZONE:** The zone where fatality results for exposed persons.

**FIREBALL:** The burning of a flammable gas cloud on being immediately ignited at the edge before forming a flammable/explosive mixture.

**FLASH FIRE:** A flammable gas release gets ignited at the farthest edge resulting in flash-back fire.

**FN-RELATION:** FN is the relation between Frequency (F) Vs. Fatality Number (N) of all the MCLS in a given facility and is expressed in Tabular and Graphic form. Frequencies are statistically smoothened to conform to the natural law of inverse relationship between frequency and fatality.

**FREQUENCY:** Frequency is the likelihood of the occurrence of an accident in a given period normally expressed as frequency per plant year.

**HAZARD:** Hazard is the potential of an Accident.

**INCIDENT:** Incident is an emergent situation of any critical deviation in the process control or otherwise that may lead to a major accident/potential emergency and disaster.

**INJURY ZONE:** Zone of injury in any hazardous event.

**LOWER EXPLOSIVE LIMIT (LEL) / LOWER FLAMMABLE LIMIT (LFL):** Lower explosive limit (LEL) or the lower flammable limit (LFL) is the minimum concentration of flammable vapour or gas in air, below which propagation of flame does not occur on contact with a source of ignition. The mixture is said to be too lean.

**MAJOR ACCIDENT HAZARD (MAH) INDUSTRY:** If the quantity of any chemical as listed in MSIHC Rules' Schedule-2 or Schedule-3 is equal to or greater than the Threshold Quantity given therein.

**MAJOR ACCIDENT:** Loss of life or 10 or more injuries on-site or 1 or more injuries off-site (as defined in MSIHC Rules).

**PLUMES:** Plumes are continuous release of hazardous gases and vapours. Smoke from a chimney is an example. Plumes can cause FIRES AND EXPLOSIONS as secondary scenarios.

**PUFFS:** PUFFS are instantaneous release of hazardous gases and vapours. Puffs can give rise to FIRE BALLS and vapour cloud explosions (VCE). A special case of vapour cloud explosion is the Boiling Liquid Evaporating Vapour Explosion (BLEVE).

**RELIABILITY:** Reliability is the likelihood of a facility running without fail out of one. Reliability=1-Probability and vice versa.

**RISK:** Risk has two components:

1. Risk of occurrence of an accident (Chance, probability or frequency) and
2. Risk of consequence of damage to life and property.

Measures of risk include FAR and FN-Relation.

**RISK ASSESSMENT:** A process that involves estimation and measurement of risk to determine priorities and to enable identification of appropriate level of risk treatment (used also to describe the overall process of risk management).

**RISK CONTROL:** Implementation of strategies to prevent or to control hazards.

**RISK MANAGEMENT:** Overall description of the steps taken to manage risk, by identifying hazards and implementing controls in the workplace.

**Risk Rating:** The category, or level, or risk assigned following risk assessment (e.g. High, Medium or Low).

**SPILLS:** Spills are liquid pools created by leaking liquid chemicals. Spills cause evaporation and dispersal of toxic gases and if the spilled liquid is flammable, then it can catch fire creating a pool fire also the vapours can cause explosion.

**UPPER (OR HIGHER) EXPLOSIVE LIMIT (UEL OR HEL) / UPPER (OR HIGHER) FLAMMABLE LIMIT**

**(UFL OR HFL):** Upper (or Higher) explosive limit (UEL/HEL) or the upper (or higher) flammable limit (UFL/HFL) is the maximum concentration of flammable vapour or gas in air, above which propagation of flame does not occur on contact with a source of ignition. The mixture is said to be too rich.

**VCE (VAPOUR CLOUD EXPLOSION):** Explosion resulting from vapour clouds formed from flashing liquids or non-flashing liquids and gases. Sometime also referred to as unconfined vapour cloud explosion. (UCVE)

**STABILITY CLASS:**

- A - Extremely unstable (sunny, light wind)

- B- Moderately unstable (less sunny or windier)
- C- Slightly unstable (very windy/sunny or overcast/light wind)
- D- Neutral (little sun and high wind or overcast/windy night)
- E - Slightly stable (less overcast and less windy night than D)
- F - Moderately stable (night with moderate clouds and light/moderate wind)

**ERPG:** Emergency Response Planning Guidelines1 (ERPG1): The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hour (without a respirator) without experiencing other than mild transient adverse health effects or without perceiving a clearly defined objectionable odor.

Emergency Response Planning Guidelines2 (ERPG2): The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hour without experiencing or developing irreversible or other serious health effects or symptoms that could impair their abilities to take protective action.

Emergency Response Planning Guidelines3 (ERPG3): The maximum airborne concentration below which it is believed nearly all individuals could be exposed for up to 1 hour without experiencing or developing life-threatening health effects.

**VULNERABILITY ZONE:** Zone of Exposure leading to Fatality or recoverable injury in any hazardous event.

## GLOSSARY OF TERMS USED – SOIL CONSERVATION

**pH:** A negative logarithm of hydrogen ion activity (concentration) is determined by means of glass or other suitable electrode or indicator at a specified moisture content expressed in terms of pH scale.

**SOIL:** (I) a dynamic natural body composed of minerals and organic solids, gases, liquid and living organisms which can serve as a medium for plant growth. (II) The collection of natural bodies occupying parts of the earth's surface that is capable of supporting plant growth and that has properties resulting from the integrated effect of climate and living organisms acting upon parent material, as conditioned by topography, over a period of time.

**SOIL CONSERVATION:** (I) Protection of the soil against loss by erosion against chemical deterioration that is excess loss of fertility by either natural or artificial means; (II) A combination of all management and land use methods which safeguard the soil against depletion or deterioration by natural or man induced factors.

**SOIL FERTILITY:** The quality of a soil that enables to provide essential chemical elements in quantities and proportions for the growth of specific plants.

**SOIL PRODUCTIVITY:** The capacity of a soil for producing a specified plant or sequence of plants under a specified system of management. Productivity emphasizes the capacity of soil to produce crops and should be expressed in terms of yield.

**SOIL QUALITY:** The capacity of specific kind of soil to function within natural or managed ecosystem boundaries to sustain or enhance plant and animal productivity, maintain or enhance water and air quality and support human health and habitation. Sometimes considered in relation to this capacity in the undisturbed natural state.

**BULK DENSITY, SOIL:** The mass of dry soil per unit bulk volume. The bulk volume is determined before drying to constant weight at 105°C.

**ILLUVIAL HORIZON:** A soil layer or horizon in which material carried from overlying layers has been precipitated from solution or deposited from suspension. This is called layer of accumulation.

**SOIL EROSION:** (I) The wearing away of the land surface by running water, wind, ice or other geological agents, including such process as gravitational creep; (II) Detachment and movement of soil or rock by water, wind, ice or gravity.

**WATER HOLDING CAPACITY:** It is defined as the capacity of soil to retain water against the downward pull of the force of the gravity and water is held with soil water potential less than - 1/3 bar.

**ANEMOMETER:** A device used to measure speed of wind or any other moving gas.

**ATMOSPHERIC STABILITY:** Atmospheric Stability is defined in terms of vertical temperature gradient in the atmosphere.



## LIST OF PERSONS MET AND INSTITUTIONS VISITED

- List of persons met from Asian Paints Limited:**

S. No.	Name of Person	Designation
1	Mr. Vivek Khanchandani	Lead Principle Specialist- SCRC
2	Mr. Godwinkumar Joel	Senior Manager- QA & EHS
3	Ms. Pallavi Priya	Manager- EHS
4	Mr. Sanjeev Kumar	Senior Executive- EHS

- List of persons met and institutions visited for socio-economic studies:**

S. No.	Villages	Date	Location within Village	Participant Names
1	Bhalot	06.03.24	Panchayat Office	Kuldeep Phogat
			Govt School	Kusum Data
2	Kheri Sadh	05.03.24	Govt School	Sunita Khasa
3	Bohar	06.03.24	Govt School	Sunita Nandal
4	Baliana	06.03.24	Govt School (Girls)	Dilraj Hooda
			Govt School	Kiran Lata

# 1 INTRODUCTION

M/s. Asian Paints Limited ('APL') has proposed expansion in existing integrated paint manufacturing facility located at Plot No. 1, Sector 30-B, HSIIDC, IMT Rohtak Haryana. APL intends to optimize & utilize its existing facility to increase the overall production of water and solvent-based paints, Intermediate along with the production of putty.

As per the EIA Notification dated 14<sup>th</sup> September 2006 and subsequent amendments, the proposed project falls under Category "B", Project or Activity 5(h) "Integrated Paint Industry".

APL has obtained Environmental Clearance for the existing facility vide letter no. J-11011/1158/2007-IA-II (I) dated 9<sup>th</sup> April 2008. APL also has valid consent to operate (CTO) from HSPCB vide Consent order no.: "HSPCB/Consent: 313096423ROHCTO5463972" dated 22<sup>nd</sup> February 2023 valid up to 30<sup>th</sup> September 2027.

## 1.1 Purpose of the Report

The purpose of this report is to study existing environmental conditions, identify environmental aspects and impacts arising out of the proposed expansion project, suggest measures to mitigate the adverse impacts, delineate a comprehensive environmental management plan along with recommendations and suggestions in the form of an EIA report, and seek prior Environmental Clearance.

The proposed expansion project of the existing manufacturing unit belonging to integrated paint industries requires prior Environmental Clearance (EC) from the SEAC, Haryana, for the activity of 5(h) (NABET Sector 23) under "B1" Category as per the Schedule of the EIA Notification of September 14, 2006, as amended to date.

This report is prepared as per the Terms of References (TORs) issued by SEAC Haryana vide their ToR Identification no: **TO24B2601HR5419231N** dated **31/05/2024**. The TOR letter is attached as **Annexure 1**. This report is prepared based on the 'General Structure of EIA' given in Appendix III and IIIA of EIA Notification, dated 14<sup>th</sup> September 2006 as amended till date.

Asian Paint Limited (herein referred to as 'APL') has appointed NABET-accredited EIA Consultant M/s. Kadam Environmental Consultants (hereafter referred to as 'KEC') having accreditation in Sector 23 for the "Integrated paint industry" under the QCI/NABET Scheme, to carry out the EIA study for obtaining Environmental Clearance for the proposed project. Accreditation Certificate issued by NABET, QCI for M/s. Kadam Environmental Consultants Vide Certificate No. **NABET/EIA/2326/RA 0303\_Rev.01, Dated: 15/07/2024, Valid upto 19<sup>th</sup> March 2026** is enclosed as **Annexure 27**.

## 1.2 Identification of project and project proponent

### 1.2.1 Identification of the project

APL is planning to propose expansion of production in its existing integrated paint manufacturing plant of Water-based & solvent-based Paints, Intermediates, and powder putty at Plot No.-1, Sector 30-B, HSIIDC, IMT Rohtak, Haryana.

The proposed expansion project of the existing manufacturing unit belongings to integrated paint industries require prior Environmental Clearance (EC) from the SEAC, Haryana for the activity of 5(h) (NABET Sector 23) under B1 Category as per the Schedule of the EIA Notification of September 14, 2006 as amended till date.

This report is prepared as per the Terms of References (TORs) issued by SEAC Haryana vide their ToR Identification no: **TO24B2601HR5419231N** dated **31/05/2024**. The TOR letter is attached as **Annexure 1**.

Existing cost of the project is INR 1111.82 Crore and estimated cost of proposed expansion is: INR 125 Crore, Total cost of the project is INR 1236.82 Crore.

### 1.2.2 Production Details

The production capacity of the proposed Integrated Paint Manufacturing and Synthetic Organic Chemicals plant is as presented in **Table 1-1**.

**Table 1-1: Production Details (Existing & Proposed)**

S. No.	Name of Products	Production capacity					Remarks
		Unit	Existing quantity		Additional quantity	Total after expansion	
			As per EC	as per CTO			
1	Water based & Solvent based Paint	KL/ Annum	4,00,000	-	1,25,000	5,25,000	-
2	Intermediates	KL/ Annum	1,60,000	-	1,02,500	2,62,500	Intermediates will be mostly used inside the plant through pipelines in a closed loop. May be transferred to other facilities through road & rail, on need-basis
3	Putty	MT/ Annum	0	1,60,000	65,000	2,25,000	Non-EC Product. Existing quantity as per valid Consent to operate (CTO) issued by Haryana State Pollution Control Board
Total Proposed (Paint + Putty)						7,50,000	

Some of the products are packed in 'Kg' not in 'KL', but the reporting will be done in measuring units provided above, using conversion factors. Daily production capacity provided in the ToR application is the average production capacity per day.

### 1.2.3 Identification of project proponent

Asian Paints Limited ('APL') is India's leading paint and decor company and ranked among the top ten Decorative coatings companies in the world with a consolidated turnover of INR 312 billion during FY 2023-2024 (Asian Paints IR 23-24 report). The company is ranked 2<sup>nd</sup> in Asia and 8<sup>th</sup> amongst the top paint companies in the world. The Asian Paints group has an enviable reputation in the corporate world for professionalism, fast-track growth, and building shareholder equity. Asian Paints operates in 15 countries and has 27 paint manufacturing facilities in the world-servicing consumers in over 60 countries. Total of 08 in-house Manufacturing locations for decorative paints located all over India. These locations are Rohtak, Haryana; Kasna, Uttar Pradesh; Ankleshwar, Gujarat; Khandala, Maharashtra; Patancheru, Telangana; Visakhapatnam, Andhra Pradesh; Mysuru, Karnataka; Sriperembudur, TamilNadu.

Besides Asian Paints, the group operates around the world through its subsidiaries - Asian Paints Berger, Apco Coatings, SCIB Paints, Taubmans, Asian Paints Causeway, and Kadisco Asian Paints.

Asian Paints manufactures a wide range of paints for Decorative and Industrial use. In Decorative paints, Asian Paints offers Interior Paints, Exterior Paints, wood Paints, and Metal Paints. The company also offers waterproofing, adhesives, and wall coverings under its portfolio.

In the Industrial coatings space, Asian Paints operates through two joint ventures with PPG Inc., USA one of the largest automotive coatings manufacturers in the world. The first Joint Venture 'PPG Asian Paints Pvt Ltd' services the increasing requirements of the Indian automotive coatings market. The second JV 'Asian Paints PPG Pvt Ltd' services the protective, industrial powder, industrial containers, and light industrial coatings markets in India.

### 1.3 Need for the project

Paint market in India has been growing steadily and this trend is expected to continue in the future. This is largely because lower per capita consumption of paint in the country, as compared to some of the other developed nations. Asian Paints Limited has also witnessed steady growth in the past and, being the largest paint Company in India, expects similar growth in the coming years. APL has 9 manufacturing facilities in the states of Gujarat, Telangana, Uttar Pradesh, Tamil Nadu, Andhra Pradesh, Karnataka, Maharashtra and Haryana. To cater to the anticipated demand growth in North India over the next few years, APL has decided to expand its existing facility at Rohtak, Haryana.

This project is quite important for the state and the country considering:

- Potential of providing employment
- Employment opportunities in transportation and other local supporting businesses
- Contribution to state and central exchequers by way of taxes and duties

#### 1.3.1 Demand Supply Gap

The Indian paints industry is expected to grow steadily in the short and medium term on the back of strong growth in the Indian economy. India's young population represents a huge opportunity with a rapidly increasing middle class and overall population. By 2030, Indian middle class is expected to have the second largest share in global consumption at 17% which could drive demand for the paint industry.

For the past few years, demand in smaller cities and towns has been growing at a faster pace than metro and tier I cities. Going forward, a rise in disposable income, incremental consumption expenditure, and development of the rural markets will fuel the paint industry's growth in these areas.

Paint market has been witnessing steady growth and APL expects that to grow over the next decade. Hence ramping up the production capacity at this facility is important from the future growth point of view.

**Source:** <https://www.equitymaster.com/research-it/sector-info/paint>

#### 1.3.2 Import vs. Indigenous Production

The project is not an import substitution project but will cater to the increasing demand for quality paint products within the Country. Within the Indian decorative paint segment, Asian Paints is the largest player, with the segment contributing more than 80% of their overall revenues.

The domestic paint industry is estimated to be INR 500 billion industry with the decorative paint category constituting almost 75% of the market. The decorative paint market includes multiple categories depending on the nature of the surface like exterior wall paints, interior wall paints, wood finishes, enamels as well as ancillary products like primers, putties, etc.

A rise in disposable income of the average middle class, urbanization, growing rural market, shortening of repainting cycle, and increase in sale of premium-end products are the major drivers that are pushing the growth of the organized paint industry.

**Source:** <https://www.equitymaster.com/research-it/sector-info/paint>

#### 1.3.3 Export Possibility

This plant would cater to domestic demand.

### 1.3.4 Energy Security

As a part of Energy security, Electricity generation of ~3.67 MW comes from Roof-top Solar. Additionally, 6 MW of utility Solar is installed at Siwani, Haryana. Renewable energy contributes to approx. 40% of existing power required in the existing facility.

## 1.4 Size, location of the project & its importance to the region

### 1.4.1 Brief Description of Nature and Size of Project

APL is proposing expansion of production in its existing integrated paint manufacturing facility of Water based & Solvent based Paint, Intermediates- Resins & Polymer and powder putty located at plot no. 1, Sector 30-B, HSIIDC, IMT Rohtak Haryana, basic information about the project is provided in **Table 1-2**.

**Table 1-2: Brief Description of Proposed expansion project**

Sr No	Details	Description
1	<b>Nature</b>	Expansion of integrated paint manufacturing facility (Brownfield)
2	<b>Location</b>	Plot No. 1, Sector 30-B, HSIDC, IMT Rohtak, Haryana
3	<b>Size</b>	Entire Plant Area 129.28 Acres i.e. 5,23,198 m <sup>2</sup> or 52.31 Hectare.
4	<b>Cost of the project</b>	Existing Cost
		INR 1111.82 crores
		Proposed Expansion cost
		INR 125 crores
		Total Cost
		INR 1236.82 crores
5	<b>Latitude &amp; Longitude of Centre of the Project Site</b>	Latitude: 28°52'8.65" N Longitude: 76°40'22.28" E
6	<b>Survey of India, OSM No. (Covering 10 km of Study Area)</b>	H43W9, H43W13
7	<b>Maximum Elevation above MSL</b>	246 m (Based on Google Earth Image)
8	<b>Seismic Zone</b>	Seismic Zone – IV (1Based on Seismic Zone Map of Faridabad, Haryana)
9	<b>Nearest Railway Station</b>	Kharwar Railway Station located at ~ 6.1 Kms towards SE direction from the site
10	<b>Nearest Town/ Village</b>	Village: Kheri sadh, 0.72 km, SW

### 1.4.2 Cost of the Project

The estimated project cost is INR 125 Crores.

### 1.4.3 Employment Generation (Direct and Indirect) due to the Project

The proposed project will generate direct and indirect employment during construction phase around 1500 Mandays will be used for various construction activities for the proposed expansion. During operation phase existing permanent workers/Direct Employment are 420 Nos and project will generate more employment after expansion which is around 10 persons thus total employment will be 430 persons after expansion. There are 735 existing temporary/ indirect workers and for proposed expansion around 50 persons will get employment, thus total worker after expansion will be 785 persons.

1 Source: Seismic Zone Map of Faridabad, Rohtak - Government of Haryana

#### **1.4.4 Regulatory Framework**

The proposed expansion project of the existing manufacturing unit belongings to integrated paint industries require prior Environmental Clearance (EC) from the SEAC, Haryana for the activity of 5(h) (NABET Sector 23) under B1 Category as per the Schedule of the EIA Notification of September 14, 2006 as amended till date.

Environment Impact Assessment study & Final Report has been prepared in compliance with the Terms of Reference Identification no: **TO24B2601HR5419231N** (vide letter no. SIA/HR/IND3/462739/2024, SEAC Haryana, dated 31/05/2024).

#### **1.5 Previous ECs, Certified Compliance report**

APL has obtained Environmental Clearance for existing facility vide letter no. J-11011/1158/2007-IA-II (I) dated 9<sup>th</sup> April 2008. A copy of this EC is attached as

## Annexure 5 .

Certified EC Compliance report (CCR) from Regional office MoEF&CC, Chandigarh vide letter No. F-492/2008/ENV/PART-II/eFile dated October 7, 2024 is attached as **Annexure 6**.

Action plan to close non-compliances & partial compliances identified in the above CCR is attached as **Annexure 7**.

## 1.6 Scope of study

### 1.6.1 General scope

The general scope of work for this EIA studies and preparation of detailed EIA/EMP report includes collection of baseline data with respect to major environmental components, viz. air, noise, water, land, socio-economic and components for one season & identification and assessment of impacts and development of mitigation measures and Environmental Management Plan.

### 1.6.2 Terms of Reference

As per the Standard Terms of References (TORs) issued by SEAC, Haryana, ToR Identification No.TO24B2601HR5419231N dated 31/05/2024. The TOR letter is attached as **Annexure 1**. This EIA report complies with Terms of Reference prescribed by the SEAC, Haryana. Summarized details of the same are tabulated in **Table 1-3**.

**Table 1-3: Compliance with the Terms of Reference (TOR)**

Sr. No.	TORs	Covered in EIA
A	<b>Standard Terms Of Reference</b>	
1	Executive Summary	Executive Summary containing a condensed version of the EIA report, justification for implementation of the project and explanation of how, adverse impacts have been mitigated, is given in <b>Chapter-11, Page no. 347</b> .
2	<b>Introduction</b>	
i	Details of the EIA Consultant including NABET accreditation.	M/s. Kadam Environmental Consultants is engaged as EIA Consultant. Details of EIA consultant are given in <b>Chapter-12, Page no. 370</b> , while the EIA consultant's Accreditation Certificates issued by NABET, valid up to 19-03-2026 is attached as <b>Annexure 27, Page no. 527</b> . Accreditation certificate issued by NABL, valid up to 08-04-2026 is attached as <b>Error! Reference source not found., Page no. Error! Bookmark not defined..</b>
ii	Information about the project proponent.	The project proponent is M/s. Asian Paints Limited and information about the same is given in <b>Chapter-1, Section-1.2, Page No. 34</b> .
iii	Importance and benefits of the project.	The Paint market in India has been growing steadily and this trend is expected to continue in the future. This is largely due to lower per capita consumption of paint in the country, as compared to some of the other developed nations. By 2030, Indian middle class is expected to have the second largest share in global consumption at 17% which could drive demand for the paint industry. APL has also witnessed steady growth in the past and, being the largest paint Company in India, expects similar growth in the coming years.  To cater to the anticipated demand growth in North India over the next few years, APL has decided to expand it's existing facility at Rohtak, Haryana.  Other than Haryana, this plant would also service demand in other nearby states.

Sr. No.	TORs	Covered in EIA																
		<p>This project is quite important for the state and the country considering:</p> <p>Potential of providing direct employment to 60 people during operation phase.</p> <p>Indirect employment opportunities in transportation and other local supporting businesses.</p> <p>Contribution to state and central exchequers by way of taxes and duties.</p>																
3	Project Description																	
i	Cost of project and time of completion.	<p>The existing facility is already in operation and proposed capacity expansion will be within the existing area. The Existing cost of the project is INR 1111.82 Crore; cost of proposed expansion: INR 125 Crore; Total cost: INR 1236.82 Crore.</p> <p>The capacity expansion will be completed in phase-wise manner in ~5 years of time. The schedule for Project approvals are provided in <i>Table 2-10, Page No. 66</i> and for project implementations in <i>Table 2-11, Page No. 66</i>.</p>																
ii	Products with capacities for the proposed project.	<p>M/s. Asian Paints Limited to produces Water &amp; Solvent Based Paints and Putty alongwith its intermediates. Details of the production capacities for the existing and proposed project are given in <i>Chapter-1, Table 1-1, Page No. 35</i>.</p>																
iii	If expansion project, details of existing products with capacities and whether adequate land is available for expansion, reference of earlier EC if any.	<p>As per the earlier EC; The existing production capacity of Water based &amp; solvent based paint: 4,00,000 KL/Annum; of Intermediates: 1,60,000 KL/Annum; of Putty as per CTO: 1,60,000 MT/Annum.</p> <p>The expansion will be done within the existing plant premises, which is sufficient for the proposed expansion, maintaining 33% area for Greenbelt. The total area of the project site is 5,23,198 m<sup>2</sup> (i.e. 52.3198 Ha), The area required for the proposed expansion is 16,613.28 m<sup>2</sup> (i.e. 1.661328 Ha), Area available for expansion is 16,613.28 m<sup>2</sup> (i.e. 1.661328 Ha), Existing Greenbelt area of 1,82,666.44 m<sup>2</sup> (i.e. 18.26 Ha, 34.9%), after expansion, it will be 1,72,655.34 m<sup>2</sup> (17.2655 Ha, 33%) and details are provided in <i>Table 2-4, on Page No. 61</i>.</p>																
iv	Details of existing products and production, if any, along with present product/production details in tabular format, to verify the compliance of the EIA Notifications.	<table><tr><th>S. No.</th><th>Existing Products</th><th>Sanctioned capacity as per EC /CTO</th><th>Existing Production F.Y. 2023-24</th></tr><tr><td>1</td><td>Water based &amp; solvent-based paint</td><td>4,00,000 KL/Annum</td><td>2,44,111 KL/Annum</td></tr><tr><td>2</td><td>Intermediates</td><td>1,60,000 KL/Annum</td><td>63,970 KL/Annum</td></tr><tr><td>3</td><td>Putty</td><td>1,60,000 MT/Annum</td><td>21,537 MT/Annum</td></tr></table> <p>Production quantities are lower than existing sanctioned environmental capacities and therefore in compliance with these.</p>	S. No.	Existing Products	Sanctioned capacity as per EC /CTO	Existing Production F.Y. 2023-24	1	Water based & solvent-based paint	4,00,000 KL/Annum	2,44,111 KL/Annum	2	Intermediates	1,60,000 KL/Annum	63,970 KL/Annum	3	Putty	1,60,000 MT/Annum	21,537 MT/Annum
S. No.	Existing Products	Sanctioned capacity as per EC /CTO	Existing Production F.Y. 2023-24															
1	Water based & solvent-based paint	4,00,000 KL/Annum	2,44,111 KL/Annum															
2	Intermediates	1,60,000 KL/Annum	63,970 KL/Annum															
3	Putty	1,60,000 MT/Annum	21,537 MT/Annum															
v	List of raw materials required and their source along with mode of transportation.	<p>List of raw materials required and their sources along with mode of transportation is given in <i>Chapter 2, Table 2-9, Page No. 65</i>. The raw materials will be sourced from domestic and imported suppliers as per requirement. The mode of transportation will be through road from respective suppliers.</p>																
vi	Other chemicals and materials required with quantities and storage capacities.	<p>Name and storage details of product is given in <i>Chapter-2, Table 2-6, Page No. 64</i> and details of raw materials are given in <i>Table 2-8 Page No. 65</i>.</p>																
vii	Details of Emission, effluents, hazardous waste generation and their management.	<p><b>Air Emissions:</b></p>																



Sr. No.	TORs	Covered in EIA
		<p>Point source emission of pollutants into air from the proposed project will be through flue gas stack attached to boilers, DG sets and GG sets. The principal air pollutants arising due to the process are PM, SO<sub>2</sub>, NO<sub>x</sub> and CO Adequate stack height and proper pollution control equipment will be provided for all flue gas stacks.</p> <p>There are 9 existing flue gas stacks attached to Boiler, DG and GG Sets. There will be additional 3 stacks attached to 3 proposed GG Sets in the expansion.</p> <p>LPG, HSD and PNG are being used as fuel in existing plant and the same will be used in the proposed plant also.</p> <p>Scrubber along with appropriate stack height are provided as APCM in existing plant. Same will be followed for proposed expansion.</p> <p>The stack emissions will be maintained as per HSPCB/CPCB norms.</p> <p>There are 22 process vents in the existing plant &amp; 09 additional vents are proposed for expansion. There will be a total of 31 process vents after expansion. All process vents have adequate stack height with dust collectors and wet scrubbers as APCM to control pollutants like PM.</p> <p>During the construction phase, vehicular emissions like PM<sub>10</sub>, PM<sub>2.5</sub>, NO<sub>x</sub>, CO &amp; HC will be generated as line source emissions. Other emissions will be from the use of construction machinery. Apart from this, the application of heavy machinery and earth movers will generate emissions. Suitable dust suppression techniques such as water sprinkling will be carried out at regular intervals.</p> <p>During the operation phase, vehicular emissions due to the transportation of raw materials, finished goods, other materials, and local travel of employees are envisaged. Approximately, 450 trucks per day will be used post-expansion. All vehicles utilized will be as have PUC Certification on periodic intervals.</p> <p>Necessary APCMs to control air emission of pollutants VOC/Hydrocarbons from process stacks/vents have been provided in respective blocks.</p> <p>Stack details with pollution control measures in <b>Chapter 2, Section 2.7.7, Page No. 86</b> of the EIA report.</p> <p><b>Wastewater Generation:</b></p> <p>After the expansion of the project there will be at peak of 178 KLD of wastewater will be generated (approx. 128 KLD of industrial effluent generation from the process, wash water, and utilities and approx. 50 KLD domestic)</p> <p>Industrial wastewater from Process &amp; utility blow-downs along with wash water will be treated in capacities of ETP treatment units that are adequate to handle wastewater up to 200 KLD. Currently, the Industry is having RO. The treated effluent from the ETP will be recycled and reused garden within plant premises.</p> <p>Domestic sewage will be generated 50 KLD collected and treated in the same ETP and recycled in greenbelt development.</p> <p>Wastewater generation and management details are given in <b>Chapter 2, Section 2.7.3, Page No. 75.</b></p> <p><b>Hazardous Waste Generation:</b></p> <p>Used oil, ETP Sludge, Process waste, Waste residue, Discarded containers/bags/liners, Spent activated carbon, etc. will be generated. This waste will be managed &amp; disposed of as per</p>

Sr. No.	TORs	Covered in EIA
		Hazardous & Other Waste (Management & Transboundary Movement) Rules, 2016. Details are given in <b>Chapter 2, Section 2.7.9, Page No. 91.</b>
viii	Requirement of water, power, with the source of supply, status of approval, water balance diagram, man-power requirement (regular and contract).	<p><b>Water:</b></p> <p>The total water requirement for the existing &amp; proposed expansion will be 2128 KLD. (Fresh water: 1950 KLD + Recycle water 178 KLD). Fresh water will be sourced from HSIIDC. Water Balance Diagram is provided as <b>Figure 2-5</b> in <b>Chapter-2, Section-2.7.3, Page 77.</b></p> <p><b>Man Power:</b></p> <p>During construction ~1500 Mandays will be employed.</p> <p><b>During operation phase: Permanent workers/Direct Employment:</b> existing 420 Nos and Proposed for expansion: 10 person total after expansion will be 430 persons.</p> <p><b>Temporary workers/In-direct Employment:</b> Existing 735 Nos and Proposed for expansion: 50 person total after expansion will be 785 persons.</p> <p><b>Power:</b></p> <p>Currently, power is being sourced from Uttar Haryana Bijlee Vitran Nigam Ltd (UHBVNL). The same source will be used after the proposed expansion. The power requirement for the existing plant is 8 MW which will remain the same after the proposed expansion. For emergency requirements Existing DG sets: 2 x 1010 KVA; 2 x 2000, (Tertiary Source of power) GG; 2 x 2875 KVA, (Secondary Source of Power) Proposed additional GG; 3 x 2875 KVA (Secondary Source of Power) capacity during power failure &amp; emergency use.</p>
ix	Details of boiler/Gen sets (including stacks/exhausts) and fuels to be used.	Details of boiler/Gen sets (including stacks/exhausts) and fuels to be used are given in <b>Chapter-2, Section 2.7.7 on Page No. 86</b> of the EIA report.
x	Process description along with major equipment and machinery, process flow sheet (quantitative) from raw materials to products to be provided.	Detailed process descriptions of the products along with major equipment and machinery, and process flow sheets are provided in <b>Chapter 2 Section 2.6.4, Page No. 73</b> of the EIA report.
xi	Hazard identification and details of proposed safety systems.	<p>Hazards resulting from the storage of toxic and flammable substances selected due to their toxicity and flammability and their accidental release due to leaks, catastrophic rupture of containment and resulting scenarios of fire, late pool fire, late ignition, and maximum concentration effect have been identified</p> <p>Safety measures containing treatment and control and transportation precautions are recommended.</p> <p>The Hazard identification is given in <b>Chapter 7, Section 7.2, Page No. 288.</b></p> <p>Safety measures containing treatment and control and transportation precautions are recommended.</p> <p>Details of the proposed safety system are given in <b>Chapter 7, Section 7.2.7, Page No. 302</b> of the EIA report.</p>
xii	Expansion/modernization proposals:	
	Copy of all the Environmental Clearance(s) including Amendments there to be obtained for the project from MOEF/SEIAA shall be attached as an Annexure. A certified copy of the latest Monitoring Report of the Regional Office of the Ministry of Environment and Forests as per the circular dated 30th May 2012 on the status of compliance of conditions stipulated in all the existing environmental clearances including Amendments shall be provided. In addition, the	<p><b>Copy of all the Environmental Clearance(s) including Amendments</b></p> <p>A copy of the earlier Environmental clearance is enclosed as <b>Annexure 5</b></p> <p><b>A certified copy of the latest Monitoring Report of the Regional Office of the Ministry of Environment and Forests is received on 7/10/2024</b></p>

Sr. No.	TORs	Covered in EIA
	status of compliance of Consent to Operate for the ongoing /existing operation of the project from SPCB shall be attached to the EIA-EMP report.	A copy of EC Compliance (CCR) is attached to <b>Annexure 6</b> on <b>Page No. 392</b> <b>Status of compliance of Consent to Operate for the ongoing /existing operation of the project from SPCB</b> The status of CTO compliance is enclosed as <b>Annexure 9</b> on <b>Page No. 422</b>
	In case the existing project has not obtained environmental clearance, reasons for not 2006 shall be provided. Copies of Consent to Establish/No Objection Certificate and Consent to Operate (in case of units operating prior to EIA Notification 2006, CTE and CTO of FY2005-2006) obtained from the SPCB shall be submitted. Further, compliance report to the conditions of consents from the SPCB shall be submitted. Taking EC under the provisions of the EIA Notification 1994 and/or EIA Notification.	<b>EC availability:</b> The existing Project has already obtained previous environmental clearance vide letter no. <b>J-11011/1158/2007-IA-II (I)</b> dated <b>9<sup>th</sup> April 2008</b> . A copy of the same is enclosed as <b>Annexure 5</b> <b>Copies of Consent to Establish/No Objection Certificate and Consent to Operate</b> Copy of Latest CTE & CTO granted by HSPCB are attached as <b>Annexure 8</b> . <b>Compliance report to the conditions of consents</b> Copy of compliance of CTO granted by HSPCB is enclosed as <b>Annexure 9</b> .
4	<b>Site Detail</b>	
i	Location of the project site covering village, Taluka/Tehsil, District and State,	The proposed expansion of the project will be implemented in the APL's existing premises located at Plot no.1, Sector 30-B, HSIIDC, IMT Rohtak, Village Baliana & Kheri Sadh, Tehsil Sampla, District Rohtak, State Haryana.
	Justification for selecting the site, whether other sites were considered.	The proposed expansion will be done within the existing plot area which is located at HSIIDC, IMT Rohtak, which is adequate.
ii	A toposheet of the study area of a radius of 10km and site location on a 1:50,000/1:25,000 scale on an A3/A2 sheet. (Including all eco-sensitive areas and environmentally sensitive places).	A topo-map of the study area of a radius of 10km and site location on a 1:50,000/1:25,000 scale on an A3/A2 sheet. (Including all eco-sensitive areas and environmentally sensitive places) given in <b>Map 2-2, Chapter-0, Section 2.2 on Page No. 55</b> of the EIA Report.
iii	Details w.r.t. option analysis for selection of the site.	Not Applicable. Since the proposed expansion will be done within the existing plot area of APL
iv	Coordinates (lat-long) of all four corners of the site.	Co-ordinates (lat-long) of all four corners of the site are given in <b>Table 2-1 of Chapter 2: Section 2.2, on Page No. 52</b> of the EIA Report.
v	Google map-Earth downloaded the project site.	Google Earth map downloaded of the project is incorporated in Map 2-3: Study Area Map on Google Earth Imagery with Project Site <b>Map 2-3, in Chapter-2 on Page No. 55</b> of the EIA Report.
vi	Layout maps indicating existing units as well as proposed units indicating storage area, plant area, greenbelt area, utilities, etc. If located within an Industrial area/Estate/Complex, the layout of the Industrial Area indicates the location of the unit within the Industrial area/Estate.	Layout map of the project site A detailed layout map of the project area is incorporated in <b>Map 2-6 in Chapter-2, on Page No. 59</b> of the EIA report. The layout of the HSIIDC Industrial Area A detailed layout map of the project area is incorporated in <b>Map 2-4 in Chapter-2, on Page No. 57</b> of the EIA report.
vii	Photographs of the proposed and existing (if applicable) plant site. If existing, show photographs of plantation/greenbelt, in particular.	Photographs of the Existing plant site; ETP, Water storage area, Solid and Haz waste storage area, entry /exit gates, storage tank farm area, and Roads are provided in <b>Photographs 2-1 in Chapter-2, Section 2.4.1, on Page No. 62</b> of the EIA report. Photographs of the existing plantation are shown in <b>Photographs 10-1 in Chapter-10, Section 10.3.12 on Page No. 328</b> of the EIA report.
viii	Land use break-up of the total land of the project site (identified and acquired), government/	The proposed site is an existing Industrial Area of HSIIDC.

Sr. No.	TORs	Covered in EIA
	private - agricultural, forest, wasteland, water bodies, settlements, etc shall be included. (not required for industrial areas).	
ix	A list of major industries with names and types within the study area (10km radius) shall be incorporated. Land use details of the study area.	A list of major industries with their names and types is given in <b>Table 2-3 of Chapter-2 on Page No. 60</b> of the EIA report. Land use details of the study area are provided in <b>Chapter-3, Section 3.5.5 on Page No. 128</b> of the EIA report.
x	Geological features and Geo-hydrological status of the study area shall be included.	Geological features and Geo-hydrological status of the study area are incorporated in <b>Chapter-3, Section 3.11 on Page No. 166</b> of the EIA report.
xi	Details of Drainage of the project up to a 5km radius of the study area. If the site is within a 1 km radius of any major river, peak and lean season river discharge as well as flood occurrence frequency based on peak rainfall data of the past 30 years. Details of the Flood Level of the project site and the maximum Flood Level of the river shall also be provided. (mega green field projects).	<p><b>Details of Drainage:</b></p> <p>A detailed drainage map of the 5 km radius of the study area is incorporated in <b>Map 3-8 in Section 3.11.2, of Chapter-3 at Page No. 170</b> of the EIA report.</p> <p><b>Major River &amp; Flood level:</b></p> <p>There is no major river within 1 km of the site.</p>
xii	Status of acquisition of land. If acquisition is not complete, stage of the acquisition process and expected time of complete possession of the land.	APL owns the land and the proposed expansion will be done within the existing plot area. The Plot allotment letter from HSIIDC is enclosed as <b>Annexure 3</b> with EIA report.
xiii	R&R details in respect of land in line with state Government policy.	The project site is located within HSIIDC, IMT Rohtak Industrial estate. The project site is an existing project and proposed expansion will be done within the existing plot area. Hence, R&R is not applicable for the proposed project
5	<b>Forest and wildlife related issues (if applicable):</b>	
i	Permission and approval for the use of forest land (forestry clearance), if any, and recommendations of the State Forest Department. (if applicable).	Not Applicable there is no Forest land involved in the project area & the proposed project.
ii	Landuse map based on High-resolution satellite imagery (GPS) of the proposed site delineating the forestland (in case of projects involving forest land more than 40 ha).	Not Applicable there is no Forest land involved in the project area & the proposed project
iii	Status of Application submitted for obtaining the stage I forestry clearance along with the latest status shall be submitted.	Not Applicable, there is no Forest land involved in the project area & the proposed project
iv	The projects to be located within 10 km of the National Parks, Sanctuaries, Biosphere Reserves, and Migratory Corridors of Wild Animals, the project proponent shall submit the map duly authenticated by the Chief Wildlife Warden showing these features vis-à-vis the project location and the recommendations or comments of the Chief Wildlife Warden-thereon.	There are no National Parks, Sanctuaries, Biosphere Reserves, and Migratory Corridors of Wild Animals within the 10 km study area of the project.
v	Wildlife Conservation Plan duly authenticated by the Chief Wildlife Warden of the State Government for conservation of Schedule I fauna, if any exists in the study area.	Eleven Schedule-I species were reported from the study area. The Wildlife Conservation Plan for the Schedule-I species is submitted to CWLW for the authentication process. The proof of submission is provided as <b>Annexure 20</b>
vi	Copy of application submitted for clearance under the Wildlife (Protection) Act, 1972, to the Standing Committee of the National Board for Wildlife.	Not Applicable
vii	Recommendations and NOC from the concerned State/UT Coastal Zone Management Authority on CRZ angle.	Not Applicable, there is no Coastal Regulatory Zone (CRZ) within the study area of the project site.
6	<b>Environmental Status</b>	

Sr. No.	TORs	Covered in EIA																													
i.	Determination of atmospheric inversion level at the project site and site-specific micrometeorological data using temperature, relative humidity, hourly wind speed and direction, and rainfall.	<p>Atmospheric inversion level (mixing height) at the project site is presented in <b>Chapter 3, Section 0, Page No. 140.</b></p> <p><b>Site-specific micrometeorological data</b> Site Specific Meteorological data shows that: The average <b>Temperature</b> recorded was 23.8°C with the maximum temperature recorded as 41.0°C and a Minimum of 5.6°C. The average <b>relative humidity</b> was 40.3% with a maximum Humidity of 95.6 and a Minimum of 8.16% Average <b>wind speed</b> was recorded 2.3 m/s, Maximum wind speed of 7.9 m/s and minimum of 0.0 m/s Wind Direction: Wind blows predominantly from the West followed by NW direction and East direction. Rainfall was recorded at 0.01 mm. Site-specific micrometeorological data using temperature, relative humidity, hourly wind speed and direction, and rainfall is measured in incorporated in <b>Chapter-3, Section 0 at Page No. 139</b> of the EIA report.</p>																													
	AAQ data (except monsoon) at 8 locations for PM10, PM2.5, SO2, NOX, CO and other Parameters relevant to the project shall be collected. The monitoring stations shall be based CPCB guidelines and take into account the predominant wind direction, population zone and sensitive receptors including reserved forests.	<p>Baseline AAQ data were collected from 2<sup>nd</sup> February 2023 to 10<sup>th</sup> May 2023.</p> <p>Details of AAQM sampling locations are summarized below:</p> <table border="1"> <thead> <tr> <th>Code No.</th><th>AAQM Station</th><th>Justification</th></tr> </thead> <tbody> <tr> <td>AA 01</td><td>At site</td><td>Base Station</td></tr> <tr> <td>AA 02</td><td>Bohar village</td><td>1<sup>st</sup> Upwind</td></tr> <tr> <td>AA 03</td><td>Gandhra village</td><td>2<sup>nd</sup> Downwind</td></tr> <tr> <td>AA 04</td><td>Sector-28, Rohtak</td><td>3<sup>rd</sup> Upwind</td></tr> <tr> <td>AA 05</td><td>Paksma village</td><td>1<sup>st</sup> Downwind</td></tr> <tr> <td>AA 06</td><td>Garhi Bohar village</td><td>Crosswind</td></tr> <tr> <td>AA 07</td><td>Baliana village</td><td>Crosswind</td></tr> <tr> <td>AA 08</td><td>Ladhaut Bhaiyanpur</td><td>1<sup>st</sup> Upwind</td></tr> <tr> <td>AA 09</td><td>Chuliana village</td><td>2<sup>nd</sup> Downwind</td></tr> </tbody> </table> <p>Details regarding AAQM sampling locations are given in <b>Chapter 3, Section 3.7.1, Page No. 142.</b></p>	Code No.	AAQM Station	Justification	AA 01	At site	Base Station	AA 02	Bohar village	1 <sup>st</sup> Upwind	AA 03	Gandhra village	2 <sup>nd</sup> Downwind	AA 04	Sector-28, Rohtak	3 <sup>rd</sup> Upwind	AA 05	Paksma village	1 <sup>st</sup> Downwind	AA 06	Garhi Bohar village	Crosswind	AA 07	Baliana village	Crosswind	AA 08	Ladhaut Bhaiyanpur	1 <sup>st</sup> Upwind	AA 09	Chuliana village
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ii	Raw data of all AAQ measurements for 12 weeks of all stations as per frequency given in the NAQQM Notification of Nov. 2009 along with - min., max., average, and 98% values for each of the AAQ parameters from data of all AAQ stations should be provided as an annexure to the EIA Report.	<p>Ambient Air Quality Monitoring was conducted at Eight (8) locations within the study area. The min, max, average &amp; 98 percentile values for the various parameters of PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>x</sub>, NO<sub>x</sub>, CO, HC, etc are presented in <b>Chapter 3, Section 3.7.1, on Page No. 142.</b></p> <p>Raw data of AAQ measurement during the monitoring period at all stations over the 12 weeks is presented in <b>Annexure 16.</b></p>																													
iii	Surface water quality of nearby River (100m upstream and downstream of discharge point) and other surface drains at eight locations as per CPCB/MoEF&CC guidelines.	<p>No river exists within the 10km radius of the study area. However, Jawaharlal Nehru Canal (Part of Western Yamuna Canal) is located ~4 km in WNW direction from the site. The remaining 07 surface water samples were collected from village ponds as per CPCB/MoEF&amp;CC guidelines. The analysis results for the collected surface water samples are tabulated in <b>Chapter 3, Section 3.10, Table 3-25 on Page No. 165</b> of the EIA report.</p>																													
iv	Whether the site falls near to polluted stretch of river identified by the CPCB/MoEF&CC, if yes give details.	<p>The Site falls at a distance of ~4 Km (Aerial Distance) to the Jawaharlal Nehra Canal/Western Yamuna Canal, a polluted stretch of river identified by CPCB/ MoEF&amp;CC. The criteria and status of Polluted River stretches in India by CPCB are provided</p>																													

Sr. No.	TORs	Covered in EIA
		in <b>Annexure 24</b> . The site overlay on the map is provided as Map 3-7 of <b>Chapter 3, at Page No. 169</b> Damla, Located in the d/s of Yamuna Nagar, a part of Western Yamuna Canal is located at a distance of 143 km from the Project Site. ( <b>Source:</b> Polluted River Stretches in India, Page No. 7 attached as <b>Annexure 24</b> )
v	Groundwater monitoring at minimum at 8 locations shall be included.	The groundwater sampling/monitoring at 09 locations was carried out following standard protocol. The details of sampling locations are provided in <b>Chapter-3, Section 3.14.4, Table 3-35 on Page No. 184</b> . The analysis results for the collected Groundwater samples are tabulated in <b>Chapter- 3, Section 3.11.1, Table 3-37 on Page No. 188</b> of the EIA report.
vi	Noise levels monitoring at 8 locations within the study area.	Details of noise sampling locations are given in <b>Chapter-3 Section 3.9 on Page No. 154</b> of the EIA report. Analysis results for Ambient Noise are provided in <b>Table 3-22 on Page No. 158</b>
vii	Soil Characteristics as per CPCB guidelines.	Details of Soil sampling locations are provided in <b>Chapter 3, Section 3.15.4 in Table 3-39 on Page No. 191</b> and soil quality analysis is provided in <b>Table 3-40 on Page No. 195</b> of the EIA report.
viii	A traffic study of the area, type of vehicles, frequency of vehicles for transportation of materials, additional traffic due to the proposed project, parking arrangement, etc.	A traffic survey was carried out as per IRC guidelines on both sides (up & down) on selected roads. Vehicles were classified into two types: Mechanized and Non-mechanized. The Mechanized vehicles include two-wheelers (bikes/Mopeds/Scooters), three-wheelers (rickshaws/small 3W tempos), four-wheelers (Cars/Jeeps /Trucks/Buses/Tractors etc.). The Non-mechanized vehicles include Cycles/Tricycles/Carts. Details of Traffic study incorporated in <b>Chapter-3, Section 3.8</b> , and Incremental traffic study result given in <b>Chapter-4, Section 4.12 at Page No. 256</b> and Detailed study report is enclosed as <b>Annexure 19</b> of the EIA report.
ix	Detailed descriptions of flora and fauna (terrestrial and aquatic) existing in the study area shall be given with special reference to rare, endemic, and endangered species. If Schedule- I fauna are found within the study area, a Wildlife Conservation Plan shall be prepared and furnished.	Details of flora and fauna are given in <b>Table 3-44 &amp; Table 3-46 of Chapter 3, Section 3.15 at Page No. 201 &amp; 208</b> of the EIA report. Eleven Schedule-I species were reported from the study area. Wildlife Conservation Plan for these species is given in <b>Chapter 10, Section-10.3.13, Page No. 333</b> of the EIA Report.
x	Socio-economic status of the study area.	Details of the socio-economic study of the study area are given in <b>Chapter 3, Section-3.17, Page No. 212</b> of the EIA report. Findings of this study are used for identification and assessment of socio-economic impacts and for development of mitigation measures.
7	<b>Environment Impact and Environment Management Plan</b>	
i	Assessment of ground-level concentration of pollutants from the stack emission based on site-specific meteorological features. In case the project is located on a hilly terrain, the AQIP Modelling shall be done using inputs of the specific terrain characteristics for determining the potential impacts of the project on the AAQ. The cumulative impact of all sources of emissions (including transportation) on the AAQ of the area shall be assessed. Details of the model used and the input data used for modelling shall also be provided. The air quality contours shall be plotted on a location map showing the location of the project site, habitation nearby, and sensitive receptors, if any.	The Air Quality Modelling Study is carried out using AIRMOD 5.4.1 software and the predicted increase in GLC concentrations for various ambient air quality parameters at various ambient air quality locations is presented in <b>Chapter 4, Section 4.11, Page No. 246</b> . Isopleths are presented as <b>Figure 12-1 on Page No. 466</b>

Sr. No.	TORs	Covered in EIA
ii	Water Quality Modelling – in case of discharge in the water body	The Project follows the Zero Liquid Discharge Concept, therefore water quality modelling is not required.
iii	The impact of the transport of the raw materials and end products on the surrounding environment shall be assessed and provided. In this regard, options for transport of raw materials and finished products and wastes (large quantities) by rail or rail-cum road transport or conveyor-cum-rail transport shall be examined.	The impact of the transport of the raw materials and end products on the surrounding environment is assessed and provided in <b>Chapter 4, Section-4.12.1, Page No. 256</b> of this EIA report.
iv	A note on the treatment of wastewater from different plant operations, the extent recycled and reused for different purposes shall be included. Complete scheme of effluent treatment. Characteristics of untreated and treated effluent to meet the prescribed standards of discharge under E(P) Rules 1986.	A note on the treatment of wastewater from different plant operations, extent recycled and reused for different purposes is provided in <b>Chapter 2, Section-2.7.4, Page No. 79</b> of this EIA report. A complete Scheme of Effluent treatment plant along with Effluent Characteristics is Provided in <b>Section 2.7.5 at Page No. 79</b>
v	Details of stack emission and action plan for control of emissions to meet standards.	Flue Gas Stack: Adequate stack height will be provided. LPG/PNG/HSD is being used as fuel for the Boiler, DG, and GG sets will be used in the proposed GG. Details of flue gas stacks are given in <b>Chapter-2, Section-2.7.7, Table 2-23 at Page 86</b> Process Stack: A scrubber with Adequate height will be provided to control the emission within norms to existing process vents. Details of process vents are given in <b>Chapter-2, Section-2.7.7, Table 2-24, on Page 86</b>
vi	Measures for fugitive emission control.	Various types of solvents are used in paint manufacturing plants to prevent leakage from pumps, seals, valves, etc. Control of Fugitive emissions from Point source, line source, and leaks is carried out using various APCMs, Proper handling, and storage of materials, adequate stack height, proper venting, use of Bag-filters, etc. Suitable dust suppression techniques such as water sprinkling will be taken during construction/ relevant activities. Details of fugitive emission and its control are given in <b>Chapter 2, Section-2.7.7, Page 86</b>
vii	Details of hazardous waste generation and their storage, utilization and management. Copies of MOU regarding utilization of solid and hazardous waste in cement plant shall also be included. EMP shall include the concept of waste-minimization, recycle/reuse/recover techniques, Energy conservation, and natural resource conservation.	Used oil, ETP Sludge, Process waste, Waste residue, Discarded containers/bags / liners, Spent activated carbon, etc. will be generated as hazardous wastes. This waste will be disposed of as per Hazardous & Other waste (Management & Transboundary Movement) Rules, 2016. Hazardous waste details are given in <b>Chapter 2, Section-2.7.9, in Table 2-26</b> Table 2-26, on <b>Page No. 92</b> of this EIA report. Copy of MOU/Memberships is attached as <b>Annexure 11 at Page No. 446</b> . The Concept of waste minimization, recycle, reuse is provided in <b>Chapter 2, Section 2.7.19 at Page No. 101</b>
viii	Proper utilization of fly ash shall be ensured as per Fly Ash Notification, 2009. A detailed plan of action shall be provided.	No Fly ash will be generated
ix	Action plan for the green belt development plan in 33 % area i.e. land with not less than 2,500 trees per ha. Giving details of species, width of plantation, planning schedule etc. shall be included. The green belt shall be around the	The proposed expansion will be done with in the existing plot area. The existing total area of the plot is 129.27 Acres out of which approx. 45.14 acres i.e. 1,82,666.44 m <sup>2</sup> area is already developed as green belt, which cover approx. 35 % of total plot area. Gap filling on boundaries and block plantation will be

Sr. No.	TORs	Covered in EIA
	project boundary and a scheme for greening of the roads used for the project shall also be incorporated.	done to further strengthen the greenbelt area and increase number of trees per hectare. Greenbelt development details are given in <b>Chapter-10, Section 10.3.12, Page 327</b> of this EIA report.
x	Action plan for rainwater harvesting measures at plant site shall be submitted to harvest rainwater from the rooftops and storm water drains to recharge the ground water and also to use for the various activities at the project site to conserve fresh water and reduce the water requirement from other sources.	As per Annexure-III given under The Haryana Water Resources (Conservation, Regulation and Management) Authority Act (2020 & 2022), paint industry is listed among the industries which are likely to pollute ground water through rain water recharge. The site has existing rain water harvesting facility in the form of run-off collection in 02 nos. of artificial pond for storm water and roof-top water. The site is utilizing rain water for various activities such as gardening, domestic, etc. The rain water harvesting details are given in <b>Chapter 10, Section-10.3.14, Page No. 337</b> of this EIA report.
xi	Total capital cost and recurring cost/annum for environmental pollution control measures shall be included.	Total capital cost will be INR 5239.28 Lakhs Recurring Cost of INR 334.98 Lakhs/Annum. Expenditure on Environmental Matters is given in <b>Chapter-10, Section-10.5, Table 10-18, Page No. 341</b> .
xii	Action plan for post-project environmental monitoring shall be submitted.	Action plan for post-project environmental monitoring is provided in <b>Chapter-6, Section-6.3, at Page No. 284</b> of this EIA report
xiii	Onsite and Offsite Disaster (natural and Man-made) Preparedness and Emergency Management Plan including Risk Assessment and damage control. Disaster management plan should be linked with District Disaster Management Plan.	Details of DMP are given in <b>Chapter 7, Section 7.3 at Page No. 302</b> of this EIA report. Disaster management plan is already linked with District Disaster Management Plan. The same will be updated in line with the additional risks associated with the proposed project.
8	<b>Occupational health</b>	
i	Plan and fund allocation to ensure the occupational health & safety of all contract and casual workers.	As per policy and norms all of the workmen are put to medical examination and testing periodically and at set interval and based on the medical report actions are taken as required. Based on the medical examination report/feedback, workmen are counselled and put in different area /job rotation kind of activities Occupational health & safety details are given in <b>Chapter-10, Section-0, Page No. 343</b> . For the safety of all contract and casual worker's personal protective equipment will be provided. The capital investment of INR 51.82 Lakh (OHC Infra, Ambulance, Medical Equipments, etc.) Additional revenue expenditure for periodic Medical check-up of regular employees, pre-employment check-up of new joiners, operational and maintenance cost for Occupational Health Centre (OHC), ambulance, etc. are estimated approx. INR 1.00 Crore.
ii	Details of exposure specific health status evaluation of worker. If the workers' health is being evaluated by pre-designed format, chest x-rays, Audiometry, Spirometry, Vision testing (Far & Near vision, colour vision, and any other ocular defect) ECG, during pre-placement and periodical examinations give the details of the same. Details regarding last month's analyzed data of the above-mentioned parameters as per age, sex, duration of exposure, and department wise.	Specimen of Pre-medical check-up reports and periodic medical check-up reports of the existing employees are attached as <b>Annexure 21, Page 505</b> & the same will be maintained in the future. Periodical examination of all employees and records of the same will also be maintained. Details of periodic tests conducted by APL are given in <b>Chapter 10, Section-0, Page 343</b>
iii	Details of existing Occupational & Safety Hazards. What are the exposure levels of hazards and whether they are within Permissible Exposure	Details of existing occupational & safety hazards are given in <b>Chapter 7, Section-7.3, on Page No. 302</b> of this EIA report.



Sr. No.	TORs	Covered in EIA
	level (PEL). If these are not within PEL, what measures the company has adopted to keep them within PEL so that the health of the workers can be preserved.	The exposure level of hazards is within the Permissible Exposure level (PEL). However, the company has adopted to keep them within PEL so that the health of the workers can be preserved.
iv	Annual report of health status of workers with special reference to Occupational Health and Safety.	Specimens of Pre-medical check-up reports and periodic medical check-up reports of the existing employees are attached as <b>Annexure 21, Page 505</b> & the same will be maintained in the future. Periodical examination of all employees and records of the same will also be maintained.
9	<b>Corporate Environment Policy</b>	
i	Does the company have a well laid down Environment Policy approved by its Board of Directors? If so, it may be detailed in the EIA report.	The company has a well laid down Environment Policy approved by its Board of Directors attached as <b>Annexure 22; page no 506</b> of this EIA report.
ii	Does the Environment Policy prescribe for standard operating process/procedures to bring into focus any infringement/deviation/violation of the environmental or forest norms/conditions? If so, it may be detailed in the EIA.	The company has a well laid down Environmental Policy approved by its Board of Directors attached as <b>Annexure 22 on Page No. 506</b> of this EIA report.
iii	What is the hierarchical system or Administrative order of the company to deal with the environmental issues and for ensuring compliance with the environmental clearance conditions? Details of this system may be given.	APL has developed the hierarchical system to deal with environmental issues and to ensure compliance with the environmental clearance conditions details of the same incorporated in <b>chapter-10 Section 10.4 page no 340</b> .
iv	Does the company have a system of reporting non-compliance / violations of environmental norms to the Board of Directors of the company and/or shareholders or stakeholders at large? This reporting mechanism shall be detailed in the EIA report.	Details of the System of reporting Non-compliance/ violation of environmental norms to the Board of Directors are given in <b>Chapter-10 as Figure 10-1 page no 341</b> of this EIA report.
v	Details regarding infrastructure facilities such as sanitation, fuel, restroom, etc. are to be provided to the labour force during construction as well as to the casual workers including truck drivers during the operation phase.	<p>During the construction phase, APL will provide the following facilities for contract employees:</p> <ul style="list-style-type: none"> <li>• Drinking water</li> <li>• Toilets</li> <li>• Dining space</li> <li>• Access to First Aid Centre</li> </ul> <p>During the operation phase, APL has existing following infrastructure facilities for their own &amp; contract employees:</p> <ul style="list-style-type: none"> <li>• Dining space/ Canteen</li> <li>• Changing room</li> <li>• Drinking water</li> <li>• Toilets and bathing facility</li> <li>• Vehicle Parking space</li> <li>• Rest room for truck drivers</li> <li>• Occupational Health centre</li> </ul> <p>Details incorporated in <b>Chapter- 2, Section 2.7.2 Page No. 75</b> of this EIA report.</p>
10	<b>Corporate Environmental Responsibility (CER)</b>	
	Adequate funds, as per the Ministry's OM/Guidelines, shall be earmarked towards Corporate Environmental Responsibility based on Public Hearing issues/socio-economic issues and item-wise details along with time time-bound action plan shall be included (CER activities shall be related to the environment). Socio-economic development activities need to be elaborated	According to the CER office memorandum dated 25 <sup>th</sup> February 2021 of MoEF&CC, the CER budget for 2 years comes to INR 95 lakh i.e. 0.75% of project cost INR 125 Crore. The budget for CER activities is as given in <b>Chapter-10, Section-10.3.15, as Table 10-17 on Page No. 339</b> of this EIA report.

Sr. No.	TORs	Covered in EIA
	upon. For the projects where a public hearing is not conducted, a CER plan shall be provided based on a socio-economic study of the area.	
11	<b>Additional studies/Measures to be considered</b>	
	Provide the latest and most eco-friendly technology for product manufacturing.	Water recycling to reduce fresh water consumption. The latest available technology for the production of paints will be adopted to reduce the burden on the Environment.
	Emphasize on Green chemistry/Clean Manufacturing.	80-90% condensate water recycling, utilization of Solar Energy, and for the clean manufacturing process, the unit will achieve a partial ZLD system.
	Provide CAS No. of products along with product list.	CAS numbers are primarily assigned to individual chemical substances. Since these products are mixtures and dispersion of various other chemicals, specific CAS number will not apply to them.  Details of Products and Raw materials are provided in <b>Chapter-2, Section-2.4.2, Page No. 64</b> of this EIA report.
	Provide details of the amount of carbon sequestered in their unit through greenbelt/other modes, in case of the expansion project.	Details of Carbon footprint print are given in <b>Chapter-2 Section-2.8 on Page No. 102</b> of the EIA report.
	Life structure and sustainability for carbon and water footprint.	Details of Carbon footprint are given in <b>Chapter-2, Section-2.8, Page No. 102</b> of this EIA report.  Details of Water footprint are given in <b>Chapter-2, Section-2.8.11, Page No. 116</b> of this EIA report.
	Detailed pollution Load estimation.	The pollution Load statement for proposed expansion during normal operation is given in <b>Chapter-2, Section 2.7.18, on Page No. 100</b>
	Transportation of Hazardous substances, effluents, etc shall be carried out through authorized and GPS-enabled vehicles/Trucks only.	Transportation of Hazardous substances will be transported by authorized and GPS-enabled vehicles
	The category of Hazardous Wastes shall be mentioned in the EIA/EMP report and the presentation.	The category of Hazardous waste is incorporated in <b>Table 2-26 of Chapter 2, Section-2.7.9, Page 92</b> of this EIA report.
	Details of greenhouse gases and emissions shall be provided.	Details of Air emissions are provided in <b>Chapter-2, Section-2.7.7, Page No. 86</b> of this EIA report.  Additionally carbon footprint study for GHG gases is provided in <b>Chapter-2, Section-2.8 on Page No. 98</b> .
	Greenbelt shall be developed in the first year of the project and wind breaks shall be erected.	The existing total area of the plot is 129.27 Acres out of which approx. 182666.44 m <sup>2</sup> i.e. 45.14 acres area is already developed as green belt, which cover approx. >33 % of total plot area.  It has ~25000 trees and shrubs. Additional 4000 trees will be planted inside the premises in the existing space. The existing Greenbelt is dense in most part of the periphery of plant. It will further be strengthened.  Greenbelt development details are given in <b>Chapter-10, Section 10.3.12, Page No. 327</b> of this EIA report
	Study area map shall be overlapped with all the associated features.	Study Area map is overlapped with all the associated features is incorporated in <b>chapter-2 as Map 2-3 on Page No. 55</b> of this EIA report.
	Emphasize on green fuels.	APL is using HSD/ LPG/LNG as fuel for the existing project same fuel will be used for the proposed expansion. Details of the fuel is given in <b>chapter-2, Section 2.7.1 at Page No. 74</b> of this EIA report.
	The project from NCR shall not use Coal as fuel. Further, PP shall avoid use of Coal in the CPAs and elsewhere also if alternatives are available.	The project does not use Coal.

Sr. No.	TORs	Covered in EIA
	Provide the Cost-Benefit analysis with respect to the environment due to the project.	In view of a number of environmental / health and safety benefits as compared to nominal environmental costs, the proposed brownfield project of Integrated Paint manufacturing paints will have no adverse effect on the environment and ecology at large.  Detailed Cost-Benefit analysis is given in <b>Chapter 9 on Page No. 313</b> of this EIA report.
	Details of carbon footprints and carbon sequestration study w.r.t. proposed project needs to be spelled out. Proposed mitigation measures also need to be analyzed and submitted for further appraisal of the EAC	Details of Carbon footprint are given in <b>Chapter-2, Section-2.8 on Page No. 102</b> of the EIA report.
	Any litigation pending against the project and/or any direction/order passed by any Court of Law against the project, if so, details thereof shall also be included. Has the unit received, any notice under Section 5 of the Environment (Protection) Act, 1986, or relevant Sections of the Air and Water Acts? If so, details thereof and compliance/ATR to the notice(s) and Present status of the case.	No litigation is pending against the project.  Also, no notice was received under Section 5 of the EPA or relevant sections of the Air and Water Act.  A pending litigation was concluded in 2024-25, details for the same are attached as <b>Annexure 4</b> .
	A tabular chart with the index for point-wise compliance of the above TORs and its details needs to be submitted in the EIA/EMP Report.	ToR compliance is given in <b>Chapter-1, Section-1.4.2, Table 1-3</b> of this EIA report.
<b>B</b>	<b>Specific Conditions</b>	
1	Details on the requirement of raw materials (binders, solvents, pigments, additives, resin, driers, etc.), their source, and storage at the plant.	Details on the requirement of raw materials (binders, solvents, pigments, additives, resin, driers, etc.), their source, and storage at the plant are given in <b>Chapter-2, Section-2.4.2, Page No. 65</b> of the EIA report.
2	Whether any of the material content lead if so details thereof.	APL strictly follows MoEF&CC Notification G.S.R. 1030(E) dated 1st November 2016 for the prohibition of the use of lead or lead compounds and has been doing self-certification by labelling the product as per this notification. Refer to <b>Annexure 23 on Page No. 508</b> for analysis reports of product for Lead (as Pb) content & photographs of products showing labelling regarding Lead contents are provided as <b>Photographs 12-1 on Page No. 524</b> .
3	Details on solvent management including loss accounting.	The plant is producing only water-based paints and the use of solvents is negligible. However, vent condensers are provided for storage of solvents to avoid any evaporation losses.
4	Details on composition, generation, and utilization of waste from the plant—left out raw materials, paint sludge, filter cartridges, off-specification paint, etc.	Details on the composition, generation, and utilization of waste are incorporated in <b>Chapter 2, Section-2.7.9, Page 92</b> of this EIA report.
5	Existing ambient air quality for expected emissions (VOCs, pigment dust, etc.) from the paint industry.	Existing ambient air quality for expected emissions (VOCs, pigment dust, etc.) from the paint industry is incorporated in <b>Chapter-3, Section 3.7.2, on Page No. 148</b> of the EIA report.
6	Detailed effluent treatment scheme including segregation for units adopting 'Zero' liquid discharge.	Detailed effluent treatment scheme including segregation is incorporated in <b>Chapter-2, Section 2.7.5, at Page No. 79</b> .
7	Authorization/Membership for the disposal of liquid effluent in CETP and solid/hazardous waste in TSDF, if any.	APL is following partial ZLD hence, CETP Membership is not required. Authorization/Membership for solid/hazardous waste in TSDF is enclosed as <b>Annexure 11 at Page No. 446</b>
8	Details of carbon footprints and carbon sequestration study w.r.t. proposed project needs to be spelled out. Proposed mitigation measures also need to be analyzed and submitted for further appraisal of the EAC.	Details of carbon footprints and carbon sequestration study are incorporated in <b>Chapter-2, Section 2.8, on Page No. 102</b> of this EIA report.

## 2 PROJECT DESCRIPTION

This chapter provides a condensed description of those aspects of the project likely to cause environmental effects. Details are described in following sections with regards to type, need, location, size or magnitude of project operations, technology and other related activities.

### 2.1 Type of Project

M/s. APL has proposed to expand in production of its existing paint manufacturing facility at HSIIDC Industrial area, IMT, District Rohtak, Haryana. The proposed project falls under activity/ sector 5 (h), Category B as per EIA notification 2006 amended till date which requires obtaining prior environmental clearance (EC) from SEAC/SEIAA - Haryana. As the project is located in the HSIIDC Industrial Area, which is a notified industrial area, a Public hearing is not applicable for the proposed expansion project.

#### 2.1.1 Demand- Supply Gap

The Paint market has been witnessing steady growth and APL expects that to grow over the next decade. Hence ramping up the production capacity at this facility is important from the future growth point of view.

#### 2.1.2 Import vs. Indigenous Production

The project is not an import substitution project but will cater to the increasing demand for quality paint products within the Country.

#### 2.1.3 Domestic / Export Markets

All paint products will be supplied in the domestic market to meet the demand. Asian Paints Limited is looking to improve its market share in India.

#### 2.1.4 Export Possibility

At present, there is no export possibility in the proposed project.

### 2.2 Location

The proposed project is a Brownfield project for Integrated Paint Manufacturing and Intermediate Products located at Plot No. 1, Sector 30-B, HSIIDC, IMT Rohtak, Haryana. The site is well connected with Khedisadh, Rohtak, & other major cities. Location Map of the Project Site is provided as **Map 2-1**. The Project site on Toposheet /Open Series Map (No. F43J10 and F43J14) is provided as **Map 2-2**. Study area map on GoogleEarth Imagery with Project Site is provided as **Map 2-3**. HSIIDC Layout Plan for Phase I, II, III of IMT, Rohtak is provided as **Map 2-4**. Project Site boundary on Google Earth Imagery with Geo-coordinates is provided as **Map 2-5**. The site layout map of the proposed project is provided as **Map 2-6**. The total plot area of the plant is 5,23,198.00 m<sup>2</sup> (i.e. 52.0 Ha).

The Geo-coordinates of the proposed site are provided in **Table 2-1**.

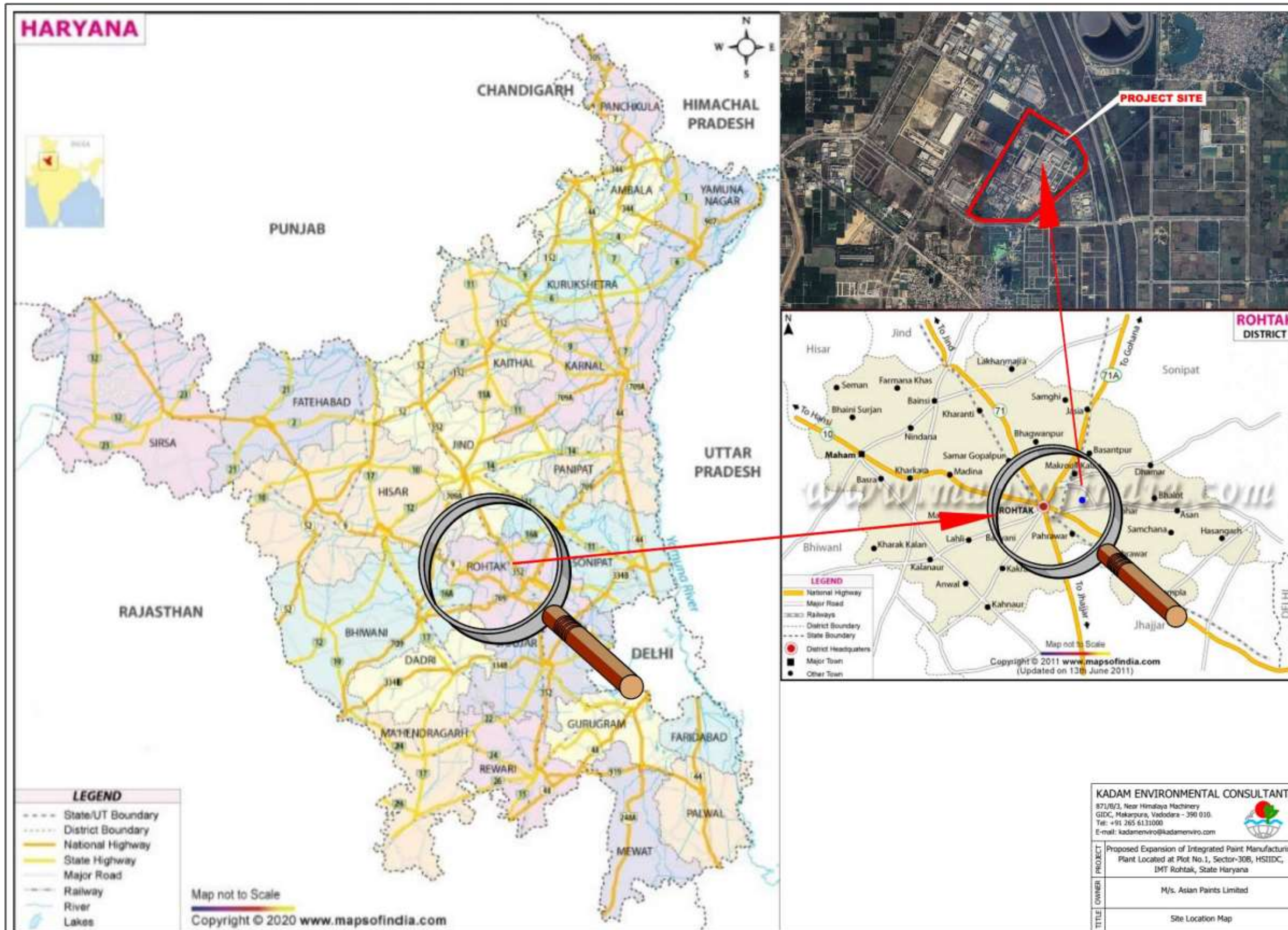
**Table 2-1: Coordinates of the proposed project site**

S. No.	Latitude	Longitude
A	28°52'25.75"N	76°40'23.30"E
B	28°52'19.55"N	76°40'37.45"E
C	28°52'14.22"N	76°40'41.04"E
D	28°52'8.93"N	76°40'40.56"E
E	28°51'56.09"N	76°40'22.81"E

S. No.	Latitude	Longitude
F	28°51'55.44"N	76°40'17.06"E
G	28°51'55.88"N	76°40'7.92"E
H	28°51'58.10"N	76°40'4.40"E

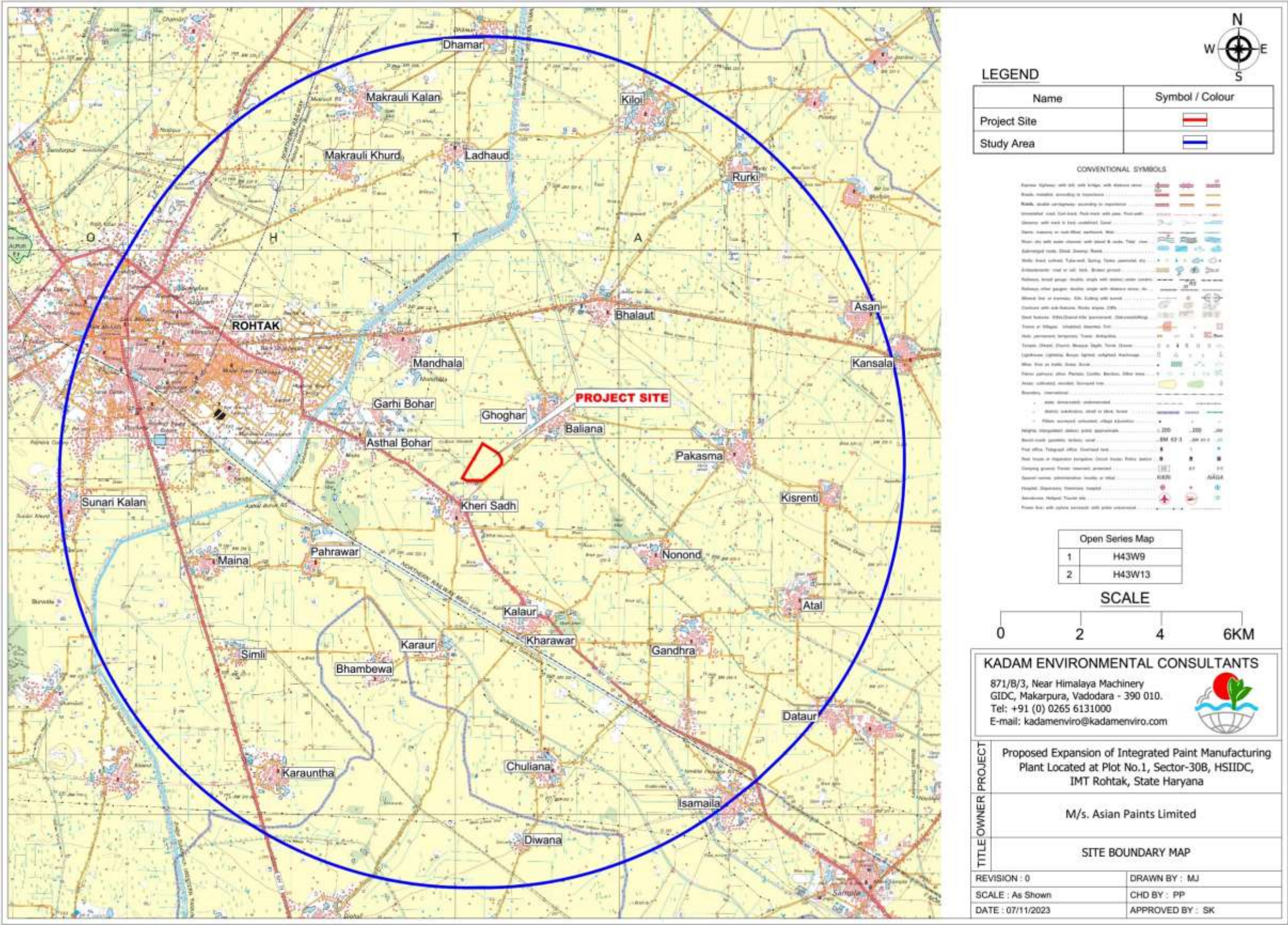


Map 2-1: Project Site Location Map



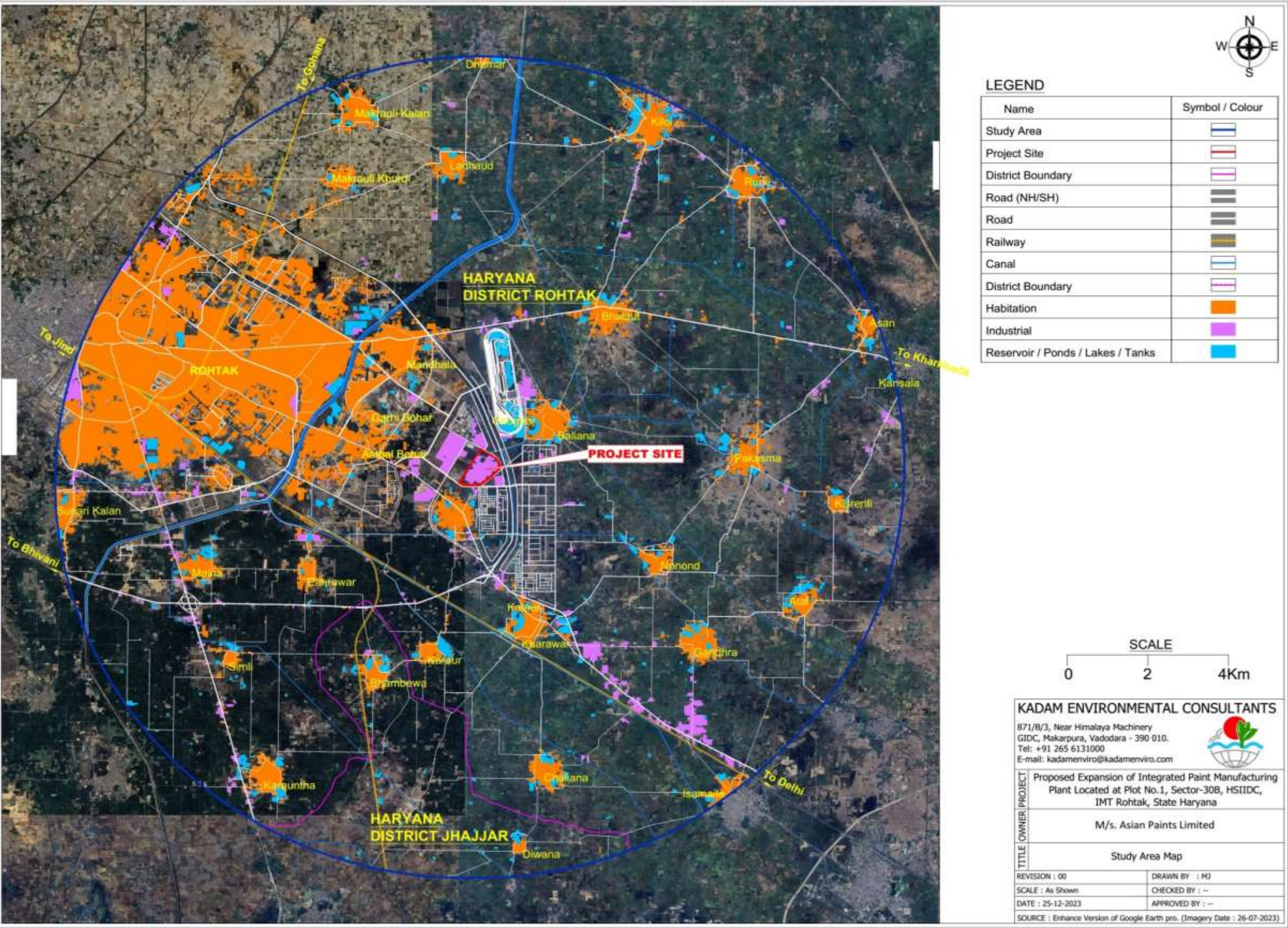


Map 2-2: Project Location on Toposheet /Open Series Map (OSM) of SoI



Map 2-3: Study Area Map on Google Earth Imagery with Project Site





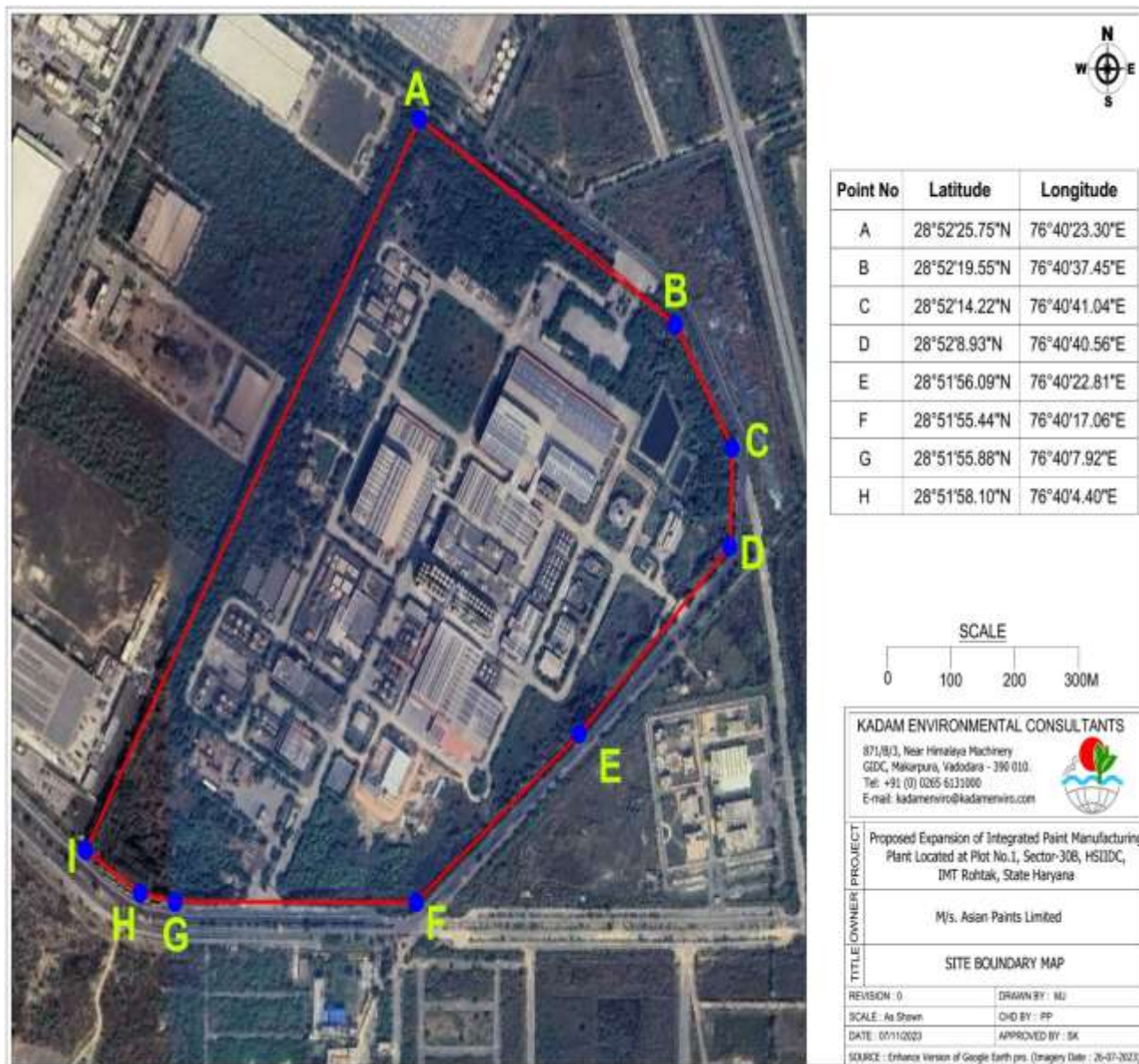


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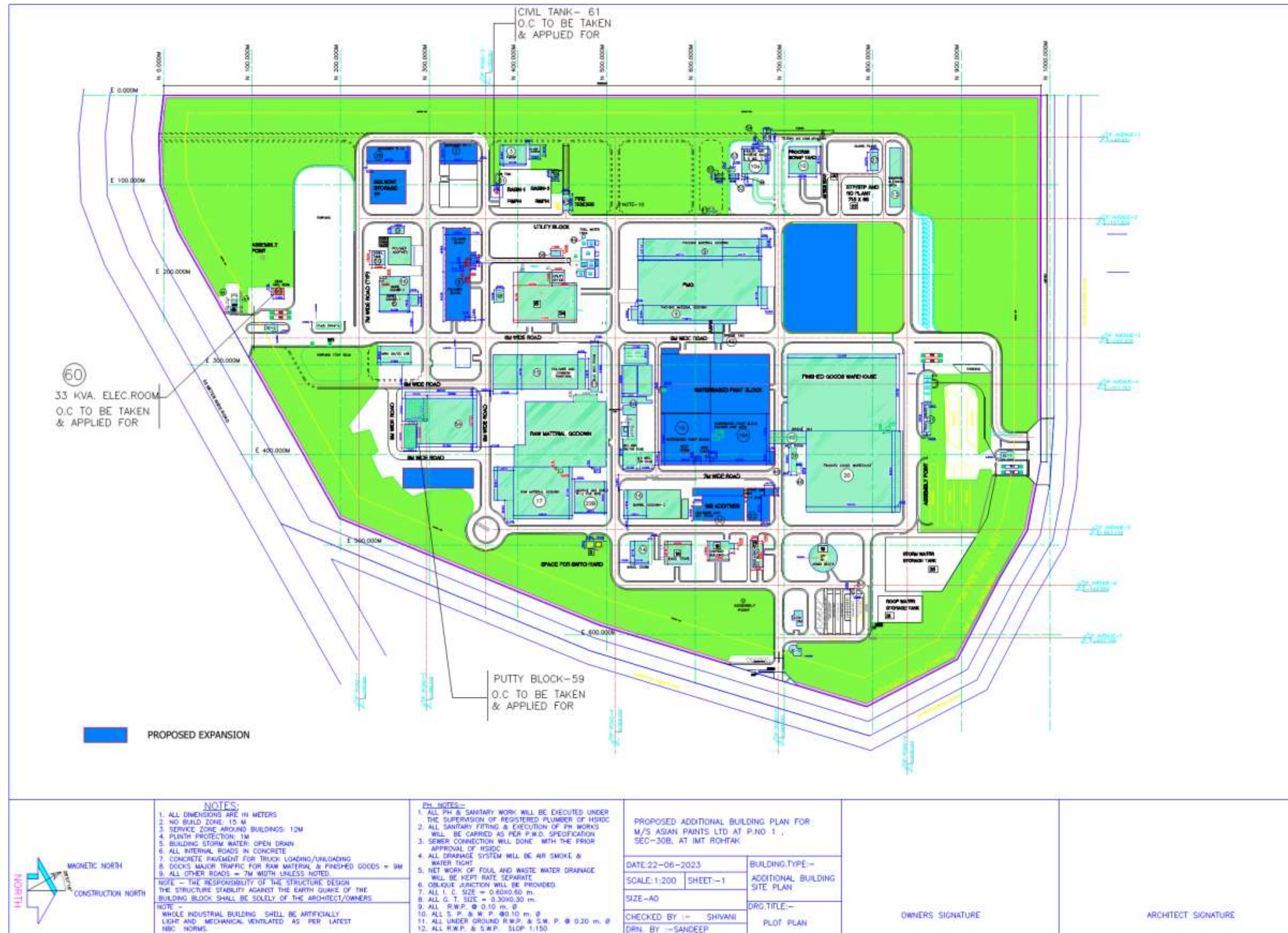


**Map 2-5: Project Site Boundary Map with Geo-coordinates**





Map 2-6: Project Site Layout Plan



**Note:** Details provided are tentative and subject to changes, based on detailed engineering during expansion.

### 2.2.1 Immediate Neighbours

Details of the immediate neighbours are given below in **Table 2-2**.

**Table 2-2: Immediate Neighbours**

S. No.	Direction	Description	Products/ Activities
1	North	Enrich Food Agro Products , Hitech Corporation	Beaverages, Food processing
2	East	MSME Technology Centre, Rohtak , NH-352	Training Centre
3	South	SRS Public School	School
4	West	Aisin Automotive Haryana Pvt Ltd , Tata Steel Recycling Business Rohtak	Automotive component manufacturer & Exporter

### 2.2.2 List of Industries

List of industries within 10 Km radius of the project site is provided in **Table 2-3**.

**Table 2-3: Major List of Industries in study area**

Sr. No.	Industry Name	Distance (km)	Direction wrt Project Site
1	M/s. Tata Steel Recycling	0.26	NW
2	M/s. Aarti Greentech Limited	0.35	NW
3	M/s. Lotte India Corporation Limited	0.44	NW
4	M/s. Armoured Unit Mishra Dhatu Nigam Limited	0.42	NW
5	M/s. Shivam Autotech Limited	0.16	NW
6	M/s. AISIN Automotive Haryana Private Limited	1.26	WNW
7	M/s. HVPNL, 132 KV substation, IMT HSIIDC	1.29	WNW
8	M/s. Micron Precision Screws	1.66	NNE
9	M/s. Maruti Suzuki India Limited R&D Plant	1.72	NNE
11	M/s. Supergas Filling Plant	1.07	NNW
12	M/s. Bhagwan Automatics	0.85	NNW
13	M/s. Amar Ujala Limited	0.81	NNW
14	M/s. Growmax India Private Limited	0.83	NW
15	M/s. B.K. Automatics	0.86	NW
16	M/s. Precision Tech Enterprises	0.78	WNW
17	M/s. MT Autocraft	0.56	WNW
18	M/s. Enterprises	0.53	NNW
19	M/s. Crystal Precision Private Limited	0.64	NNW
20	M/s. Vespas Orthotics Industries	0.65	NNW
21	M/s. Enrich Agro Food Products	0.16	NW
22	M/s. Hitech Corporation Limited	0.1	WNW
23	M/s. Sudhir Automotive Industries Private Limited	4.71	SSE
24	M/s. R.K. Panels & Boards (P) Limited	5.15	SSE
25	M/s. Ok Lifecare Private Limited	5.0	SE
26	M/s. Mahadev Packaging Private Limited	5.13	SE
27	M/s. Shankar Silicate Industries	5.3	SE
28	M/s. United Electronics	5.79	SE
29	M/s. NEO-HY Industry	5.74	SE
30	M/s. Mohindra Fasteners Limited	5.5	SSE

## 2.3 Approach and Connectivity to Project Area

### 2.3.1 By Road

APL-Rohtak Site is located adjacent to NH-352 in E direction, which is further connected with NH-9 located ~ 1.80 km in South direction.

### 2.3.2 By Rail

The nearest railway station at Kharwar is located ~ 6.1 km in SE direction. The next nearest railway station of Asthal Bohar Junction is located ~9.9 km in WSW direction from project site.

### 2.3.3 By Air

The nearest Airport - Indira Gandhi International Airport, New Delhi ~ 70 km in SE direction from the project site.

### 2.3.4 By Waterway

The project site is not connected and approachable from Waterways.

## 2.4 Size or magnitude of operation

### 2.4.1 Size, Land Distribution at Site & Project Site Layout

The total plot area of the project is 52.3198 Ha (523198 m<sup>2</sup>). The proposed expansion will be done in the existing plot area with no additional land required, having a total production capacity of 10,12,500 TPA (Existing- 720,000 proposed- 292,500). The product list is given in **Table 2-5**, the Site layout map is shown in **Map 2-6** and the area breakup at the project site is given in **Table 2-4**. Photographic documentation of Process area, ETP, Storage area, Stacks and Hazardous waste storage is provided as **Photographs 2-1**.

**Table 2-4: Area Break up at Site**

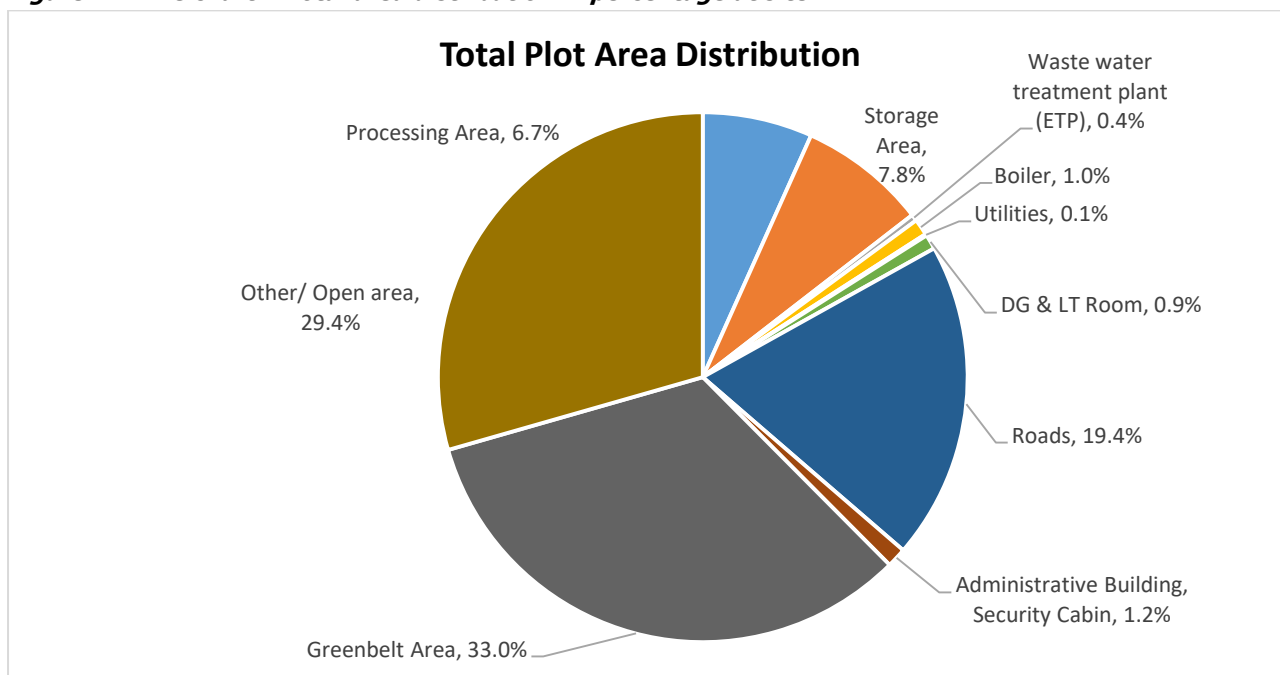
S. No.	Title	Area (m <sup>2</sup> )			% of the Total Area
		Existing	Proposed Expansion	Total After Expansion	
1	Processing Area	23,114.72	11,811.10	34,925.82	6.7%
2	Storage Area				0.0%
a	Hazardous Chemical	11592.03	-	11592.03	2.2%
b	Other Non-Hazardous Chemicals	13,066.14	-	13,066.14	2.5%
c	Hazardous Waste	970.95	-	970.95	0.2%
d	Water Storage	3,818.13	-	3,818.13	0.7%
e	Fuel, Solvent and other liquid chemical storage	10,281.51	1,028.15	11,309.66	2.2%
3	Wastewater treatment plant (ETP)	2,247.91	-	2,247.91	0.4%
4	Boiler	4,296.20	859.24	5,155.44	1.0%
5	Utilities	392.29	-	392.29	0.1%
6	DG & LT Room	1,943.19	2,914.79	4,857.98	0.9%
7	Roads	101,691.80	-	1,01,691.80	19.4%
8	Administrative Building, Security Cabin	6,491.00	-	6,491.00	1.2%
9	Greenbelt Area	182,666.44	-10,011.10	1,72,655.34	33.0%
10	Other/ Open area	160,625.69	-6602.18	1,54,023.51	29.4%

S. No.	Title	Area (m <sup>2</sup> )			% of the Total Area
		Existing	Proposed Expansion	Total After Expansion	
	<b>Total</b>	<b>523,198.00</b>	<b>-</b>	<b>5,23,198.00</b>	<b>100.0%</b>

**Note:** The details provided are tentative and subject to change, based on detailed engineering during expansion. 33% of the Greenbelt area will be maintained.

The pie chart showing the total area distribution in percentage at the site is shown in **Figure 2-1**.

**Figure 2-1: Pie chart – Total area distribution in percentage at site**



**Photographs 2-1: Photographic documentation of Plant, Process area, Storage, Stacks, and Hazardous waste storage area.**







Processing Block



Processing Block



Non-hazardous waste storage (scrap yard)



Process Stacks



Non-Hazardous waste Storage (scrap yard)



Scrap Yard



APL-Rohtak Site Visit- Gate No. 01



Hazardous Waste Storage Area

## 2.4.2 Production Capacity, Storage, Handling & Mode of Transportation for Products & Raw Material

### Production Capacity

The production capacity of the project for existing and after expansion is as per **Table 2-5**.

**Table 2-5: Existing & After Expansion Production Capacity**

S. No.	Name of the Product	Unit	Existing Production		Additional Production	Total production after capacity expansion
			As Per EC	As per CTO		
1	Water-based & Solvent based paint	KL/Annum	4,00,000	-	1,25,000	5,25,000
2	Intermediates	KL/Annum	1,60,000	-	1,02,500	2,62,500
3	Putty	MT/Annum	0	1,60,000	65,000	2,25,000
<b>Total Proposed (Paint + Putty)</b>						<b>7, 50,000</b>

### Storage Detail of Products

Storage details of products for existing and after expansion, capacity is as given in **Table 2-6**.

**Table 2-6: Storage Detail of Products – Existing and after Expansion**

S. No.	Product Name	State	Means of Storage	Capacity of Storage Means	No. of Storage means	Storage Capacity (at a given time)	Total production Capacity	Pressure	Temp
<b>Existing: Products</b>									
1.	Water & Solvent Based Paints	Liquid	Bins/Cranes/ASRS	0.5	26000 Bins (14 Cranes)	13,000 KL	4,00,000 KL/Annum	NA	Ambient
2.	Putty	Powder	Bins	1.26 MT	1400 Bins	1764 MT	1,60,000 MT/Annum	NA	Ambient
<b>After Expansion: Products</b>									
1.	Water & Solvent Based Paints	Liquid	Bins/Cranes/ASRS	0.5	26000 Bins (14 Cranes)	13,000 KL	4,00,000 KL/Annum	NA	Ambient
2.	Putty	Powder	Bins	1.26 MT	1400 Bins	1764 MT	1,60,000 MT/Annum	NA	Ambient

**Note:** MT=Metric Tonne, KL=Kilo Litre.

### Mode of Transportation of Products

Details of the transportation of Products are given in **Table 2-7**.

**Table 2-7: Mode of Transportation of Products**

S. No.	Final Product	State	Means of Transportation	End Use
1.	Water Based Paints	Liquid	By Road & Rail	Supply to the direct customer or supply in the market
2.	Solvent Based Paints	Liquid	By Road & Rail	Supply to the direct customer or supply in the market
3.	Putty	Powder	By Road & Rail	Supply to the direct customer or supply in the market

### Storage detail of Raw Materials

Storage detail of raw materials for existing & after expansion capacity are given in **Table 2-8**.



**Table 2-8: Storage Detail of Raw materials – Existing & after Expansion**

S. No.	Raw Material Name	State	Means of Storage	Capacity of Storage Means	No. of Storage means	Total Capacity (MTM)	Safety Measures	Pressure	Temp.
<b>Existing: Raw Material</b>									
1	Pigment	Liquid/ Powder	Day tank Day bin	4 m <sup>3</sup> 1 to 3 KL	4 day tank 4 day bin	13 MT	MSDS	Ambient	Ambient
2	Rutile	Powder	Silo	180 to 330 m <sup>3</sup>	20 Silo	3430 MT	MSDS	Ambient	Ambient
3	Extender	Powder	Silo	"20-25 Kg 190-240 Kg 20-60 Kg"	58 Silo	9298 MT	MSDS	Ambient	Ambient
4	Additives	Liquid/ Powder	Silo , Tank, day tank , day bin	4 to 5 M <sup>3</sup> 30 to 700 KL 0.25 to 5 KL	"16 Day bin 49 tanks 52 day tanks 4 Silo"	6347 MT	MSDS	Ambient	Ambient
5	Monomer	Liquid	Tank, day tank	"0.5 to 2 KL 50 to 700 KL"	"11 Tank 4-day tank"	3677 MT	MSDS	Ambient	Ambient
6	Monomer	Liquid	Tank	50-150 KL	7 Tank	343 MT	MSDS	Ambient	Ambient
<b>After Expansion: Raw Material</b>									
1	Pigment	Liquid/ Powder	Day tank Day bin	4 m <sup>3</sup> 1 to 3 KL	4-day tank 4-day bin	13 MT	MSDS	Ambient	Ambient
2	Rutile	Powder	Silo	180 to 330 m <sup>3</sup>	20 Silo	3430 MT	MSDS	Ambient	Ambient
3	Extender	Powder	Silo	"20-25 Kg 190-240 Kg 20-60 Kg"	58 Silo	9298 MT	MSDS	Ambient	Ambient
4	Additives	Liquid/ Powder	Silo, Tank, day tank, day bin	4 to 5 m <sup>3</sup> 30 to 700 KL 0.25 to 5 KL	"16 Day bin 49 tanks 52-day tanks 4 Silo"	6347 MT	MSDS	Ambient	Ambient
5	Monomer	Liquid	Tank, day tank	"0.5 to 2 KL 50 to 700 KL"	"11 Tank 4-day tank"	3677 MT	MSDS	Ambient	Ambient
6	Monomer	Liquid	Tank	50-150 KL	7 Tank	343 MT	MSDS	Ambient	Ambient

### Mode of Transportation of Raw Materials

Details of the transportation of Raw materials are given in **Table 2-9**. The raw materials will be sourced from domestic and imported suppliers as per requirement.

**Table 2-9: Mode of Transportation – Raw Materials**

S. No.	Raw Material	State	Means of Transportation	Source
<b>Existing: Raw Materials</b>				
1	Extender	Powder	Tankers/Trucks	Imported/Domestic market
2	Pigment	Liquid, Powder	Tankers/Trucks	Imported/Domestic market
3	Additives	Liquid, Powder	Tankers/Trucks	Imported/Domestic market
4	Monomer	Liquid	Tankers/Trucks	Imported/Domestic market
5	Solvent	Liquid	Tankers/Trucks	Imported/Domestic market
<b>After Expansion: Raw Material</b>				

S. No.	Raw Material	State	Means of Transportation	Source
1	Extender	Powder	Tankers/Trucks	Imported/Domestic market
2	Pigment	Liquid, Powder	Tankers/Trucks	Imported/Domestic market
3	Additives	Liquid, Powder	Tankers/Trucks	Imported/Domestic market
4	Monomer	Liquid	Tankers/Trucks	Imported/Domestic market
5	Solvent	Liquid	Tankers/Trucks	Imported/Domestic market

### 2.4.3 Justification for selection of capacity

As explained above, the paint market has been witnessing steady growth and APL expects that to grow over the next decade. Hence ramping up the production capacity at this facility is important from the future growth point of view.

There is a capacity enhancement basis for 3 opportunities that are being worked upon for execution and relevant increase in volume produced per year. The first 2 of the 3 opportunities are part of the project upgrade while the 3<sup>rd</sup> is the opportunity that will be implemented subsequently.

1. APL Rohtak proposes to add a few additional processing equipment to the existing processing set-up across paint, putty, and intermediates which will add capacity.
2. There are further technological advancements scope that have been identified for improvement in current process cycle times giving a higher output in the existing + proposed set-up.
3. There is also an opportunity available to move from a 6-day working to a 7-day working thereby increasing the production days per year and hence increasing the productivity.

## 2.5 Proposed schedule for approval and implementation

After obtaining Environmental Clearance (EC) and Consent to Establish the proposed expansion, identified activities will be commenced. The Schedule for Project approvals is provided in *Table 2-10* and for project implementations in *Table 2-11*.

**Table 2-10: Schedule for Project Approvals (Tentative)**

S. No.	Process/Activities	Date	
		Start	End
1.	TOR application - Online submission	22/02/2024	28/02/2024
2.	Receipt of ToR Letter from SEAC, Haryana	31/05/2024	
3.	EC & CTE Approval	30/06/2025	
4.	CTO from HSPCB	20/10/2025	15/04/2026

**Table 2-11: Schedule for Project Implementations (Tentative)**

S. No.	Process/Activities	Date	
		Start	End
1.	Civil work	01/06/2026	01/12/2027
2.	Procurement of machinery required	20/12/2027	01/06/2028
3.	Erection& installation of machinery	02/06/2028	31/12/2028
4.	Trial of machinery & equipment	1/01/2029	1/06/2029
5.	Commissioning and start of expanded production	02/06/2029	31/12/2029

## 2.6 Technology and Process Description

The manufacturing process of water-based paints, solvent-based paint, powder putty, resins, and polymer emulsion are given in subsequent sections.

Following types of paints and intermediates shall be manufactured in the proposed unit:

- Paints (Water based Paints & Solvent based Paints).
- Intermediates
- Putty

The description of the manufacturing process with Process flow diagram and mass balance of the above products are as below:

### 2.6.1 Water and Solvent Based Paints Manufacturing

The paint manufacturing process consist of four stages. The complexity in the industry is at the stage of formulating the recipe of the product and selection of equipment and process to be used.

The actual manufacturing process consist of the following four stages:

- Pre- dispersion
- Dispersion
- Mixing & Tinting
- Packing

Numerous variations exist in each of these four stages depending upon the particular product and the volume of product. The basic stages involved are further elaborated as follows:

#### Pre Dispersion:

This stage involves wetting the pigments with sufficient quantity of appropriate binder, breaking large agglomerates to make a mill base which has a required consistency for grinding.

#### Dispersion

The raw material is further reduced to smaller particles of uniform size, which are dispersed uniformly in the medium. The type of paint and the final particle size required, determine the equipment to be used and the time required for dispersion. An appropriately sized disperser is used for this purpose.

#### Mixing & Tinting

Dispersed mill base is then thinned with water and medium and shade adjustment is done using tinters. Small quantities of driers and additives are added by this, the paint is thinned down to the required consistency and tinted to the exact shade required.

Quality checks are carried out for consistency, viscosity, colour, drying time, and other specified properties before the batch is approved for packing.

#### Packing

The paint is through this final stage wherein it is filtered and packed in the desired pack size. Normal pack sizes vary from 1 to 50 liters / kgs. Exceptional pack size includes 200 / 1000 liter containers. In very rare cases, it may be directly transported to the consumer in the tank with a stirring facility.

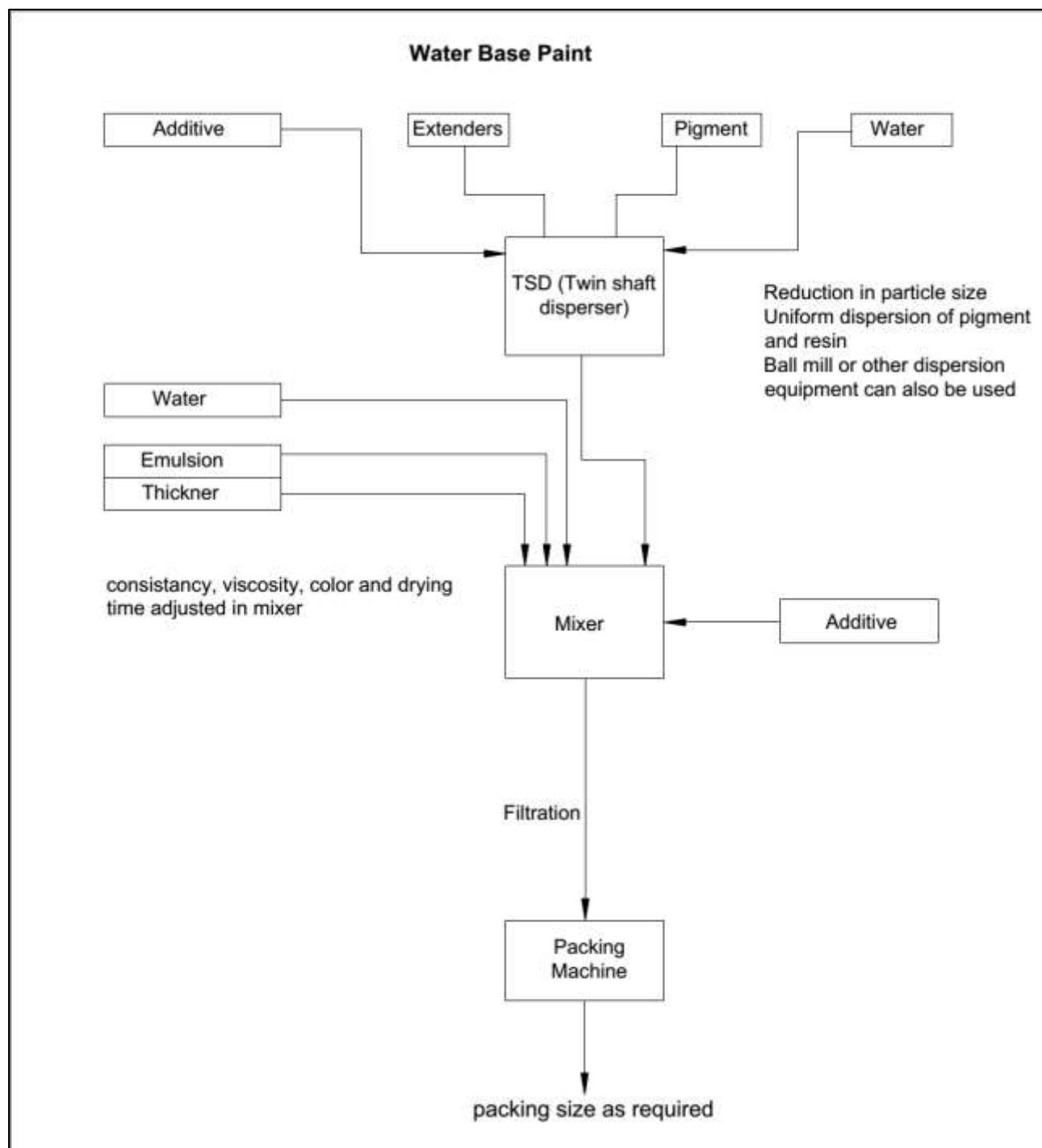
Material Balance for the Paint Manufacturing process is as given in

**Table 2-12.**

**Table 2-12: Material balance for Paints**

S. No.	Input/MT of Product					
	Raw Materials		Quantity (MT/MT)			
1	Additives		0.0952			
2	Emulsion		0.2225			
3	Extenders		0.3056			
4	Pigments		0.0665			
5	Solvent and Misc.		0.0130			
6	Water		0.2972			
Total			1.00			
S. No.	Output/MT of Product					Remark
	Product	Liquid Effluent	Air Emission	Recovery/ Product	Solid Waste	
1	Water Based Paint	-	-	0.982	-	Product
2	Losses	-	0.002		0.002	To Dust Extraction with Bag Filter & Solid waste to TSDF
3	Waste Water	0.005	-	-	-	To ETP for treatment
Total		0.005	0.002	0.991	0.002	
		1.00				

**Note:** Details may have some smaller changes based on actual detailed engineering design.

**Figure 2-2: Schematic flow diagram for Waterbase Paints Manufacturing.**

### 2.6.2 Intermediate Manufacturing

The following steps are involved in the production of Intermediates (like Polymers including Redispersible Polymer Powder):

#### Preparation of Surfactant Solution:

De-mineralized water is heated (70-80°C) & added to surfactant to prepare a homogeneous surfactant solution.

**Preparation of Pre-Polymer**

De-mineralized water is charged & stirring is started. The prepared surfactant solution along with monomer & catalyst is utilized for the preparation of Pre-polymer.

**Reactor charge**

De-mineralized water is charged into the reactor at ~85-degree temperature. Charge surfactants followed by catalyst solution into the reactor. Charge X % of the prepared pre-polymer into the reactor. Additives if prescribed are added at this stage. The reactor temperature is raised (~78 degrees). Wetting is checked.

**Pre-polymer addition**

Prepared Pre-polymer is added to the reactor at a uniform rate utilizing a metering pump. Maintain the temperature at  $78 \pm 10$  degrees throughout the addition. Wetting is checked at every defined frequency of pre-polymer addition. After the addition of pre-polymer, the vessel is flushed with DM water.

**Digestion**

DM water is added to the digestion catalyst & mixed well to form the solution. After the complete addition of monomer & flushing, the digestion catalyst solution is charged at a uniform rate. Digest the batch for the time specified as per formulation. Maintain a temperature of ~80 degrees during digestion.

**In-process check**

The polymer sample is taken out, cooled to room temperature, neutralized, and strained through adequate sized mesh. A film is drawn on a clean glass plate using a 150-micron applicator and observed for the absence of cissing. If cissing is observed digestion is continued till the film is cissing free. % Non-volatiles are checked at the end of digestion

**Discharge**

Batch is cooled down (50-70 degrees). It is discharged to a Let Down Vessel (LDV). After complete transfer flushing of the reactor is done with DM water.

**Addition of additives:** LDV Additives are added in LDV below 50 degrees. Additives include biocide, defoamer & pH adjuster. It is ensured that pH is within 8.5 – 9.5.

**Preparation of PVA solution**

Take water into the separate vessel equipped with an agitator and heat it to 70 °C. Add PVA granules slowly into the hot water under continuous stirring to form a homogenous mixture and filter the solution.

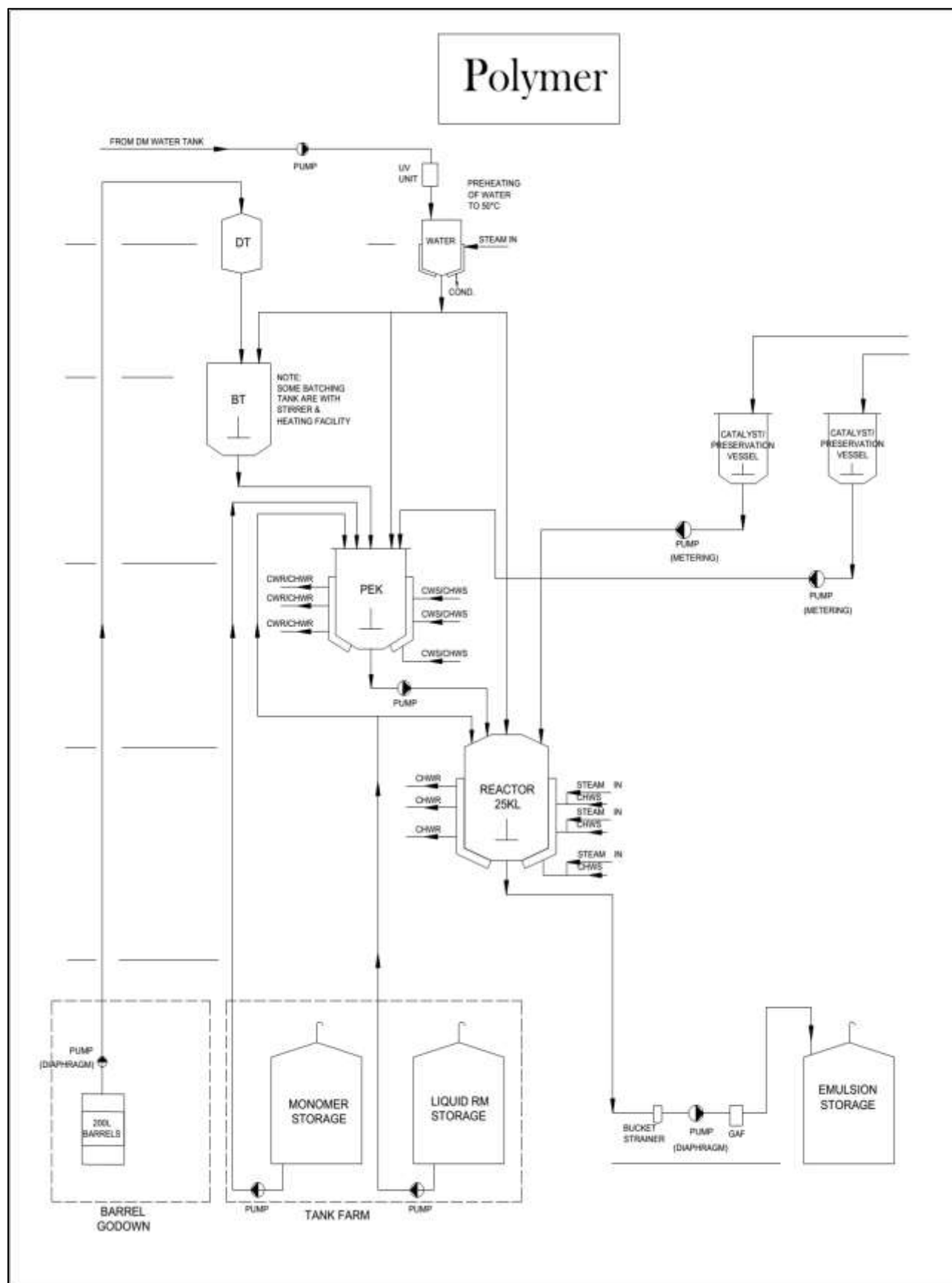
**Blending of emulsion and PVA solution (Spray feed liquid)**

Take emulsion in feed vessel with agitator and add emulsion into it. Start stirring with an agitator and add PVA solution slowly into the vessel under constant stirring.

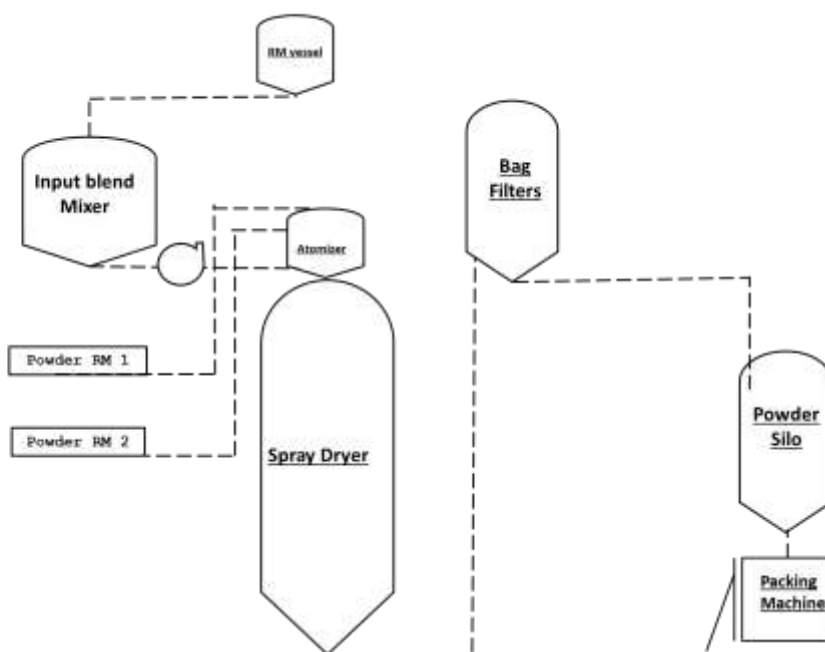
**Spray Drying**

Feed the feed tank material into the spray dryer and evaporate the water by heating the spray mix with hot air. Dry powder needs to be collected through the cyclone separator and packed in a 25 kg bag.

**Figure 2-3: Schematic flow diagram for Polymer Manufacturing**



RDP  
Drying



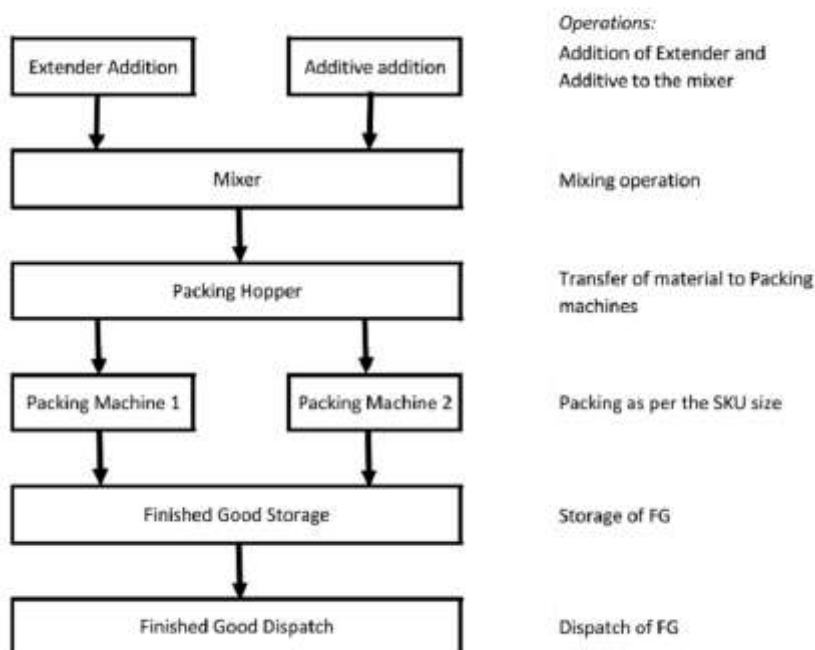
### 2.6.3 Manufacturing of powder putty

The manufacturing process of Powder putty is given in

**Figure 2-4.**

**Figure 2-4: Schematic flow diagram of Manufacturing Process for Putty**

#### Manufacturing Process for Putty



The material Balance for the putty manufacturing process is given in **Table 2-13.**



**Table 2-13: Material Balance for Putty**

S. No.	Input/MT of Product					
	Raw Materials		Quantity (MT/MT)			
1	Extender		0.9800			
2	Additives		0.0200			
Total			1.00			
S. No.	Output/MT of Product					Remark
	Product	Liquid Effluent	Air Emission	Recovery/ Product	Solid Waste	
1.	Putty	-	-	0.991	-	Product
2.	Losses	-	0.004	-	0.005	Dust Extraction with Bag Filter
Total		-	0.004	0.991	0.005	Reused
		1.00				

**Note:** Details may have some smaller changes based on actual detailed engineering design.

#### 2.6.4 List of Major Equipment's

The List of major equipment's (Specifically for Production) for the proposed project are provided in **Table 2-14**.

**Table 2-14: List of major Equipment (Specifically for Production)**

S. No.	Name of Equipment	Existing Quantity (Nos.)	Additional Equipment	Total
1	TSD	18	4	22
2	Ystral	2	0	2
3	SBS	1	1	2
4	Mixer	56	12	68
5	Packing Machine (FPM)	15	06	21
6	Reactor	11	4	15
7	Spray drier	0	2	2

**Note:** Details provided are tentative and subject to changes, based on detailed engineering during expansion.

## 2.7 Project description

Manpower requirement

The proposed expansion will generate direct & indirect employment opportunities during the Construction Phase & Operation phase as described below;

#### During construction phase:

Temporary workers/In-direct Employment: 1500 Mandays (approx.).

#### During operation phase:

Permanent workers/Direct Employment: existing 420 Nos and Proposed for expansion: 10 person total after expansion will be 430 person.

Temporary workers/In-direct Employment: existing 735 Nos and Proposed for expansion: 50 person total after expansion will be 785 person.

#### 2.7.1 Power & Energy requirement

The power requirement of 8 MW will be provided by Uttar Haryana Bijlee Vitran Nigam Ltd (UHBVNL), a primary source of supply. During the power failure or unavailability of supply, two Gas generators of 2875 KVA capacity will

be used as a secondary source of supply. However, during the failure of primary and secondary power sources, two DG of 2000 KVA will be used as a tertiary source of power & two DG of 1010 KVA will be used in case of emergency only, during a power failure, secondary and tertiary sources break down.

Additionally, three GG of 2875 KVA are proposed to fulfill the demand during power failure & will be used as a secondary source of power. PNG will be used as fuel in Gas Generators and HSD will be used in DG sets. PNG will be sourced from BPCL, Kahni Village, Rohtak through pipeline. HSD will be sourced from HPCL, Bahadurgarh Terminal by road.

**Fuel type & Consumption:** Existing HSD for DG sets @196.67 LPH for 1000 KVA and 392.08 LPH for 2000 KVA DG set and PNG for GG 392.08 LPH for 2875 KVA GG set.

Details of Fuel consumption are given in **Table 2-15**.

**Table 2-15: Fuel Consumption**

Sr. No.	Stack Attached to	Capacity	Type of Fuel used	Fuel consumption in ltr/Hr	Nos. of working hours	Remarks
Existing						
1	Boiler 501	2 TPH	PNG	200.00	18	Working
2	Boiler 502	2 TPH	LPG	200.00	-	Stand-by
3	Boiler 503	4 TPH	PNG/HSD	400.00	18	Stand-by
4	DG R 502	1010 KVA	HSD	196.67	During power failure	Tertiary Source of power. Only used as and when required.
5	DG R 503	1010 KVA	HSD	196.67		Tertiary Source of power. Only used as and when required.
6	DG R 505	2000 KVA	HSD	392.08		Tertiary Source of power. Only used as and when required.
7	DG R 506	2000 KVA	HSD	392.08		Tertiary Source of power. Only used as and when required.
8	GG 501	2875 KVA	PNG	392.08		Secondary Source of power. Only used as and when required, in case of grid failure
9	GG 504	2875 KVA	PNG	392.08		Secondary Source of power. Only used as and when required, in case of grid failure
		Proposed Additional				
1	GG	2875 KVA	PNG	@392.08 LPH per GG	During power failure	Secondary Source of power. Only to be used as and when required, in case of grid failure
2	GG	2875 KVA				Secondary Source of power. Only to be used as and when required, in case of grid failure
3	GG	2875 KVA				Secondary Source of power. Only to be used as and when required, in case of grid failure

**Note:** Details may have some smaller changes based on actual detailed engineering design.

### 2.7.2 Infrastructure Facilities

During the construction phase, APL will provide the following facilities for contract employees:

- Drinking water
- Toilets
- Dinning space
- First Aid Centre

During the operation phase, APL has existing following infrastructure facilities for own & contract employees:

- Dinning space/ Canteen
- Changing room
- Drinking water
- Toilets and bathing facility
- Vehicle Parking space
- Rest room for truck drivers
- Occupational Health center

### 2.7.3 Water Requirement –Source of water, water consumption, wastewater Generation & Disposal details.

#### Source of Water

HSIIDC is fulfilling fresh water requirements after the proposed expansion the source of water supply will remain the same. The water supply agreement, from HSIIDC for the proposed expansion project is attached in **Annexure 10**. Rohtak is not categorized under the over-exploited category of groundwater availability. Water consumption details existing & proposed are as follows:

#### Water Consumption, Wastewater Generation & Disposal

The water consumption and wastewater generation including wastewater recycling is presented in the below tables

Existing permission for Fresh water supply by HSIIDC: 1312 KLD.

Fresh Water requirement: Existing- 1312 KLD Proposed 638 KLD Total after Expansion 1950 KLD.

Recycled water Existing 140 KLD.

Recycled water proposed: 178 KLD (140+38).

Detailed water requirements and waste water generation are given in **Table 2-16 &**

**Table 2-17** existing water balance diagram is shown in **Figure 2-5** and the proposed water balance diagram is shown in **Figure 2-6**.

**Table 2-16 Details of Water consumption**

S. No.	Area	Water Consumption (KLD)		
		Existing	Proposed	Total
A	Domestic	50	20	70
B	Gardening	15	45	60
C	Industrial			
	Process	1000	400	1400
	Washing	100	50	150
	Boiler	16	10	26
	Cooling tower	266	148	414
	Fire fighting	5	3	8

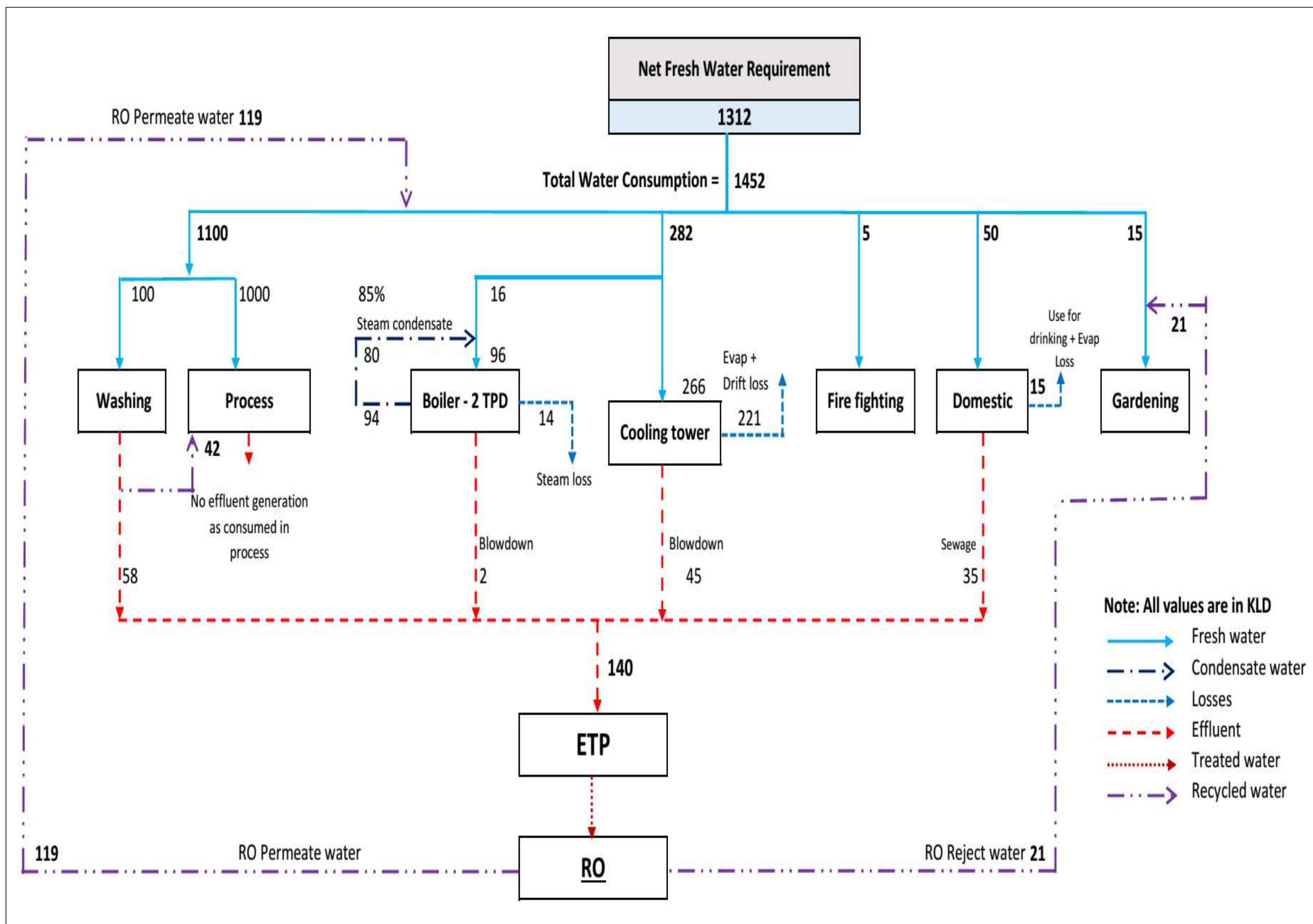
Industrial Total	<b>1387</b>	<b>611</b>	<b>1998</b>
<b>TOTAL</b>	<b>1452</b>	<b>676</b>	<b>2128</b>
Recycled Water	<b>140</b>	<b>38</b>	<b>178</b>
Net Fresh Water	<b>1312</b>	<b>638</b>	<b>1950</b>

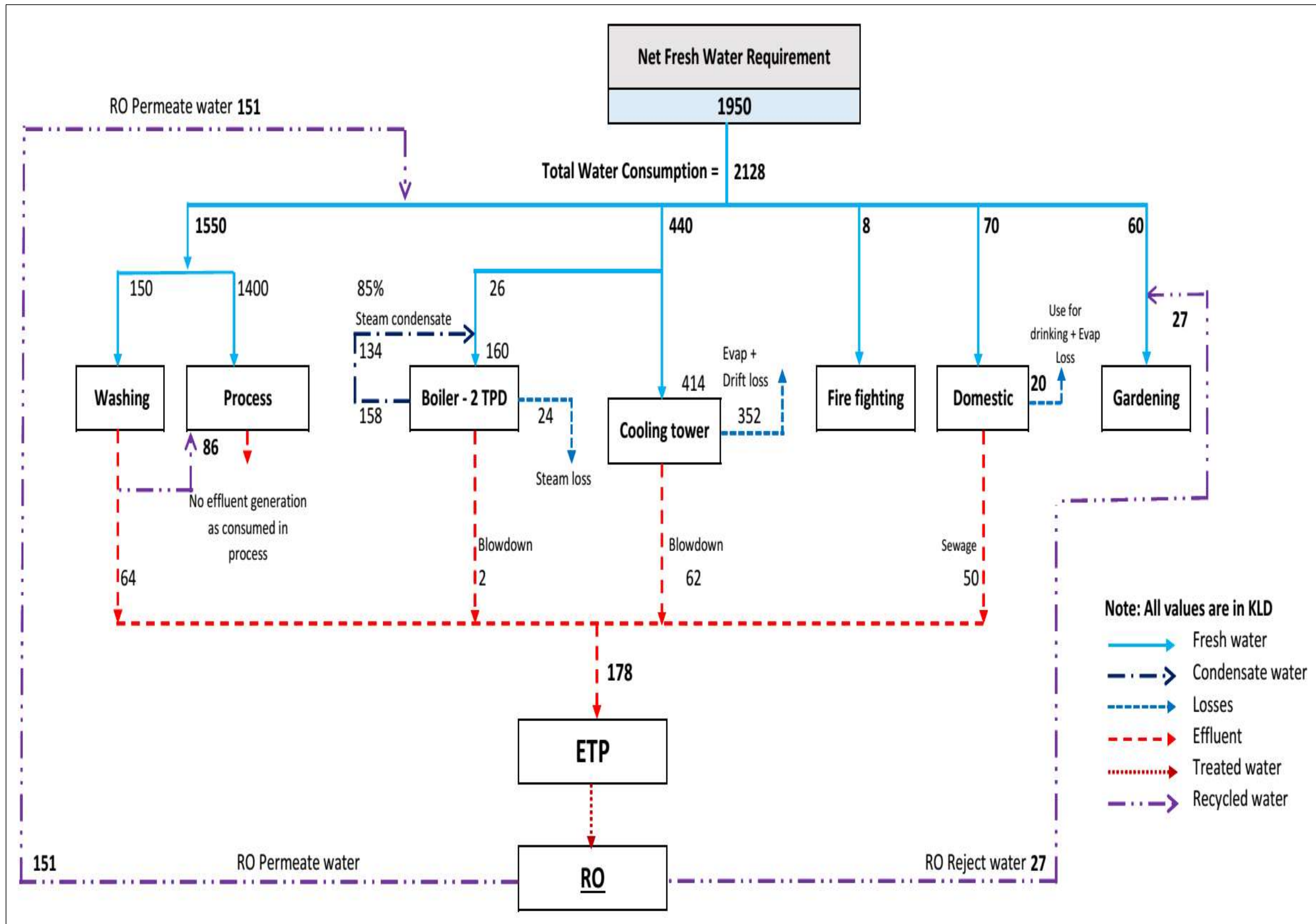
**Table 2-17: Details of Waste Water Generation and Management**

S. No.	Area	Waste water generation (KLD)			Management
		Existing	Proposed	Total	
A	Domestic	35	15	50	Treated in ETP
B	Industrial				Total Waste water will be treated in ETP unit including RO. Treated water from RO will be recycled and reused back in to plant process activities, utilities as well as gardening.
	Process	0	0	0	
	Washing	58	6	64	
	Boiler	2	0	2	
	Cooling tower	45	17	62	
	Industrial Total	<b>105</b>	<b>23</b>	<b>128</b>	
	TOTAL	<b>140</b>	<b>38</b>	<b>178</b>	
	Recycled Water	<b>140</b>	<b>38</b>	<b>178</b>	Water recycled from RO

Copy of Water supply permission from HSIIDC, IMT Rohtak is enclosed as **Annexure 10**.

Figure 2-5: Existing Water Balance Diagram



**Figure 2-6: Water Balance Diagram after proposed expansion**

## 2.7.4 Details of Waste water treatment Facilities –Existing and proposed

### Wastewater Generation and Segregation

#### Existing:

Presently upto 105 KLD of waste water is generated with following breakup of sources:

**Table 2-18: Existing Waste water Generation - Industrial**

Sr. No.	Source of Waste Water	Quantity (KLD)
1.	Process, and Washing	58
2.	Boiler Blowdown	2
3.	Cooling tower Blowdown	45
	<b>Total</b>	<b>105</b>

Sewage water upto quantity of **35 KLD** is presently being generated from domestic areas like hand washing, toilet cleaning and flushing, etc.

#### Proposed Expansion:

After proposed expansion, a total quantity of upto 128 KLD of industrial waste wastewater will be generated. The breakup of the proposed waste water generation figures based on sources of generation is presented as below:

**Table 2-19: Waste water Generation after proposed Expansion.**

Sr. No.	Source of Waste Water	Quantity (KLD)
1.	Process Waste water	0
2.	Washings	64
3.	Boiler	2
4.	Cooling tower	62
	<b>Total</b>	<b>128</b>

Sewage water upto maximum of **50 KLD** will be generated from different domestic activities like hand washing, toilet cleaning and flushing after proposed expansion.

## 2.7.5 Wastewater Characterization & Effluent Treatment Scheme, its adequacy and efficacy

Currently the plant generates 140 KLD effluent from existing operation and it is treated in ETP having primary, secondary & tertiary units including RO. After expansion, effluent generation will be increased from 140 KLD to 178 KLD and same will be treated in ETP and RO. No ETP expansion is proposed as present as ETP is adequate to treat the increased flow conditions.

The waste water characteristics of various streams in the existing operational premises is presented as below:

**Table 2-20: Wastewater Characteristics of Process, Utilities and Domestic Sewage of existing premises**

Sr. No.	Parameters	Unit	Water Based Paints Effluent	Polymer Plant Effluent	Raw Material Block Effluent	Combined Utility Effluent	Design Characteristics of existing ETP treatment system
1	Flow	cu. m/day	35	16	7	47	105
2	pH	-	8.26	4.91	6.65	8.2	6.56
3	COD	mg/l	37711	8675	16874	100	15201
4	BOD	mg/l	18760	2102	6295	50	6658
5	TH	mg/l	700	700	1000	500	560
6	Chloride	mg/l	2076	3174	2005	1750	2152
7	Sulphate	mg/l	808	710	1922	700	1758
8	TDS	mg/l	3464	4590	5200	3000	4412

Sr. No.	Parameters	Unit	Water Based Paints Effluent	Polymer Plant Effluent	Raw Material Block Effluent	Combined Utility Effluent	Design Characteristics of existing ETP treatment system
9	TSS	mg/l	650	380	2515	150	1070
10	Oil & Grease	mg/l	28	16	19	5	12

\*Note: All values are in mg/l except pH.

**Table 2-21: Stage wise reduction of parameters in existing ETP – Performance Evaluation**

Sr. No.	Parameter	Equalization Tank	Primary Outlet	Inlet to Aeration I Tank	Aeration I Outlet	Aeration II Outlet	Final Outlet	Desired Outlet
1	Flow	105	105	140	140	140	140	140
2	pH	6.56	7.83	7.28	6.93	7.54	7.26	6.5 – 8.5
3	COD	15201	4610 (69%)	3272	450	189	120 (97%)	<200
4	BOD	6658	1643 (75%)	1545	200	35	29 (98%)	<30
5	TH	560	470	380	250	360	350	
6	Chloride	2152	1409	1380	1250	1224	1177	
7	Sulphate	1758	58	65	70	62	75	
8	TDS	4412	1980	1840	1650	1656	1668	
9	TSS	1070	180 (83%)	110	57	65	58 (67%)	<100
10	Oil & Grease	12	5 (58%)	5	<1	<1	<1 (BDL)	<10
11	MLSS	--	--	2879	1489			
12	MLVSS	--	--	1623	763			

**Table 2-22: Details of units of Existing ETP**

S. No.	Treatment	Unit
1.	<b>Primary Treatment</b>	Equalization Tank (02 No. (50KL & 01 No. (10KL)
		Air Blower 02 No. (Capacity: 75 m3 /hour each)
		Effluent Feed pump 02 No.
		Chemical treatment tank 03 Nos. (Capacity: 13 KL each)
		Dissolved Air Flootation (DAF) 02 No. (Capacity: 30KL & 50KL)
	<b>Primary Treated Effluent</b>	Through Gravity
	<b>Domestic Effluent</b>	10 No. Sewage Pits
2.	<b>Secondary Biological Treatment</b>	Bio-Reactor I & Bio- Clarifier I 02 No.
		Bio-Reactor II & Bio- Clarifier II 02 No
		Air Blower 04 No (02 nos for each bioreactor)
		Diffused aeration System 01 set each for both bio-reactors
3.	<b>Tertiary Treatment</b>	Re-Activator Clariflocculator 01 No. (Capacity: 25 KL)
		Filter Feed Sump 01 No. (Capacity: 25 KL)
		Pressure Sand Filter 02 No.
		Activated Carbon Filter 02 No.
4.	<b>RO Treatment</b>	RO of Capacity 5 m <sup>3</sup> /hr
5.	<b>Sludge Treatment &amp; Disposal</b>	Primary Sludge Tank 01 No.
		Centrifugal Feed Pumps 01 No.
		Centrifuge-Poly-Dosing Pumps 01 No.
		Decentre Centrifuge Machine 01 No.



**Primary Effluent treatment:*****Equalization tank***

The main purpose of this unit is to homogenize different effluent streams and stabilize its parameters like pH and COD. Coarse bubble aeration grids would be provided for mixing the effluent entering from different blocks and it keeps the effluent in suspension.

Equalization tank contains 2 tanks of 50 kl capacity and one chamber of 10 kl capacity. The process effluent generated from different blocks (i.e. Water-based Paint Block, Polymer, Emulsion Tank Farm – strainer cleaning activity) is collected in one of the tanks (say Tank A). Hydraulic Retention Time (HRT) of 24 hours is provided in each EQ Tank. During this time the equalized effluent from another tank (say Tank B) is sent for primary treatment.

Effluent streams that have higher COD values than the normal process effluent is collected in the separate 10 kl chamber and added according to the COD of the effluent in the Equalization Tank.

The caustic solution of suitable concentration is added in the EQ Tank to neutralize the effluent streams, if required. Thus, completely homogeneous effluent stream is obtained which can be treated easily and effectively.

Also, as a part of operational control, Level Transmitters (LTs) are provided in both the EQ Tanks so that in no case effluent overflows. Blowers, control valves, effluent pumps and LTs are controlled through the DCS.

Two numbers of air blowers (1 W & 1 stand-by) of capacity 75 m<sup>3</sup>/hour are installed. Two numbers of HDPE aeration grids have been provided having capacities of 75 m<sup>3</sup>/hour.

***Collection cum Chemical Treatment Tank (CTT)***

The equalized effluent is pumped to existing primary treatment unit i.e. CTT. All the tanks are provided with a level transmitter to prevent overflow of effluent.

Once the CTT is filled up, the level transmitter signals the DCS to close the corresponding effluent inlet valve. At this signal, Process Feed Pumps are stopped. The stirrer in the filled-up CTT is turned on. 10% solution of PAC coagulant is kept prepared in one dosing tank and 0.05% polyelectrolyte solution in another. Once the dosing cycle is completed, the stirrer continues to operate for a pre-set time interval, default being 15 minutes. Subsequently, the solids are allowed to settle for pre-set time duration, default being 90 minutes.

Since the bottleneck of primary treated effluent transfer pump is removed, and flow is through gravity, all three tanks can be operated simultaneously with a cycle time of 4.5 hours. Hence the total effluent treatment for primary treatment can be stretched up to 190 kl/day also. Hence Primary treatment will not be a bottleneck for any further expansion if required.

The supernatant is transferred to an Intermediate Hold Tank of 30 KL capacity through gravity. (Prior design was having Primary Treated Effluent Transfer Pumps for transferring the supernatant to AIS). The settled sludge is also transferred to a Primary Sludge Holding Tank by gravity. Approximate quantity of slurry generated per batch varies from 2.5 KL to 3 KL. It is dewatered through a centrifuge.

***Dissolved Air Floatation (DAF) Unit***

From Intermediate Hold Tank (capacity – 30 kl) the effluent is constantly fed into a system called DAF (Dissolved Air Floatation). The principle of this system is explained below.

DAF is a water treatment process that clarifies wastewaters (or other water) by the removal of suspended matter such as oil or suspended solids. The removal is achieved by dissolving air in the water or wastewater under pressure and then releasing the air at atmospheric pressure in a flotation tank or basin. The released air forms tiny bubbles which adhere to the suspended matter causing the suspended matter to float to the surface of the water where it may then be removed by a skimming device.

The DAF Unit comprise of:

- Coiled pipe Flocculator
- Dosing pumps for PAC and Polyelectrolyte solution
- DAF Tank
- Surface scrapper
- Recirculation pump for air saturation

MOC of Coiled pipe Flocculator is HDPE. The same has the design flow of 3m<sup>3</sup>/hour. PAC and Polyelectrolyte dosing pumps of up to 90 LPH capacities are provided for dosing in the DAF unit. Air is provided through air compressor.

TSS of primary treated effluent is considerably reduced (Approximately 90%) due to DAF. This also contributes to COD reduction to some extent.

After treatment of process effluent in DAF, it is collected in the Hold Tank having capacity of 50 kl. Utility effluent is mixed in the hold tank with the primary treated effluent. Both the Intermediate Hold Tank and Hold Tank are provided with Level Transmitters to avoid overflow of effluent. From this point the second stage of effluent treatment starts.

### **Secondary Effluent treatment:**

#### ***Bio-Reactor -1***

Bio-reactor - 1 has the clarifier and biomass recycling system built within the aeration tank. This configuration is much more efficient than conventional system as it sustains higher biomass (MLVSS) levels. This is because of higher recycle rates within the system and use of mild force to push the biomass into the aeration tank, rather than merely gravity settling.

The existing AIS is having working volume of 355 m<sup>3</sup> which includes aeration volume of 325 m<sup>3</sup> and internal clarifier area of 10 m<sup>2</sup>. It has been designed for COD load of 2600 mg/l, F/M 0.2 day<sup>-1</sup> and MLSS of 3000 mg/l.

#### ***Bio-Reactor – 2***

Supernatant from Bio-reactor – 1 is sent to Bio-reactor – 2 where sewage effluent is added. The Bio-reactor – 2 is a multi-compartmental plug flow reactor having 400kl working volume. Two number of air blowers (1 W and 1 stand-by) having capacity 350 m<sup>3</sup>/hour are provided for aeration in the Bio-reactor. 12" PTFE disc type diffusers are provided in each of the six compartments. Online DO meter is provided for constant monitoring of DO in each section. DO is maintained in the range of 0.5 – 2 mg/l.

Two number of recirculation pumps (1 W & 1 stand-by) having capacity of 6m<sup>3</sup>/hour and 12 number of air grids (MOC – PP) of 350 m<sup>3</sup>/hour are provided for proper effluent recirculation in the bio-reactor – 2. One nutrient dosing tank (500 L) is provided for bio-reactor – 2 with a nutrient dosing pump of 90 LPH capacity.

A bio-clarifier having 25 kl volume is provided after second bio-reactor to remove bio-sludge by gravity settling. Hydraulic Retention Time (HRT) of 5.5 hours is provided for complete settlement of solids. The settled bio-sludge is drained from the bottom. Thus we can achieve more than 95% reduction in COD as well as BOD by the end of the secondary treatment. Also approximately 50% TSS reduction is achieved here.

### **Tertiary treatment:**

#### ***Reactivator Clariflocculator***

The supernatant from Bio-reactor – 2 is fed into a Reactivator Clariflocculator which has a working volume of 25 kl. Here solution of ploy-electrolyte is dozed as a coagulating agent and further removal of suspended particles happens. Hydraulic Retention Time (HRT) of approximately 5.5 hours is provided for sufficient settlement of sludge.

Due to addition of poly- electrolyte, the sludge formed here is chemical sludge and therefore it is sent to Primary Sludge Holding Tank rather than treated as bio-sludge.

The treated supernatant is sent to the existing Filter Feed Sump (FFS) of 25 kl capacity. Level transmitter is provided in the FFS to avoid overflow of effluent.

### ***Pressure Sand Filter (PSF)***

Clarified effluent from Reactivator Clariflocculator is now filtered through a PSF having fine sand, coarse sand and pebbles as filter media. Pressure switch is provided at the inlet of the PSF to avoid increase of differential pressure beyond the design operating pressure of PSF.

### ***Activated Carbon Filters (ACFs)***

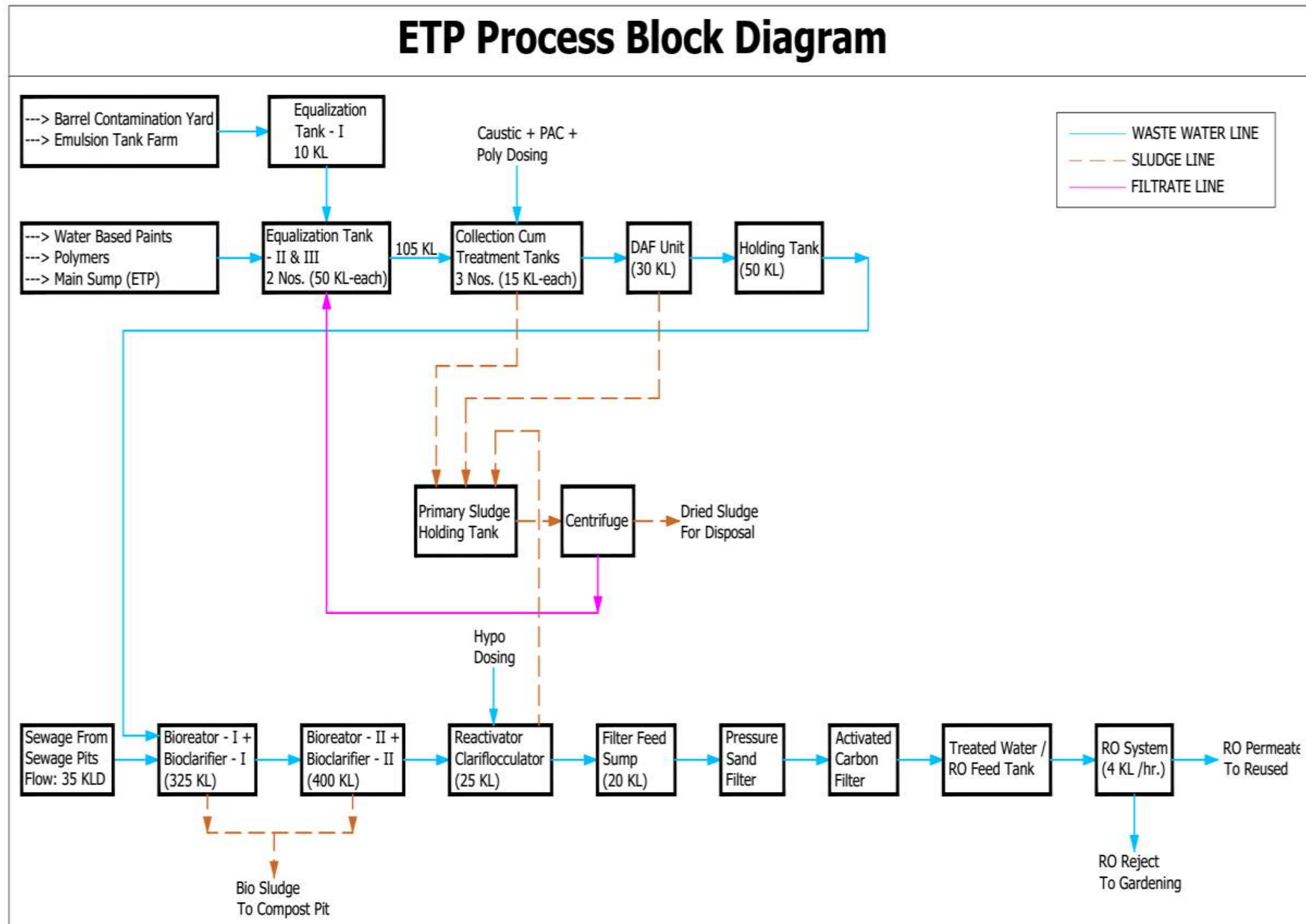
PSF only removes remaining suspended particles from the effluent but it does not remove the refractory COD, colour and smell of the secondary treated effluent. Activated carbon adsorbs the remaining organic matter and removes smell and colour from effluent making it crystal clear. One PSF and One ACF is provided. Two spare ACFs are provided as maintenance standby during replacement of media.

The PSF and ACFs are required to be cleaned from accumulated solids. For this treated effluent is backwashing of the filters. The backwash water sent back to Bioreactor for treatment. Operation of both the filters can be controlled through DCS. The treated effluent is collected in the existing treated water tank.

### **Sludge Treatment & Disposal**

- Sludge from all clarifying operations in CTT Tanks, DAF Unit and Reactivator Clariflocculator shall be drained out periodically into the primary sludge tank.
- Thickened sludge is obtained at the bottom outlet which shall be fed to the decanter centrifuge system by centrifuge feed pumps P-07A/B.
- For de-watering using decanter centrifuge, a separate poly dosing tank DT-08 and poly dosing pump DP-07 is provided.
- Poly-electrolyte of approx. 0.15% shall be prepared in dosing tank and shall be continuously dosed at 150-350 LPH to the inlet of the decanter centrifuge machine. Hence, Poly-electrolyte dosed to the centrifuge shall be @ 1.5 kg / Ton of dry solids charged to the centrifuge.
- The decanter machine shall be intermittently flushed and cleaned with raw water before shut down so as to drain the accumulated solids sticking on the walls of the rotating parts.
- Start Centrifuge poly dosing tank mixer M-08 from the DCS module for mixing poly electrolyte solution in the dosing tank. Run continuously while dosing poly electrolyte to the centrifuge machine.

Figure 2-7: Process Flow Diagram of Existing ETP



**2.7.6 Performance Adequacy report of the existing ETP**

PERFORMANCE ADEQUACY OF EXISTING TREATMENT UNITS FOR INCREASED FLOW FROM 140 to 200 KLD										
Sr No	ETP Existing Treatment Units	No of Units	Volume (cu.m)	Total Volume (cu.m)	Actual Flow to ETP		Proposed Flow to ETP		Standard Guideline	Remarks
					Actual Flow in KLD	Retention Time in Hrs	Proposed Flow in KLD	Retention Time in Hrs		
1	Equalization Tank I for Concentrate Streams	1	10.00	10.0	10.00	24.0	15.00	16.0	12-24 Hrs	Adequate
2	Equalization Tank - II & III	2	50.00	100.0	100.00	24.0	125.00	19.2	12-24 Hrs	Adequate
3	Collection cum Treatment Tank	3	15.00	45.0	110.00	9.8	140.00	7.7	2-4 Hrs	Adequate
4	DAF Tank	1	30.00	30.0	110.00	6.5	140.00	5.1	2-4 Hrs	Adequate
5	Holding Tank	1	50.00	50.0	110.00	10.9	140.00	8.6	4-8 Hrs	Adequate
6	Bioreactor I + Bio clarifier I	1	325.00	325.0	140.00	55.7	200.00	39.0	2 - 3 days	Adequate
7	Bioreactor II + Bio clarifier II	1	400.00	400.0	140.00	68.6	200.00	48.0	2 - 3 days	Adequate
8	Filter Feed Sump	1	20.00	20.0	140.00	3.4	200.00	2.4	2-4 Hrs	Adequate
9	Treated Water Tank/RO Feed Tank	1	20.00	20.0	140.00	3.4	200.00	2.4	2-4 Hrs	Adequate

Based on the above performance evaluation of existing ETP, capacities of ETP treatment units are adequate to handle wastewater upto 200 KLD.

## 2.7.7 Air Emission

### Point Source emission and control

Existing Point source emission of pollutants into air from the project are flue gas stacks attached to boilers, DG & GG sets of different capacities and various process vent likely air pollutants of VOCs and PM from process vents and PM, SO<sub>x</sub>, NO<sub>x</sub> from flue gas stack. The flue & process stack emissions are being maintained as per HPCB/CPCB norms. There will no addition of Boiler and DG set in proposed expansion. Only 3 nos. of GG (2875 KVA x3) are proposed for secondary source of power. These are only to be used as and when required, in case of grid failure.

### Flue Gas Stacks

The sources of gaseous emission from flue gas stacks along with details of stacks no., stack height, stack diameter, and Air Pollution Control Measures ('APCM') are given in **Table 2-23**. Details on Fuel type and their consumption are provided in **Table 2-15**.

**Table 2-23: Details of Flue Gas Stacks**

Sr. No.	Stack Attached to	Capacity	Stack Height (m) from Ground level	Stack top Diameter, m	APCM
Existing					
1	Boiler 501	2 TPH	30	0.834	Stack height as per CPCB
2	Boiler 502	2 TPH	30	0.834	
3	Boiler 503	4 TPH	30	0.834	
4	DG R 502	1010 KVA	30	0.35	
5	DG R 503	1010 KVA	30	0.35	
6	DG R 505	2000 KVA	30	0.45	
7	DG R 506	2000 KVA	30	0.45	
8	GG 501	2875 KVA	30	0.45	
9	GG 504	2875 KVA	30	0.45	
Proposed					
1	GG	2875 KVA	30	0.45	Stack height as per CPCB
2	GG	2875 KVA	30	0.45	
3	GG	2875 KVA	30	0.45	

**Note:** DG Sets will be used only during Power failure. Details may have some smaller changes based on actual detailed engineering design.

***Emission control measures from emergency backup DG sets, Boilers & GG***

- The primary source of Fuel for boiler and GG sets are PNG.
- The Diesel generators are retrofitted with Emission control devices (RECD), also they are Tertiary source of power.
- The control of air pollution from stacks of diesel generators, steam boilers, are provided with adequate stack height to attain maximum dispersion of flue gases containing SPM, SO<sub>2</sub>, NO<sub>x</sub> and CO.

***Process Gas Vents***

Details of existing Process vents is provided in

**Table 2-24.**

There are no new process vent proposed for the proposed expansion of the project.



**Table 2-24: Details of Existing and Proposed Process vents along with APCM's.**

S. No.	Vent Attached to	Vent Height (m) from Roof Level	No. of Vent		Pollutant Details	APCM
			Existing	Proposed	Pollutant Name	
1	Vent attached to Paint block	2	06	02	VOC	Scrubber
2	Vent attached to Water Based Polymer block	2	06	02	VOC	Scrubber

**Note:** Details may have some smaller changes based on actual detailed engineering design.

### **Powder Handling Measures**

There are multiple measures taken for handling powders starting with Silo storage, Closed loop handling, Dust collectors with bag filters, and reverse jet filters to avoid spillage or emissions.

**Table 2-25: Other Stacks/Vents.**

S. No.	Vent Attached to	Vent Height (m) from above the Roof Level	No. of Vent		Pollutant Details	APCM
			Existing	Proposed	Pollutant Name	
1	Vent attached to RMG/ WPB (Processing Block)/ Putty	2	10	05	PM	Dust Collectors

Additionally, we have ~200 RJFs attached to silos and other powder-handling equipment.

### **Emission control from Process gas stacks/ Vents**

- Process Stacks/vents with a height of 2-3 m above the rooftop level are provided.
- Necessary APCMs to control air emission of pollutants PM & VOC from process stacks/vents are provided in respective blocks
- To control PM emissions, Cartridge/ bag filters - reverse flow pulse cleaning is attached to the dust collector in the bulk powder handling area and bag filter/reverse jet filter is attached to the dust collector with silos.
- Apart from these, APL will carry out ambient air quality & stack monitoring on a regular basis to ensure that there will be no emissions that exceed the prescribed standard limits of regulatory authorities.
- Ambient air quality monitoring for fugitive emissions (total dust emissions) at different work zone areas of the plant will also be carried out regularly.

**Line source emission**

Line source emission from the proposed expansion project will be fugitive emissions due to vehicular movement for transportation. There are negligible fugitive emissions at plant premises due to vehicular movement for transportation of raw materials & products. Vehicular emissions ( $PM_{10}$ ,  $PM_{2.5}$ ,  $NO_x$ , CO & HC) from the exhaust of vehicles is envisaged.

During construction phase, emissions will be from use of construction machinery and transportation of vehicles. The mode of transportation will be through road from respective suppliers. Total ~160 trucks/day are used to meet the current production levels. Details on average Truck numbers in current production is provided as follows:

- Number of Finished Good (FG) Trucks: ~80/day
- Number of Packing Material (PM) Trucks: ~35/day
- Number of Raw Material (RM) Trucks: ~30/day
- Apart from this ~15 trucks/day for other materials

Additional ~290 Trucks will be used to meet the proposed production level. Details on Trucks post expansion are as follows:

- Number of Finished Good (FG) Trucks: ~150/day
- Number of Packing Material (PM) Trucks: ~50/day
- Number of Raw Material (RM) Trucks: ~60/day
- Apart from this ~30 trucks/day for other materials

Total of ~450 trucks/day will be used to meet the total production post expansion. Apart from it, application of heavy machinery and earthmovers will generate emissions.

Suitable dust suppression techniques such as water sprinkling will be taken at these times as relevant.

**Leakage Related Emissions**

Fugitive emissions from accidental release of pollutant through equipment leaks, defective seals or joints, or intentional venting, flaring, or discharging of GHGs are part of Leakage related emissions.

For safe handling and storage, material safety datasheets are taken into consideration.

The compatibility matrix is used to determine the tank's construction material; for example, all pH<5 materials are kept in SS316L tanks. To prevent soil contamination, installation of dyke walls, impervious flooring, etc, has been done. A PTFE gasket is supplied for the sampling area to prevent containment loss.

PVRVs and vent condensers placed in tanks also help to reduce fugitive emissions. Frequent internal and external health checks of storage tanks are done to prevent leaks and emissions.

### 2.7.8 Noise Generation

Sources of noise generation will be from plant machinery i.e. pumps, boilers, GG and DG set, scrubber, Dust Collector etc during operation phase. Vehicle movement for transportation of materials and work force during construction as well as operation phase.

### 2.7.9 Solid/Hazardous waste management

Since APL-Rohtak is an operational plant, it already generates solid and hazardous waste from their production, utility and ETP areas and the management for the same is being done on site.

For dedicated building for Scrap and hazardous waste storage is constructed and operational on site of 970 sq.m of area. Photographs of the Hazardous Waste Storage area is presented as below:

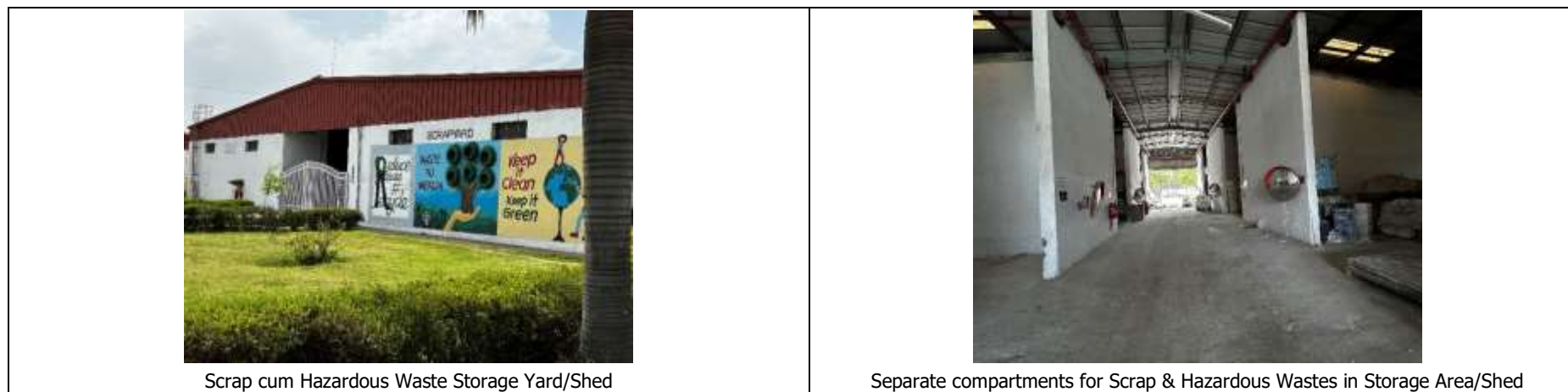
**Photographs 2-2: Photos of On-site Hazardous waste storage area.**



Storage of Hazardous Waste in racks form



Compartmentalised Storage for Scrap



Details of the Solid & Hazardous waste generation, Quantification, Classification, Collection, Transportation and method of collection & treatment/disposal for proposed project are as given in

**Table 2-26.**

Table 2-26

**Table 2-26: Hazardous Waste Generation and Disposal/Management**

S. No.	Process as per Hazardous Waste (Management and Handling) Rules, 2016	Type of Waste	Hazardous Waste Category	Quantity per Year MT/Yr.		Total	Source	Treatment / Disposal
				Existing	Proposed			
1	Cleaning, emptying and maintenance of petroleum oil storage tanks including ships	Oil contaminated with wash water & sludge.	3.1	5	-	5	1. Cleaning of Storage and Day Tanks	Pre-processing / Co-processing
2	cleaning, emptying and maintenance of petroleum oil storage tanks including ships	Sludge and filters contaminated with oil	3.3	5	-	5	1. Removing contaminated soil due to leakage, spillage & overflow of material. 2. Replacement of engineering consumables contaminated with any material	Pre-processing / Co-processing

S. No.	Process as per Hazardous Waste (Management and Handling) Rules, 2016	Type of Waste	Hazardous Waste Category	Quantity per Year MT/Yr.		Total	Source	Treatment / Disposal
				Existing	Proposed			
3	Industrial operations using mineral/synthetic oil as lubricant in hydraulic systems or other applications	Used/Spent Oil	5.1	10	-	10	1. Maintenance / testing activity of plant machinery and equipment 2. hydraulic testing of equipment's 3. replacement of used transformer oil	Sale to Authorized reprocessor
4	Production of asbestos or asbestos containing material	Discarded Asbestos	15.2	2	-	2	Used Asbestos Gaskets /cuttings from maintenance activity	Disposal through secured Landfill at TSDF
5	Production and/or industrial use of solvents	Contaminated aromatic, aliphatic or naphthenic Solvent, may or may not be fit for use.	20.1	35	-	35	Stripping of solvent during resin processing Solvent boiling of resin / emulsion / polymer reactors Cleaning of vessel / equipment with solvent	Pre-processing / Co-processing
6	Production and/or industrial use of solvents	Distillation Residues	20.3	15	-	15	Recycling of waste solvent	Pre-processing / Co-processing
7	Production and/or industrial use of paints, pigments, lacquers, varnishes, plastics and inks	Process waste	21.1	120	-	120	1. Testing of RMs / water-based paints, 2. Scrapping of equipment's and pails 3. PPE's, paper and other equipment contaminated with paint 4. waste paint	Pre-processing / Co-processing
8	Production and/or industrial use of glues, cements, adhesive and resins	Waste Residue /Residues such as filter aids	23.1	95	53.4375	148.4375	1.Discarded Resin / emulsion / polymer, test samples 2. Scrapings of Resin /emulsion / polymer 3. Spilled resin/ emulsion/ polymer material 4. residue from emulsion process 5. Replacement of filter media in filter machines / equipment used to filter resins/ paints/ emulsions	Pre-processing / Co-processing

S. No.	Process as per Hazardous Waste (Management and Handling) Rules, 2016	Type of Waste	Hazardous Waste Category	Quantity per Year MT/Yr.		Total	Source	Treatment / Disposal
				Existing	Proposed			
9	De-contamination of barrels/containers used for handling of hazardous waste/chemicals	Chemical Containing residue arising from decontamination	34.1	15	-	15	Cleaning of contaminated Barrels / Carboys / Drum / Tote	Pre-processing / Co-processing
10	Handling of Hazardous chemicals and wastes	Discarded containers/barrels/liners contaminated with HW/chemicals(packing material and sample container).	33.1	77	-	77	All containers for RM, Intermediates, Consumables(MS / HDPE) ,Rejection of Packing Material metal/plastic containers during packing operations Discarding used sample tins/bottle, Removal of after-pack sample containers	Pre-processing / Co-processing
11	Purification and treatment of exhaust air, water & waste water from the. treatment plants (ETP's)	Flue Gas cleaning residue	35.1	2	-	2	Cleaning of stacks and Secondary Combustion Chamber / heat recovery unit / mixing chamber of incinerators/boiler tubes	Pre-processing / Co-processing/secured Landfill through TSDF
12	Purification and treatment of exhaust air, water & waste water from the treatment plants (ETP's)	Spent Ion Exchange Resin containing toxic metals.	35.2	5	-	5	Generation of used resin beads during its replacement with fresh	Pre-processing / Co-processing
13	Purification and treatment of exhaust air, water & waste water from the treatment plants (ETP's)	Chemical Sludge from waste-water treatment( dry sludge)	35.3	590	184.375	774.375	1. Cleaning of effluent gutter / drain 2. Treatment of effluents, dewatering / drying of chemical sludge 3.RO reject evaporation	Pre-processing / Co-processing
14	Purification and treatment of exhaust air, water & waste water from the treatment plants (ETP's)	Oil and Grease skimming residue	35.4	15	-	15	Removal of floating oil / solvent from trade effluent / sewage using oil skimmer or any manual method	Pre-processing / Co-processing
15	Purification process for organic compounds/solvents	Spent Carbons.	36.2	5	-	5	Generation of exhausted activated carbon during its	Pre-processing / Co-processing

S. No.	Process as per Hazardous Waste (Management and Handling) Rules, 2016	Type of Waste	Hazardous Waste Category	Quantity per Year MT/Yr.		Total	Source	Treatment / Disposal
				Existing	Proposed			
							replacement with fresh activated carbon	

THE BATTERIES (MANAGEMENT AND HANDLING) RULES, 2001								
16	THE E-WASTE (MANAGEMENT) RULES 2022	Lead Acid Batteries	Schedule III, Part A, Basel No. A1160	1	-	20	Used /Waste lead acid batteries	Sale back to supplier/ SPCB Authorized recyclers

**Note:** Details may have some smaller changes based on actual detailed engineering design.

A dedicated hazardous waste storage has been provided in plant premises for the generated Hazardous waste at designated area as per Hazardous waste (Management and Handling) Rules, 2016.

After proposed expansion the hazardous waste will be collected and stored in existing Hazardous Waste Storage area as per hazardous waste rules within the plant premises.

Copy of memberships with acceptable quantities is attached vide **Annexure 11**.



**2.7.10 Non-Hazardous Waste (Quantification, Source, Collection & Treatment/Disposal)**

Non-Hazardous solid wastes like wooden, MS scrap, plastic & Gunny bags, paper bags and miscellaneous garbage are being collected in scrap yard and are being sold to authorised recyclers. Details of non-hazardous solid waste generation quantity & method of collection & treatment/ disposal area s given in **Table 2-27**.

**Table 2-27: Non-Hazardous Solid Waste Generation & management**

S. No.	Type of waste	Existing	Additional	Total Quantity	Treatment / Disposal
1	Paper Waste	115.86	231.72	347.58 MT/Annum	Local Scrap Vendors & Recyclers
2	Plastic Waste (excluding the RM containers)	261.41	522.81	784.22 MT/Annum	Disposed through CPCB authorized recyclers
3	Metal Waste (excluding the RM containers)	62.44	68.68	131.12 MT/Annum	Local Scrap Vendors & Recyclers
4	Plastic RM containers	127.75	140.53	268.28 Nos./Annum	Sent to suppliers / CPCB authorized recyclers
5	Metal RM containers	47.46	52.21	99.68 Nos./Annum	Local Scrap Vendors & Recyclers
6	Powder waste	67.83	135.66	203.49 MT/Annum	Local Scrap Vendors & Recyclers
7	Wooden waste	699.26	769.19	1468.45 MT/Annum	Will be sent to SPCB authorized recyclers
8	Miscellaneous (cartons/ sample tins/ cans)	46.36	92.72	139 MT/Annum	Sent to suppliers/recyclers

**2.7.11 Other Solid Wastes Identification & Management****Bio-medical Waste**

Very small quantity of waste comprises of discarded medicines, solid waste such as dressing, bandages and material contaminated with blood is generated from Occupational Health Centre (OHC) and MBT is periodically handed over to nearest authorized vendors as per SPCB regulations and Bio-Medical Waste Management Rules, 2016. Bio-medical waste is disposed at nearest common biomedical waste management facility S.D. Bio-medical Waste Management Co., Rohtak & service agreement from concerned authority is taken which attached as **Annexure 12**. Whereas authorization letter from Haryana State Pollution Control Board for BMW waste is also attached as **Annexure 13**.

Following types of Bio-medical waste generated from Plant OHC.

**Table 2-28: Generation of Bio-medical waste & Management**

S. No.	Name of the waste	Category as per BMW rules	Generation Qty. (TPA)	Source	Mode of disposal
1	Contaminated waste (Recyclable)	Red	0.172	OHC and MBT in QA	Disposed through SPCB authorized recyclers
2	Chemical Solid Waste	Yellow	0.52		
3	Waste sharps including Metals	White	0.03		
4	Glassware	Blue	0.06		

**Electronic Waste**

E-Waste comprises of discarded computers, copiers, fax machines, inverters, cell phones, CD's, LAN Cables, Keyboards, Mouse, SMPS, Fuses, Data cables, mobile/laptop peripherals like earphones, chargers, circuit boards, printer cartridges etc. is mainly generated from the computer lab and administrative

buildings. E-wastes will be disposed as per the provisions of the E-Wastes (Management and Handling) Rules, 2022 and till amendment.

#### **2.7.12 Storage and Handling of Solid and Hazardous waste**

- The Solid/Hazardous Waste will be collected and temporarily stored in Hazardous Waste Storage Area as per hazardous waste rules within the plant premises.
- Solid waste will be properly handled in closed containers and properly stored in hazardous waste storage areas as per rules, having suitable lining and covered shed and also bunding for overflow of spillage water which can contaminate the surroundings.
- All waste will be handled with proper PPEs ensuring safety of the individuals working with the solid waste handling.
- The wastes will be handed in drums and HDPE Bags and further transferred at the storage location in the Solid cum Hazardous Waste Storage.
- Recyclable waste will be sold to scrap vendor.

#### **2.7.13 Methodology of de-contamination and disposal of discarded containers**

The empty barrels / containers generated at the site are washed with recycled water. The resultant effluent – Wash water, is conveyed to Effluent Treatment Plant for treatment and further disposal. The washed drums / containers shall be reused / sold to Authorized vendors. APL-Rohtak will maintain the records of generation of empty barrels / containers & final disposal of these to Authorised vendors through Form 3<sup>2</sup>.

The procedure of shifting empty drums and carboys from the Plant to the hazardous scrap yard and final disposal to an authorized/approved scrap dealer will be as follows. All required PPE must be worn by the person during the entire process of the decontamination of the drums and carboys. (i.e. suitable hand gloves, chemically resistant boots, safety helmet, chemical splash goggles, a face shield, etc.

#### **Shifting of empty drums and carboys from the Plant**

HOD/Section Head of the concerned department shall be responsible to ensure the implementation of the following steps before shifting the empty drums/containers and carboys to the scrap yard.

- Ensure the drums/carboys/ containers, etc. are completely empty by the respective /section prior to shifting to scrap yard.
- Records shall be maintained by the respective department / section for the drums received from the stores/ware house and shifted to scrap yard to avoid any non-compliance and misuse of the drums/carboys/ containers.
- Respective department raise the scrap ticket for the drums/ containers mentioning the quantity and simultaneously inform to EHS department

#### **Decontamination of Drums/Containers / Carboys**

- Stores Section shall be responsible to ensure the safety of person and proper decontamination of empty drums/carboys.
- Identify and ensure the availability of all necessary PPE require for the decontamination process.
- All the labels shall be removed from the drums/Containers / carboys before disposal.
- Decontaminate by rinsing the inside and outside of the drum/ Containers / carboy with water. Be sure to include the underside of the container lid, bungs or other parts of the container. If there is visible

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2 As per The Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, as amended till date.

contamination, continue to rinse the container and / or other components until no visible contamination is present.

- Each decontaminated drum/carboy shall be checked and approved by third party before disposal.
- The wash water i.e effluent shall be discharged to ETP for treatment
- In case of container contaminated with paint, resin or non-water soluble material, then container shall be rinsed with distilled solvent.

#### 2.7.14 Firefighting System

Asian paint limited have well developed existing Firefighting system with the following equipment:

- Fire water tank
- Fire pump house
- Fixed firefighting system
- Portable fire extinguisher
- Foam dumping system
- Sprinkler system
- Fire Alarm System
- Fire Alarm System

#### 2.7.15 Greenbelt

The proposed expansion will be done with in the existing plot area. The existing unit already has well developed greenbelt in an area of 182,666.44 m<sup>2</sup> or 18.26 ha (34.9%) by using many plant species. The canopy area of 1,46,066.00 m<sup>2</sup> or 14.06 ha (26.87%) exists with the plantation of ~25,000 trees and shrubs within the project premises.

The industry already has a greenbelt area (34.9%) with a plantation of ~25,000 trees and shrubs within the project premises. Additional plantation of 4000 trees are proposed to be planted at site for Gap filling on boundaries and block plantation with suggested tree species.

**Table 2-29: List of Existing Species of Green Belt**

S. No.	Scientific Name	Common Name	Family
<b>TREES</b>			
1.	<i>Acacia auriculiformis</i> *	Vilayati Babul/ Australian Acacia	Mimosaceae
2.	<i>Acacia nilotica</i> *	Babool	Mimosaceae
3.	<i>Aegle marmelos</i> *	Bel	Rutaceae
4.	<i>Albizia lebbeck</i> *	Shirish	Mimosaceae
5.	<i>Albizia julibrissin</i> *	Persian acacia	Fabaceae
6.	<i>Alstonia scholaris</i> *	Saptarni/ Scholar tree	Apocynaceae
7.	<i>Azadirachta indica</i> *	Neem	Meliaceae
8.	<i>Bauhinia tomentosa</i> *	Pila Kanchan	Caesalpiniaceae
9.	<i>Bauhinia variegata</i> *	Kachnar/ Orchid tree	Caesalpiniaceae
10.	<i>Caryota urens</i> *	Fishtail Palm	Arecaceae
11.	<i>Cascabela thevetia</i> *	Pila Kanher/ Bitti	Apocynaceae
12.	<i>Cassia fistula</i> *	Amaltas/ Bahava	Caesalpiniaceae
13.	<i>Casuarina equisetifolia</i> *	Suru/ Whistling Pine	Casuarinaceae
14.	<i>Citrus limon</i> *	Nimbu/ Lemon	Rutaceae
15.	<i>Cordia dichotoma</i> *	Lasora/ Indian Cherry	Boraginaceae
16.	<i>Dalbergia sissoo</i> *	Shisam/ Indian Rosewood	Fabaceae
17.	<i>Delonix regia</i> *	Gulmohar	Caesalpiniaceae
18.	<i>Erythrina variegata</i>	Pangara/ Indian Coral Tree	Fabaceae

S. No.	Scientific Name	Common Name	Family
19.	<i>Ficus bengalensis</i> *	Barh/ Banyan Tree	Moraceae
20.	<i>Ficus benjamina</i> *	Weeping Fig Tree	Moraceae
21.	<i>Ficus elastica</i> *	Indian Rubber Tree	Moraceae
22.	<i>Ficus glomerata</i> *	Goolar/ Cluster Fig Tree	Moraceae
23.	<i>Ficus microcarpa</i>	Chinese Banyan Tree	Moraceae
24.	<i>Ficus racemosa</i> *	Goolar	Moraceae
25.	<i>Ficus religiosa</i> *	Peepal/ Sacred Fig	Moraceae
26.	<i>Ficus virens</i> *	Pilkhan	Moraceae
27.	<i>Grevillea robusta</i> *	Silver Oak	Proteaceae
28.	<i>Holoptelia integrifolia</i> *	Pahadi Papdi/ Indian Elm Tree	Ulmaceae
29.	<i>Kigelia africana</i>	Sausage Tree/ Baalam Khira	Bignoniaceae
30.	<i>Lagerstroemia speciosa</i> *	Pride of India/ Jarul	Lythraceae
31.	<i>Leucaena leucocephala</i> *	Subabul/ River Tamarind	Mimosaceae
32.	<i>Mangifera indica</i> *	Aam/ Mango	Anacardiaceae
33.	<i>Manilkara hexandra</i>	Khirni/ Ceylon Iron Wood	Sapotaceae
34.	<i>Manilkara zapota</i> *	Chickoo/ Sapota	Sapotaceae
35.	<i>Callistemon viminalis</i> *	Bottlebrush Tree	Myrtaceae
36.	<i>Melia azedarach</i> *	Bakaneem/ Persian Lilac/ Chinaberry Tree	Meliaceae
37.	<i>Millingtonia hortensis</i> *	Akasneem/ Indian Cork Tree	Bignoniaceae
38.	<i>Mimusops elengi</i> *	Moulshri/ Bakul	Sapotaceae
39.	<i>Polyalthia longifolia</i> *	Ashok/ False Ashok/ Mast Tree	Annonaceae
40.	<i>Moringa oleifera</i> *	Sejan/ Drumstick Tree	Moringaceae
41.	<i>Morus alba</i> *	Shahtoot/ Mulberry	Bignoniaceae
42.	<i>Murraya koenigii</i> *	Curry patta	Meliaceae
43.	<i>Murraya paniculata</i> *	Kamini/ Kunti	Myrtaceae
44.	<i>Peltophorum pterocarpum</i> *	Copperpod/ Sonmohar	Caesalpiniaceae
45.	<i>Phoenix sylvestris</i> *	Date Palm	Arecaceae
46.	<i>Plumeria obtusa</i> *	White Frangipani/ Champa/ Gulchin	Apocynaceae
47.	<i>Millettia pinnata</i> *	Karanj/ Papdi/ Pongam Tree	Fabaceae
48.	<i>Prosopis cineraria</i> *	Khejadi	Mimosaceae
49.	<i>Pterospermum acerifolium</i> *	Kanak Champa	Sterculiaceae
50.	<i>Punica granatum</i> *	Anaar/ Pomegranate	Lythraceae
51.	<i>Putranjiva roxbhurgii</i> *	Putranjiva	Putranjivaceae
52.	<i>Ricinus communis</i> *	Castor oil plant/ Arandi	Euphorbiaceae
53.	<i>Roystonea regia</i>	Royal Palm	Arecaceae
54.	<i>Senna siamea</i> *	Kassod/ Kashid	Caesalpiniaceae
55.	<i>Spathodea campanulata</i> *	African Tulip Tree	Bignoniaceae
56.	<i>Syzygium cumini</i> *	Jamun	Myrtaceae
57.	<i>Tabebuia rosea</i> *	Pink Trumpet Tree	Bignoniaceae
58.	<i>Tabernamontana divaricate</i> *	Crape Jasmine/ Chandni/ Tagar	Apocynaceae
59.	<i>Terminalia arjuna</i> *	Arjun	Combretaceae
60.	<i>Thespesia populnea</i> *	Paras Pipal/ Bhend/ Indian Tulip Tree	Malvaceae
61.	<i>Trachycarpus fortunei</i>	Windmill Palm	Arecaceae
62.	<i>Washingtonia filifera</i> *	Washington Palm	Arecaceae
63.	<i>Wodyetia bifurcata</i> *	Foxtail Palm	Arecaceae

Source: (\*) Species observed during the survey and rest of the information obtained from secondary evidences/  
Rapid Biodiversity Assessment Report for Asian Paints, Rohtak

**2.7.16 Stormwater Management Plan**

As a part of stormwater Management, the surface runoff from the plant premises falls into the network of drains, which carries run-off water to the collection Pit, further collection pit is connected to the storage area/ Pond. The collected stormwater is reused post treatment for process, followed by Utility and finally used for landscaping or gardening.

In order to prevent the blockage, regular cleaning of stormwater drains are carried out during pre-monsoon.

**2.7.17 Rain water Harvesting System**

The site has existing rain water harvesting facility in the form of run-off collection in 02 nos. of artificial pond for storm water and roof-top water (with capacity of 8120 KL). The site is utilizing rain water for various activities such as gardening, domestic, etc.

**2.7.18 Pollution Load Statement**

Pollution Load statement for proposed expansion during normal operation is given in **Table 2-30**.

**Table 2-30: Pollution Load Statement for proposed expansion -normal operation**

S. No.	Parameter	Details			Remarks
		Existing	Proposed	Total	
1	Land area	523,198 m <sup>2</sup>	-	523,198 m <sup>2</sup>	No Change
2	Power	8 MW	-	8 MW	No Change
3	Water requirement				
a.	Permissible Raw water supply	1312 KLD	638	1950	Source –Existing (HSI IDC)
b.	Total Raw water requirement (Fresh Water)	1312 KLD	638 KLD	1950 KLD	Source –Existing (HSI IDC)
c.	Wastewater Generation (Industrial + Domestic)	140 KLD	38 KLD	178 KLD	Effluent will be sent to ETP followed by RO
e.	Recycled water from RO	140 KLD	38 KLD	178 KLD	
d.	Total water consumption	1452	676	2128	
7	Wastewater (Industrial)	105 KLD	23 KLD	128 KLD	
a.	Process	0	0	0	
b.	Boiler	2	0	2	
c.	Cooling	45	17	62	
d.	Washing (Floor Cleaning)	58	6	64	
8.	Domestic wastewater generation	35	15	50	
9.	Air emission – Point sources				
a.	Flue Gas Stacks (PM, SO <sub>2</sub> , NO <sub>x</sub> )	9	3	12	
b.	Process Vents (PM, HCN, NH <sub>3</sub> , SO <sub>2</sub> , NO <sub>x</sub> , Other gas)	22	09	31	
10.	Hazardous chemical storage	970.50 m <sup>2</sup>	-	970.50 m <sup>2</sup>	No Change
11.	Solid & Hazardous waste				
(i)	Hazardous Waste				
a.	Oil contaminated with wash water & sludge.	5 (TPA)	-	5 (TPA)	No Change
b.	Sludge and filters contaminated with oil	5 (TPA)	-	5 (TPA)	No Change
c.	Used/Spent Oil	10 (TPA)	-	10 (TPA)	No Change
d.	Discarded Asbestos	2 (TPA)	-	2 (TPA)	No Change

S. No.	Parameter	Details			Remarks
		Existing	Proposed	Total	
e.	Contaminated aromatic, aliphatic or naphthenic Solvent, may or may not be fit for use.	35 (TPA)	-	35 (TPA)	No Change
f.	Distillation Residues	15 (TPA)	-	15 (TPA)	No Change
g	Process waste	120 (TPA)	-	120 (TPA)	No Change
h	Waste Residue /Residues such as filter aids	95 (TPA)	53.4375 (TPA)	148.4375 (TPA)	Increase
i	Chemical Containing residue arising from decontamination	15 (TPA)	-	15 (TPA)	No Change
j	Discarded containers/barrels/liners contaminated with HW/chemicals (packing material and sample container).	77 (TPA)	-	77 (TPA)	No Change
k	Flue Gas cleaning residue	2 (TPA)	-	2 (TPA)	No Change
l	Spent Ion Exchange Resin containing toxic metals.	5 (TPA)	-	5 (TPA)	No Change
m	Chemical Sludge from waste-water treatment( dry sludge)	590 (TPA)	184.375 (TPA)	774.375 (TPA)	Increase
n	Oil and Grease skimming residue	15 (TPA)	-	15 (TPA)	Removal of floating oil / solvent from trade effluent / sewage using oil skimmer or any manual method
o	Spent Carbons.	5 (TPA)	-	5 (TPA)	Generation of exhausted activated carbon during its replacement with fresh activated carbon
(ii)	Non-Hazardous waste				
a.	Paper Waste	115.86 (TPA)	231.72 (TPA)	347.58 (TPA)	Sell To outside party/ Customer
b	Plastic Waste (excluding the RM containers)	261.41 (TPA)	522.81 (TPA)	784.22 (TPA)	Sell To outside party/ Customer
c	Metal Waste (excluding the RM containers)	62.44 (TPA)	68.68 (TPA)	131.12 (TPA)	Sell To outside party/ Customer
d	Plastic RM containers	127.75 (TPA)	140.53 (TPA)	268.28 (TPA)	Sell To outside party/ Customer
e	Metal RM containers	47.46 (TPA)	52.21 (TPA)	99.68 (TPA)	Sell To outside party/ Customer
f	Powder Waste	67.83 (TPA)	135.66 (TPA)	203.49 (TPA)	Sell To outside party/ Customer
g	Wooden Waste	699.26 (TPA)	769.19 (TPA)	1,468.45 (TPA)	Sell To outside party/ Customer
h	Miscellaneous	46.36 (TPA)	92.72 (TPA)	139.08 (TPA)	Sell To outside party/ Customer

### 2.7.19 Concept of Waste-Minimization, Recycle/Reuse/Recover Techniques, Energy Conservation & Natural Resource Conservation

The following hierarchy is being followed for waste management with an ultimate aim of "Zero Waste":

- Resource conservation
- Elimination of waste streams
- Minimizing waste

- Reuse of wastes
- Recycle of wastes
- Treatment and disposal for making wastes harmless.

The followings are the measure to conserve the freshwater usage:

- The manufacturing facility will be zero liquid discharge plant.
- The treated effluent from the ETP will be recycled and reused in process within plant premises.
- APL will take up Cleaner production / Waste minimisation activities in the plant after expansion, either internally or with external assistance from organisations like National Productivity Council.

### **2.7.20 Action Plan for Odour Control**

Following measures will be followed to control odour:

- Raw material and finished goods will be transferred and processed/stored into closed system, there will be no expose of the raw materials and finished good into the atmosphere air.
- Scrubber system will be provided to evacuate and adsorption of the odour/vapours/fumes of the chemical generates during the reaction process, handling and storage of raw material and finished goods.
- Green belt development inside the periphery of the plant, open area and also along the road area. It helps to reduce the concentration of pollutant in the ambient air and source emissions.
- Covering the water supply, pipelines, roads storm water drainage, sewerage, temporary waste storage facility, treated wastewater disposal (land/sewer/surface water bodies), common facility etc.
- Gas detector in storage & process area to detect the leakage of gases.
- Adequate stack height to disperse the release odour into the atmosphere.

## **2.8 Carbon Footprint**

### **2.8.1 About Carbon Footprint**

Carbon footprint is the total greenhouse gas (GHG) emissions caused by an individual, event, organization, service, place or product, expressed as carbon dioxide equivalent (CO<sub>2</sub>e). Greenhouse gases, including the carbon-containing gases carbon dioxide and methane, can be emitted through the burning of fossil fuels, land clearance, and the production and consumption of food, manufactured goods, materials, wood, roads, buildings, transportation and other services.

Over the last few years, the importance of sustainability has considerably grown and it is now being considered a key issue for every company's performance. In this regard, Carbon Footprint study has become one of the most relevant methodologies to help organizations accomplish these goals. Carbon footprint describes the environmental impact of a product or service over its entire life cycle (International Standards Office, 2013). Carbon footprint analysis is focused exclusively on Global Warming Potential (GWP). It measures the climate change potential of GHG emissions in units of CO<sub>2</sub> equivalent. Carbon footprint refers to the spent natural resources and produced GHG emissions over the life cycle of the commodity. It is based on extensive factors ranging from source and supply chain of raw materials to disposal of the waste materials and the disposal of product itself and owing to this Carbon Footprint study has become one of the most relevant methodologies to help organizations know their environmental impact. As a result of availability of such impacts data, companies are increasingly being asked to perform their activities in the most environmentally friendly way, not only about internal processes but also in relation to their customers and suppliers, throughout their value chain.



A carbon footprint is usually expressed as a measure of weight, as in tons of CO<sub>2</sub> or CO<sub>2</sub>e per year. The secondary carbon footprint reflects the carbon emissions associated with the consumption of goods and services.

### 2.8.2 Scope of GHG Emissions

Calculating the carbon footprint is fundamental to understand how various activities impact environment and global sustainability. For this purpose, the carbon footprints (CF) of all activities have been calculated considering below listed scopes:

- **Scope - 1: Direct emissions from activities owned or controlled by the organization**
  - Direct GHG emissions which occur from sources that are owned or controlled by the company, for example, emissions from combustion in owned or controlled boilers, furnaces, vehicles, etc.; emissions from chemical production in owned or controlled process equipment. Direct CO<sub>2</sub> emissions from the combustion of biomass shall not be included in scope 1 but reported separately. GHG emissions not covered by the Kyoto Protocol, e.g. CFCs, NO<sub>x</sub>, etc. shall not be included in scope 1 but may be reported separately.
- **Scope - 2: Indirect emissions associated with purchased electricity**
  - Scope 2 accounts for GHG emissions from the generation of purchased electricity consumed by a company. Purchased electricity is defined as electricity that is purchased or otherwise brought into the organizational boundary of the company. Scope 2 emissions physically occur at the facility where electricity is generated.
- **Scope - 3: Indirect emissions from activities that occur at sources outside its control and are not classified as scope 2**
  - Scope 3 is an optional reporting category that allows for the treatment of all other indirect emissions. Scope 3 emissions are a consequence of the activities of the company, but occur from sources not owned or controlled by the company. Some examples of scope 3 activities are extraction and production of purchased materials; transportation of purchased fuels; and use of products and services.

### 2.8.3 Global Warming Potential

Climate change can be defined as the change in global temperature caused by the greenhouse effect that the release of "greenhouse gases" by human activity. There is now scientific consensus that the increase in these emissions is having a noticeable effect on climate. This raise of global temperature is expected to cause climatic disturbance, desertification, rising sea levels and spread of disease.

Climate change is one of the major environmental effects of economic activity, and one of the most difficult to handle because of its broad scale.

The Environmental Profiles characterization model is based on factors developed by the UN's Intergovernmental Panel on Climate Change (IPCC). Factors are expressed as Global Warming Potential over the time horizon of different years, being the most common 100 years (GWP100), measured in the reference unit, kgCO<sub>2</sub> equivalent.

## Material and Methodology

### *Overall Framework of the Study*

To obtain the objective of the study, the methodology framework is based on the Carbon Footprint framework and approaches. This framework starts by sampling, data collection, data analysis, results interpretation and dissemination.

### ***System Boundary***

System boundaries are a set of criteria that define the scope of the analysis. These boundaries specify the unit processes to be included in the study. Accurate description of the system and its boundaries has strong implications for the results of the assessment and must be clearly stated. The Scope-1 emissions arise from direct emissions from activities owned or controlled by the organization such as all production processes and operation of utilities. As the production activities within our system boundary lead to negligible emission of GHGs, fuel consumption for operation of utilities is identified as the source for Scope-1 emissions. Secondly, Scope-2 emissions are calculated based on the purchased power for all operations. Finally, Scope-3 emissions encompass indirect emissions from activities that occur at sources outside its control and are not classified as Scope-2. This study sets the boundary so that Scope-3 emissions are attributed to upstream and downstream transportation, consequently avoiding overlap of upstream and downstream emissions with other organisations. Thus, the unit process, products and activities included in this study are as follows:

- A) Scope - 1:
  - I) Fuel Consumption
- B) Scope - 2:
  - I) Purchased electricity consumed
- C) Scope - 3:
  - I) Transportation
    - 1) Employee Commute
    - 2) Business Travel
  - II) Refrigeration/AC
  - III) Solid/HW Disposal

### ***Functional Unit***

One of the primary purposes of a functional unit (FU) is to provide a reference to the input and output data (in a mathematical sense). In this study, we have considered 1 MT of a product as a functional unit.

### **Data Collection and Sources**

Data were collected from both primary and secondary sources. Primary data are directly accessible, plant-specific, measured, modelled, or estimated data generated for the products under study. Secondary data are from literature sources, eco-invent databases, but may not be specific to the product of interest.

Data categories for which inventory data were collected, including material requirement from the production team and energy inputs from the engineering team; and wastes and product outputs from production planning team. In general, inventory data are normalized to either the mass of an input or output per functional unit, or energy input (e.g., kWh) per functional unit. Data were also collected on the final disposition of emissions outputs, such as whether outputs are recycled, treated, and/or disposed. This information was used to help determine which impacts are calculated for inventory item.

### **Uncertainty Analysis**

Global Warming Potential has been used widely for assessing the environmental impacts of a product including the Global Warming Potential. Oftentimes, the result is reported as a single value of the environmental impact for a given functional unit. However, a single value without an uncertainty range can never represent the true mean of the environmental impact. Every measurement has uncertainty.

As such, a single value should not be used in expressing results (Heijungs. R.et.al. Al 2000). Limitations and uncertainties in the results are due to limitations and uncertainties inherent in Impact Assessment methodology itself, as well as limitations and uncertainties in the project Inventory data.

In addition, impact assessment uncertainty contributes to the overall limitations. The categories with greater model and data uncertainty in the impact assessment were given “medium” to “low” ratings. In general, the number of data sets available for the upstream and manufacturing primary data was quite limited.

Further, investigation into the proportion of the market modelled is necessary to understand the potential magnitude of the uncertainty in the material and energy inputs derived from the primary and secondary data used in this study.

Data suppliers indicated this is likely the case with the chemical product manufacturing and associated upstream processes, although we cannot quantitatively confirm this given proprietary concerns of participating companies.

#### **2.8.4 Inventory Analysis and Evaluation of Results**

Inventory analysis involves data collection and calculation procedures to quantify relevant inputs and outputs of the product system, processes or activity. Data collection is the identification and quantification of relevant inputs and outputs for each unit processes of a specific product system, process or activity. Data for each unit process within the systems boundary often includes energy, raw material, products, co-products, and waste and emissions to air, water, and soil.

For an exhaustive and accurate inventory, it is imperative that all listed product systems, processes or activities be firstly categorized by scope. Accordingly, all product systems, processes or activities were identified to belong to Scope - 1, Scope - 1 and Scope - 3 as stated in Scope of GHG Emissions. Each of the product systems, processes, or activities was then further substantiated by collection of data.

Data was collected from both primary and secondary sources. Primary data are directly accessible, plant-specific, measured, modelled, or estimated data generated for the products under study. Secondary data are from literature sources, eco-invent databases, but may not be specific to the product of interest.

Data categories for which inventory data were collected, including material requirement from the production team and energy inputs from the engineering team; and wastes and product outputs from production planning team. In general, inventory data are normalized to either the mass of an input or output per functional unit, or energy input (e.g., kWh) per functional unit. Data were also collected on the final disposition of emissions outputs, such as whether outputs are recycled, treated, and/or disposed. This information was used to help determine which impacts are calculated for inventory item.

Results for below listed products are given in following sections:

- A) Scope - 1
  - I) Fuel Consumption
- B) Scope - 2
  - I) Electricity
- C) Scope - 3
  - I) Transportation
    - 1) Employee Commute
    - 2) Business Travel
  - II) Refrigeration/AC
  - III) Solid/HW Disposal

### 2.8.5 Scope - 1

These are direct emissions from activities owned or controlled by the organization. Direct GHG emissions which occur from sources that are owned or controlled by the company, for example, emissions from combustion in owned or controlled boilers, vehicles, etc.; emissions from chemical production in owned or controlled process equipment. GHG emissions not covered by the Kyoto Protocol, e.g. CFCs, SO<sub>2</sub>, etc. are not included in Scope-1.

#### Existing Fuel Consumption for Utilities

Utility sources have been identified to utilized fuel for the generation of energy of various forms (i.e. Heat, Steam and Electricity). The GHG emissions, consequently Global Warming Potential due to the aforementioned sources are evaluated in the sections below.

#### Existing Fuel Consumption (PNG)

The inventory and inputs considered for the GHG emissions due to fuel consumption is given in Table 2-31.

**Table 2-31: Inventory and inputs considered for evaluation of emissions from operation**

Utility	Fuel	Fuel Consumption		Operation Time		Source of Emission factor
		Liter/year	kg/year	hr/day	days/year	
Boiler	Natural Gas	2196000	1300032	18	305	Ramachandra, T.V., et al. "GHG Footprint of Major Cities in India." Renewable and Sustainable Energy Reviews, vol. 44, Apr. 2015, pp. 473–495, <a href="https://doi.org/10.1016/j.rser.2014.12.036">https://doi.org/10.1016/j.rser.2014.12.036</a>

The Global Warming Potential calculated for the activity considering PNG as the fuel is given in Table 2-32.

**Table 2-32: Global Warming Potential for emissions from operation**

Fuel	Emission factor				Quantity	NCV	Energy	Emission				Global Warming Potential
	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	Unit				CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	Unit	
PNG	56.1	0.005	0.0001	t/TJ	1.30	48	62.401536	3,500.73	6.5521613	1.9344476	t	3,509.21
Total												3,509.21

The Global Warming Potential (GWP) calculated for emissions due to consumption of PNG is ~ **3,509.21 tCO<sub>2</sub>e per annum**.

#### Existing Fuel Consumption (PNG)

The inventory and inputs considered for the GHG emissions due to fuel consumption is given in **Table 2-33**.

**Table 2-33: Inventory and inputs considered for evaluation of emissions from operation**

Utility	Fuel	Fuel Consumption		Operation Time		Source of Emission factor
		Liter/year	kg/year	hr/day	days/year	
G G Set	Natural Gas	119584.4	70793.9648	1	305	Ramachandra, T.V., et al. "GHG Footprint of Major Cities in India." Renewable and Sustainable Energy Reviews, vol. 44, Apr. 2015, pp. 473–495, <a href="https://doi.org/10.1016/j.rser.2014.12.036">https://doi.org/10.1016/j.rser.2014.12.036</a>

The Global Warming Potential calculated for the activity considering PNG as the fuel is given in **Table 2-34**.

**Table 2-34: Global Warming Potential for emissions from operation**

Fuel	Emission factor				Quantity	NCV	Energy	Emission				Global Warming Potential
	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	Unit				CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	Unit	
PNG	56.1	0.005	0.0001	t/TJ	0.07	48	3.3981103	190.63	0.3568016	0.1053414	t	191.10
Total												191.10

The Global Warming Potential (GWP) calculated for emissions due to consumption of PNG is ~ **191.10 tCO<sub>2</sub>e per annum**.

**Existing Fuel Consumption (HSD)**

The inventory and inputs considered for the GHG emissions due to fuel consumption is given in **Table 2-33**.

**Table 2-35: Inventory and inputs considered for evaluation of emissions from operation**

Utility DG Set	Fuel	Fuel Consumption		Operation Time		Source of Emission factor
		<i>Liter/year</i>	<i>kg/year</i>	<i>hr/day</i>	<i>days/year</i>	
	HSD	29896.1	17698.4912	0.25	305	Ramachandra, T.V., et al. "GHG Footprint of Major Cities in India." Renewable and Sustainable Energy Reviews, vol. 44, Apr. 2015, pp. 473–495, <a href="https://doi.org/10.1016/j.rser.2014.12.036">https://doi.org/10.1016/j.rser.2014.12.036</a>

The Global Warming Potential calculated for the activity considering PNG as the fuel is given in **Table 2-34**.

**Table 2-36: Global Warming Potential for emissions from operation**

Fuel	Emission factor				Quantity	NCV	Energy	Emission				Global Warming Potential
	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	Unit	KTPA	TJ/kt	TJ	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	Unit	tCO <sub>2</sub> e, GWP100
HSD	74.1	0.003	0.0006	t/TJ	0.02	43.33	0.7668756	56.83	0.0483132	0.1426389	t	57.02
Total												57.02

The Global Warming Potential (GWP) calculated for emissions due to consumption of PNG is ~ **57.02 tCO<sub>2</sub>e per annum**.

**Post-Expansion Fuel Consumption for Utilities**

Utility sources have been identified that utilize fuel to generate energy of various forms (e.g., Heat, Steam, and Electricity). The GHG emissions and consequent Global Warming Potential due to the aforementioned sources are evaluated in the sections below.

**Post Expansion Fuel Consumption (PNG)**

The inventory and inputs considered for the GHG emissions due to fuel consumption are given in **Table 2-37**.

**Table 2-37: Inventory and inputs considered for evaluation of emissions from Post expansion operation**

Utility Boiler	Fuel	Fuel Consumption		Operation Time		Source of Emission factor
		<i>Liter/year</i>	<i>kg/year</i>	<i>hr/day</i>	<i>days/year</i>	
	Natural Gas	3888000	2301696	18	360	Ramachandra, T.V., et al. "GHG Footprint of Major Cities in India." Renewable and Sustainable Energy Reviews, vol. 44, Apr. 2015, pp. 473–495, <a href="https://doi.org/10.1016/j.rser.2014.12.036">https://doi.org/10.1016/j.rser.2014.12.036</a>

The Global Warming Potential calculated for the activity considering PNG as the fuel is given in **Table 2-38**.

**Table 2-38: Global Warming Potential for emissions from Post expansion operation**

Fuel	Emission factor				Quantity	NCV	Energy	Emission				Global Warming Potential
	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	Unit	KTPA	TJ/kt	TJ	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	Unit	tCO <sub>2</sub> e, GWP100
PNG	56.1	0.005	0.0001	t/TJ	2.30	48	110.48141	6,198.01	11.600548	3.4249236	t	6,213.03
Total												6,213.03

The Global Warming Potential (GWP) calculated for emissions due to consumption of PNG is ~ **6,213.03 tCO<sub>2</sub>e per annum**.

**Post-Expansion Fuel Consumption (PNG)**

The inventory and inputs considered for the GHG emissions due to fuel consumption are given in **Table 2-39**.

**Table 2-39: Inventory and inputs considered for evaluation of emissions from post-expansion operation**

Utility G G Set	Fuel	Fuel Consumption		Operation Time		Source of Emission factor
		Liter/year	kg/year	hr/day	days/year	
	Natural Gas	101627.136	60163.26451	0.72	360	Ramachandra, T.V., et al. "GHG Footprint of Major Cities in India." Renewable and Sustainable Energy Reviews, vol. 44, Apr. 2015, pp. 473–495, <a href="https://doi.org/10.1016/j.rser.2014.12.036">https://doi.org/10.1016/j.rser.2014.12.036</a>

The Global Warming Potential calculated for the activity considering PNG as the fuel is given in **Table 2-40**.

**Table 2-40: Global Warming Potential for emissions from post-expansion operation**

Fuel	Emission factor				Quantity	NCV	Energy	Emission				Global Warming Potential
	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	Unit				CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	Unit	
PNG	56.1	0.005	0.0001	t/TJ	0.06	48	2.887836697	162.01	0.303222853	0.089522938	t	162.40
Total												162.40

The Global Warming Potential (GWP) calculated for emissions due to consumption of PNG is ~ **162.40 tCO<sub>2</sub>e per annum**.

#### Existing Fuel Consumption (HSD)

The inventory and inputs considered for the GHG emissions due to fuel consumption is given in **Table 2-41**.

**Table 2-41: Inventory and inputs considered for evaluation of emissions from post-expansion operation**

Utility DG Set	Fuel	Fuel Consumption		Operation Time		Source of Emission factor
		Liter/year	kg/year	hr/day	days/year	
	HSD	16937.856	10027.21075	0.12	360	Ramachandra, T.V., et al. "GHG Footprint of Major Cities in India." Renewable and Sustainable Energy Reviews, vol. 44, Apr. 2015, pp. 473–495, <a href="https://doi.org/10.1016/j.rser.2014.12.036">https://doi.org/10.1016/j.rser.2014.12.036</a>

The Global Warming Potential calculated for the activity considering PNG as the fuel is given in **Table 2-42**.

**Table 2-42: Global Warming Potential for emissions from post-expansion operation**

Fuel	Emission factor				Quantity	NCV	Energy	Emission				Global Warming Potential
	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	Unit				CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	Unit	
HSD	74.1	0.003	0.0006	t/TJ	0.01	43.33	0.434479	32.19	0.0273722	0.0808131	t	32.30
Total												32.30

The Global Warming Potential (GWP) calculated for emissions due to consumption of PNG is ~ **32.30 tCO<sub>2</sub>e per annum**.

#### 2.8.6 Scope - 2

Scope-2 emissions are the indirect emissions associated with purchased electricity. They account for GHG emissions from the generation of purchased electricity or energy consumed by a company. Purchased electricity/energy is defined as electricity or other utilities that are acquired or otherwise brought into the organizational boundary of the company. Hence, Scope-2 emissions physically occur at the facility where electricity or energy is generated.

#### Emissions from Electricity Consumption (Existing)

The inputs and inventory considered for Scope-2 emissions of existing purchased or acquired electricity as given in **Table 2-54**.

**Table 2-43: Inventory and Inputs for purchased electricity (Existing)**

Activity	Quantity		Operation Time	Operation Days	Total
			hours per day	days per annum	MW per Annum
Electricity acquired	4.5	MWh	24	305	32940

Considering the global warming potential emission factor from CO<sub>2</sub> Baseline Database for the Indian Power Sector by the Central Electricity Authority the global warming potential of the activity is calculated as given in

Table 2-44.



Table 2-44: Global Warming Potential for emissions from purchased electricity (Existing)

Activity	Quantity		Emission factor		Carbon footprint of activity
					tCO2e per day, GWP100
Electricity acquired	4.5	MWh	0.715	tCO2e/MWh	77.22
Total (per annum)					23,552.10

The Global Warming Potential Impact calculated for electricity is ~23,552.10 tCO<sub>2</sub>e per annum

Emissions from Electrcity Consumption (Post-expansion)

The inputs and inventory considered for Scope-2 emissions from purchased or acquired electricity post-expansion are given in Table 2-54.

Table 2-45: Inventory and Inputs for purchased electricity (Post-expansion)

Activity	Quantity		Operation Time	Operation Days	Total
			hours per day	days per annum	MW per Annum
Electricity acquired	8	MWh	24	360	69120

Considering the global warming potential emission factor from the CO<sub>2</sub> Baseline Database for the Indian Power Sector by the Central Electricity Authority the global warming potential of the activity is calculated as given in

Table 2-44.

Table 2-46: Global Warming Potential for emissions from purchased electricity

Activity	Quantity		Emission factor		Carbon footprint of activity
					<i>tCO<sub>2</sub>e per day, GWP<sub>100</sub></i>
Electricity acquired	8	<i>MWh</i>	0.715	<i>tCO<sub>2</sub>e/MWh</i>	137.28
Total (per annum)					49,420.80

The Global Warming Potential Impact calculated for electricity is ~49,420.80 tCO<sub>2</sub>e per annum

### 2.8.7 Overall Carbon Footprint

Overall carbon footprint and scope-wise carbon footprint with percentage contribution are given in **Table 2-47**.

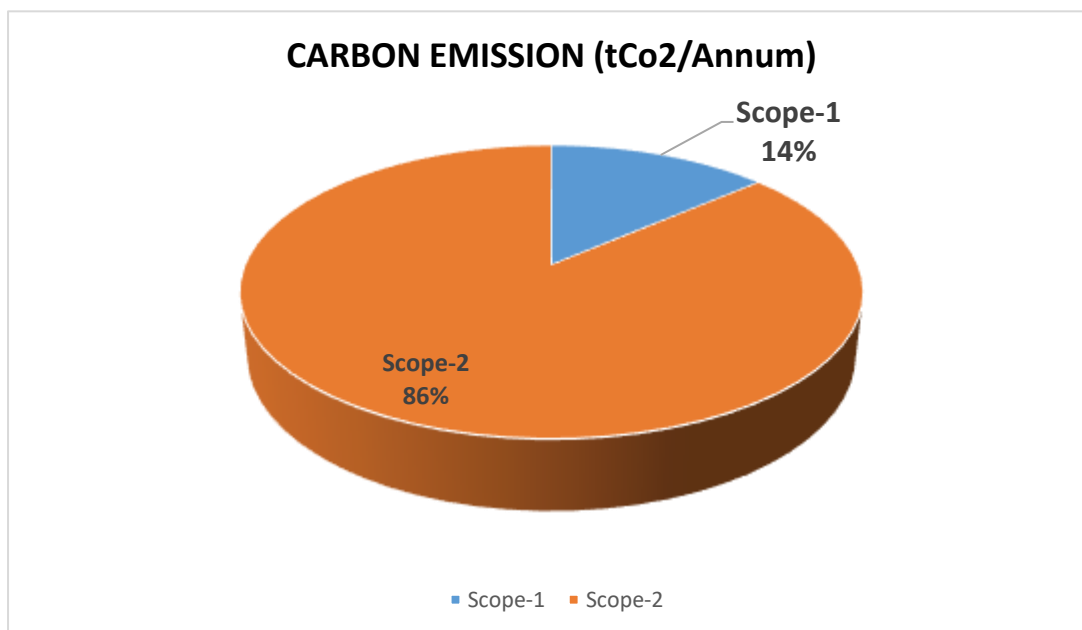
#### Existing Carbon Footprint

The existing carbon footprint with percentage contribution is provided in **Table 2-47**.

**Table 2-47: Existing Carbon Footprint**

Scope	Activity	Global Warming Potential	Percentage Contribution
		tCO <sub>2</sub> e per annum, GWP100	
<b>Scope-1</b>	Fuel Consumption		
	Boiler - PNG	3,509.21	12.86%
	G G Set - PNG	191.10	0.70%
	DG Set- HSD	57.02	0.21%
	Total Scope-1	<b>3,757.33</b>	<b>13.76%</b>
<b>Scope-2</b>	Purchased Electricity	23,552.10	86.24%
	<b>Total</b>	<b>27,309.43</b>	<b>100%</b>

**Figure 2-8: Existing Carbon Emissions from Scope-1&2.**



- The GWP of emissions from **Scope-1** is ~ **3,757.33 tCO<sub>2</sub>e per annum** and contributes to ~**13.76%** of the existing carbon footprint of the proposed plant. The fuel consumption for operation is found to be the individual activity with the biggest contribution to both Scope-1 as well as the overall carbon footprint.
- The GWP of emissions from **Scope-2** is ~**23,552.10 tCO<sub>2</sub>e per annum** and contributes to ~ **86.24%** of the carbon footprint of the proposed plant.

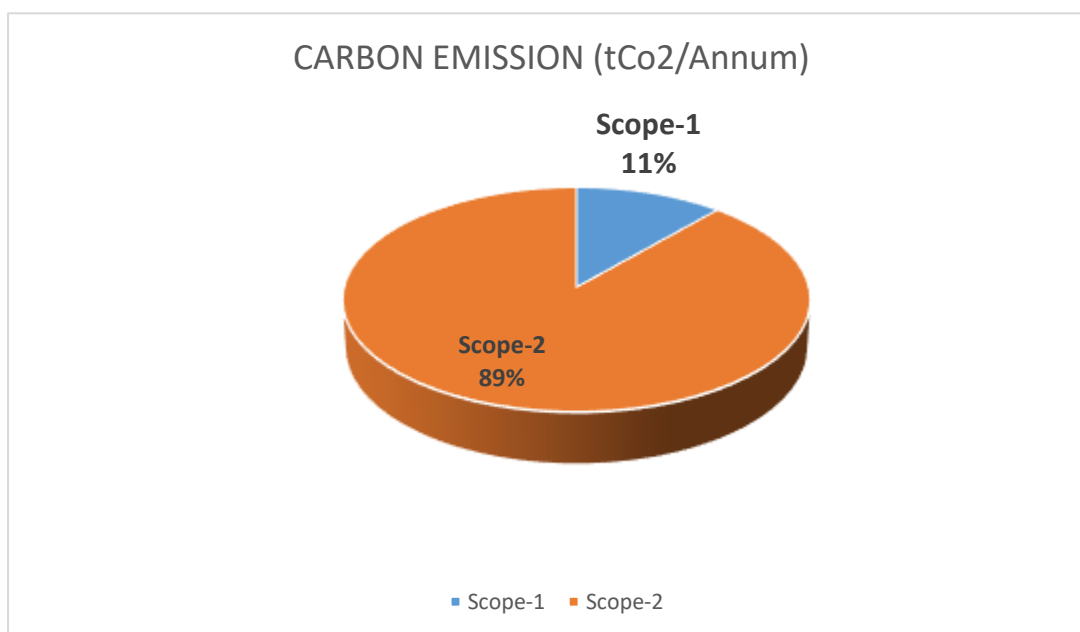
Thus, the overall carbon footprint or global warming potential of all GHG emissions from all existing activities at the proposed plant is ~ **27,309.43 tCO<sub>2</sub>e per annum**

#### Post-expansion Carbon Footprint

The existing carbon footprint with percentage contribution is provided in **Table 2-48**.

**Table 2-48: Carbon Footprint post-expansion**

Scope	Activity	Global Warming Potential	Percentage Contribution
		tCO <sub>2</sub> e per annum, GWP100	
<b>Scope-1</b>	Fuel Consumption		
	Boiler - PNG	6,213.03	11.14%
	G G Set - PNG	162.40	0.29%
	DG Set- HSD	132.3	0.06%
	Total Scope-1	<b>6407.73</b>	<b>11.48%</b>
<b>Scope-2</b>	Purchased Electricity	49,420.80	88.52%
	<b>Total</b>	<b>55,828.53</b>	<b>100 %</b>

**Figure 2-9: Carbon Emissions from Scope-1&2. (Post Expansion)**

- The GWP of emissions from **Scope-1** is ~ **6,407.73 tCO<sub>2</sub>e per annum** and contributes to ~**11.48%** of the post-expansion carbon footprint of the proposed plant. The fuel consumption for operation is found to be the individual activity with the biggest contribution to both Scope-1 as well as the overall carbon footprint.
- The GWP of emissions from **Scope-2** is ~**49,420.80 tCO<sub>2</sub>e per annum** and contributes to ~ **88.52%** of the carbon footprint of the proposed plant.

Thus, the overall carbon footprint or global warming potential of all GHG emissions from all post-expansion activities at the proposed plant is ~ **55,828.53 tCO<sub>2</sub>e per annum**

### 2.8.8 Mitigation Measures

Carbon footprint analysis measures the climate change potential of GHG emissions in units of CO<sub>2</sub> equivalent. It is based on extensive factors ranging from source and supply chain of raw materials to disposal of the waste materials and the disposal of product itself and owing to this Carbon Footprint study has become one of the most relevant methodologies to help organizations know their environmental impact. As a result of the availability of such impacts data, companies/organizations are increasingly being asked to perform their activities in the most environmentally friendly way, not only about internal processes but also in relation to their customers and suppliers, throughout their value chain. While, there are several methodological issues,

which still need to be resolved, carbon footprint analysis is a credible indicator of carbon emissions. Thus, it can be used to develop a carbon emission mitigation and management plan. The Carbon Emission Mitigation Plan lists the measures that the proponent would like to implement for reducing the environmental damage that has been identified in this study. The steps include:

### 1. Solar Power

M/s Asian Paints Limited have a set-up of solar panel on building rooftops at the facility as a source of alternative or renewable energy generation. This will ensure the reduction of purchased electricity, reducing scope - 2 emissions. The solar panels could be provided on the following buildings:

Considering power generation from solar panels is estimated to be 3.67 MWh. Considering this norm and the provision of solar panels the GHG emission reduction is estimated in the table below:

Power generation capacity	Emission factor	GWP offset per day	GWP offset per annum
MWh	tCO <sub>2</sub> e per MWh	tCO <sub>2</sub> e , GWP 100	tCO <sub>2</sub> e, GWP 100
3.67	0.815	= 23.92 (=3.67*0.815*considering 8 hrs of working per day)	= <b>8,733.87</b> (=23.92*365)

Power generation from solar panels installed at Siwani is estimated to be 6.0 MWh. Considering this norm and the provision of solar panels the GHG emission reduction is estimated in the table below:

Power Generation	Emission Factor	GWP offset
<i>MWh</i>	<i>kgCO<sub>2</sub> per MWh</i>	<i>tCO<sub>2</sub>e, GWP 100 per Annum</i>
6	0.815	<b>14278.80</b>

Thus, ~ **23,012.67 tCO<sub>2</sub>e per annum** can be offset using Solar Power generation.

### 2. Green Belt Development

Greenbelt design and development has been attributed great importance and has become an essential element of planning policy. The plot area of the project is 5,23,198 m<sup>2</sup>. Around 1,82,666.44 m<sup>2</sup> i.e. >33% of the total plot area will be developed as a greenbelt. The industry already has a greenbelt area (>33%) with a plantation of ~25,000 trees and shrubs within the project premises. Additional 4000 trees are proposed to be planted at the site for Gap filling on boundaries and block plantation with suggested tree species.

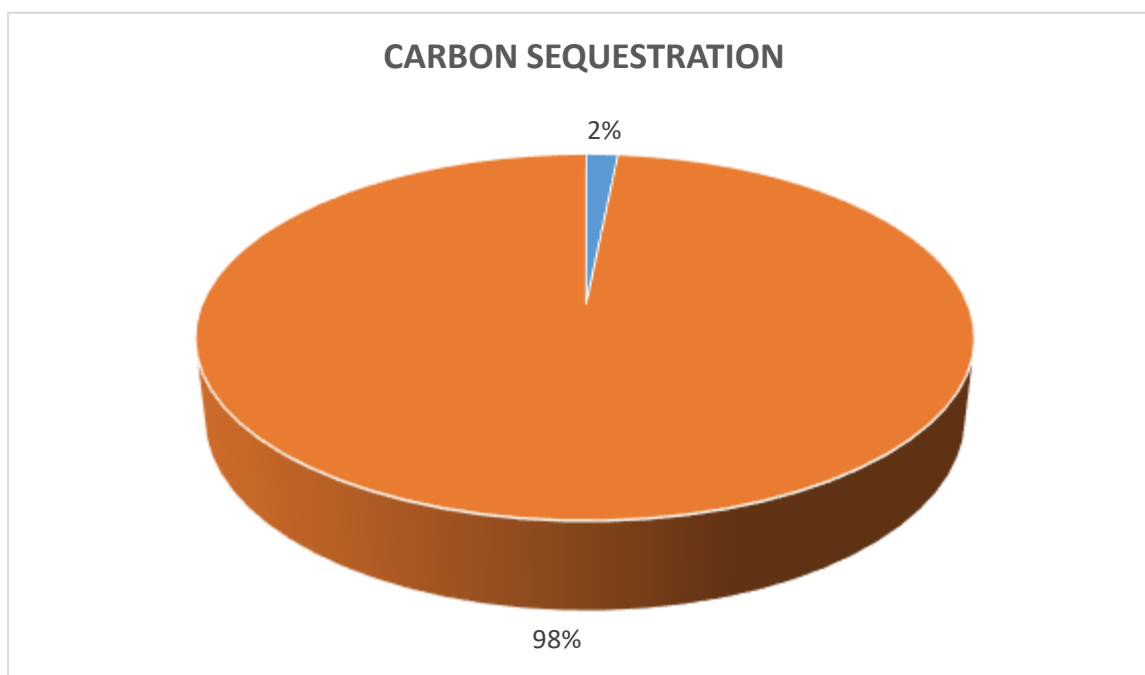
Global warming emission factor for Annual Carbon Sequestration Potential from Assessment of Status and Carbon Sequestration Potential of Green Cover in the Major Urban Development Authorities of Haryana is considered to calculate the GWP reduced due to the activity is presented in the table below:

Plot Area, m <sup>2</sup>	Greenbelt Area, m <sup>2</sup>	Number of trees	Sequestration Potential tCO <sub>2</sub> per Hectare per annum	GWP offset tCO <sub>2</sub> e, GWP 100
523198	1,82,666.44	25000	20	<b>365.33</b>

Thus, ~**365.33 tCO<sub>2</sub>e per annum** is offset using greenbelt plantation.

**Note:** The average carbon sequestration potential of trees in the Rohtak region is around **20 Mg CO<sub>2</sub> per hectare per year**.

3 Nandal, A., Yadav, S.S. & Nath, A.J. Trees outside forests as climate change mitigation champions: evaluating their carbon sequestration potential and monetary value in Maharshi Dayanand University, Rohtak (Haryana), India. Environ Monit Assess 195, 995 (2023). <https://doi.org/10.1007/s10661-023-11597-9>

**Figure 2-10: Carbon Sequestration**

### 2.8.9 Overall Reduction of CO<sub>2</sub> Emission due to Mitigation Measures

The aforementioned mitigation measures would reduce global warming impact or emissions and mitigate the overall carbon footprint of the facility is presented in the table below:

S. No.	Mitigation Measure	CO <sub>2</sub> emissions offset
		tCO <sub>2</sub> e per annum
1	Solar Power	23,012.67
2	Greenbelt Plantation	365.33
<b>Total</b>		<b>23,378.00</b>

Thus, ~ **23,378.00 tCO<sub>2</sub>e per annum** can be offset to mitigate the carbon footprint of the proposed facility. The envisaged reduction is ~85.6 % with existing operations whereas ~ 42 % of the total Overall Carbon footprint of the site premises after the proposed expansion.

### 2.8.10 Mitigation Measures

Carbon footprint describes the environmental impact of a product or service over its entire life cycle (ISO, 2013). It refers to the spent natural resources and produced GHG emissions over the life cycle of the commodity. Carbon footprint analysis is an LCA impact category focused exclusively on Global Warming Potential (GWP) and measures the climate change potential of GHG emissions in units of CO<sub>2</sub> equivalent. It is based on extensive factors ranging from the source and supply chain of raw materials to disposal of the waste materials and the disposal of the product itself and owing to this Carbon Footprint study has become one of the most relevant methodologies to help organizations know their environmental impact. As a result of the availability of such impact data, companies are increasingly being asked to perform their activities in the most environmentally friendly way, not only about internal processes but also concerning their customers and suppliers, throughout their value chain. While there are several methodological issues, that still need to be resolved, Carbon Footprint Analysis is a credible indicator of carbon emissions. Thus, it can be used to develop a carbon emission mitigation and management plan.

The carbon emission mitigation plan lists the measures that the proponent would like to implement for reducing the environmental damage/ global warming potential that has been identified in this study.

1. Solar Power
2. Greenbelt Plantation

### 2.8.11 Summary & Conclusion

All emissions have been categorized as direct and indirect emissions. Direct emissions are identified from sources that are owned and controlled by the proponent. These emissions are considered scope-1. Indirect emissions are emissions that are a consequence of the activities of the reporting company but occur at sources owned or controlled by another company. These include scope-2 and scope-3 emissions. Scope-2 includes emissions from energy purchased or acquired and consumed by the reporting company, while scope-3 emissions include upstream and downstream value chain emissions.

Inventory of project-specific data like energy/power, water, input of raw materials as well as environmental releases in air, water, solid and hazardous wastes, etc. In addition, the travel distance of materials through trucks is also considered. Databases such as Ecoinvent provide industrial data on energy supply, resource extraction, material supply, chemicals, metals, agriculture, waste management services, and transport services for a variety of generic unit processes that allow for the development of more complex product systems.

Firstly, Scope - 1 emissions are direct emissions from activities owned or controlled by the organization. In this facility Scope - 1 emissions are identified to originate from fuel consumption for the operation of three major utilities. **Thus, the GWP of emissions from fuel consumption for aforementioned activities or Scope - 1 emissions will be ~6407.73 tCO<sub>2</sub>e per annum, which contributes to ~11.48% of the carbon footprint of the proposed facility.**

Further, Scope - 2 emissions are the indirect emissions associated with purchased electricity. They account for GHG emissions from the generation of purchased electricity or energy consumed by a company. Purchased electricity or energy is defined as electricity or energy that is purchased or otherwise brought into the organizational boundary of the company. Hence, Scope 2 emissions physically occur at the facility where electricity or energy is generated. The power requirement for the proposed project will be met by acquiring or purchasing 8 MW of electricity from the Uttar Haryana Bijlee Vitran Nigam Ltd (UHBVNL). Thus, the GWP of emissions from purchased electricity or Scope - 2 will be **~49,420.80 tCO<sub>2</sub>e per annum, which contributes to ~88.52 % of the carbon footprint of the proposed facility.**

***In conclusion, the overall proposed activities will have a carbon footprint of ~ 55,828.53 tCO<sub>2</sub>e per annum out of which ~23,378tCO<sub>2</sub>e per annum will be offset/sequestered through Solar & Greenbelt.***

## 2.9 Water Footprint

### 2.9.1 Concept

The water footprint of an individual, community, or business is defined as the total volume of freshwater used to produce the goods and services consumed and produced by the individual /community/business.

### 2.9.2 Components of Water Footprint

The water footprint has three components: **Green, Blue, and Grey.**

- **Green Water Footprint** is water from precipitation that is stored in the root zone of the soil and evaporated, transpired, or incorporated by plants.
- **Blue Water Footprint** is water that has been sourced from surface or groundwater resources and is either evaporated, incorporated into a product, taken from one body of water and returned to another or returned at a different time.
- **Grey Water Footprint** is the amount of freshwater required to assimilate pollutants to meet specific water quality standards.



### 2.9.3 Water Footprint Components

The water Footprint can be categorised into following components for a Chemical Manufacturing Industry;

- **Green Water Footprint:** There is no direct involvement of this facility in enriching green water footprint because APL Rohtak is categorized as Chemical manufacturing plant and ground water recharge is not allowed. However, the site has existing rain water harvesting facility in the form of run-off collection in 02 nos. of artificial pond for storm water and roof-top water. The site is utilizing rain water for various activities such as gardening, domestic, etc.
- **Blue Water Footprint:** Fresh water requirement is being fulfilled by HSIIDC after proposed expansion the source of water supply will remain same.
- **Grey Water Footprint:** All the generated effluent will be reused after treating in ETP followed by RO. The unit will be Partial Zero Liquid Discharge unit and no Treated effluent will be discharged outside the unit. The generated sewage water will be treated in ETP. The treated water will be used for Gardening purpose. Hence the Grey Water Footprint of the unit is NIL or Zero.
- The detailed calculations for above mentioned components are presented in the following chapters.

### 2.9.4 Production Capacity

The production capacity of the proposed Integrated paint manufacturing and Synthetic Organic Chemicals plant is as presented in **Table 1-1**.

### 2.9.5 Water Consumption

Water will be sourced from MPIDC water supply. Total water requirement for the proposed project will be **2969 KLD**; out of which 469 KLD will be recycled back and **2500 KLD will be fresh water requirement**. Water Consumption details are presented in **Table 2-49**.

**Table 2-49: Water Consumption Details and breakup**

S. No.	Area	Water Consumption (KLD)		
		Existing	Proposed	Total
A	Domestic	60	20	80
B	Gardening	15	65	80
C	Industrial			
	Process	944	360	1304
	Washing	114	46	160
	Boiler	17	0	17
	Cooling tower	295	182	477
	Fire fighting	7	3	10
Industrial Total		1377	591	1968
<b>TOTAL</b>		<b>1452</b>	<b>676</b>	<b>2128</b>
Recycled Water		140	38	178
Net Fresh Water		1312	638	1950

Considering no of working days as 365, the Annual Water requirement is calculated as presented in **Table 2-50** as below:

**Table 2-50: Total Water Requirement (KL/Annum)**

S. No.	Area of consumption	Water Consumption (KL/Annum)
<b>A</b>	<b>Domestic</b>	<b>25,200</b>
<b>B</b>	<b>Gardening</b>	<b>21,600</b>
C	Industrial	
1	Process	504,000
2	Washing	54,000

S. No.	Area of consumption	Water Consumption (KL/Annum)
3	Boiler	9,360
4	Cooling tower	149,040
5	Fire fighting	2,880
<b>Total (KL/Annum)</b>		<b>7,76,720</b>
<b>Recycled water (KL/Annum)</b>		<b>64,970</b>
<b>Total Fresh Water Consumption (KL/Annum)</b>		<b>6,55,200</b>

The water required at the plant is categorized as Domestic water consisting of water used for domestic purposes like hand washing, cooking, toilet flushing etc; Gardening water used for maintenance of green belt, Industrial water used for cooling tower makeup, DM/ Process water, Equipment washing, etc. and others (water used for miscellaneous purposes).

### 2.9.6 Waste Water/ Effluent Generation

Total wastewater generation for the proposed project will be 178 KLD. From that, 128 KLD will be industrial wastewater and 50 KLD will be domestic wastewater generation. Industrial wastewater will be treated in ETP followed by RO and MEE. RO permeate and MEE condensate will be reused in cooling tower. Domestic wastewater will be treated in ETP. ETP treated water will be reused in gardening. Zero Liquid Discharge (ZLD) system will be adopted for the proposed project for Industrial wastewater.

**Table 2-51: Total Waste Water Generation (KLD)**

S. No.	Area	Waste water generation (KLD)			Management
		Existing	Proposed	Total	
A	Domestic	35	15	50	Treated in ETP
B	Industrial				Total Waste water will be treated in ETP units including RO. Treated water from RO will be recycled and reused back in to plant process activities, utilities as well as gardening.
	Process	0	0	0	
	Washing	58	6	64	
	Boiler	2	0	2	
	Cooling tower	45	17	62	
<b>Industrial Total</b>		<b>105</b>	<b>23</b>	<b>128</b>	
<b>TOTAL</b>		<b>140</b>	<b>38</b>	<b>178</b>	
<b>Recycled Water</b>		<b>140</b>	<b>38</b>	<b>178</b>	<b>Total Recycled water</b>

**Table 2-52: Total Waste Water Generation (KL/Annum)**

S. No.	Area of consumption	Waste Water Generation (KL/Annum)
<b>A</b>	<b>Domestic</b>	<b>18,000</b>
<b>B</b>	<b>Industrial</b>	
1	Process	0
2	Washing	23,040
3	Boiler	720
4	Cooling tower	22,320
<b>Total Effluent (KL/Annum)</b>		<b>64,080</b>
<b>Effluent to Disposal (KL/Annum)</b>		<b>-</b>

Since the treated waste water is not discharged outside the site premises and is completely reused after treatment in ETP followed by RO system, the water foot print for grey water is zero.

Specific Waste Water generation per tonne of finished goods is hence considered as Zero.

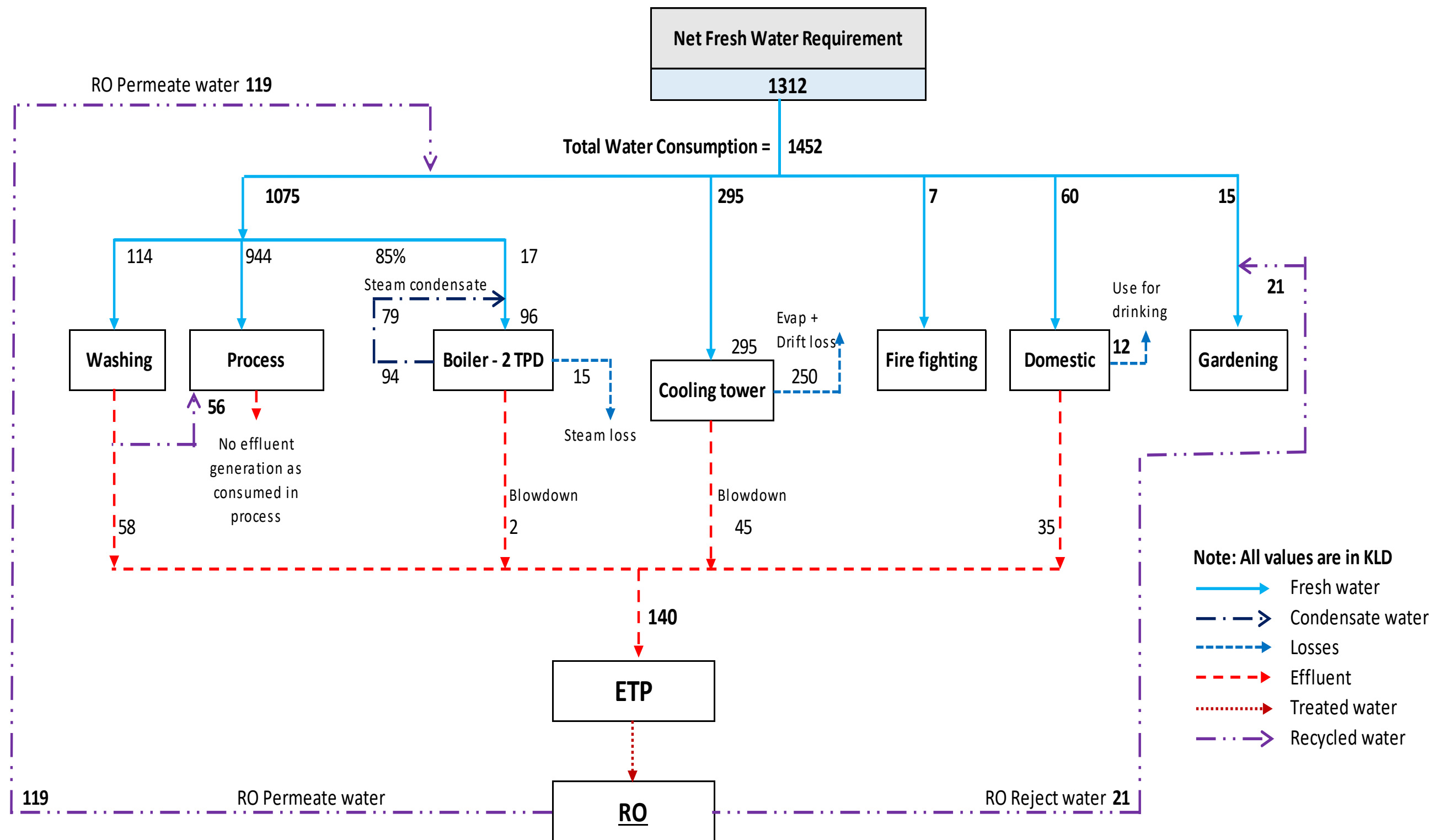
### 2.9.7 Computation of Run-off

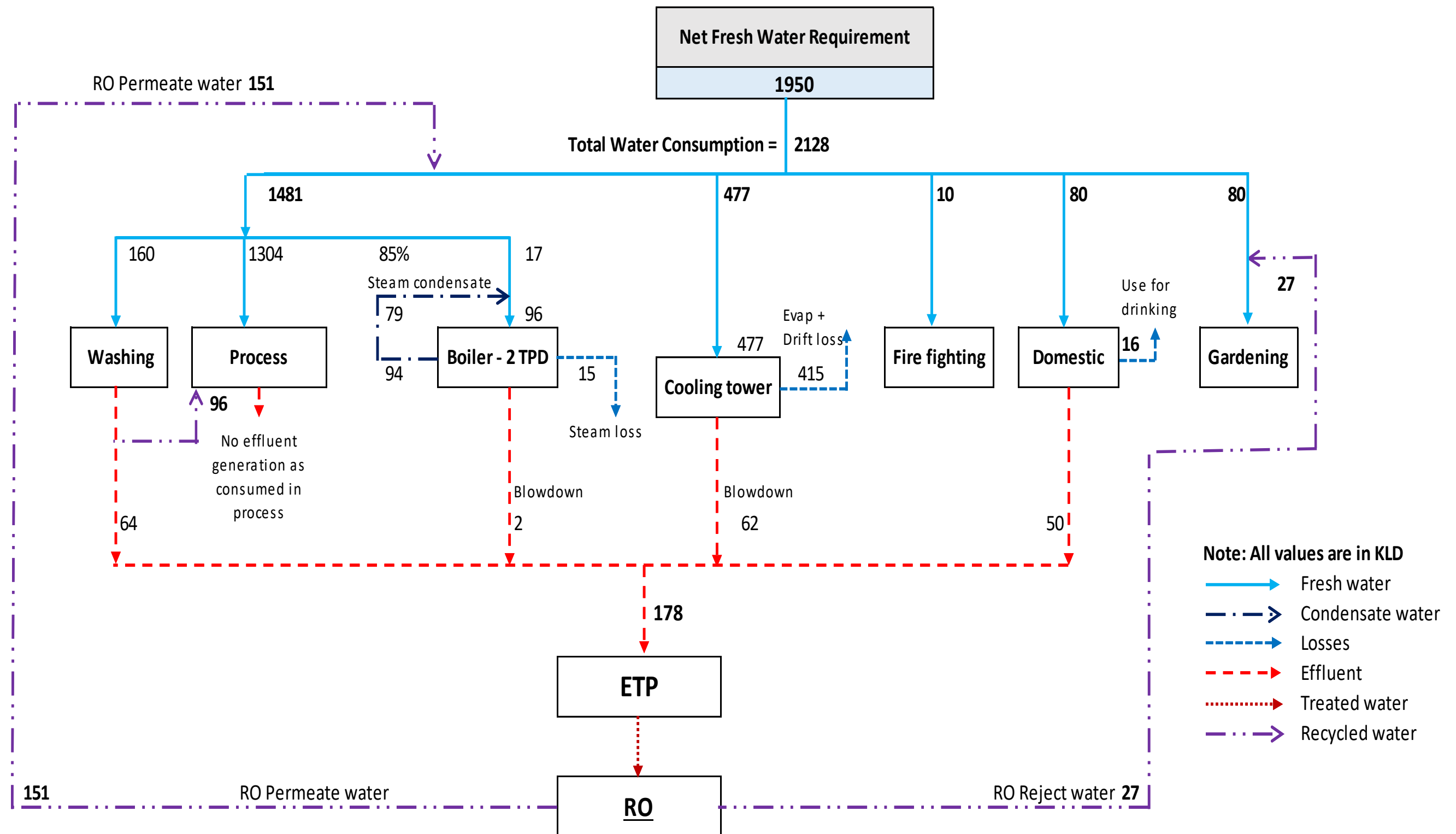
The tentative rain water computation is as follows:

**Table 2-53: Tentative Run-off Computation**

Sl. No.	Area Type	Area Break-up (in m <sup>2</sup> )	Run-off Co-efficient Consider	Annual Rainfall (in m)	Effective Run-off Generation (in m <sup>3</sup> )
1	Roof top area	6,491.00	0.85	0.61	3,384.89
2	Roads	1,01,691.80	0.65	0.61	40,552.15
Total area consider for estimating run-off		1,08,182.80	Total quantum of available run-off per annum		43,937.04
Considering 20% losses and first flush wastages, available rainwater					39,150 m <sup>3</sup> /Annum

**Note:** The above calculation is based on Manual of Artificial Recharge of Ground Water by CGWB (2007)

**2.9.8 Water Balance: Existing**

**2.9.9 Water Balance: Proposed**

### 2.9.10 Water Footprint Assessment

The water footprint assessment is carried out considering the following points:

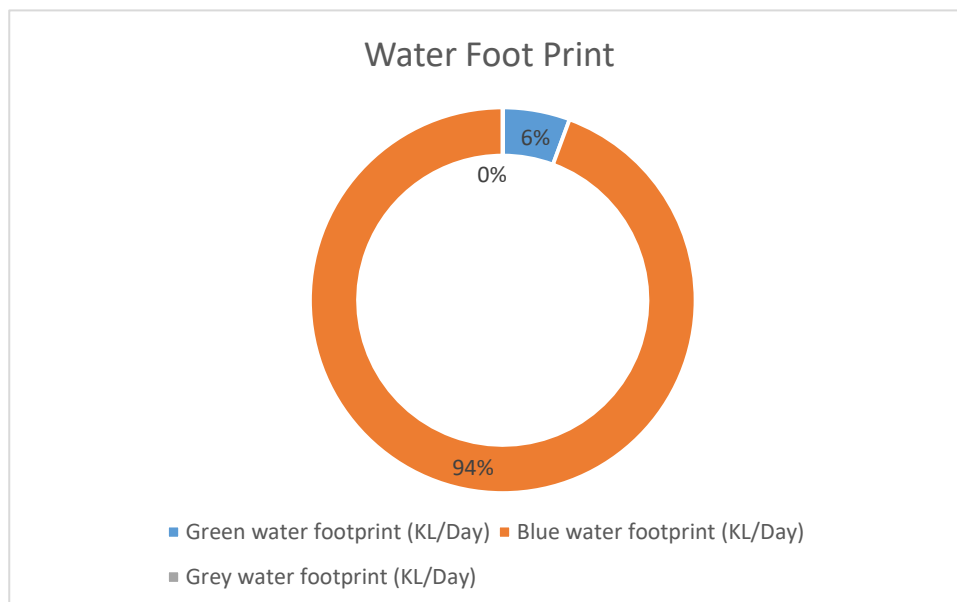
The calculated water footprint is the direct water footprint of the plant as it is solely calculated on the basis of activities directly related to production or manufacturing and from overhead (supporting services) activities.

Rainwater harvesting is carried out within the Plant premises.

Water Footprint of Plants is given below:

Category	KL per Annum
Green water footprint (KL/Day)	39150
Blue water footprint (KL/Day)	655200
Grey water footprint (KL/Day)	0

### 2.9.11 Pie Chart for Water Footprint



Green water footprint = Total rainwater collected through rainwater harvesting.

Blue water footprint = Total Fresh water requirement

Grey water footprint = Total effluent discharged outside of plant premises. (Grey water footprint is Zero as the Manufacturing unit is partial ZLD)

## 2.10 In-built mitigation measures

Description of operational control incorporated into the project to meet environmental standards, environmental operating conditions are given in **Table 2-54**.

**Table 2-54: Operational Control at installation Stage**

S. No.	Name of Plant	Parameters	Operational Controls at Design Stage		
			Air	Water	Solid / Hazardous Waste
			Air (Prevention & Control of Pollution) Act – 1981	Water (Prevention & Control of Pollution) Act – 1974	Solid Waste Management Rules, 2016 and Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016
1.	Integrated Paint Manufacturing Plant	Energy			
		Waste Water	-		-
		SPM, SO <sub>2</sub> , NO <sub>x</sub> from flue gas stacks of Boiler, DG, and GG Set	Adequate stack height	-	-
		SPM, HCN, NH <sub>3</sub> , SO <sub>2</sub> , NO <sub>x</sub> , Other gases emission from proposed stacks in process area	Scrubber and Acoustic enclosure and dust collector		
		Solid Waste	-	-	Maintenance / testing activity of plant machinery and equipment 2. Hydraulic testing of equipment's 3. replacement of used transformer oil will be sold to Authorizer recycler
					Used Asbestos Gaskets /cuttings from maintenance activity Disposal through secured Landfill at TSDF
					Cleaning of stacks and Secondary Combustion Chamber / heat recovery unit / mixing chamber of incinerators/boiler tubes will be disposed of by Pre-processing / Co - processing/secured Landfill through TSDF

## 2.11 Assessment of New & Untested Technology

Latest and updated technology will be used for proposed expansion.

## 3 DESCRIPTION OF THE ENVIRONMENT

### 3.1 Introduction

This chapter illustrates the description of the existing environmental status of the study area with reference to the prominent environmental attributes. The study area covers 10 km radius around the project site. The land use and socio-economic aspects were studied with respect to 10 km radius around the site.

The existing environmental setting is considered to adjudge the baseline conditions which are described with respect to climate, atmospheric conditions, water quality, soil quality, ecology, socio-economic profile, Landuse and places of archaeological importance.

### 3.2 Study Area

The study area is considered to be area within 10 km radius of the project site. Study area map of the project is as shown in **Map 2-3**.

### 3.3 Study Period

Baseline monitoring of the study area has been carried from 2<sup>nd</sup> February, 2023 to 10<sup>th</sup> May, 2023.

### 3.4 Baseline Environment Quality

The baseline environmental quality was assessed through field studies within the impact zone as well as collection of secondary data for various components of the environment viz. land, air, noise, water, ecological environment and socio-economic environment with specific reference to environmental aspects, which may have a bearing on the impacts of the proposed project. The methodology for conducting the baseline environmental survey obtained from the guidelines given in the EIA Manual of the MoEFCC.

Baseline information with respect to air, noise, soil and water quality in the study area was collected by conducting Study area survey, secondary data collection, primary data collection which includes sampling/field studies.

Field monitoring for meteorological conditions, ambient air quality, water quality, noise quality, soil quality etc. has been carried out, which constitutes major portion of the baseline environmental studies. In addition to these important parameters, certain aspects like land use, socio-economic studies, ecological & biodiversity studies etc. are covered during the study period. This information is based on secondary information sources and constitutes remaining part of the baseline environmental studies. The entire data has been collected through actual physical surveys and observations, literature surveys, interaction with locals, government agencies and departments.

For the proposed project, the baseline environmental quality was assessed by Kadam Environmental Consultants from 2<sup>nd</sup> February 2023 to 10<sup>th</sup> May 2023.

The environmental baseline of the study area with respect to these parameters is discussed in subsequent sections.

#### 3.4.1 Secondary Data Collection

Secondary data collection includes review of secondary/published information on:

- Long term climatological data published by IMD for Indian Meteorological Department for 30 years i.e. from 1991-2020, for Rohtak (Station ID: 42176), which is located at distance of 09.17 km in South West direction is the nearest IMD station from proposed expansion project site.
- Socio-economic profile from census data 2011;



- Sensitive area as biosphere reserve, forests, sanctuaries, places of historical, archaeological, tourist's importance, etc. if any.

For the physical environment, sampling and analysis with respect to ambient air, meteorology, water quality, soil quality and noise quality were carried out by M/s. Kadam Environmental Consultants, Vadodara, Gujarat, India, an MoEF&CC (Ministry of Environment, Forests and Climate Change, Govt. of India) gazette environmental laboratory and a laboratory accredited by National Accreditation Board for Testing & Calibration Laboratories (NABL). The certificate of these accreditation are given as **Annexure 27 on Page No.527**.

### 3.4.2 Primary Data Collection

Primary data collection includes:

#### Sampling/Field Studies of,

Ambient air quality

Ambient noise quality

Water resources – surface and ground

Geology, earthquake and landslide condition

Soil quality

#### Survey of,

Land use – land cover pattern

Flora and fauna / ecology – terrestrial & aquatic

Socio-economic study including demography, social profile, infrastructure and need assessment

Traffic survey

### 3.4.3 Sensitive Ecological Features

List of sensitive ecological features within 10 Km study area is as given in **Table 3-1**.

**Table 3-1: Sensitive Ecological Features**

S. No.	Sensitive Ecological Features	Name of feature / Location	Distance (km)	Direction	Reason of Significance
1	Lakes/Reservoirs/Dams	Kheri Sadh Pond	0.37	S	Non-significant
		Baliana Pond	1	ENE	
		Garhi Bohar Pond	1.91	WNW	
2	Stream/Rivers/Drains/Canal	Jawaharlal Nehru Canal	3.63	WNW	Significant
		Drain (Near Project Site)	0.16	E	
3	Airports	Bhiwani Airport	70	WSW	Non-significant
4	Railway Lines	Rohtak Railway Station	8.9	WNW	Non-significant
5	National / State Highways	NH-352	Adjacent	E	Non-significant
6	Ports	Kandla Port	~917	SW	-
7	Mountains/Hills	None within 15 km	-	-	-
8	Defense Installations	None within 15 km	-	-	-
9	National Park / Wildlife Sanctuary / Tiger Reserve / Elephant Reserve / Turtle Nesting Ground / Reserve Forest	-	-	-	-
10	Core Zone of Biosphere Reserve / Habitat for migratory birds	None within 15 km	-	-	-

### 3.5 Land use / Land cover

#### 3.5.1 Classification of Land use and Land cover

The National Remote Sensing Agency (NRSA), Government of India, conducted a land use survey using Remote Sensing Techniques in the year 1988-89 at the behest of the Planning Commission for classifying land by visual interpretation techniques and digital techniques. NRSA's output resulted in a two-level system of classification, comprising seven primary land use / land cover categories. Some of these primary categories required further delineation, leading to a second level of classification that resulted in further sub-categories.

This system of classification has been the basis for Kadam's land use/land cover studies. Whilst these categories are generally found relevant with respect to describing land use and land cover classes in the Indian context, sometimes modifications are required, and made, to include additional sub-categories, which are more relevant in describing the land use and land cover for a particular study.

#### 3.5.2 Study Area

The study area has been defined as an area covering the buffer distance of 10 km around the proposed project site covering IMT Rohtak, Rohtak District in state Haryana.

#### 3.5.3 Study Methodology Adopted

To accomplish the objective, the following steps were undertaken:

- Study and collection of relevant documents and maps.
- Interpretation of imagery.
- Checking of interpreted imagery.
- Field survey / ground truthing
- Generation of final land use / land cover map.

#### Data Collection

This covered:

- Downloading of remote sensing data using the licensed software, Google Earth Pro having high resolution (<1.0m) imagery.
- Topographical maps as base map.
- Quick reconnaissance survey of the study area by Kadam staff to get a general feel of the entire ground area which can aid in the preliminary interpretation of the data.

#### Interpretation of Satellite Data

The downloaded satellite imagery was interpreted considering the basic elements of interpretation such as size, shape, texture, pattern, location, association, shadow, aspect and resolution along with ground truth and ancillary information collected during the preliminary reconnaissance survey the interpretation was accomplished. The classification scheme followed in the project has been described in earlier Sub-sections **3.5.1** & **3.5.4**.

#### 3.5.4 Field Survey/Ground Truthing

The aim of ground truth studies is to confirm whether the interpreted land uses are correct thus improving the quality of the output. It also allows interaction with local parties and stakeholders, thereby giving background information on the land use.

Ground truth was carried out to check the discrepancy of the interpreted data. The survey consisted of traversing the study area, cross-checking of identified features with those represented on the map.

Field notes were kept in the form of log sheets that recorded information pertaining to co-ordinates, photographs and identified land uses. Additional features identified or remarks made against existing interpretation were also recorded.

The field survey was carried out in the study area by Kadam's land use and land cover Functional Area Expert for quality check of the map.

GPS readings were taken during the surveys wherever it was felt that additional confirmation in interpretation of the data and also observations of land features were noted. Additionally, spot checks were also done to confirm the land use / land cover interpretation even where confidence of interpretation was high.

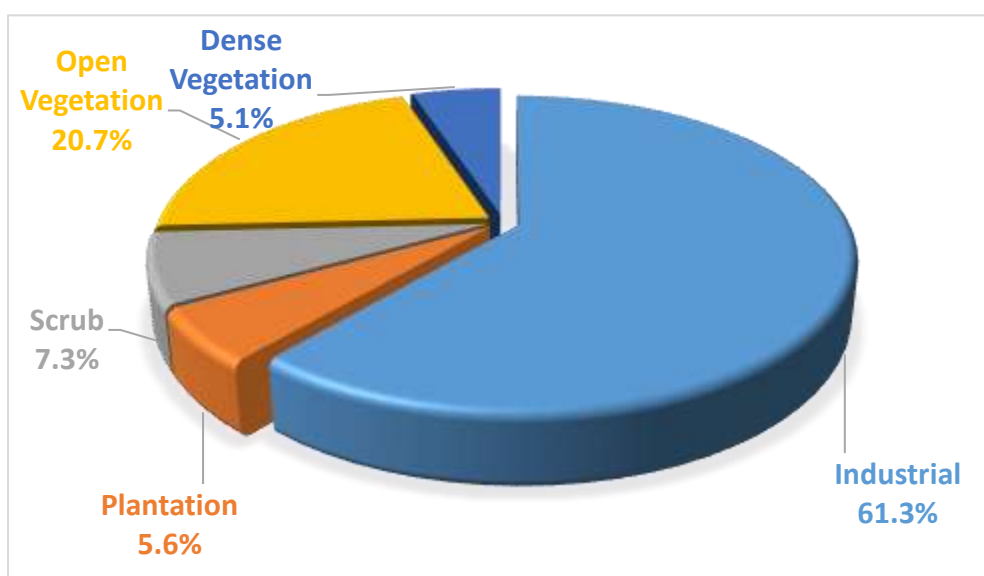
**Table 3-2** enumerates the land features and its corresponding GPS readings of all the ground truthing locations selected; whereas, major industries within 10 Kms radius of project Site is shared in **Table 2-3** and **Table 3-1** represents Ecological sensitive features.

**Table 3-2: GPS Readings within Study Area**

Sl. No.	Location	Latitude (Northing)	Longitude (Easting)	Land use / Land cover Classification
1	Gate-1, Asian Paints, Rohtak	28°52'08.00" N	76°40'38.28" E	Industry
2	Near Raw Material Disposal, APL	28°52'03.33" N	76°40'23.53" E	Industrial Area
3	Baliana	28°52'38.12" N	76°41'11.73" E	Water Body, Open Vegetation
4	Baliana	28°52'51.71" N	76°41'28.31" E	Habitation
5	Asthal Bohar	28°52'25.55" N	76°38'43.80" E	Habitation
6	Jawaharlal Nehru Canal & WYC (Bhalot Sub-Branch) Canal, Bohar	28°53'52.83" N	76°38'34.13" E	Water Body, Habitation, Scrub land
7	Gandhara	28°49'52.79"N	76°43'31.50"E	Habitation
8	Baba Garib Nath Mandir, Gandhara	28°49'57.49"N	76°43'05.18"E	Water Body, Agricultural Land
9	Kheri Sadh	28°51'30.93"N	76°40'02.21"E	Water Body
10	Bhalot	28°54'09.32"N	76°42'14.71"E	Habitation
11	Nunond	28°50'55.02"N	76°42'54.99"E	Habitation
12	Nunond	28°50'58.41"N	76°42'20.22"E	Land without scrub
13	(Gandhar Drain) Nunond	28°50'33.76"N	76°43'10.47"E	Drain
14	Kehrawar Village	28°50'09.29"N	76°41'01.99"E	Water Body
15	Kehrawar Village	28°49'19.89"N	76°41'49.81"E	Aquatic Culture
16	Near M/s. Aarti Greentech Limited	28°52'20.04"N	76°40'04.41"E	Industry
17	Sector-33, Rohtak	28°53'45.54"N	76°39'37.58"E	Water Body
18	Tilyar Lake	28°52'46.25"N	76°38'10.51"E	Water Body
19	Near M/s. Enrich Agro Food Products	28°52'29.98"N	76°40'19.98"E	Industry
20	M/s. Maruti Suzuki - R&D	28°52'37.69"N	76°40'41.03"E	Industry
21	Maina Village	28°51'04.68"N	76°35'48.23"E	Agricultural Land, Industry, Scrub
22	Near Huda Park, Rohtak	28°52'38.73"N	76°35'15.06"E	Habitation
23	Suncity Heights, Sector-36A, Rohtak	28°55'18.25"N	76°36'42.22"E	Habitation
24	Asan Minor	28°54'27.20"N	76°45'05.62"E	Water Body
25	GD Goenka International School, Asan	28°53'56.08"N	76°44'50.06"E	Habitation
26	Shivalya Shiv Mandir, Rurki	28°56'00.70"N	76°44'26.44"E	Habitation
27	Asan Village	28°54'00.89"N	76°45'56.67"E	Water Body
28	Near Pakasma Drain	28°51'52.08"N	76°45'07.33"E	Water Body
29	Maharishi Dayanand Park – Garden, Atil Village	28°50'22.05"N	76°44'55.49"E	Water Body
30	Kahlan Wala Talab, Kiloi Village	28°56'40.46"N	76°42'37.28"E	Water Body

**3.5.5 Land use / Land cover pattern of Plant premises****Table 3-3: Land use / Land cover categories within Plant Premises**

Sr. No.	Level 1 Classification	Level 2 Classification	Area, Level 2 Class			Area, Level 1 Class		
			Ha	~km2	~%	Ha	~km2	~%
1	Built-up Land or Habitation	Industrial	32	0.32	61.30	32	0.32	61.30
2	Agricultural Land	Plantation	3	0.03	5.64	3	0.03	5.64
3	Vegetation Cover	Scrub	4	0.04	7.27	17	0.17	33
		Open Vegetation	11	0.11	20.68			
		Dense Vegetation	3	0.03	5.12			
Total			52	0.52	100	52	0.52	100

**Figure 3-1: Pie Chart of LULC classes within Plant Premises****3.5.6 Land use / Land cover pattern of Study Area**

The land use and land cover of the above mentioned study area covering various categories. The features identified have been presented, considering the discussion provided in **Table 3-4**.

**Table 3-4: Synopsis of Land use / Land cover Classification Used for the Project**

Sl. No.	Level 1 Classification	Level 2 Classification
1.	Built-up Land or Habitation	Residential / Commercial
		Industrial
2.	Agricultural Land	Crop Land / Fallow Land
		Plantation
3.	Water Bodies	Reservoir / Lakes / Ponds / Tanks
		Stream / Drain
4.	Vegetation Cover	Scrub
		Open Vegetation
		Dense Vegetation
5.	Wastelands	Land without Scrub
6.	Other	Aquatic Culture

## Build-up Land or Habitation

### Residential / Commercial

The built-up area covers ~12% of the total study area. Rohtak is the major city located in the study area. The urbanization is observed in the form of various plotting schemes, apartments, etc. The study area also covers major roads such as NH-10, NH-71, NH-71A and SH-18 (State Highway).

Baliana, Karauntha, Kiloi Dopana, Kheri Sadh, Pakasma, etc. are major villages located within the study area.

### Industrial Area

The level of class covers 0.67% of the total study area.

Nearby situated industries are; M/s. Tata Steel Recycling, M/s. Aarti Greentech Limited, M/s. Maruti Suzuki India Limited R&D Plant, M/s. OM Enterprises, M/s. Enrich Agro Food Products, M/s. Mohindra Fasteners Limited, etc. as listed under **Table 2-3**.

The details of industries located in the study area can also be referred from:

- Brief Industrial Profile of District Rohtak and Jhajjar, Government of India:
  - a) [https://dcmsme.gov.in/old/dips/har\\_rohtak.pdf](https://dcmsme.gov.in/old/dips/har_rohtak.pdf)
  - b) <https://dcmsme.gov.in/old/dips/jhajjar.pdf>
- Haryana State Industrial & Infrastructure Development Corporation Limited:
  - a) <https://hsiidc.org.in/activities-and-services/infrastructure-development-industrial-estates>

## Agricultural Land

### Crop Land / Fallow Land

The crops cultivated particularly in this area are wheat, gram, rice, bajra, rapeseed mustard, sugarcane, etc. The irrigation is essentially through canal and tube-well.

This class is dominating the study area by 71.80% (i.e. 24,707 hectare) of the total study area.

### Plantation

The level of class covers 0.094% and mostly observed plantation of eucalyptus, mango, etc.

## Wastelands

### Land without Scrub

The class land without scrub has 2.996% of the study area.

## Water Bodies

### Reservoir / Lakes / Ponds / Tanks

The level of class covers 1.538% of the study area. During ground truth survey in the month of April, nearby water bodies were observed fill with water. The major water bodies are Deswal Lake, Dhokar Pond, Tilyar Lake, etc. Besides various water bodies are located in the study area. It is observed that most of the water bodies are connected with the village domestic effluent.

### River / Stream / Drain

The level of this class covers 0.001% of total study area. Major drains such as Pakasma drain, Gandhra drain; minor drains such as Rurki, Asan are located in the study area. All the drains in the study area are elongated.

### Canal

The level of class covers 0.357% of the study area. It covers Jawaharlal Nehru Canal (Rohtak to Sonipat), W.Y.C. (Bhalot Sub-Branch) and their distributaries.

### Vegetation Cover

The level of class covers the study area by 10.46% of vegetation cover.

Mostly the species of Neem (*Azadirachta indica*), Banyan (*Ficus benghalensis*), Pipal, Baval (*Prosopis juliflora*), etc. were observed in the study area. The sub-class of scrub covers 7.181%, whereas the sub-class of open vegetation covers 3.171% and the sub-class of dense vegetation covers 0.111% of the land.

### Others

Aquatic Culture near the Village of Kehrawar, Makrouli Minor, and Rohtak. The level of this class covers 0.088% of the study area.

### 3.5.7 Class Wise Area Statistics

The area statistics of these classes in the study area are presented in **Table 3-5**.

**Table 3-5: Area Statistics for Land Use/ Land Cover Categories in the Study Area**

S. No.	Level 1 Classification	Level 2 Classification	Area, Level 2 Class			Area, Level 1 Class		
			Ha.	~km <sup>2</sup>	~%	Ha.	~km <sup>2</sup>	~%
1.	Built-up Land or Habitation	Residential / Commercial	4128	41.28	11.998	4358	43.58	12.66
		Industrial	229	2.29	0.666			
2.	Agricultural Land	Crop Land / Fallow Land	24707	247.07	71.80	24739	247.39	71.89
		Plantation	32	0.32	0.094			
3.	Water Bodies	Reservoir / Lakes / Ponds / Tanks	529	5.29	1.538	653	6.53	1.90
		Stream / Drain	0.46	0.0046	0.001			
		Canal	123	1.23	0.357			
4.	Vegetation Cover	Scrub	2471	24.71	7.181	3600	36.00	10.46
		Open Vegetation	1091	10.91	3.171			
		Dense Vegetation	38	0.38	0.111			
5.	Wastelands	Land without Scrub	1031	10.31	2.996	1031	10.31	2.996
6.	Other	Aquatic Culture	30	0.30	0.088	30	0.30	0.088
<b>Total</b>						<b>34411</b>	<b>344.11</b>	<b>100</b>

**Note:** road area is not separately calculated.

### 3.5.8 Final Map preparation

The proportional presence of different land uses and land cover in terms of statistical percentages was derived for the study area. Appropriate legends were used to represent the various categories of land use and land cover, and were then written on the prepared land use and land cover map. The map is attached as **Map 3-1**, and Pie Chart of LULC classes in the study area is shown in **Figure 3-2**. This concluded the Land Use Identification and description component of the study area.

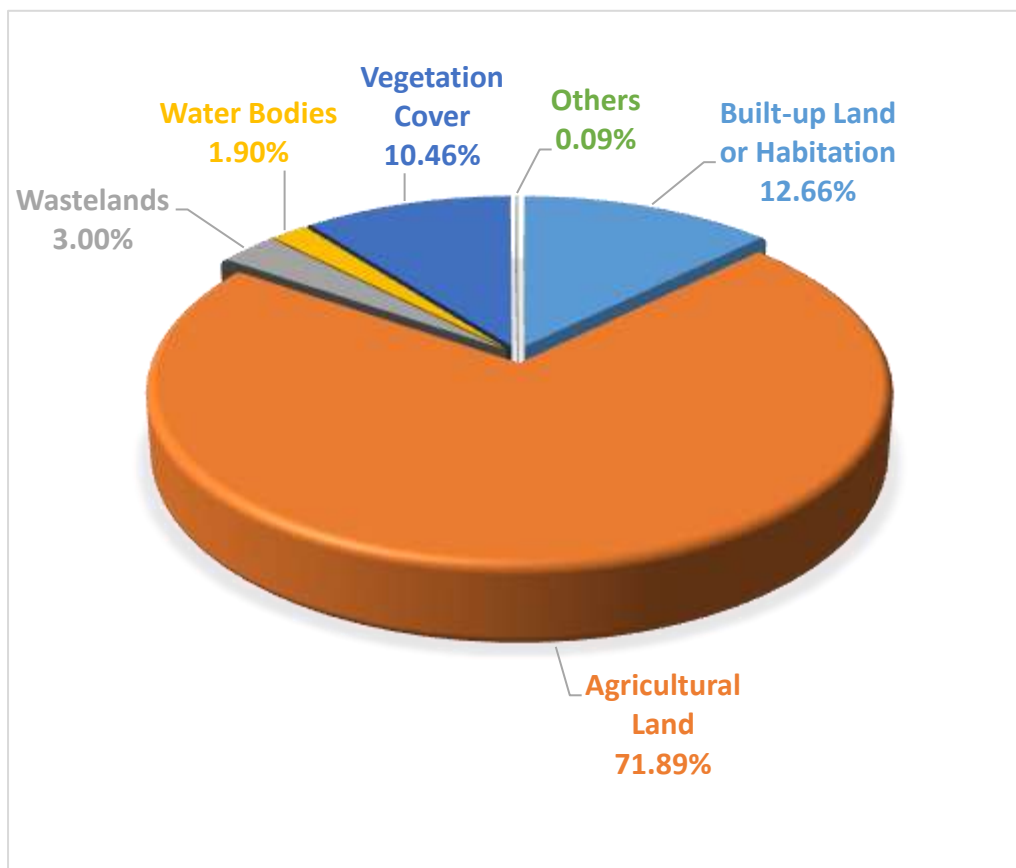
**Figure 3-2 Pie Chart of LULC classes in the study area****Photographs 3-1: Landuse Site Visit**

Photo 1: FAE's at Gate-1, Asian Paints Limited (APL), Rohtak



Photo 2: FAE's &amp; Site Representative, Near Raw Material Godown, APL-Rohtak



Photo 3: Water body, Baliana



Photo 4: FAE at APL-Rohtak



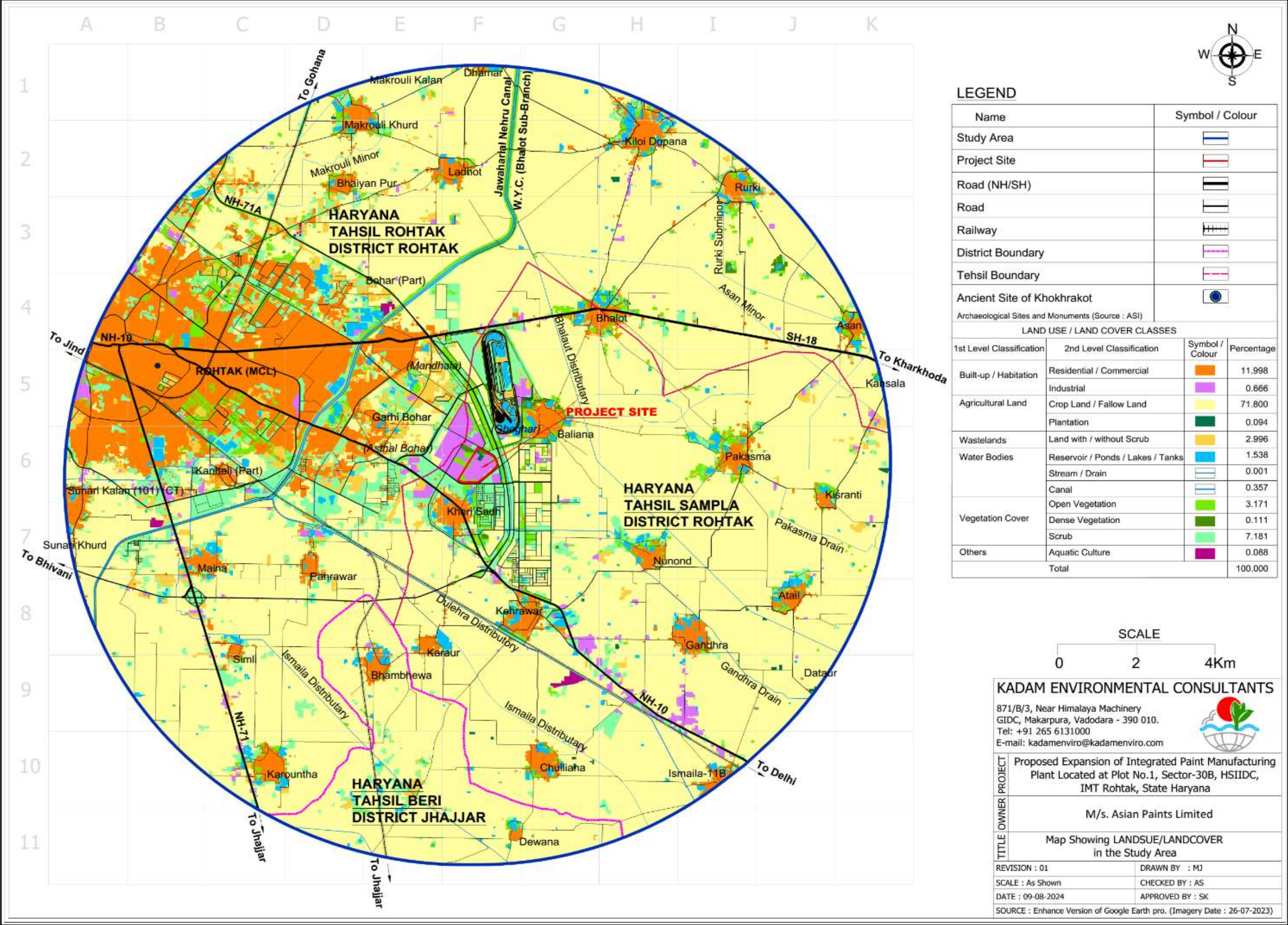
Photo 5: TM-LULC at Astal Bohar



Photo 6: Water Conservation at Gandhra Pond by APL-Rohtak

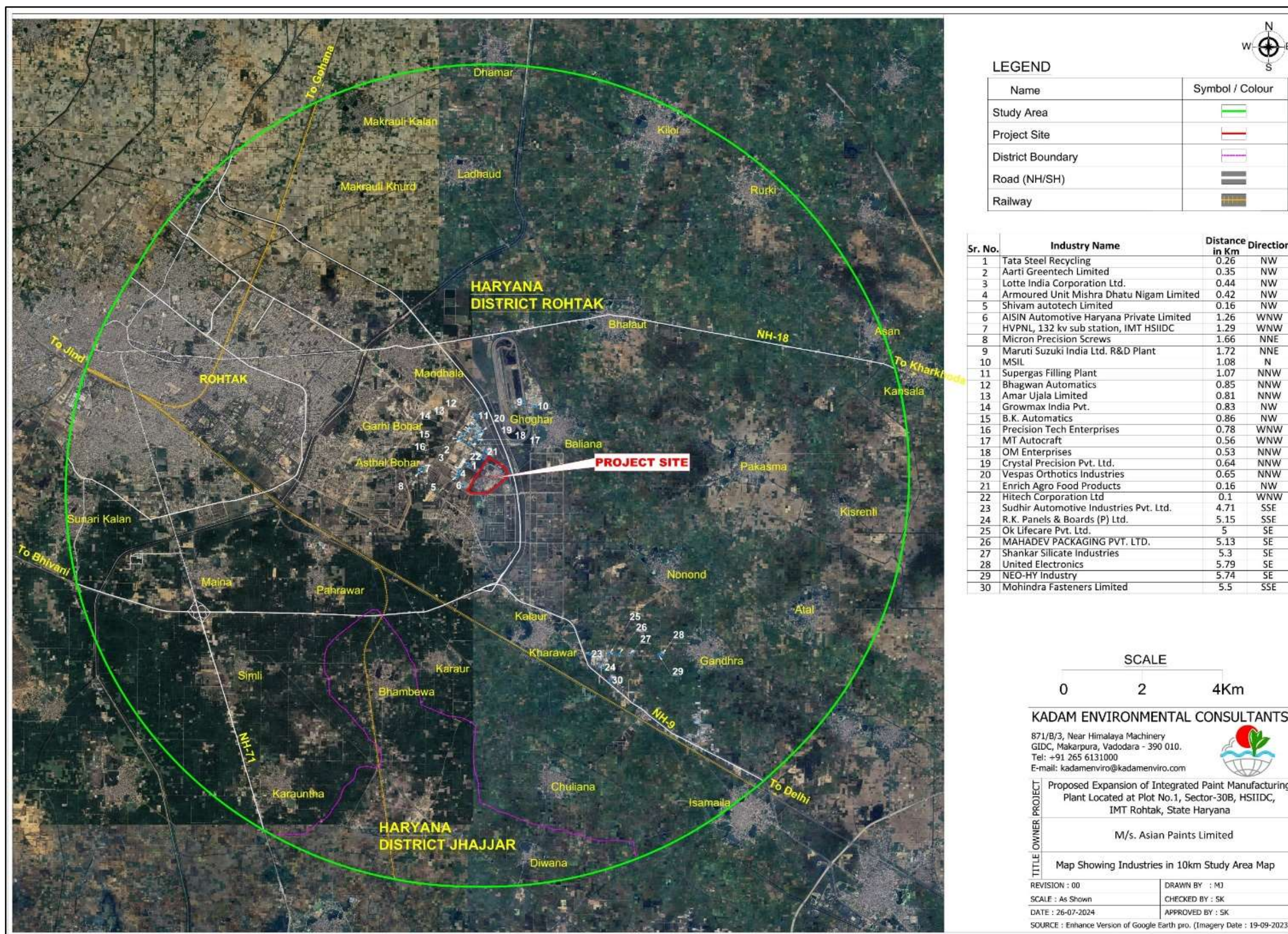


Map 3-1: Land Use Map of 10 Kms Radius of Study Area





Map 3-2 Map Showing Industries in 10 km study area map





## 3.6 Meteorology

### 3.6.1 Study Area & Period

The study area covering the buffer distance of 10 km around the project site. Baseline monitoring of the study has been carried from 2<sup>nd</sup> February 2023 to 10<sup>th</sup> May 2023 in Summer season.

#### Secondary Data Collection & Review – Long-term Meteorology<sup>4</sup>: Rohtak (Station ID: 42176)

Secondary data for weather conditions in the region is available from long-term climatological tables published by Indian Meteorological Department for 30 years i.e. from 1991-2020, for Rohtak (Station ID: 42176), which is located at distance 09.17 km in South West direction is the nearest IMD station from project site.

These tables give useful information about a region's weather, since they are collected over a 30-year period. Copy of Long-term climatological data tables of Rohtak station, is attached as **Annexure 15**.

Long-term climatological data analysed/reviewed for important parameters like temperature, humidity and rainfall, findings are given as below:

#### Temperature

The mean daily maximum and minimum temperatures recorded were 44.7°C (in the month of May) and 02.7°C (in the month of January) respectively.

The highest temperature recorded was 47.2°C on 08<sup>th</sup> June, 1995, 46.9°C on 08<sup>th</sup> July, 1976 & 46.8°C on 23<sup>rd</sup> May, 2010. The lowest temperature recorded was -0.8°C on 24<sup>th</sup> December, 2011.

In winter season, mean daily maximum temperature was recorded between 20.1°C – 29.4°C and mean daily minimum temperature was recorded between 6.9°C – 14.6°C. In summer season, mean daily maximum temperature was recorded between 40.4°C – 37.1°C and mean daily minimum temperature was recorded between 14.8°C – 21.6°C. In monsoon season, mean daily maximum temperature was recorded between 34.1°C – 36.0°C and mean daily minimum temperature was recorded between 20.4°C – 23.7°C. In the post monsoon season, mean daily maximum temperature was recorded between 23.0°C – 33.2°C and mean daily minimum temperature was recorded between 3.1°C – 13.6°C.

#### Humidity

Most humid conditions are found in the monsoons, followed by summer, post-monsoons, and winter in that order. Mornings are more humid than evenings and relative humidity ranges from a high of 59-82% in monsoon mornings to low of 51-62% in winter evenings.

In monsoon season, humidity in morning hours ranges between 59% – 82% while in evening hours it was between 43% – 70%. In post monsoon season humidity in morning hours ranges between 72% – 82% while in evening hours it was between 50% – 58%. In winter season humidity in morning hours ranges between 79% – 86% while in evening hours it was between 51% – 62%. In summer humidity in morning hours ranges between 47 – 68% while in evening hours it was between 28% – 42%. Summer is hot and humid.

<sup>4</sup> Indian Meteorological Department (IMD), Long Term Climatological Tables, 1991 – 2020, for Rohtak Station.

### Wind speed

The mean maximum and minimum Wind speed recorded were 6.0 Kmph (in the month of May) and 02.6 Kmph (in the month of November) respectively. The Maximum number of days with wind speed (1-19 Kmph) were 25 in June, while the minimum number of days with wind speed (1-19 Kmph) were 13 in November.

### Wind direction

Long-Term wind direction is given in **Table 3-6**.

Table 3-6: Predominant Wind Direction based on Long-term Data (IMD Rohtak; 1991-2020)

Season	Month	Hours	Wind blow from		
			1st Predominant	2nd Predominant	3rd Predominant
Winter	January	I	SW	W	NW
		II	NW	W	E
	February	I	W	SW	NW
		II	NW	W	E
Summer	March	I	SW	W	NW
		II	NW	W	SW
	April	I	SW	W	NW
		II	NW	W	SW
	May	I	W	E	SW
		II	W	NW	E
Monsoon	June	I	W	E	SW
		II	W	E	NW
	July	I	E	W/SW	SE
		II	E	NE	NW
	August	I	E	SW	W
		II	E	W	NW
	September	I	SW	W	E
		II	NW	W	E
Post Monsoon	October	I	SW	W	E
		II	NW	W	E/NE/SW
	November	I	SW	W	NW/SE
		II	NW	W	SW
	December	I	SW	W	E
		II	NW	W	E/NE/SW
Annual		I	SW	W	NW
		II	NW	W	E

**Note:** I & II in hours describe Morning hours and Evening hours

Season specific wind rose diagram of secondary meteorological data from long-term climatological tables of Rohtak station published by Indian Meteorological Department for 30 years i.e. from 1991- 2020 area as presented in **Figure 3-3**.

**Figure 3-3: Season wise wind-rose diagrams – Long-term climatological tables**



### Cloud cover

The area remains cloudy between July – September (Throughout the year), which is the active period of the monsoon season. During this time cloud cover is between 0.7 to 4.5 Oktas during day time and 0.8 to 4.8 Oktas during night time.

### Rainfall

Average rainfall in the region is 613.5 mm. Maximum number of Rainy days recorded were 7.2 during July and August. While, maximum rainfall in a day recorded was 297.9 mm on 30<sup>th</sup> June, 1981.

### Average long term meteorological condition – IMD Rohtak (During 1991-2020)

Average meteorological condition is given in **Table 3-7**.

**Table 3-7: Average Meteorological condition at IMD Rohtak**

Month	Mean Daily Temperature		Rainfall Monthly (mm)	No. of Rainy days	Relative Humidity (%) (Mornings)	Relative Humidity (%) (Evening)
	Max	Min				
January	20.1	6.9	10.9	1.2	86	62
February	24.0	9.8	18.0	1.6	79	51
March	29.4	14.6	11.1	1.2	68	42
April	37.1	20.1	14.5	1.2	48	28
May	40.4	24.7	35.8	2.3	47	29
June	39.5	26.6	62.1	3.8	59	43
July	36.0	26.8	143.8	7.2	77	64
August	34.4	26.0	193.0	7.2	82	70
September	34.1	24.1	99.3	4.7	79	63
October	33.2	18.1	16.0	0.7	72	50
November	28.7	12.0	4.7	0.3	74	53
December	23.0	7.3	4.5	0.4	82	58
<b>Total</b>	-	-	<b>613.5</b>	<b>31.8</b>	-	-
<b>Average</b>	<b>31.7</b>	<b>18.2</b>	-	-	<b>71</b>	<b>51</b>

### 3.6.2 Primary Data Collection & Review – Site Specific Meteorology

The Baseline meteorological data collection was carried out for from 2<sup>nd</sup> February 2023 to 10<sup>th</sup> May 2023 for which a Meteorological station was setup at the ETP terrace of Asian Paints Ltd, Rohtak shown in **Photographs 3-2**.

**Photographs 3-2: Photographs showing Meteorological Station installed at site**



### Methodology for collection of meteorological data

Methodology for site-specific meteorological data collection is given in **Table 3-8**.

**Table 3-8: Monitoring Methodology for site-specific meteorological data collection**

S. No.	Sampling Parameters	Sample collection		Total Sampling Period	Sampling Frequency	Methodology
		Sampling equipment	Sensitivity/ Detection Limit			
1.	Wind Speed	Anemometer cup counter (0 to 65 m/s)	0.25 m/s	2nd February, 2023 to 10th May, 2023	Hourly	As per manufacturer's manual (IS 8829 - 1978) Instruments are calibrated.
2.	Wind Direction	Wind vane (0° to 357°)	1°			
3.	Temperature	Thermometer (-40° to 60°)	0.1°C			
4.	Humidity	Relative Humidity meter (0-99 %)	3 %			

S. No.	Sampling Parameters	Sample collection		Total Sampling Period	Sampling Frequency	Methodology
		Sampling equipment	Sensitivity/ Detection Limit			
5.	Rainfall	Rain gauge	0.5 mm		4 Hourly	Visual Inspection by the observer.
6.	Cloud Cover	--	--			

#### Site Specific Meteorological Data for 2<sup>nd</sup> February, 2023 to 10<sup>th</sup> May, 2023

Mean site average specific Meteorological data collected during study period is presented in **Table 3-9**.

**Table 3-9: Mean site specific meteorological data for Summer season 2023**

Hour	Temperature (deg C)	Relative Humidity (%)	Wind Speed (m/s)	Wind Direction (blowing from)	Rain Fall (mm)	Cloud Cover (Okta)
1	16.7	58.3	1.9	NW	0.0	0
2	17.7	56.1	3.3	W	0.0	0
3	20.4	47.5	2.5	W	0.0	0
4	23.8	38.0	2.8	W	0.0	0
5	27.4	29.7	2.7	NW/W	0.0	0
6	29.8	25.0	2.4	W	0.1	0
7	31.0	23.2	2.5	W	0.1	0
8	31.8	22.1	2.5	W	0.0	0
9	32.0	21.6	2.5	W	0.0	0
10	31.9	21.6	2.6	W	0.0	0
11	31.2	22.5	2.5	NW	0.0	0
12	29.5	27.5	2.3	NW	0.0	0
13	26.3	36.5	2.1	NW	0.0	0
14	24.1	40.3	2.1	NW	0.0	0
15	23.1	41.8	2.2	W	0.1	0
16	22.2	43.5	2.1	W	0.1	0
17	21.4	45.2	2.3	W	0.0	0
18	20.6	46.8	2.0	NW/W	0.0	0
19	19.9	48.6	2.2	NW	0.0	0
20	19.2	50.5	2.1	W	0.0	0
21	18.5	52.4	2.2	W	0.0	0
22	17.9	54.3	2.0	NW	0.0	0
23	17.5	55.9	2.0	NW/SW	0.0	0
24	17.1	57.1	2.0	SW	0.0	0
<b>Average</b>	<b>23.8</b>	<b>40.3</b>	<b>2.3</b>	<b>W</b>	<b>0.0</b>	<b>0</b>

Summary of site-specific meteorological data for 2<sup>nd</sup> February, 2023 to 10<sup>th</sup> May, 2023 presented in **Table 3-10**.

**Table 3-10: Site Specific meteorological data summary for 2<sup>nd</sup> February 2023 to 10<sup>th</sup> May 2023**

Parameter	Unit	Meteorological Data		
		Maximum	Minimum	Average
Temperature	°C	41.04	5.62	23.8
Humidity	%	95.56	8.16	40.3
Wind Speed	m/s	7.9	0.0	2.3
Cloud Cover	Tenth	0	0	0
Rainfall	mm	0.0	0	0
Predominant	-	1 <sup>st</sup> Predominant	2 <sup>nd</sup> Predominant	3 <sup>rd</sup> Predominant
Wind Direction	Blowing From	W	NW	E

Site Specific Meteorological data shows that:

- Average Temperature recorded as 23.8°C with maximum temperature recorded as 41.4°C and Minimum of 5.62°C.
- Average relative humidity was 40.3 % with maximum as 95.56 % and Minimum of 8.16%
- Wind blows predominantly from West direction followed by from NorthWest (NW) direction.
- Average wind speed was recorded 2.3 m/s, Maximum wind speed of 7.9 m/s and minimum of 0.0 m/s

### Mixing Height / Atmospheric Inversion Levels

The atmospheric inversion levels / mixing height is estimated based on the site specific Meteorological data and are presented in **Table 3-11**.

**Table 3-11: Average Mixing Height for 24 hrs period**

Hour	Mixing Height	Hour	Mixing Height
1	242.9	13	954.8
2	260.6	14	1069.0
3	367.2	15	1173.4
4	375.4	16	1245.3
5	368.2	17	1308.4
6	318.6	18	934.2
7	389.7	19	256.1
8	442.6	20	251.2
9	506.9	21	279.5
10	617.3	22	221.9
11	749.5	23	252.4
12	883.3	24	242.9

### Collation of site specific data with secondary data of IMD

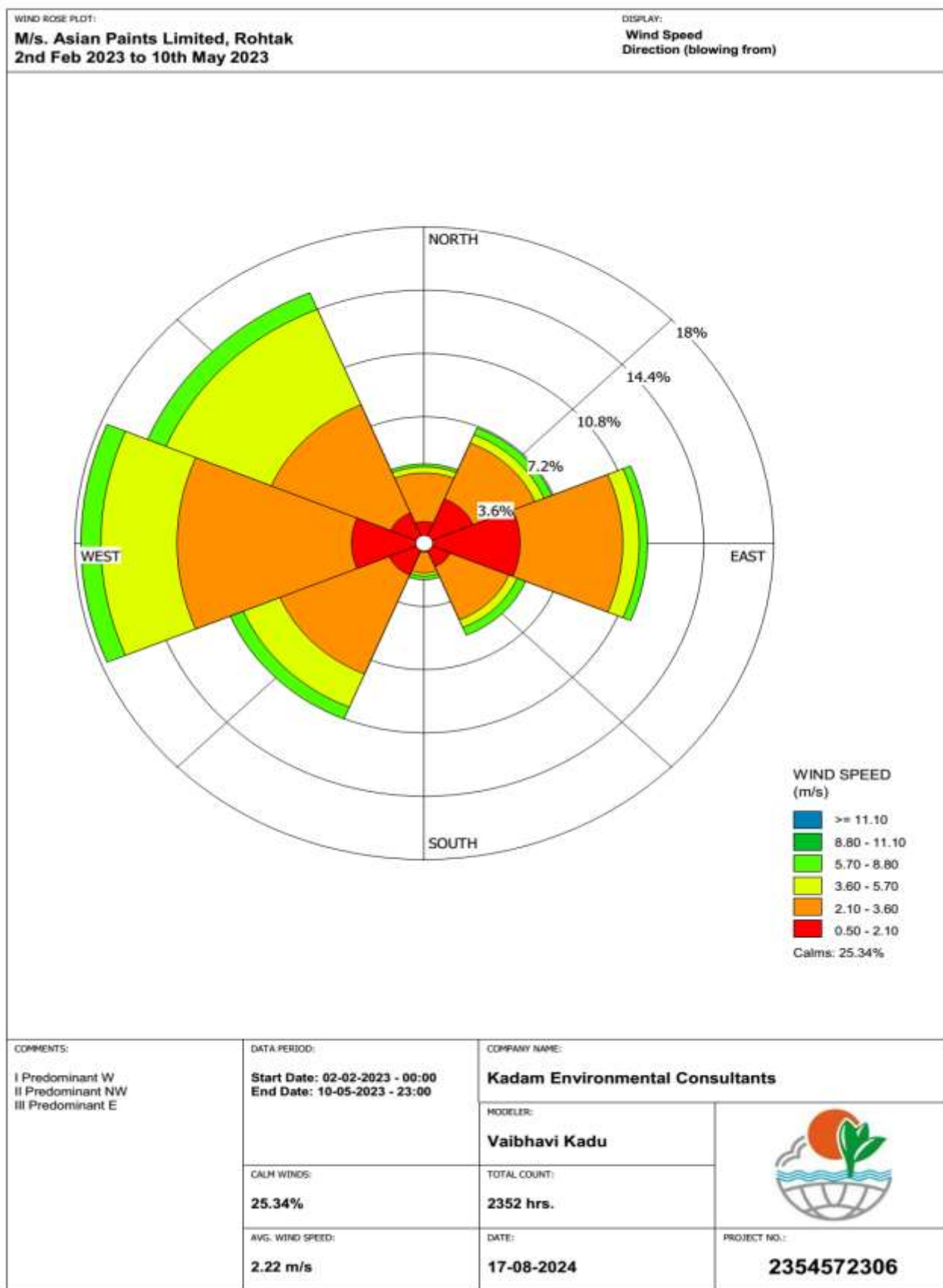
Site-specific meteorological data is compared with IMD – Rohtak station. Secondary data as given in **Table 3-12**.

Table 3-12: Collation of primary meteorological data with secondary data of IMD Rohtak

S. No.	Parameters	Site Specific (24 hours)	IMD, Rohtak (Long term 1991 – 2020); (8.30 and 17.30 hours only)	Remarks
		Summer Season, 2023	(February, March, April 1991-2020)	
1.	Wind Speed	Average Wind Speed: 2.3 m/s	Mean Wind Speed is 1.10 km/hr	Divergences noted can be ascribed to locational differences, differences in number of readings and duration of studies (one season v/s long term)
2.	Wind Direction	Wind blows predominantly from W direction. Calm Conditions: 1.4%	Wind blows predominantly from NW direction. Calm Conditions: 2.12 %.	
3.	Temperature	Maximum: 41.04°C Minimum: 5.62°C	Highest temperature: 31.7 °C Lowest temperature: 18.2°C	
4.	Relative Humidity	Maximum: 95.56% Minimum: 8.16%	Maximum: 71% (morning) Minimum: 51% (evening)	



**Figure 3-4: Wind Rose Diagram for site-specific meteorological conditions during baseline monitoring**



### 3.7 Ambient Air Quality

The basic objective of ambient air quality (AAQ) determination around the proposed project site was to assess the existing ambient levels of primary air pollutants in the area.

The criteria for selecting monitoring stations on the basis of available meteorological data and other related factors was to assess the general ambient air quality status of the area and to record the prevailing concentration of pollutants for determining critical targets for worst maximum concentrations.

#### 3.7.1 Selection of AAQ Monitoring Locations with Rationale

The locations for Ambient Air quality monitoring were decided based on the prescribed guidelines.<sup>5</sup>

Total Nine (9) AAQM stations were selected on the basis of local climate conditions mainly wind direction patterns which include base station, upwind station, downwind station and crosswind station as per wind regime. These stations were located within rural settlements as well as in consideration of other important features of the study area. Details of AAQ monitoring locations are given in **Table 3-13**.

**Table 3-13: Ambient air quality monitoring locations**

Sl. No.	Code No.	AAQM Station	Latitude	Longitude	Distance from project site (Km)	Direction (from project site)	Justification
1	AA 01	At site	28°52'6.63"N	76°40'31.12"E	-	-	Base Station
2	AA 02	Bohar village	28°53'23.04"N	76°38'52.83"E	3.10	NW	To assess the air quality at the village located in 2 <sup>nd</sup> predominant Upwind direction
3	AA 03	Gandhra village	28°49'47.18"N	76°43'25.75"E	6.30	SE	To assess the air quality at the village located in 2 <sup>nd</sup> predominant Downwind direction
4	AA 04	Sector-28, Rohtak	28°52'13.04"N	76°37'47.31"E	4.00	W	To assess the air quality at the area of sector-28 located in 1 <sup>st</sup> predominant upwind direction
5	AA 05	Paksma village	28°52'11.09"N	76°44'14.71"E	5.79	E	To assess the air quality at the village located in 1 <sup>st</sup> predominant Downwind direction
6	AA 06	Garhi Bohar village	28°51'46.93"N	76°39'53.38"E	0.46	SW	To assess the air quality at the village located in 1 <sup>st</sup> predominant upwind direction
7	AA 07	Baliana village	28°52'35.07"N	76°41'5.82"E	0.9	NE	To assess the air quality at the village located in 3 <sup>rd</sup> predominant Downwind direction
8	AA 08	Ladhaut Bhaiyanpur	28°56'18.28"N	76°40'12.14"E	7.21	N	To assess the air quality at the village located in Crosswind
9	AA 09	Chuliana village	28°53'56.81"N	76°42'31.20"E	7	S	To assess the air quality at the village located in Crosswind

Photographs of Air Quality monitoring are presented in

<sup>5</sup> As per Guidelines for Ambient Air Quality Monitoring by CPCB, MoEF Published as SERIES: NAAQMS/ .../2003-04, April, 2013.

**Photographs** 3-3 and sampling location map is presented in **Map 3-3**.

**Photographs 3-3: Ambient Air Quality Monitoring**



AA-01 (Project Site)



AA-02 (Bohar Village)



AA-03 (Gandhra Village)



AA-04 (Sector-28, Rohtak)



AA-05 (Paksma Village)



AA-06 (Garhi Bohar Village)



AA-07 (Baliana Village)



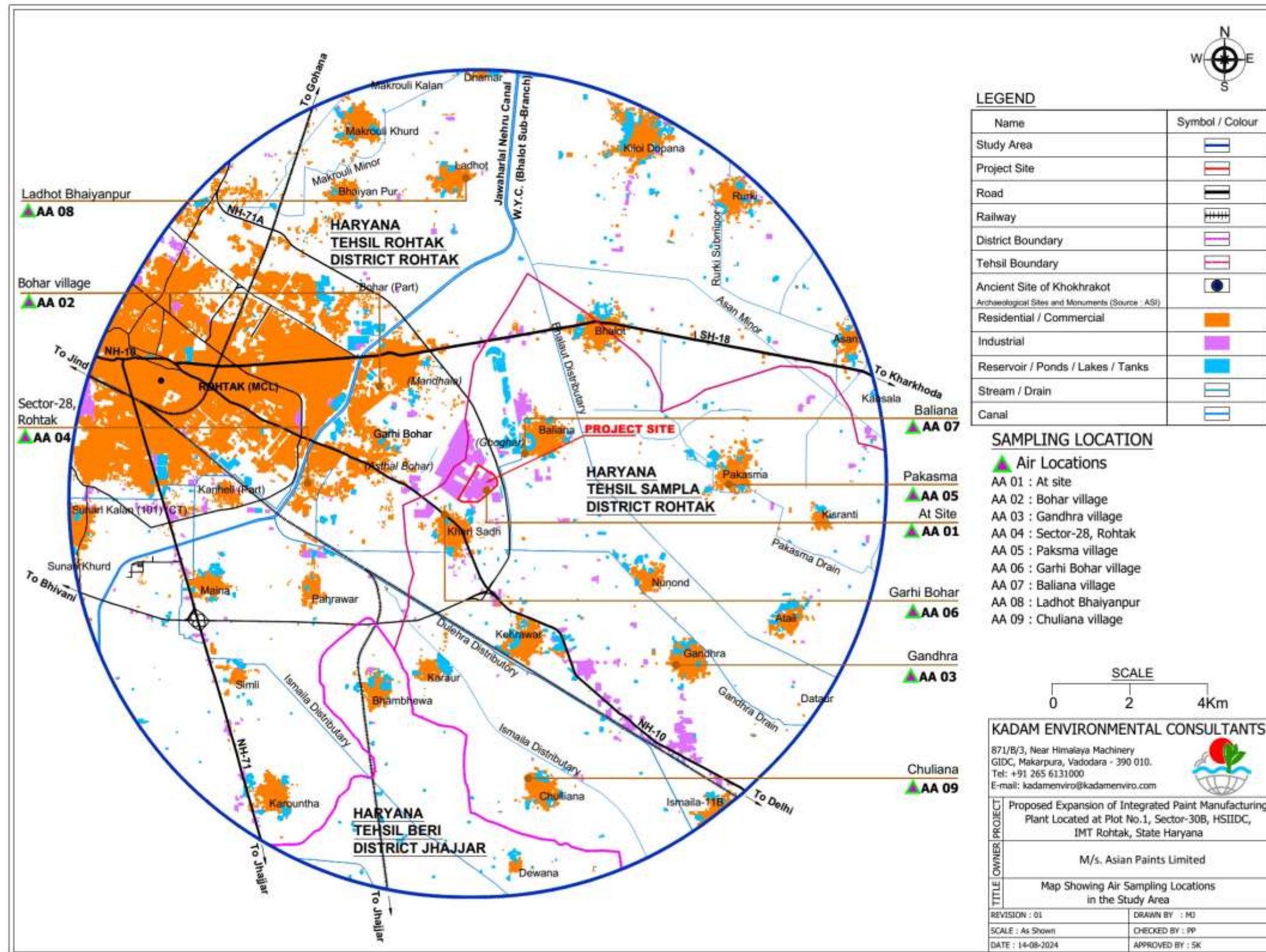
AA-08 (Ladhaut Bhaiyanpur)



AA-09 (Chuliana Village)



Map 3-3: Ambient Air Sampling Location Map



### Parameters monitored & Methodology of Ambient Air Quality Monitoring

The pollutants monitored are Particulate Matter (PM<sub>10</sub>, PM<sub>2.5</sub>), Sulphur Dioxide (SO<sub>2</sub>), Oxides of Nitrogen (NO<sub>x</sub>), Volatile Organic Carbons (VOC), Hydrocarbons (HC-as Methane) and Carbon Monoxide (CO). AAQM monitoring was finalised as per IS 5182 methods. The sampling methodology for ambient air quality monitoring is presented in **Table 3-14**.

**Table 3-14: Methodology for Ambient Air Quality Monitoring**

S. No.	Env. Component	Sampling location	Total Sampling Period	Sampling Frequency	Sample Collection & Analysis					Method
					Parameters	Field Instrument	Analytical Instrument	Sensitivity	Detection Limit	
1.	Ambient Air Quality	9 (Nine) Locations	Summer Season (2 <sup>nd</sup> February, 2023 to 10 <sup>th</sup> May, 2023)	24 – hour sample collection twice a week at each station	PM <sub>10</sub>	Respirable Dust Sampler (RDS) APM-460	Electronic balance	± 0.01 mg	10.0 µg/m <sup>3</sup>	IS: 5182: Part 23, 2006, with cyclone
					PM <sub>2.5</sub>	Fine Particulate sampler AAS-127	Electronic balance	± 0.01 mg	2.0 µg/m <sup>3</sup>	CPCB Guideline volume -1 (Gravimetric method)
					SO <sub>2</sub>	Impinger Module with control valve & Flow Meter (attached to RDS)	Spectrophotometer	± 0.001 nm	3.75 µg/m <sup>3</sup>	IS: 5182: Part 2 (2001)
					NO <sub>x</sub>	Impinger Module with control valve & Flow Meter (attached to RDS)	Spectrophotometer	± 0.001 nm	6 µg/m <sup>3</sup>	IS: 5182: Part 6 (2006)
3.				Grab sample collection once a week at each station	HC as Methane	Tedler Bags & Pump	Gas Chromatograph	-	327 mg/m <sup>3</sup>	IS 5182 (Part 17) : 1979 (RA 2003)
4.				1 hour sample collection once a week at each station	CO	Tedler Bags & Pump	Gas Chromatograph	-	0.57 mg/m <sup>3</sup>	IS 5182 (Part 10): 1999 (RA 2009)
5.				24 –hour sample collection once a week at each station	VOC (as BTX)	Charcoal tube attached with sampler	Gas Chromatograph	-	1 µg/m <sup>3</sup>	IS 5182 (Part 11): 2006 (RA – 2017)

### 3.7.2 Ambient Air Monitoring Analysis Results

Date wise detailed results of AAQM analysis are given in **Annexure 16**. Summary of the ambient air quality analysis are represented in **Table 3-15**.

Table 3-15: Summary of Ambient Air Quality monitoring result

Average Pollutant Concentration µg/m3, except CO (in mg/m3)								
Pollutants→		PM10	PM2.5	SO2	NOx	HC	CO	VOC
Time Weighted Average →		(24hr.)	(24hr.)	(24hr.)	(24hr)	Grab	(1 hr)	(24hr)
CPCB Norms→	Industrial, Residential, Rural and Other Area	100	60	80	80	NS	4	NS
	Ecologically Sensitive Area (Notified by Central Govt.)	100	60	80	80	NS	4	NS
Particular		Sampling Location & Code						
(AA01) At Site								
Maximum		118	40	11.0	17.7	1012	1.18	<1
Minimum		58	11	3.8	6.0	911	0.84	<1
Average		92	25	8.5	12.4	955	1.04	<1
98%tile		117	39	10.8	17.3	1008	1.18	<1
(AA02) BOHAR VILLAGE								
Maximum		113	39	9.7	18.6	1038	1.25	<1
Minimum		37	9	3.8	6.0	938	0.87	<1
Average		77	24	8.0	11.4	984	1.01	<1
98%tile		109	38	9.7	18.2	1035	1.24	<1
(AA03) GANDHRA VILLAGE								
Maximum		96	41	10.1	21.0	1087	1.29	<1
Minimum		57	15	3.8	13.5	973	0.99	<1
Average		80	27	7.9	16.4	1028	1.11	<1
98%tile		96	41	10.0	20.3	1085	1.28	<1
(AA04) SECTOR-28 ROHTAK								
Maximum		97	39	9.7	28.0	1087	1.16	<1
Minimum		32	7	6.4	12.0	973	1.01	<1
Average		72	26	8.2	16.2	1033	1.09	<1
98%tile		96	38	9.6	25.6	1085	1.16	<1
(AA05) PAKASMA VILLAGE								
Maximum		116	56	10.2	21.5	1038	1.18	<1
Minimum		63	9	6.3	12.0	955	0.85	<1
Average		92	25	8.2	15.4	988	1.04	<1
98%tile		114	50	9.9	21.0	1034	1.18	<1
(AA06) GARHI BOHAR VILLAGE								
Maximum		109	36	9.4	19.4	1004	1.25	<1
Minimum		36	7	6.8	12.7	911	0.87	<1
Average		83	26	8.4	14.9	956	1.08	<1
98%tile		108	35	9.4	18.5	1004	1.24	<1
(AA07) BALIANA VILLAGE								
Maximum		110	58	9.8	20.0	1004	1.22	<1
Minimum		46	7	4.6	6.4	935	1.03	<1
Average		85	26	7.8	14.4	966	1.12	<1
98%tile		110	52	9.8	19.7	1002	1.22	<1
(AA08) LADHAUT BHAIYANPUR								



Average Pollutant Concentration $\mu\text{g}/\text{m}^3$ , except CO (in $\text{mg}/\text{m}^3$ )								
Pollutants→		PM10	PM2.5	SO <sub>2</sub>	NO <sub>x</sub>	HC	CO	VOC
Time Weighted Average →		(24hr.)	(24hr.)	(24hr.)	(24hr)	Grab	(1 hr)	(24hr)
CPCB Norms→	Industrial, Residential, Rural and Other Area	100	60	80	80	NS	4	NS
	Ecologically Sensitive Area (Notified by Central Govt.)	100	60	80	80	NS	4	NS
Particular		Sampling Location & Code						
Maximum		115	38	11.3	23.0	1062	1.20	<1
Minimum		61	21	7.4	13.5	961	0.86	<1
Average		90	30	9.3	16.9	1005	1.06	<1
98%tile		113	38	11.0	22.5	1058	1.20	<1
(AA09) CHULIANA VILLAGE								
Maximum		97	39	10.7	23.0	1038	1.23	<1
Minimum		39	11	5.6	11.0	955	0.99	<1
Average		74	21	8.2	15.2	993	1.11	<1
98%tile		97	37	10.4	22.2	1035	1.23	<1

### Observations:

The comparison of the results with the value range indicators NAAQ standards 2009 provided by CPCB for Industrial, Residential, Rural & Other Area indicates:

- At various locations, average concentration of PM10 was observed varying from 72 to 92  $\mu\text{g}/\text{m}^3$ . Average concentration of PM10 levels are within the permissible limits at all locations.
- Average concentration of PM2.5 levels was observed in range of 21 to 30  $\mu\text{g}/\text{m}^3$ , which is less than the permissible limits for all locations.
- Average concentration of SO<sub>2</sub> levels was observed in the range of 7.8 to 9.3  $\mu\text{g}/\text{m}^3$ , which is within the specified limit of CPCB.
- NO<sub>x</sub> levels were observed in the range of 11.4 to 16.9  $\mu\text{g}/\text{m}^3$ , which is within the specified limit of CPCB.
- Concentration of VOC level was observed to be below detectable level i.e. < 1.0  $\mu\text{g}/\text{m}^3$ .
- Average concentration of HC was found in the range of 955 to 1033  $\mu\text{g}/\text{m}^3$ .
- Average concentration of CO level was noted in the range of 1.01 – 1.12  $\text{mg}/\text{m}^3$ .

## 3.8 Traffic Survey

Traffic survey is one of the important parameter to estimate possible increase in pollution level in the vicinity of project area due to movement of vehicles. The vehicle movement may have impact on ambient air quality and it is considered as line source. Vehicles are of two types, passenger and commercial/goods vehicles. Passenger vehicles include Buses, Taxies & Jeeps; whereas commercial/goods vehicles take account of tankers, trucks and containers.

Traffic survey was carried out on important roads as well as site approach roads. Traffic survey has vital role in finding existing traffic density on the roads near to the site. In comparison with existing traffic concentration, it is easy to estimate not only incremental numbers of various means of transportation but also pollution levels due to proposed project.

### 3.8.1 General Study Methodology

Manual methods use field personal to count and classify traffic flowing past a fixed point. Number of enumerators needed to count the vehicle depends upon the number of lanes in highway on which count is to be taken, type and accuracy of information desired. IRC recommends recording of data in each direction of travel separately and posting of observers for each direction. It is desirable to have literate enumerators with qualification preferably

middle or matriculation accuracy and maintaining precision the work is done in shifts, with adequate time given to each surveyor for rest as well as food and water.

The data is recorded mostly in five Dash system in which vertical Strokes are entered for the first 4 vehicles which is followed by an Oblique stroke for the Fifth so as to represent a total of 5. Once an observer is familiar with this system, he tends to follow this is momentarily evaluation simple, hassle free with minimum of errors.

For example, for Traffic entering a Four legged intersection, is broken usually into three Categories viz a viz Left Turning, Right turning and Straight ahead traffic enumerator flow conditions are such that the percentage of U significant than they are also calculated. IRC has prescribed the field data sheet for such flow and based on our experience for the survey on rural roads.

### 3.8.2 Parameters/ Vehicle Classification

Vehicles were classified into two types: mechanized and non-mechanized. Mechanized vehicles include two-wheelers (bikes/ mopeds/ scooters), three-wheelers (rickshaws/ small 3W Tempos), and four-wheelers (cars/ jeeps/ trucks/ buses/ tractors, etc.). Non-mechanized vehicles include cycles/tricycles/carts.

### 3.8.3 Road Identification for Traffic Survey

Sample Code	Location	Road Name	Latitude	Longitude	Remarks
TS 01	Nr. IMT Chock	IMT Road	28°51'52.26"N	76°39'44.86"E	Double Road two-way with divider

### 3.8.4 Traffic Survey – Methodology

A traffic survey was carried out on both sides (up and down) of selected important roads, per IRC guidelines. Vehicles were classified into two types: Mechanic and Non-Mechanic.

The Mechanized vehicles including two-wheelers (bikes/Mopeds/Scooters), three-wheelers (rickshaws/small 3W tempos), four wheelers (Cars/Jeeps/Trucks/Buses/Tractors, etc.). The Non-mechanized vehicles include Cycle/Tricycle/Carts.

Vehicle counts were recorded at every 15-minute interval for 24 hours. Traffic Survey data sheets are given in **Annexure 19**.

Based on traffic count on road, the capacity of road to be find out by using the equivalent factor for PCU for various category vehicles. It is compared with IRC recommended PCU/day. All calculations are based on Guidelines for IRC for Highways in IRC: 64-1990. Photographic documentation of traffic study are shown in

***Photographs*** 3-4.

**Photographs 3-4: Traffic Survey at IMT Entrance Road Sector 30-B Rohtak**



**3.8.5 Traffic Survey – Existing traffic density (Vehicles count)**

Existing vehicle count /density as vehicles over 24-hour duration for up & down traffic flow is given in **Table 3-16**.

**Table 3-16: Existing Traffic survey density over 24 hours duration (total vehicles count) – APL to IMT Chock**

Name of the Road: APL to IMP Chock												
Traffic Flow	Fast moving Vehicles						Slow moving Vehicles					Total
	Motorcycle /Scooters	Passenger Car, Pick-up Van or Auto-Rickshaw	Agricultural Tractor, Light Commercial Vehicles	Truck	Bus	Truck-Trailer, Agricultural Tractor-Trailer	Cycle	Cycle Rickshaw	Hand Cart	Horse-drawn vehicle	Bullock Cart	
Towards APL (Up)	3047	1239	207	380	61	59	267	1	0	0	0	5261
Towards IMT Chock (down)	2916	1213	206	373	47	59	255	1	0	0	0	5070
	<b>5963</b>	<b>2452</b>	<b>413</b>	<b>753</b>	<b>108</b>	<b>118</b>	<b>522</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10331</b>

**Traffic survey study data on APL to IMT Chock traffic flow towards APL (Up) & IMT Chock (Down)**

Existing Traffic counts as vehicles in PCU/Hr for up & down traffic flow are presented respectively in **Table 3-17**.

**Table 3-17: Existing traffic in PCU/Hr for traffic flow to APL (Up)**

Sr No	Vehicle Type	Equivalent PCU Factors**	No. of count (UP-to LNG)	Share %	Calculated PCU/day	Calculated PCU/Hr
<b>Fast Vehicles</b>						
1	Motorcycle or Scooter etc.	0.50	3047	57.9	1524	63
2	Passenger Cars, Pick-up Van, Auto-rickshaw	1.00	1239	23.6	1239	52
3	Agricultural Tractor, Light Commercial vehicles	1.50	207	3.9	311	13
4	Truck or Bus	3.00	441	8.4	1323	55
5	Truck-trailer, Agricultural Tractor-Trailer	4.50	59	1.1	266	11
<b>Slow Vehicles</b>						
6	Cycle	0.50	267	5.1	134	6
7	Cycle-Rickshaw	2.00	1	0.0	2	0
8	Hand Cart	3.00	0	0.0	0	0
9	Horse-drawn vehicle	4.00	0	0.0	0	0
10	Bullock Cart	8.00	0	0.0	0	0
<b>Total</b>			<b>5261</b>	<b>100.0</b>	<b>4797</b>	<b>200</b>
<b>Note:</b> *PCU: Passenger Car Unit, Source: ** Equivalent Factor for PCU calculations are considered from Guidelines for Capacity of Roads IRC, Table 1: Recommended PCU (Passenger Car Unit) factor for various types of vehicles on Urban Areas.						

**Table 3-18: Existing traffic in PCU/Hr for traffic flow to IMT Chock (DOWN)**

Sr No	Vehicle Type	Equivalent PCU Factors**	No. of count (UP-to APL)	Share %	Calculated PCU/day	Calculated PCU/Hr
<b>Fast Vehicles</b>						
1	Motor cycle or Scooter etc.	0.50	2916	57.5	1458	61
2	Passenger Car, Pick-up Van, Auto-rickshaw	1.00	1213	23.9	1213	51
3	Agricultural Tractor, Light Commercial vehicles	1.50	206	4.1	309	13
4	Truck or Bus	3.00	420	8.3	1260	53
5	Truck-trailer, Agricultural Tractor-Trailer	4.50	59	1.2	266	11
<b>Slow Vehicles</b>						
6	Cycle	0.50	255	5.0	128	5
7	Cycle-Rickshaw	2.00	1	0.0	2	0
8	Hand Cart	3.00	0	0.0	0	0
9	Horse-drawn vehicle	4.00	0	0.0	0	0
10	Bullock Cart	8.00	0	0.0	0	0
<b>Total</b>			<b>5070</b>	<b>100.0</b>	<b>4635</b>	<b>193</b>
<b>Note:</b> *PCU: Passenger Car Unit, Source: ** Equivalent Factor for PCU calculations are considered from Guidelines for Capacity of Roads IRC, Table 1: Recommended PCU (Passenger Car Unit) factor for various types of vehicles on Urban Areas.						

### 3.9 Noise & Vibrations

#### 3.9.1 General Study Methodology

Monitoring of noise is done by identifying suitable number of noise quality monitoring locations. Background noise quality is monitored in dB (A) Leq (d) and dB (A) Leq (n) at the selected locations.

#### 3.9.2 Methodology for Noise Level Analysis

- Identification of sources of noise and vibrations at proposed project.
- Identification of baseline monitoring station within study area.
- Noise sampling during study period and report its results.
- To run sound plan software for assessment of noise levels.
- Determining possible impacts of Noise & Vibrations on the environment.
- Checking whether the increase of SPL in the locations surrounding the project.
- Suggestions of mitigation measures of Noise/Vibrations and to reduce noise/vibrations of sources exceeding the allowable limits of SPL.

Methodology for monitoring ambient Noise Level is as given in **Table 3-19**.

**Table 3-19: Ambient Noise Level Monitoring Methodology**

Env. Component	Sampling location	Sampling Frequency	Methodology	Sample collection		Sampling Parameter
				Sampling equipment	Detection Limit	
Ambient Noise	08 Locations	Once during the study (Hourly reading for 24 hours at each location)	IS 9989 -1981 Reaffirmed 2001	Sound Level Meter	0.1 dB (A)	Decibels – dB (A)

The standard for monitoring ambient noise level as per CPCB guidelines is as given in **Table 3-20**.

**Table 3-20: Ambient Air Quality Standards in respect of Noise for Different Areas/Zones**

Ambient Air Quality Standards in Respect of NOISE	Area Code	Category	Limits in dB(A) Leq*	
			Day Time	Night Time
THE NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000	A	Industrial	75.0	70.0
	B	Commercial	65.0	55.0
	C	Residential	55.0	45.0
	D	Silence	50.0	40.0

Day Time: 6:00 AM to 10:00 PM; Night Time: 10:00 PM to 6:00 AM

**Note:** dB (A) Leq\*: denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

#### 3.9.3 Primary data collection & Review – Noise Level Monitoring

##### Sampling Location Details

Locations for noise monitoring were identify by desktop study and fixed the location during field survey within maximum distance of 2.0 km from the source of noise generation i.e. proposed plant area and at sensitive locations i.e. nearby habitation area.

Sampling location map is presented in **Map 3-4** and the locations selected for ambient noise quality monitoring are presented in **Table 3-21**.

**Table 3-21: Ambient Noise monitoring Locations**



Loc. Code	Location	Date	Category	Distance w.r.t site (km)	Direction (from site)	Coordinates	
						Latitude	Longitude
NL01	At Site (Main Gate - E)	02/02/2023	Industrial	-	N	28°52'08.45"N	76°40'37.11"E
NL02	At Site (S Gate)	03/02/2023	Industrial	-	S	28°51'57.43"N	76°40'14.49"E
NL03	At Site (Plant Area)	03/02/2023	Industrial	-	E	28°52'04.95"N	76°40'15.44"E
NL04	At Site (Plant Area)	03/02/2023	Industrial	-	SE	28°52'07.31"N	76°40'22.99"E
NL05	At Site (North Side)	12/06/2023	Industrial	-	W	28°52'19.87"N	76°40'23.52"E
NL06	At Site (Plant Area)	03/06/2023	Industrial	-	E	28°52'15.89"N	76°40'32.59"E
NL07	Baliana	02/02/2023	Residential	2.2	SW	28°52'40.15"N	76°41'18.88"E
NL08	Kheri Sadh	17/03/2023	Residential	1.8	N	28°51'36.92"N	76°40'11.18"E

Photographs 3-5: Photograph of Noise Monitoring



NL01 At Site (Main Gate - E)



NL02 At Site (S Gate)



NL03 At Site (Plant Area)



NL04 At Site (Plant Area)





NL05 At Site (North Side)



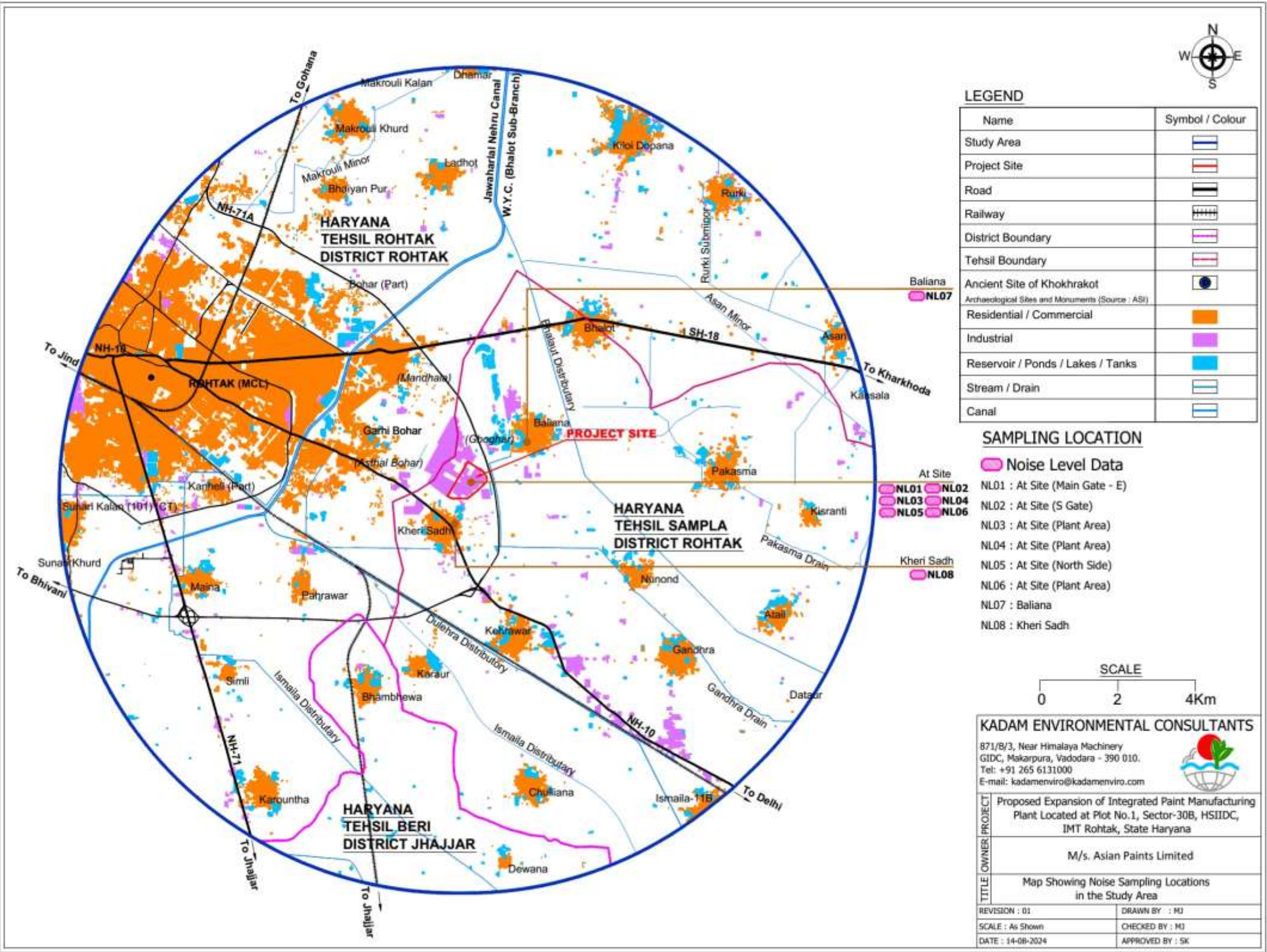
NL07 Baliana

NL06 At Site (Plant Area)



NL08 Kheri Sadh

Map 3-4: Noise Sampling Location Map



**Table 3-22: Ambient Noise Level Results**

Loc. Code	Location	Date	Category	CPCB Limits in dB (A)		Avg. Noise levels in dB (A)	
				Day Time	Night Time	Day Time	Night Time
NL01	At Site (Main Gate - E)	02/02/2023	Industrial	75.0	70.0	59.8	56.7
NL02	At Site (S Gate)	03/02/2023	Industrial	75.0	70.0	64.1	57.8
NL03	At Site (Plant Area)	03/02/2023	Industrial	75.0	70.0	65.2	55.2
NL04	At Site (Plant Area)	03/02/2023	Industrial	75.0	70.0	56.7	48.9
NL05	At Site (North Side)	12/06/2023	Industrial	75.0	70.0	65.5	59.7
NL06	At Site (Plant Area)	03/06/2023	Industrial	55.0	45.0	54.1	44.2
NL07	Baliana	02/02/2023	Residential	55.0	45.0	53.7	43.1
NL08	Kheri Sadh	17/03/2023	Residential	55.0	45.0	54.1	44.3

### 3.9.4 Observation

Noise level during daytime & nighttime, in Industrial area and Residential area was observed within CPCB standards i.e. Industrial area (75 dBA (d) & 70 dBA (n)) and Residential area (55 dBA (d) & 45 dBA (n)).

## 3.10 Surface Water Quality

Surface Water Quality monitoring was carried out in the study area of 10 km based on the land use pattern and ground truth of surrounding area (Monitoring Period: Pre monsoon i.e. **2<sup>nd</sup> February, 2023 to 10<sup>th</sup> May, 2023**). The selection of sampling locations is based on:

- Surface water drainage pattern / prevalent direction of general gradient of surface water flow
- Nearby vicinity of surface water bodies upstream and downstream of the site.
- Selection of upstream and downstream of open surface water bodies in immediate vicinity are the principal areas where there would be an immediate impact due to any contaminated water drainage out of site premises.
- This signifies the baseline water quality within the study area.

### 3.10.1 Methodology Adopted

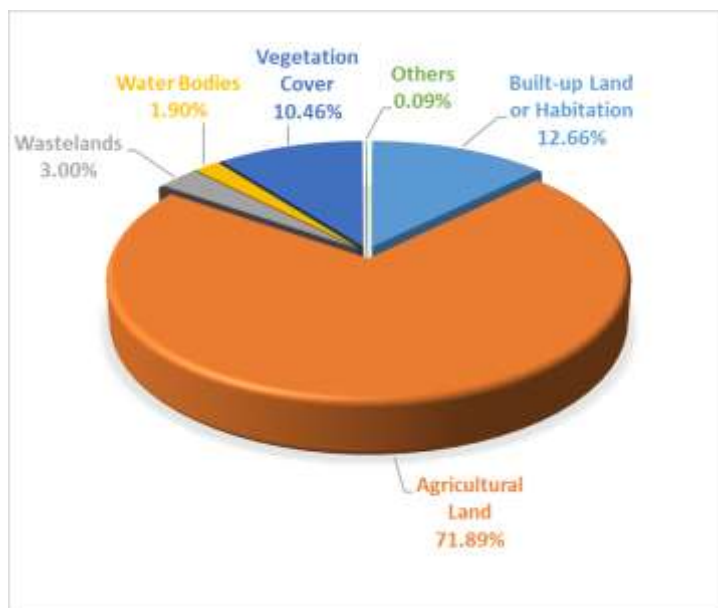
The considerations made for selection of the sampling locations is as under:

1. Surface water drainage pattern / prevalent direction of general gradient of surface water flow.
2. Nearby vicinity of surface water bodies upstream and downstream of the site.
3. Selection of upstream and downstream surface water bodies in immediate vicinity are the principal areas where there would be an immediate impact due to any contaminated water drainage out of site premises.

This will signify the baseline water quality within the study area. Surface water sampling locations are selected based on review of land use plan, surface drainage pattern and flow direction within the 10 km radius of project. The surface water drainage map is presented in **Map 3-8**.

### Land Use Map of Study Area

The land use map of the study area is shown in **Map 3-1** and sampling location map is given in **Map 3-5**.

**Figure 3-5: Pie Chart of LULC classes in the study area****3.10.2 Justification of Sample Collection – Surface Water**

Surface water sampling locations are selected based on review of land use map (**Map 3-1 & Figure 3-2**), surface drainage pattern/ground water flow direction (**Map 3-8**) & nearby site habitation village /locations in 10 km radius of project (**Map 2-3**).

**3.10.3 Details of Surface Water Sampling Locations**

Total 08 nos. of Surface water sampling locations were selected to assess the surface water quality. The details of surface water sampling locations are presented in **Table 3-23**.

**Table 3-23: Details of Surface Water Sampling Locations**

Sampling Code	Location	Source	Latitude	Longitude	Distance from project site (km)	Direction w.r.t to project site
SW01	Bauwara Village	Pond	28° 53' 03.24" N	76° 41' 09.18" E	1.2	NE
SW02	Kheri Sadh Village	Pond	28° 51' 43.00" N	76° 40' 14.18" E	0.42	NNE
SW03	Tilyar lake	Lake	28° 52' 46.25" N	76° 38' 10.51" E	3.5	ESE
SW04	Kharawar Village	Pond	28° 50' 09.29" N	76° 41' 01.99" E	3.4	NNW
SW05	Bhaluat Village	Pond	28° 54' 09.10" N	76° 41' 58.03" E	4.0	SW
SW06	Sector 33 Rohtak	Pond	28° 53' 45.54" N	76° 39' 37.58" E	2.86	SSE
SW07	Jawaharlal Nehru Canal Nr. Omaxe city	Canal	28° 52' 06.52" N	76° 37' 34.27" E	4.3	E
SW08	Pakasma Village	Pond	28° 52' 29.61" N	76° 44' 6.38" E	5.52	W

Sampling location map is as presented in **Map 3-5**. Surface Water drainage is presented in **Map 3-8**

Photographs of surface water sampling are as presented in

***Photographs 3-6.***



**Photographs 3-6: Surface Water Sampling**



SW01- Bauwara Village



SW02- Kheri Sadh Village



SW-03- Tilyar lake



SW-04- Kharawar Village



SW05- Bhaluat Village



SW06- Sector 33 Rohtak



SW07- Jawaharlal Nehru Canal Nr. Omaxe city



SW08- Pakasma Village

### 3.10.4 Analysis Method Adopted

Surface water samples are collected using manual grab sampling technique. The samples were further analysed as per the APHA Standard Methods (23<sup>rd</sup> Edition). **Table 3-24** below describes analytical methodology for parameters to be analysed and with minimum detection limit of the instruments available at KEC laboratory.

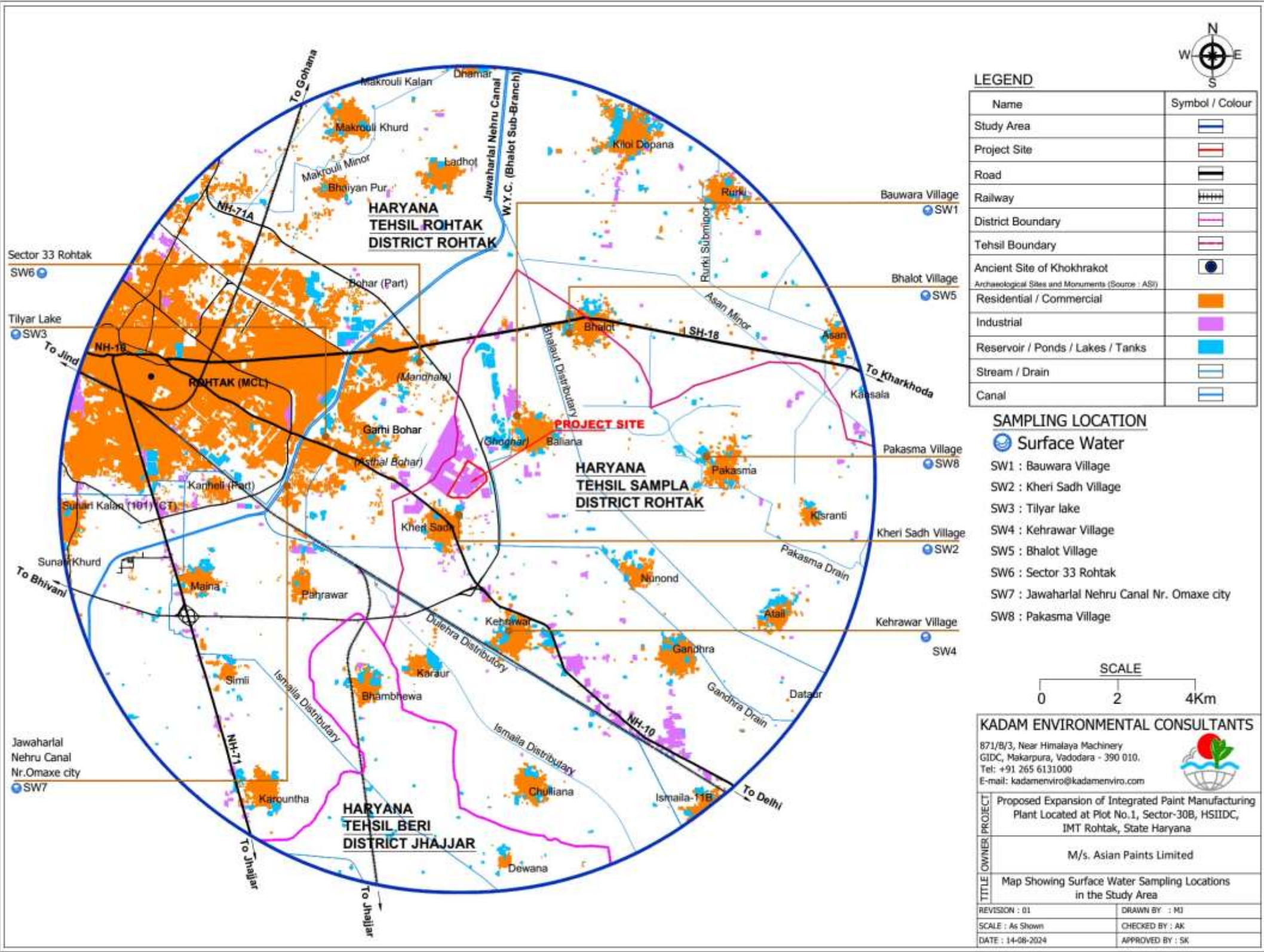
**Table 3-24: Analysis Methods Adopted for Surface Water Samples**

S. No.	Parameters	Methodology	Minimum Detection Limit
1	pH	APHA: 4500-H+ B (23 <sup>rd</sup> Edition), Electrometric method	2
2	TDS	APHA: 2540C (23 <sup>rd</sup> Edition), Gravimetric	3 mg/l
3	Electrical conductivity	APHA: 2510 B (23 <sup>rd</sup> Edition), Conductivity meter	1µmoh/cm
4	COD	APHA: 5220 B (23 <sup>rd</sup> Edition), Open reflux method	5 mg/l
5	BOD	IS: 3025 (Part – 44): 1993 (RA 2014) Iodometric	2 mg/l
6	Chlorides	APHA: 4500-Cl- B (23 <sup>rd</sup> Edition), Argentometric method	1.0 mg/l
7	Phenol	APHA: 5530-D (23 <sup>rd</sup> Edition), Direct photometric Method	0.001 mg/l
8	Sulphates	APHA:4500-E as SO42-(23 <sup>rd</sup> Edition), Turbidimetric method	1 mg/l
9	Total Hardness	APHA: 2340-C (23 <sup>rd</sup> Edition), EDTA Titrimetric method	2 mg/l
10	Ca++ Hardness	APHA: 3500-Ca-B (23 <sup>rd</sup> Edition) EDTA Titrimetric method	2 mg/l
11	Mg++ Hardness	APHA: 3500-Mg-B (23 <sup>rd</sup> Edition), By calculation	2 mg/l
12	Total Alkalinity	APHA: 2320 B (23 <sup>rd</sup> Edition), Titration method	5 mg/l
13	Nitrate	IS: 3025 (part-34)1988 (RA 2014), 3.3 colorimetric method	0.1 mg/l
14	Nitrite	IS: 3025 (part-34) 1988 (RA 2014)	0.05 mg/l
15	Fluoride	APHA: 4500 F-D (23 <sup>rd</sup> Edition), SPANDS method	0.05 mg/l
16	Sodium	APHA: 3500 Na-B (23 <sup>rd</sup> Edition), Flame emission Photometric method	1 mg/l
17	Potassium	APHA: 3500 K-B (23 <sup>rd</sup> Edition) Flame emission Photometric method	1 mg/l
18	Calcium	APHA: 3500-Ca-B (23 <sup>rd</sup> Edition) EDTA Titrimetric method	2 mg/l
19	Magnesium	APHA: 3500-Mg-B (23 <sup>rd</sup> Edition), Calculation method	2 mg/l
20	Salinity	APHA: 2520 B (23 <sup>rd</sup> Edition), Electrical Conductivity method	-
21	Total Nitrogen	APHA: 4500 N Org-B, (23 <sup>rd</sup> Edition), Macro Kjeldahl method	0.05 mg/l
22	Total Phosphorous	APHA: 4500 P-C (23 <sup>rd</sup> Edition), Colorimetric method	0.02 mg/l
23	Dissolved Oxygen	APHA: 4500 O-C(23 <sup>rd</sup> Edition), Iodometric method	0.2 mg/l
24	Ammonical Nitrogen	IS: 3025 (part-34), 1988 (RA 2014), Distillation & Colorimetric	0.05 mg/l
25	SAR	Flamephotometric & EDTA method	-



S. No.	Parameters	Methodology	Minimum Detection Limit
26	Heavy Metals	-	-
a	Arsenic (as As)	APHA: 3500-As-B (23 <sup>rd</sup> Edition) Silver di-ethyldithiocarbamate method/APHA: 3114-B (23 <sup>rd</sup> Edition) AAS	0.01 mg/l
b	Cadmium (as Cd)	APHA: 3111-B(23 <sup>rd</sup> Edition) AAS	0.003 mg/l
c	Chromium (as Cr)	APHA: 3500-Cr-B (23 <sup>rd</sup> Edition), colorimetric method	0.02 mg/l
d	Copper (as Cu)	APHA: 3500-Cu-B (23 <sup>rd</sup> Edition) Neocuproine method/ APHA: 3111- B (23 <sup>rd</sup> Edition) AAS	0.03 mg/l
e	Cyanide (as CN)	APHA: 4500 CN- D & E(23 <sup>rd</sup> Edition)	0.03 mg/l
f	Iron (as Fe)	APHA: 3500-Fe-B (23 <sup>rd</sup> Edition), Phenanthroline method/APHA: 3111-B (23 <sup>rd</sup> Edition) AAS	0.05 mg/l
g	Lead (as Pb)	APHA: 3111-B (23 <sup>rd</sup> Edition) AAS	0.01 mg/l
h	Mercury (as Hg)	IS 3025 (P-48): 1994 (RA 2014))/ APHA: 3112-B (23 <sup>rd</sup> Edition) Cold vapour AAS method	0.001 mg/l
i	Manganese (as Mn)	APHA: 3500-Mn-B (23 <sup>rd</sup> Edition) Persulphate method / APHA: 3111-B(23 <sup>rd</sup> Edition) AAS	0.02 mg/l
j	Nickel (as Ni)	APHA: 3111-B(23 <sup>rd</sup> Edition) AAS	0.02 mg/l
k	Zinc (as Zn)	APHA: 3111-B(23 <sup>rd</sup> Edition) AAS	0.03 mg/
l	Boron (as B)	APHA: 4500 B-C (23 <sup>rd</sup> Edition), Carmine method	0.05 mg/l
26	Total Coliform	APHA: 9221-B (23 <sup>rd</sup> Edition), Multiple Tube Fermentation	Absent
27	Fecal Coliform	APHA: 9221-E (23 <sup>rd</sup> Edition), Multiple Tube Fermentation	Absent
28	Oil and Grease	APHA: 5520-B (23 <sup>rd</sup> Edition)	1 mg/l

Map 3-5: Surface water sampling locations map



**Surface Water Quality**

Analytical results of the surface water samples are as presented in **Table 3-25**.

**Table 3-25: Analysis Result of Surface Water Samples**

Sr. No.	Parameters	Unit	Classification for Inland Surface Water (CPCB)					SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
			A	B	C	D	E	Baliana	Kherisadh	CGW Rohtak	Kharawar	Bhalaut	Sector 33	Omax City center	Pakashma
								Pond	Pond	Lake	Pond	Pond	Pond	Canal	Pond
1	pH	pH Scale	6.5 to 8.5	6.5 to 8.5	6.0 to 9.0	6.5 to 8.5	6.5 to 8.5	8.43	8.16	7.92	8.02	7.38	7.95	7.72	7.27
2	D.O.	mg/l	6.0	5.0	4.0	4.0	NA	<0.2	<0.2	6.1	1.1	<0.2	0.7	5.6	1.4
3	Total Dissolved Solids	mg/l	500.0	NA	1500	NA	2100	1816	2012	356	2139	2864	2284	340	3860
4	Electrical Conductivity	µmohs/cm	NA	NA	NA	1000	2250	2684	2975	582	3520	4715	3796	536	6424
5	COD	mg/l	-	-	-	-	-	170	174	17	115	306	149	34	98
6	BOD	mg/l	2.0	3.0	3.0	NA	NA	34	46	5	33	92	45	10	26
7	Color	Pt.co	10	300	300	-	-	20	25	10	20	10	15	10	10
8	Total Hardness	mg/l	300	NA	NA	NA	NA	590	750	330	770	900	770	280	1330
9	Ca++ Hardness	mg/l	200	NA	NA	NA	NA	128	264	66	110	200	108	96	408
10	Mg++ Hardness	mg/l	100	NA	NA	NA	NA	462	486	264	660	700	662	184	922
11	Chlorides(as CL)	mg/l	250	NA	600	NA	600	638	660	66	705	1108	895	58	1586
12	Sulphate	mg/l	400	NA	400	NA	1000	354	430	64	459	384	281	78	334
13	Nitrate (as NO3)	mg/l	20	NA	50	NA	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
14	Fluoride	mg/l	1.5	1.5	1.5	-	-	0.24	0.37	1.09	0.07	<0.05	0.29	<0.05	0.23
15	Phenolic Compound	mg/l	0.002	0.005	0.005	NA	NA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
16	Ammoniacal Nitrogen	mg/l	NA	NA	NA	1.2	NA	1.97	30.22	1.38	9.52	114.40	5.47	<0.05	4.80
17	Sodium Absorption Ratio		NA	NA	NA	NA	26	5.54	4.84	0.74	5.05	6.17	6.5	0.69	8.2
18	Copper	mg/l	1.5	NA	1.5	NA	NA	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
19	Iron	mg/l	0.3	NA	50	NA	NA	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
20	Manganese	mg/l	0.5	NA	NA	NA	NA	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
21	Mercury	mg/l	0.001	NA	NA	NA	NA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
22	Cadmium	mg/l	0.01	NA	0.01	NA	NA	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
23	Arsenic	mg/l	0.05	NA	0.2	NA	NA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
24	Cyanide	mg/l	0.05	0.05	0.05	NA	NA	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
25	Lead	mg/l	0.1	NA	0.1	NA	NA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
26	Zinc	mg/l	15	NA	15	NA	NA	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
27	Chromium	mg/l	0.05	1	0.05	NA	NA	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
28	Boron	mg/l	NA	NA	NA	NA	2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
29	Total Coliform	MPN/100ml	50	500	5000	-	-	120	150	63	79	170	130	94	46

**Note: NS – Not Specified**

Classification of river water as per their intended use is as given in **Table 3-26**.

**Table 3-26: Classification of River Water as per their Intended Use**

S. No.	Class	Intended Use
1	A	Drinking water source without conventional treatment but after disinfection
2	B	Outdoor bathing (organized)
3	C	Drinking water source with conventional treatment followed by disinfection
4	D	Propagation of wild life, fisheries
5	E	Irrigation, industrial cooling etc.

### 3.10.5 Observations of Surface Water Quality Analysis

The baseline quality of surface water based on the results of the surface water quality monitoring within the study area, it is observed that;

- As per Inland surface water classification, the quality of surface water of locations SW01, SW02, SW04 SW05, SW06 and SW08 falls in Class E, as they have very low DO values, high TDS, Electrical Conductivity, Chlorides and Ammonical Nitrogen content. So, it can be used for irrigation and industrial cooling purposes.
- The quality of surface water of locations SW03, falls in Class E, as they have slightly higher BOD and Ammonical Nitrogen content. So, it can be for irrigation and industrial cooling purposes.
- The quality of surface water of locations SW07 is classified as canal and falls in Class B, as it has slightly higher coliform content than Class A. Because of which, it can be used in outdoor bathing purposes.

## 3.11 Geology and Hydrogeology

### Collection of existing maps and data

This covered:

- Land use map
- Google Earth and/or Topographical maps (drainage patterns, water bodies, topography, morphology and vegetation cover)
- District Resource Map (DRM), Geological Survey of India (GSI)
- India Water Resources Information System (WRIS)
- District Ground Water Brochure, Central Ground Water Board (CGWB)
- Rainfall Data, Indian Meteorological Department
- Earthquake & Flood Hazard Map, Building Materials & Technology Promotion Council (BMTPC), Government of India

The integrated study of above maps leads to identification of specific issues related to geology and its effect on topography, morphology, drainage pattern and groundwater. It further gives an idea about water quality i.e. soluble salts. It further explains relation between surface and ground water.

Based on these inferences field visit, observation points and sampling locations are decided and acted upon. In some cases, non-invasive geophysical techniques are selected and data is correlated with surface features as well as with project requirement.

### 3.11.1 Geomorphology

#### Physiography

The effects of desertification and presence of stabilised and semi-stabilised dunes is also observed in SW part of study area. There exists local depressions, palaeochannels, lakes/ponds, etc. Overall it represents a flat terrain.

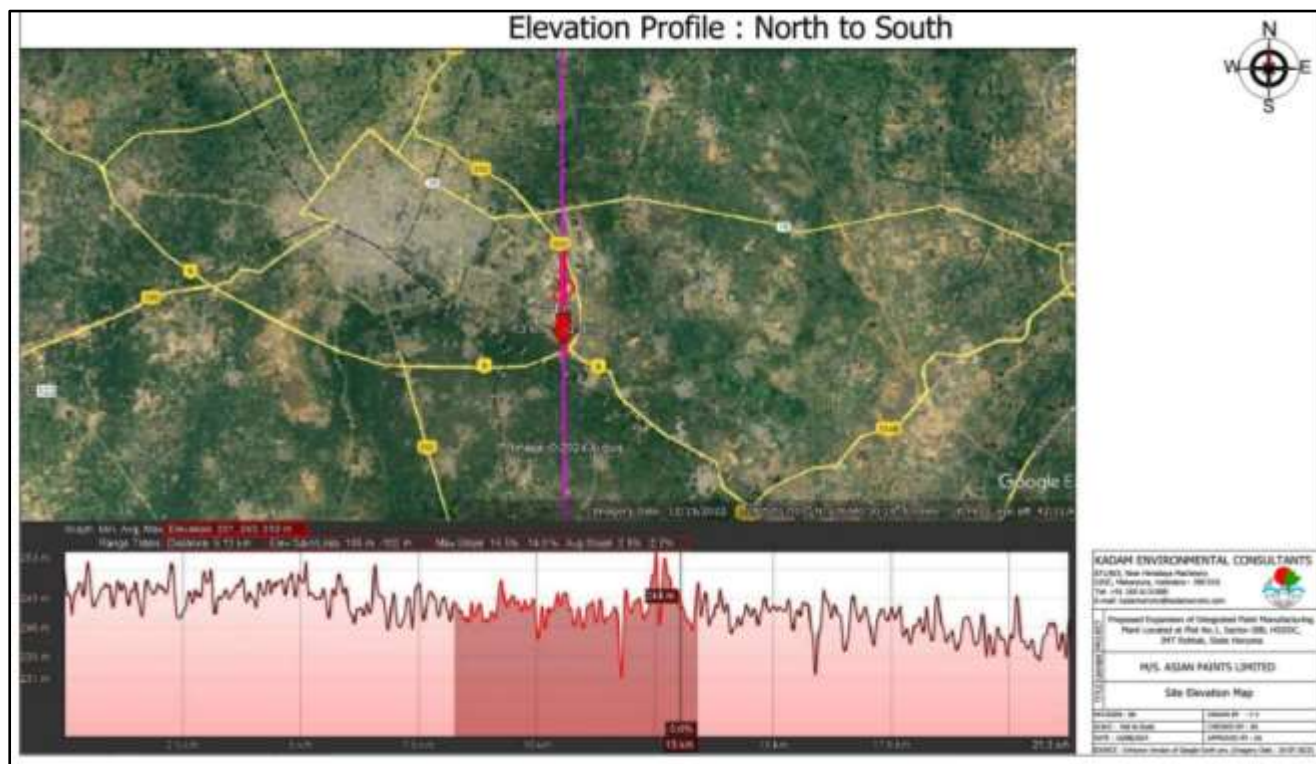


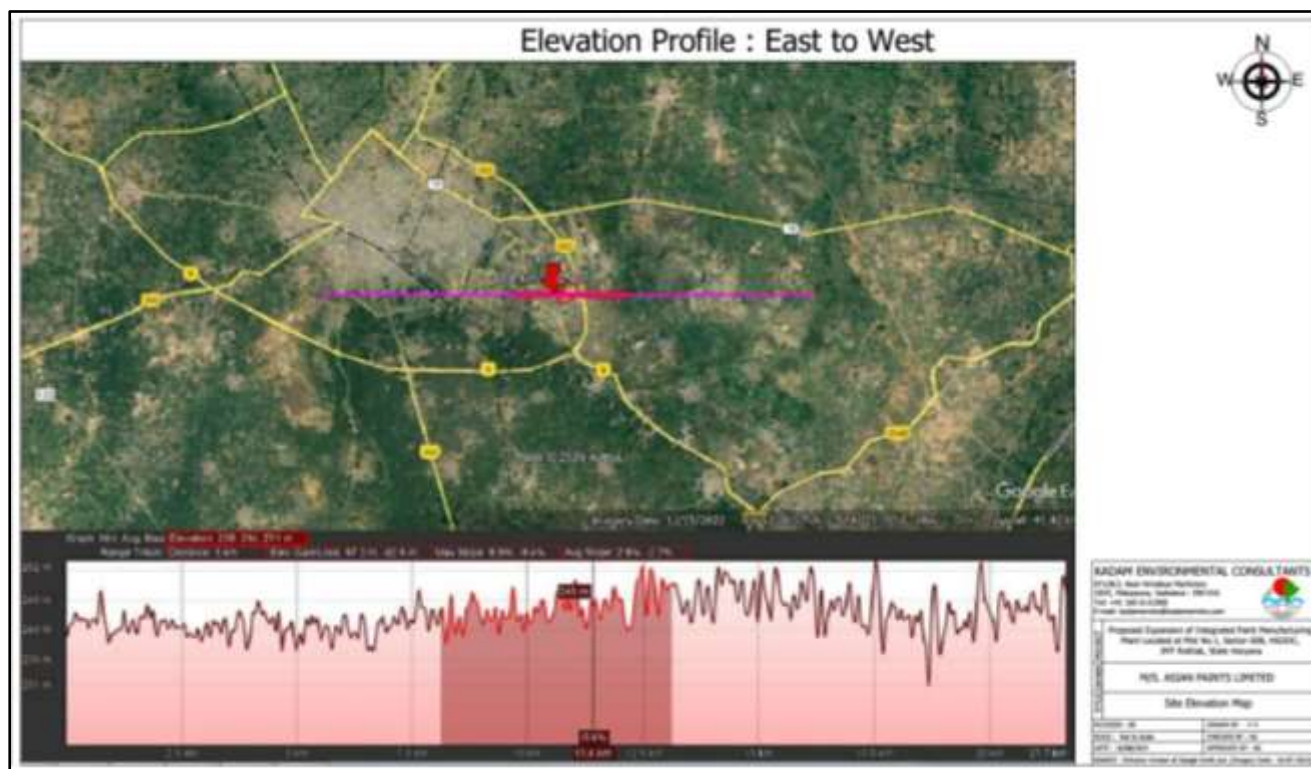
## Topography

Based on Google Earth Engine (GEE), the study area elevation levels vary between ~237 to ~253m above mean sea level. The northern part of the study area is elevated as compared to the southern part. The elevation profile anticipated towards ESE/SE/SSE from NW/NNW/North.

As per elevation profile given in **Map 3-6**, the study area has concave slope with gentle gradient.

**Map 3-6: Elevation Profile using Google Earth Engine**





### 3.11.2 Drainages

As per *Basin Atlas of India*<sup>6</sup>, the study area falls in Yamuna Upper Sub-Basin which is a part of Ganga Basin.

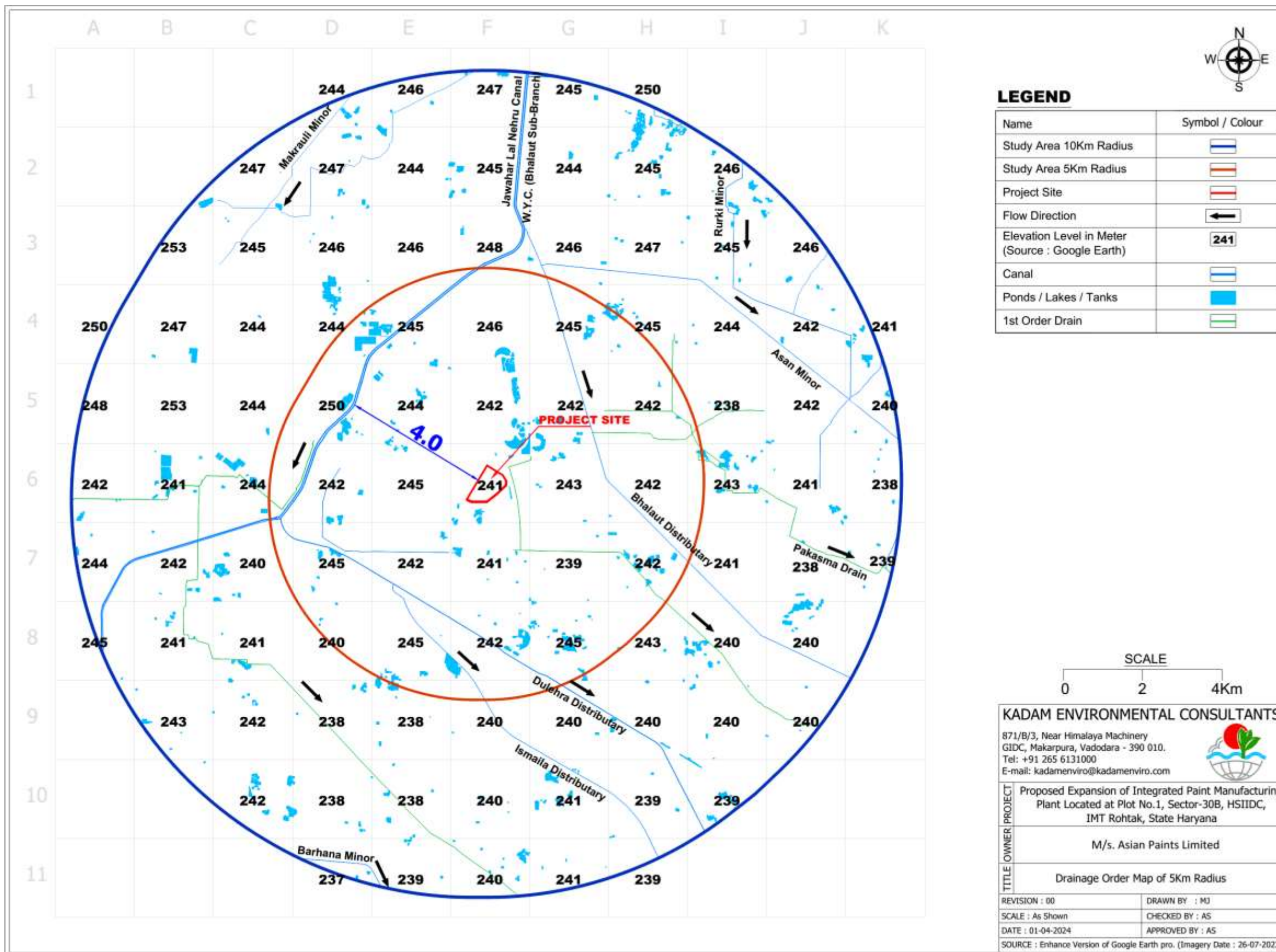
The study area falls in command area of Jawahar Lal Nehru Canal, Western Yamuna Canal (W.Y.C.) Bhalaut Sub-Branch and other distributary canals. A sub-part of stretch of Polluted river as per MoEFCC/CPCB. The project site doesnot falls in the nearby stretch of Polluted river, the site overlay on the Yamuna Upper Basin is shown as Map 3-7.

It is also drained by Pakasma Drain, and other local drains of 1<sup>st</sup> order as shown in **Map 3-8**.

6 Source: <https://indiawris.gov.in/wris/#/Basin>

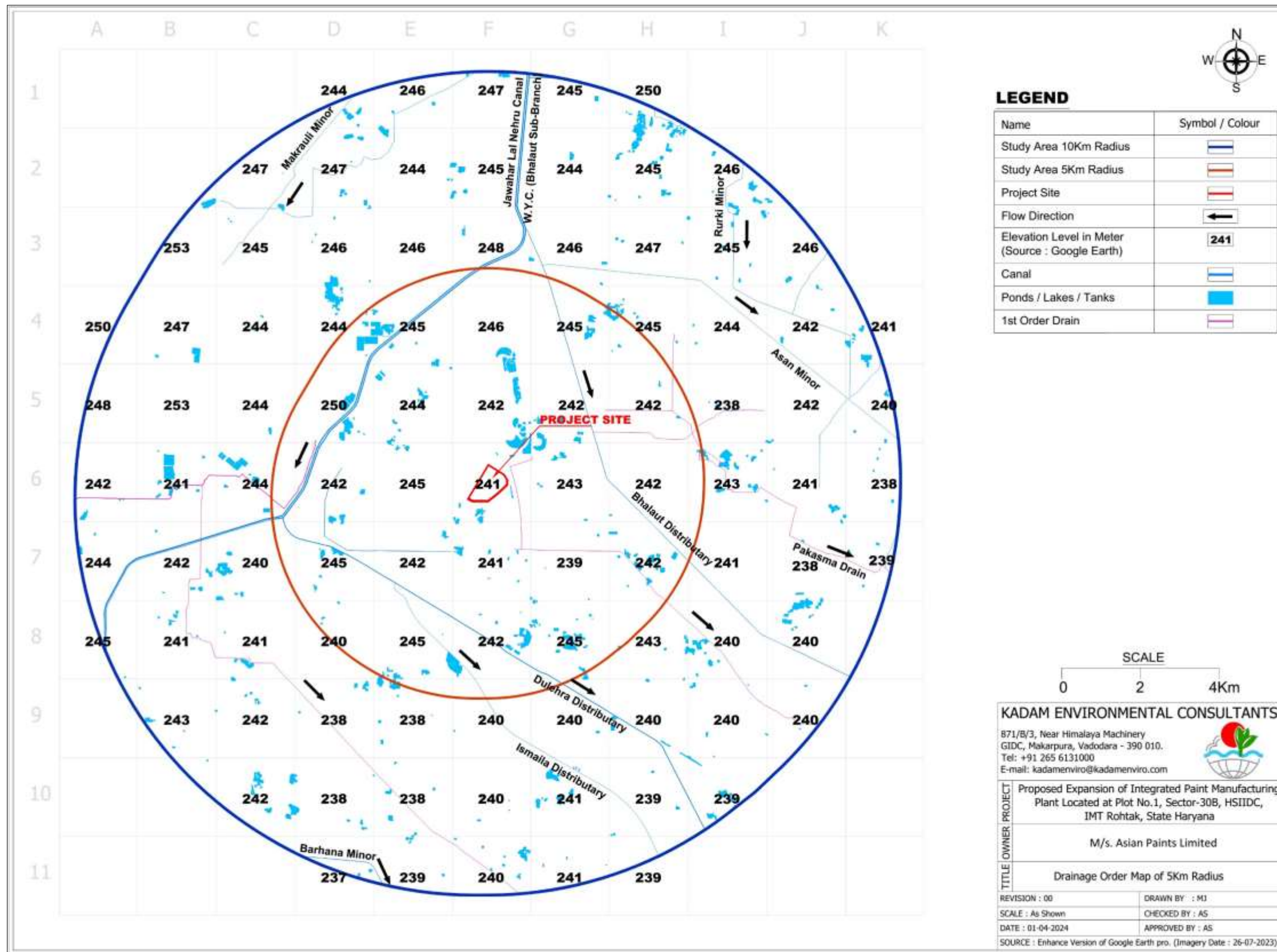


Map 3-7: Project Site Overlay on Drainage map with distance from polluted river stretch as per CPCB.





Map 3-8: Drainage Order Map – 10km &amp; 5km Radius to the Project Site



### 3.11.3 Seismicity & Flood Hazards

#### Seismicity Hazards

The project site and study area of 10km radius falls in Zone IV: High Damage Risk Zone as shown in Earthquake Hazard (**Map 3-9**).

Project site is located on sub-surface fault known as *7 Mahendragarh-Dehhradhun Fault* - which is well known as MDSSF as given in **Map 3-9** and **Map 3-10**.

#### Description of Seismic Zones

##### **Zone IV: High Damage Risk Zone**

*8MSK scale* was referred to check the macro-seismic intensity scale used to evaluate the severity of ground shaking on the basis of observed effects in an area. *9BIS code* assigns zone factor of 0.24.

#### Seismic Intensity

The study area has experience earthquake of 2.4 magnitude as per **Map 3-10**.

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7 Indian Meteorological Department: <https://www.jstor.org/stable/24102079>;  
Hyderabad & IIT Roorkee: <https://www.ias.ac.in/public/Volumes/jess/131/00/0074.pdf>

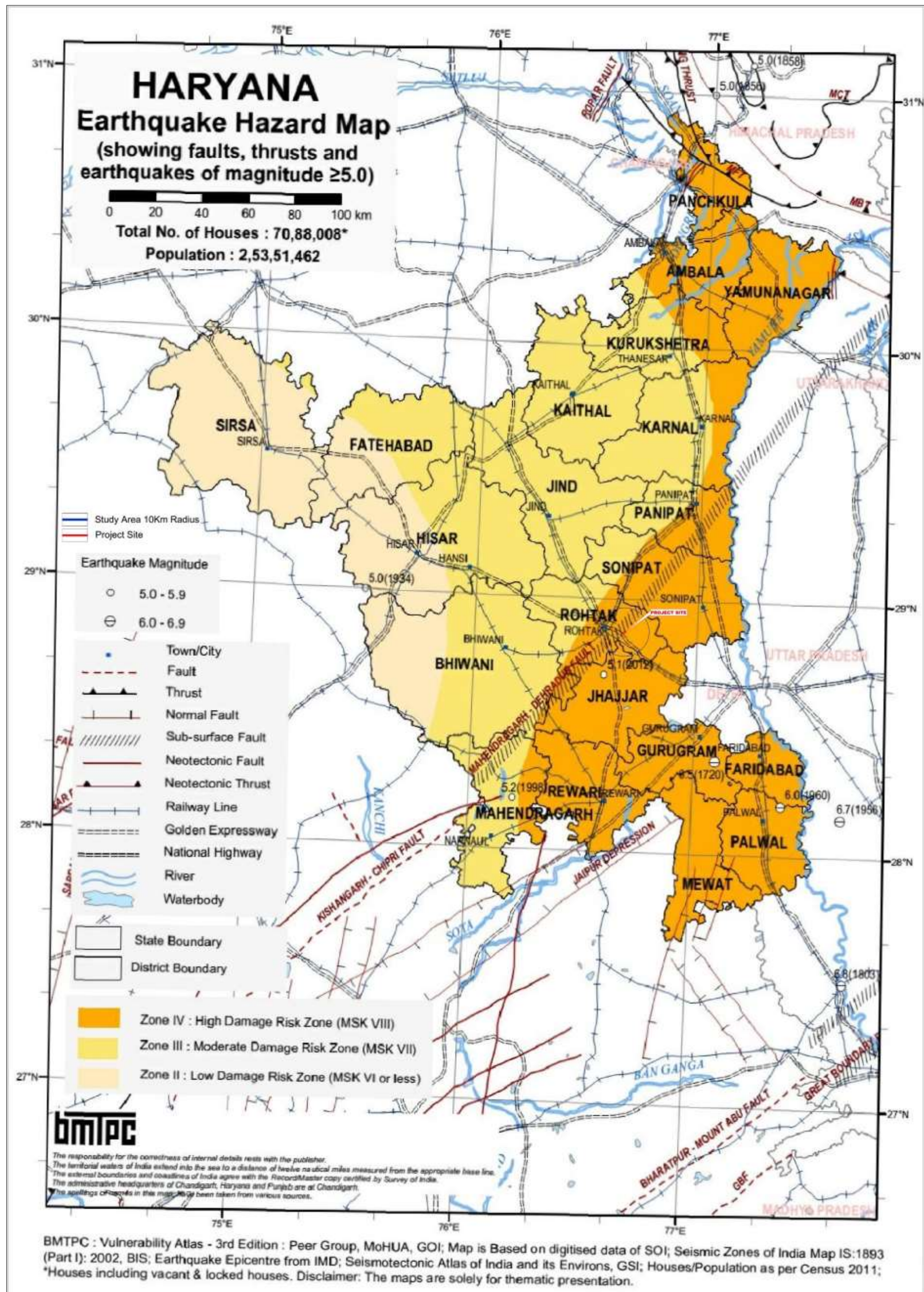
CSIR,

8 MSK: Medvedev-Sponheuer-Karnik scale (<https://law.resource.org/pub/in/bis/S03/is.1893.1.2002.pdf>)

9 BIS: Bureau of Indian Standard

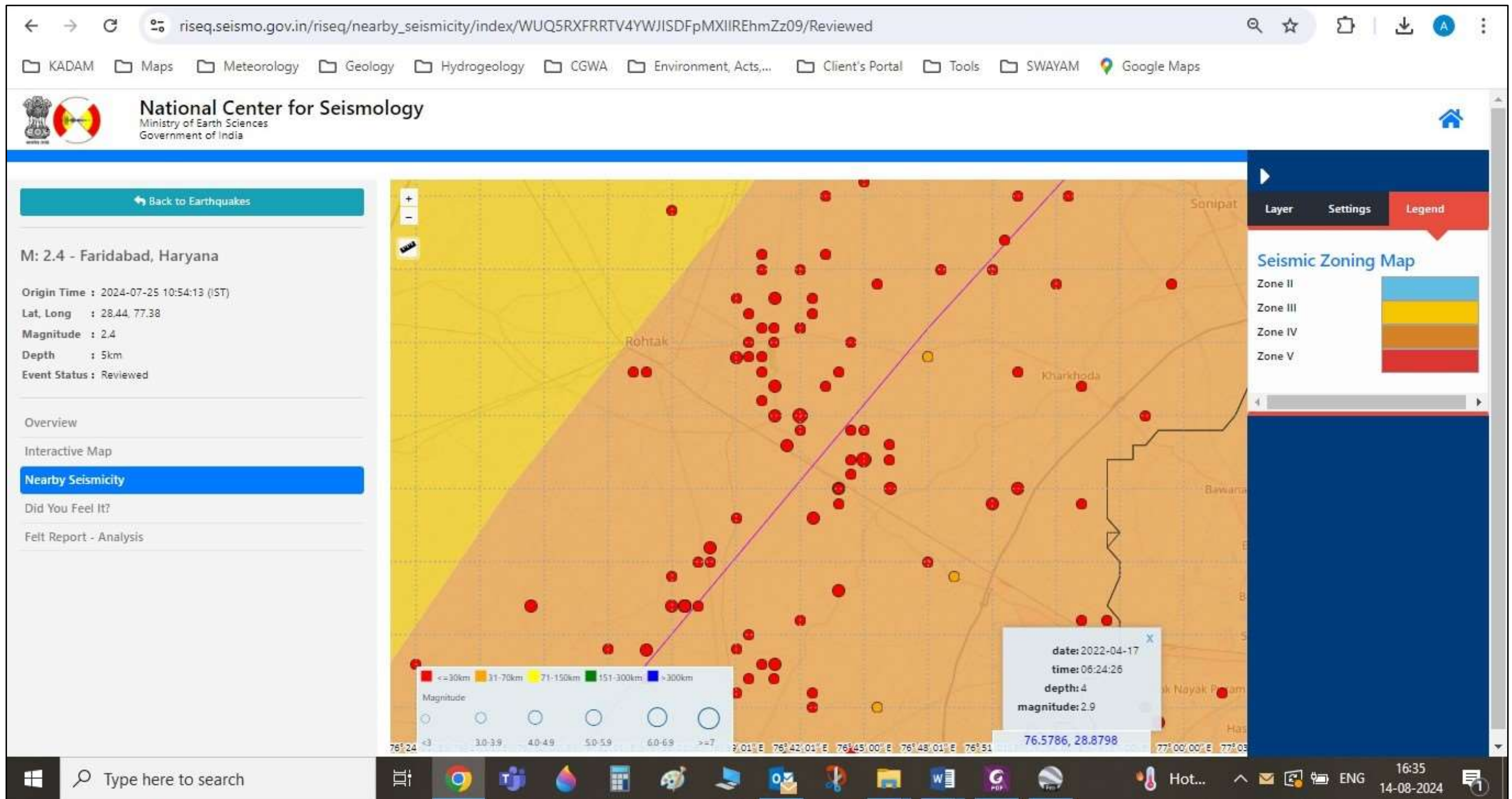


Map 3-9: Earthquake Hazard Map





Map 3-10: Seismic Intensity Map



#### **3.11.4 Flood Hazards**

*10As reported*, the past history of the floods in the Ganga and Yamuna sub-basins, Rohtak is listed among the affected district.

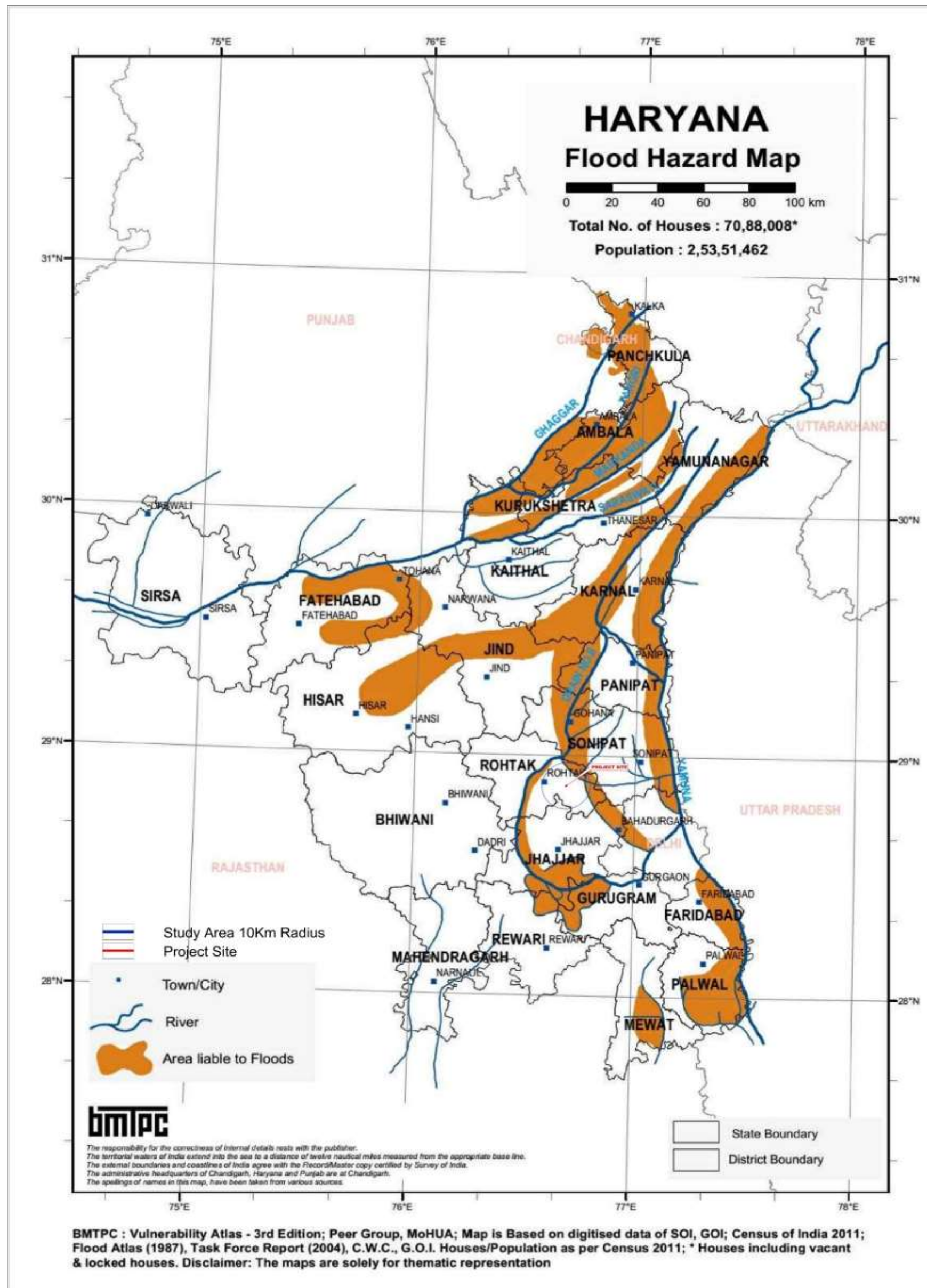
Study area is partially located in area liable to floods (**Map 3-11**).

As per observation the carrying capacity of drain is limited and as per discussion with local habitants, it overflows during rainy season. Hence results in water logging in the area.

In discussion to site authority, the project site experiences water logging condition during rainy season since it is situated in low lying area.

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*10Draft Regional Plan-2041 of National Capital Region (NCR) by National Capital Region Planning Board, Ministry of Housing and Urban Affairs, Government of India*

**Map 3-11: Flood Hazard Map**



### 3.12 Geology

#### 3.12.1 Regional Geology

As per Geological Survey of India (GSI), the entire district is covered by Quaternary sediments. These sediments are classified into Older Alluvium and Aeolian sediments. The Older Alluvium (Middle to Late Pleistocene age) consists of alternate beds of sand, silt and clay with *11kankar* but dis-continuous. The sediments are fine to medium grained and rounded to subrounded in shape. The thickness of these sediments varies between 160 to 350 meters below ground surface (m bgs). The sediments of Older Alluvium are overlain by Aeolian sediments (Holocene age) comprising quartz grains with little or no mica with thickness varies from a few centimetres to 5 meters bgs.

#### 3.12.2 Local Geology

The study area is occupied by Indo-Gangetic alluvial plain of Quaternary Age of older alluvium and aeolian sediments. The alluvium formations is comprises of clay, silt, sand, kankar, *12murrams*, gravels, etc. The district resource map is given in **Map 3-12**. No information of geotechnical soil investigation report or soil bearing capacity report provided by project proponent hence not referred.

Stratigraphic succession given by Geological Survey of India is tabulated below:

**Table 3-27: Stratigraphic Succession – District Rohtak, State Haryana**

Geological Unit	Lithology	Age	Period
Aeolian Sediments	Yellowish fine to medium grained sand with minor silt	Holocene	Quaternary
Older Alluvium	Polycyclic sequence of sand, silt and clay with kankar	Middle to Late Pleistocene	

#### 3.12.3 Minerals Availability

Minor occurrences of *Reh13 (Kallar)* is the only mineral resource of the study area as given in **Map 3-12**. The sensitive ecological features pertaining to geology are as under:

**Table 3-28: Sensitive Ecological Features – Geology**

Sr. No.	Sensitive Ecological Features	Name of feature / Location	Distance (km)	Direction	Reason of Significance
1	Areas susceptible to natural hazard which could cause the project to present environmental problems (earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions)	Taluka Rohtak and Sampla of District Rohtak in State Haryana; Taluka Beri of District Jhajjar – includes the study area	--	--	Earthquakes: the project site is located over geological fault-line and study area falls under Zone-IV of High Damage Risk Zone Flooding: the study area may experience water-logging condition on account of geological situation Kallar/Reh mineral utilizing soil as mineral in the study area

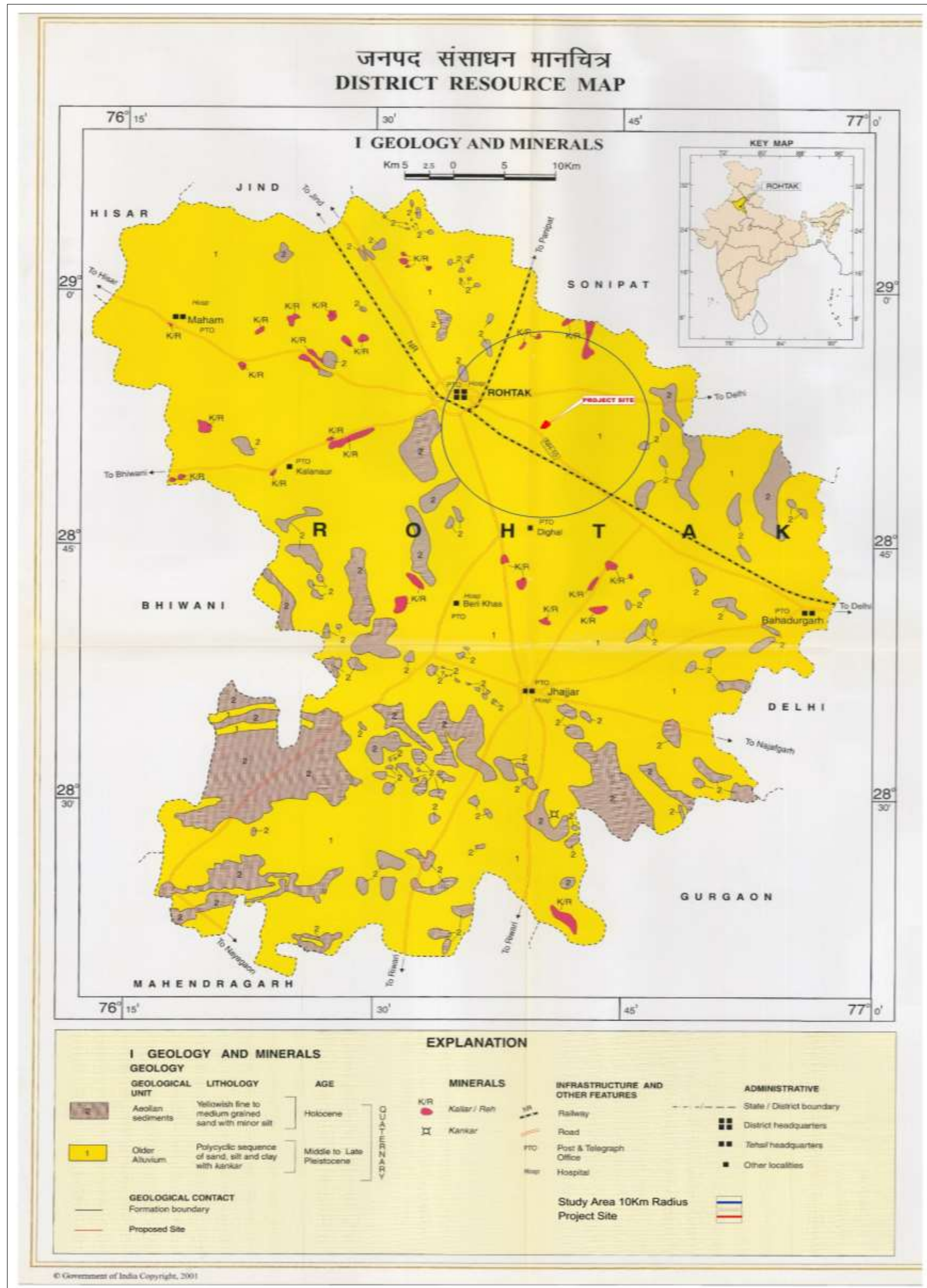
*11Kankar is a poorly graded gravel*

*12Murran is a calcareous material*

*13Reh (Kallar) is the local name saline & alkaline soils in parts of Haryana, Punjab and Uttar Pradesh*



Map 3-12: District Resource Map – 14Geology and Minerals



14Source: Geological Survey of India

### 3.13 Hydrogeology

#### 3.13.1 Regional Hydrogeology

As per studies carried out by Central Ground Water Board (CGWB), it reveals that clay group of formations dominate over the sand group in the area. Borehole drilled in the district were abandoned either due to bad quality of water or poor discharge. Two or four granular zones with aggregates thickness from 23 to 52m bgs are present in the area up to bed rock. The successful tapping zones are 27-34 m, 37-40 m and 46-52 m bgs. Well discharge reported 870 litres per minute (lpm) at a drawdown of 7.5 m bgs and transmissivity (T) 207 m<sup>2</sup>/day.

The aquifer details are tabulated below:

**Table 3-29: Types of Aquifer**

Location of Bore-wells	Aquifer Group	Depth in meters		Thickness (meters)
		From	To	
Rohtak	Aquifer Group I	0	105	105
	Aquitard I	105	132	27
	Aquifer Group II	132	200	68
	Aquitard II	200	220	20
	Aquifer Group III	220	313	93
	Aquitard III	313	325	12
	Aquifer IV	325	365	40
	Aquitard IV	365	375	10

#### 3.13.2 Local Hydrogeology

As per well-inventory study, manual drilling and rotary-rig machine techniques are utilized in borehole drilling activity since the area is underlain by thick alluvium deposits. Deep tube-wells are not planned out due to increase in salinity with depth. Water logging is one of the main reason for deterioration of ground water quality.

No information on *15existing ground water well* provided by project proponent hence not referred.

### 3.14 Ground Water Environment

#### 3.14.1 Occurrence & Distribution of Ground Water

The occurrence of ground water generally depends upon rainfall, drainage, topography and geological conditions. The ground water in alluvium occur under water table and semi to confined conditions. The major usage of ground water is in irrigation, domestic and drinking purposes.

#### 3.14.2 Regulatory Status

The study area covering Taluka Rohtak & Sampla of District Rohtak and Taluka Beri of District Jhajjar in the state of Haryana.

The categorization of blocks/taluks as per Dynamic Ground Water Resource Estimation – 2023 are as below:

**Table 3-30: Categorization of Ground Water Assessment Unit of Study Area**

Sr. No.	Block / Taluka	District / State / Union Territory	Category	Source
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*15EIA report for proposed 4 lakh KL/year paint manufacturing facility at IMT Rohtak, Haryana – Prepared by M/s. Asian Paints Limited*

1	Rohtak	District Rohtak, State Haryana	SAFE	<b>Ground Water Assessment Category as per Dynamic Ground Water Resource Estimation 2023 by Central Ground Water Board (CGWB)</b>  And Stage of Ground Water Development and Categorization of the Assessment Units as on 31.02.2022 by Haryana Water Resources Authority
2	Sampla			
3	Beri	District Jhajjar, State Haryana		

### 3.14.3 Water Development

#### Ground Water Development

Fresh water requirement will be fulfilled by HSIIDC being the source of water supply as given in **Annexure 10**. Hence no ground water utilization is envisaged for the proposed expansion.

### 3.14.4 Groundwater Environment

#### Selection of Ground Water Sampling Location

In selection of ground water sampling location under the monitoring program, the local geology and hydrogeology are the significant basis. The occurrence, distribution and movement of aquifers plays a vital role. The reference point which allows to ascertain the hydrogeological condition, is fixed (i.e. project site), which further lead to select the location in upstream and downstream based on the local geomorphology. Avoid the areas of turbulence and weirs and always collect the samples from ground water abstracting structures, which are in continuous use.

#### Methodology of Sampling

The purpose of ground water monitoring program and the collections of samples within that program is to obtain representative portions of the aquifer and to obtain in situ measurements at a selected time and place.

The collection of water sample from ground water abstraction structures occur in five (05) steps -

- Sampling preparation,
- Accessing the well before sampling & securing the well after sampling,
- Measuring water level,
- Purging the well, and
- Collecting & delivering the water sample

#### Sampling Preparation

The ground water sampling is carried out for analysing suitability of water for drinking purpose. And hence, the field sampling equipment is cleaned and calibrated before sampling. The field investigator must carry:-

- Clean water containers from Laboratory
- Container sample labels, markers/pen/pencil
- Field sheets for well-inventory data
- Measuring tape for dimension of borehole i.e. dia. of borehole/casing/outlet, measuring level, etc.
- Pumping equipment such as bailer/peristaltic pump
- Water level measuring instrument
- Test kits for measuring field parameters such as pH/TDS.
- Personal protective equipment's, first aid

#### Accessing the Well before Sampling & Securing the Well after Sampling

In general, the casing of bore-wells/tube-wells are usually packed and occasionally it is more difficult to identify the discharge pipe which is away from the located structures for collecting sample. In case of open-well, sampling is

comparatively convenient. Ideally, when testing for ground water, the water sample shall not be collected from the tap.

Sampling is done immediately by direct filling bottles from the tubing outlet of a submersible pump of bore-wells/tube-wells. The location details and reference points must be noted in field data sheet using hand GPS machine and photographs must be taken with reference identification number.

### Measuring Water-level

After accessing the ground water structure, the first step is to measure the total depth to the water table using water level measuring instrument. Water-level information is important which may be directly linked to ground water quality changes. Considerable care is taken to avoid tangling or wedging the sampling equipment. The measuring details is noted down in field data sheet with date and time.

### Purging the Borehole

As a thumb rule, the standing water within the borehole is exposed to atmospheric conditions and can undergo changes to its physical and chemical characteristics and is not representative of the water in the aquifer, for this reason the borehole is purged before sampling. Also, purging is to reduce the turbidity to the point that the sample will represent the dissolved concentration of contaminants (metals and many organics).

### Collecting and Delivering the Samples

The water samples are collected after the completion of purging. Before the sample containers are filled, sampling bottles is properly labelled and details is recorded. Since water samples are not analysed in the field, they typically required preservations, which ensure the quality of the samples does not change between the time of collection in the field and time of analysis in the laboratory. If a water sample is analysed for multiple parameters, it requires different preservation methods and to take more than a single sample. The sample is deliver to the laboratory within 2-3 days of sampling. If samples are shipped, the sealed sample containers are out into ice-box, are then packed with ice coolants and transported to the analytical laboratory by express delivery service. At the laboratory, the samples are logged in given sample ID numbers, and kept cool until they can be analysed.

### Selection of Parameters

The ground water samples were analysed as per the APHA Standard Methods (23<sup>rd</sup> Edition) for the given parameters in the Technical Guidance published in December 2010.

Also, the baseline monitoring parameters guidance as per NABET & MoEF&CC (for standard/specific ToR) and approved sector at KEC Laboratory considering the sector wise parameters.

### Groundwater Monitoring Methodology

The below describes analytical methodology for the parameters were analysed and the minimum detection limit of the instruments available at KEC laboratory.

The methodology and parameters to be analysed are mentioned in **Table 3-31** and analysis results are shown in Table 3-37

**Table 3-31: Ground Water Quality Testing Methodology**

S. No.	Parameters	Methodology	Minimum Detection Limit
1	pH	APHA: 4500-H+ B(23 <sup>rd</sup> Edition), Electrometric method	1
2	Temperature	APHA: 2550 B (23 <sup>rd</sup> Edition), Standard Thermometer	0.5 Deg C
3	Turbidity	APHA: 2130 B (23 <sup>rd</sup> Edition), Nephelometric Method	0.1 NTU
4	Colour	APHA: 2120 B (23 <sup>rd</sup> Edition), Visual comparison Method	1 Pt-Co

S. No.	Parameters	Methodology	Minimum Detection Limit
5	TDS	APHA: 2540C (23 <sup>rd</sup> Edition), Gravimetric	3 mg/l
6	Electrical conductivity	APHA: 2510 B (23 <sup>rd</sup> Edition), Conductivity meter	1µmoh/cm
7	COD	APHA: 5220 B(23 <sup>rd</sup> Edition), Open reflux method	5 mg/l
8	BOD	IS: 3025(part-44):1993 (RA 2014) Iodometric	2mg/l
9	Chlorides	APHA:4500-Cl- B (23 <sup>rd</sup> Edition), Argentometric method	1.0 mg/l
10	Phenol	APHA: 5530-D (23 <sup>rd</sup> Edition), Direct photometric Method	0.001 mg/l
11	Sulphates	APHA:4500-E as SO <sub>4</sub> 2-(23 <sup>rd</sup> Edition), Turbidimetric method	1 mg/l
12	Total Hardness	APHA: 2340-C (23 <sup>rd</sup> Edition), EDTA Titrimetric method	2 mg/l
13	Ca++ Hardness	APHA: 3500-Ca-B (23 <sup>rd</sup> Edition) EDTA Titrimetric method	2 mg/l
14	Mg++ Hardness	APHA: 3500-Mg-B (23 <sup>rd</sup> Edition), By calculation	2 mg/l
15	Total Alkalinity	APHA: 2320 B (23 <sup>rd</sup> Edition), Titration method	5 mg/l
16	Nitrate	IS:3025 (part-34)1988 (RA 2014), 3.3 colorimetric method	0.1 mg/l
17	Fluoride	APHA:4500 F-D(23 <sup>rd</sup> Edition),SPANDS method	0.05 mg/l
18	Sodium	APHA:3500 Na-B (23 <sup>rd</sup> Edition), Flame emission Photometric method	1 mg/l
19	Potassium	APHA: 3500 K-B (23 <sup>rd</sup> Edition) Flame emission Photometric method	1 mg/l
20	Calcium	APHA: 3500-Ca-B (23 <sup>rd</sup> Edition) EDTA Titrimetric method	2 mg/l
21	Magnesium	APHA: 3500-Mg-B (23 <sup>rd</sup> Edition), Calculation method	2 mg/l
22	Salinity	APHA: 2520 B (23 <sup>rd</sup> Edition), Electrical Conductivity method	-
23	Total Nitrogen	APHA: 4500 N Org-B, (23 <sup>rd</sup> Edition), Macro Kjeldahl method	0.05 mg/l
24	Total Phosphorous	APHA: 4500 P-C (23 <sup>rd</sup> Edition), Colorimetric method	0.02 mg/l
25	Dissolved Oxygen	APHA: 4500 O-C(23 <sup>rd</sup> Edition), Iodometric method	0.2 mg/l
26	Ammonical Nitrogen	IS:3025(part-34), 1988 (RA 2014), Distillation & colorimetric	0.05 mg/l
27	SAR	Lab SOP-138, Based on APHA 23 <sup>rd</sup> Edition	0.01
28	<b>Heavy Metals</b>		
a	Arsenic (as As)	APHA: 3500-As-B (23 <sup>rd</sup> Edition) Silver diethyldithiocarbamate method/APHA: 3114-B (23 <sup>rd</sup> Edition) AAS	0.01 mg/l
b	Cadmium (as Cd)	APHA: 3111-B (23 <sup>rd</sup> Edition) AAS	0.003 mg/l
c	Chromium (as Cr)	APHA: 3500-Cr-B (23 <sup>rd</sup> Edition), colorimetric method	0.02 mg/l
d	Copper (as Cu)	APHA: 3500-Cu-B (23 <sup>rd</sup> Edition) Neocuproine method/ APHA: 3111- B (23 <sup>rd</sup> Edition) AAS	0.03 mg/l
e	Cyanide (as CN)	APHA: 4500 CN- D & E(23 <sup>rd</sup> Edition)	0.03 mg/l
f	Iron (as Fe)	APHA: 3500-Fe-B (23 <sup>rd</sup> Edition), Phenanthroline method/APHA: 3111-B(23 <sup>rd</sup> Edition) AAS	0.05 mg/l
g	Lead (as Pb)	APHA: 3111-B(23 <sup>rd</sup> Edition) AAS	0.01 mg/l
h	Mercury (as Hg)	IS 3025 (P-48): 1994 (RA 2014))/ APHA: 3112-B (23 <sup>rd</sup> Edition) Cold vapour AAS method	0.001 mg/l
i	Manganese (as Mn)	APHA: 3500-Mn-B (23 <sup>rd</sup> Edition) Persulphate method/APHA: 3111-B (23 <sup>rd</sup> Edition) AAS	0.02 mg/l
j	Nickel (as Ni)	APHA: 3111-B(23 <sup>rd</sup> Edition) AAS	0.02 mg/l
k	Zinc (as Zn)	APHA: 3111-B(23 <sup>rd</sup> Edition) AAS	0.03 mg/
l	Boron (as B)	APHA: 4500 B-C (23 <sup>rd</sup> Edition), Carmine method	0.05 mg/l
29	Total Coliform	APHA: 9221-B & C:2017 (23 <sup>rd</sup> Edition), Multiple Tube Fermentation	N.D(1.8)
30	Fecal Coliform	APHA: 9221-E & C(23 <sup>rd</sup> Edition), Multiple Tube Fermentation	N.D(1.8)

### 3.14.5 Secondary Ground Water Data

The ground water data available from various sources is tabulated below:

**Table 3-32: Depth to Water Level from Central Department Board <sup>16</sup>**

District	Location	Depth to Water Level in meters below ground surface			
		June 2022	August 2022	November 2022	January 2022
Rohtak	Baliana	3.33	--	2.51	--
	Bhalot	0.88	--	--	--
	Makhrauli Khurd	2.28	--	0.18	--
	Rohtak	4.69	--	2.27	--

**Table 3-33: Last Decade Ground Water Level Data from State Department Board <sup>17</sup>**

District	Taluka	Location	Water Level 2010 (m)	Water Level 2020 (m)	Fluctuation (m)
Rohtak	Rohtak	Rohtak	1.47	3.08	-1.61
		Kansala	3.18	3.14	0.04
		Ladhot	2.18	2.5	-0.32
		Makrouli Kalan	1.7	2.25	-0.55
		Makrouli Khurd	3.84	2.25	1.59
		Bohar	2.98	2.04	0.94
		Kanheli	0.85	1.95	-1.1
		Sunari Kalan	3.71	1.65	2.06
		Simli	1.11	1.48	-0.37
		Pahrawar	1.61	1.45	0.16
		Maina	1.1	1.42	-0.32
		Dhamar	3.23	1.4	1.83
		Karountha	1.37	1.18	0.19
		Kilio Dopana	2.18	1.08	1.1
		Bhalot	4.54	0.4	4.14
	Sampla	Kherawar	2.47	4.35	-1.88
		Atail	3.02	4.31	-1.29
		Kisranti	6.62	3.65	2.97
		Pakasma	3.85	3.5	0.35
		Gandhra	1.87	2.45	-0.58
		Kheri Sadh	1.92	2.45	-0.53
		Nunond	1.79	2.4	-0.61
		Baliana	3.43	2.34	1.09
		Ismailia-11B	2.99	1.54	1.45
Jhajjar	Beri	Bhambhewa	3.41	2.11	1.3
		Dewana	3.2	1.47	1.73

<sup>16</sup> Source: Ground Water Year Book of Haryana State (2022-23):

<https://cgwb.gov.in/cgwbpnm/public/uploads/documents/1703230535460614837file.pdf>

<sup>17</sup> Source: Haryana Water Resources (Conservation and Management) Authority:

<https://hwra.org.in/index.html>

**Table 3-34: Well Depth and Water Quality Data 18**

S. No.	Parameters	Dhamar	Dataur	Kehrawar	Gandhra	Kheri Sadh	Kiloi Dopana	Makrauli Kalan	Bohar	Pakasma	Nunond	Garhi Bohar	Garhi Bohar (Tube-well)	Ladhot	Atail	Bhambhewa
1	Well Depth	4.9	5.5	6.1	6.1	6.1	8.2	9.1	9.1	9.1	12.2	12.2	18.3	36.6	10.7	6.1
2	pH	7.5	8	8	7.9	8	7.6	7.3	7.7	7.8	7.8	7.6	7.9	7.5	7.8	7.7
3	EC in $\mu\text{S}/\text{cm}$	1954	2230	2180	1211	1366	1654	4410	1909	1809	1460	729	1625	470	2292	939
4	Turbidity in NTU	1.57	1.01	0.61	3.26	1.27	0.34	0.83	0.56	0.61	0.54	0.34	0.54	0.35	0.50	0.55
5	TDS mg/l	1466	2165	1582	863	1070	1125	2908	1221	1282	1083	625	1361	372	1767	724
6	Alkalinity (mg/l)	300	528	396	280	416	372	416	376	380	320	252	484	184	368	316
7	$\text{HCO}_3$ (mg/l)	492.16	647.36	492.16	364.56	520.51	428.36	507.23	456.71	449.62	400	350.38	662.29	215.69	485.07	359.93
8	Cl (mg/l)	230	505	525	140	138	248	975	308	263	25	50	73	18	325	83
9	$\text{SO}_4$ (mg/l)	316.7	277.2	152.5	113.5	86.1	138.1	565.9	103.3	173.5	369.5	54.7	236.7	41.3	432.6	78.9
10	$\text{NO}_3$ (mg/l)	10.6	63.4	1.1	5.8	2	2.5	50.6	10.2	10.5	9.8	1.3	2.1	2.5	49.1	8.1
11	F (mg/l)	1.17	6.66	1.04	0.83	1.93	2.59	1.42	1.65	1.88	1.13	2.77	8.75	1.12	0.44	1.68
12	Ca (mg/l)	138.8	26.5	101.6	65.6	12.5	78.8	148.6	78.4	84.3	73.5	38.4	20	23.4	63.7	46.3
13	Mg (mg/l)	65.2	58.6	134.5	53	21	66.8	148.5	100.8	52.4	69.4	47	20.8	24	80.2	62.6
14	Na (mg/l)	206.3	569.2	168.9	116.3	285.7	153.4	435.2	107.1	244	129.6	74.1	334.1	37.9	302.2	80.1
15	K (mg/l)	5.1	11	4.8	3.5	3.1	7.2	75.7	54.9	3.1	5.4	5.9	3.4	8.6	28.6	4.1
16	T.H as $\text{CaCO}_3$	615	307	807	382	117	471	982	610	426	469	289	135	157	489	373
17	Fe (mg/l)	0.69	3.13	1.84	4.18	1.86	0.37	1.61	0.51	2.52	0.85	0.26	0.12	0.17	1.44	0.34
18	Mn (mg/l)	0.06	0.07	0.20	0.04	0.04	0.01	0.36	0.04	0.03	0.01	0.00	0.00	0.00	0.02	0.01
19	Zn(mg/l)	0.20	0.03	0.17	0.18	0.16	0.21	0.00	0.02	0.04	0.14	0.13	0.03	0.01	0.16	0.04
20	Al(mg/l)	0.02	2.37	0.01	1.31	1.16	0.01	0.89	0.02	0.74	0.05	0.01	0.02	0.01	0.59	0.03
21	Cu(mg/l)	0.0006	0.0052	0.0000	0.0052	0.0110	0.0009	0.0053	0.0230	0.0018	0.0017	0.0014	0.0036	0.0048	0.0067	0.0020
22	Pb(mg/l)	0.0000	0.0224	0.0000	0.0000	0.0000	0.0000	0.0000	0.0117	0.0156	0.0000	0.0000	0.0000	0.0000	0.0000	0.0011
23	Cr(mg/l)	0.0001	0.0045	0.0007	0.0082	0.0032	0.0001	0.0001	0.0002	0.0057	0.0060	0.0003	0.0031	0.0009	0.0084	0.0019
24	Ni(mg/l)	0.0000	0.0000	0.0000	0.0013	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0009	0.0000	0.0005	0.0000	0.0014
25	Co(mg/l)	0.0003	0.0016	0.0007	0.0010	0.0010	0.0002	0.0034	0.0003	0.0007	0.0002	0.0001	0.0001	0.0001	0.0006	0.0002
26	As(mg/l)	0.0018	0.0063	0.0033	0.0024	0.0073	0.0028	0.0070	0.0034	0.0037	0.0011	0.0013	0.0095	0.0015	0.0035	0.0016
27	Se(mg/l)	0.0024	0.0056	0.0051	0.0013	0.0022	0.0014	0.0057	0.0049	0.0044	0.0018	0.0008	0.0030	0.0006	0.0051	0.0020
28	Cd(mg/l)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0003	0.0000	0.0000	0.0000
29	SAR	3.62	14.13	2.59	2.59	11.47	3.07	6.04	1.89	5.14	2.60	1.89	12.49	1.31	5.95	1.80
30	RSC (meq/l)	-4.21	4.47	-8.07	-1.65	6.19	-2.40	-11.32	-4.72	-1.14	-2.82	-0.04	8.15	0.39	-1.82	-1.56
31	%Na	42.6	80.3	31.6	40.3	84.2	42.1	51.5	33.2	55.7	38.1	36.8	84.4	37.3	58.7	32.5
32	Total Coliform	--	--	Nil	--	--	--	--	--	--	--	--	--	4	--	--
33	Faecal Coliform	--	--	Nil	--	--	--	--	--	--	--	--	--	Nil	--	--

18Source: Report on Aquifer Mapping and Formulation of Aquifer Management Plan for the National Capital Region (NCR), Haryana Volume-II, August 2015 by Central Ground Water Board (CGWB), North Western Region, Chandigarh



### 3.14.6 Primary data Collection

#### Groundwater Sampling Locations

The ground water sampling within the radial distance of 10 km from the proposed project site boundary was carried out and well-inventory details is shared in **Table 3-35**.

**Table 3-35: Well-Inventory & Ground Water Sampling Locations**

Sample ID	Location	Source	Date of Sampling	Co-ordinates	Total Depth (m bgs)	Water-Level (m bgs)	Considered from Gate No. 1, APL, Rohtak		Sampling Rational
							Distance (Km)	Direction	
GW 1	Baliana	Hand-pump	08-05-2023	28°52'30.91"N 76°41'35.41"E	9-10	7	1.70	NE	To check ground water quality within study area
GW 2	Baliana	Hand-pump	08-05-2023	28°52'43.04"N 76°41'25.51"E	7	5-6	1.69	NE	
GW 3	Kheri Sadh	Hand-pump	08-05-2023	28°51'34.51"N 76°40'00.22"E	8	6	1.45	SSW	
GW 4	Bhalot	Tube-well	08-05-2023	28°54'09.32"N 76°42'14.71"E	12	6-7	4.57	NNE	
GW 5	Nunond	Tube-well	08-05-2023	28°50'55.03"N 76°42'54.99"E	7	5-6	4.32	SE	
GW 6	Kehrawar	Tube-well	08-05-2023	28°50'07.79"N 76°41'12.94"E	9-10	7	3.80	SSE	
GW 7	Bohar	Tube-well	08-05-2023	28°53'39.08"N 76°39'16.43"E	6	4-4.5	3.59	NW	
GW 8	Pahrawar	Tube-well	08-05-2023	28°50'49.88"N 76°37'54.23"E	12	8-8.5	5.05	SW	
GW 9	Asthal Bohar	Hand-pump	04-04-2024	28°52'25.99"N 76°38'43.84"E	NA	NA	3.16	WNW	

### 3.14.7 Field Visit & Ground Water Sampling Photograph

The field visit and ground water sampling are shown in **Photograph 3-1**.

**Photograph 3-1: Field Visit & Ground Water Sampling**

 <p>Rohtak, Haryana, India Unnamed Road, Rohtak, Haryana 124021, India Lat 28.976253° Long 76.693169° 08/06/23 05:01 PM GMT +05:30</p>	 <p>Rohtak, Haryana, India VMIIB+HB, Rohtak, Haryana 124021, India Lat 28.976621° Long 76.69042° 08/06/23 12:09 PM GMT +05:30</p>
<p>GW-01, Baliana</p>	<p>GW-02, Baliana</p>
 <p>Kheri Sadh, Haryana, India Baliana Mor, VMIIB+HB, Kheri Sadh, Haryana 124021, India Lat 28.885889° Long 76.686729° 08/06/23 03:44 PM GMT +05:30</p>	 <p>Bhalot, Haryana, India WP23+QGF, Bhalot, Haryana 124401, India Lat 28.902589° Long 76.704887° 08/06/23 11:38 AM GMT +05:30</p>
<p>GW-03, Kheri Sadh</p>	<p>GW-04, Bhalot</p>
 <p>Nunond, Haryana, India Unnamed Road, Nunond, Haryana 124501, India Lat 28.848619° Long 76.716276° 08/06/23 12:42 PM GMT +05:30</p>	 <p>Kharawar, Haryana, India BMPP+6BF, Kharawar, Haryana 124021, India Lat 28.895499° Long 76.686822° 08/06/23 01:43 PM GMT +05:30</p>
<p>GW-05, Nunond</p>	<p>GW-06, Kehrawar</p>
 <p>Bohar, Haryana, India VMIIB+GRC, Bohar, Haryana 124021, India Lat 28.894188° Long 76.654554° 08/06/23 10:56 AM GMT +05:30</p>	 <p>Pahrawar, Haryana, India B/JWJ+PFD, Pahrawar, Haryana 124021, India Lat 28.94719° Long 76.63173° 08/06/23 02:39 PM GMT +05:30</p>
<p>GW-07, Bohar</p>	<p>GW-08, Pahrawar</p>

	
GW-09, Asthal Bohar	Abandoned Open-well, Asthal Bohar
	
Jawaharlal Nehru Canal, Bohar	Water Body, Mandhala

### 3.14.8 Key Findings: Well Inventory

As per discussion with local people and well owners, water quality has been deteriorating and salinity ingress is observed among the pumping wells and hence rapid abandoned of wells are reported. No major water-level fluctuation is noticed. For drinking purpose, primary treatment using RO (Reverse Osmosis) is provided. Despite of extensive water canal network, the ground water is majorly utilized in agricultural activities. The agricultural field are hard to plough due to hard and saline nature of soil on account of ground water irrigation.

As per well-inventory study, the depth to water level is ranging from 4 to 9m below ground surface (m bgs) and total depth of well are ranging from 6m to 12m bgs – refer **Table 3-35**.

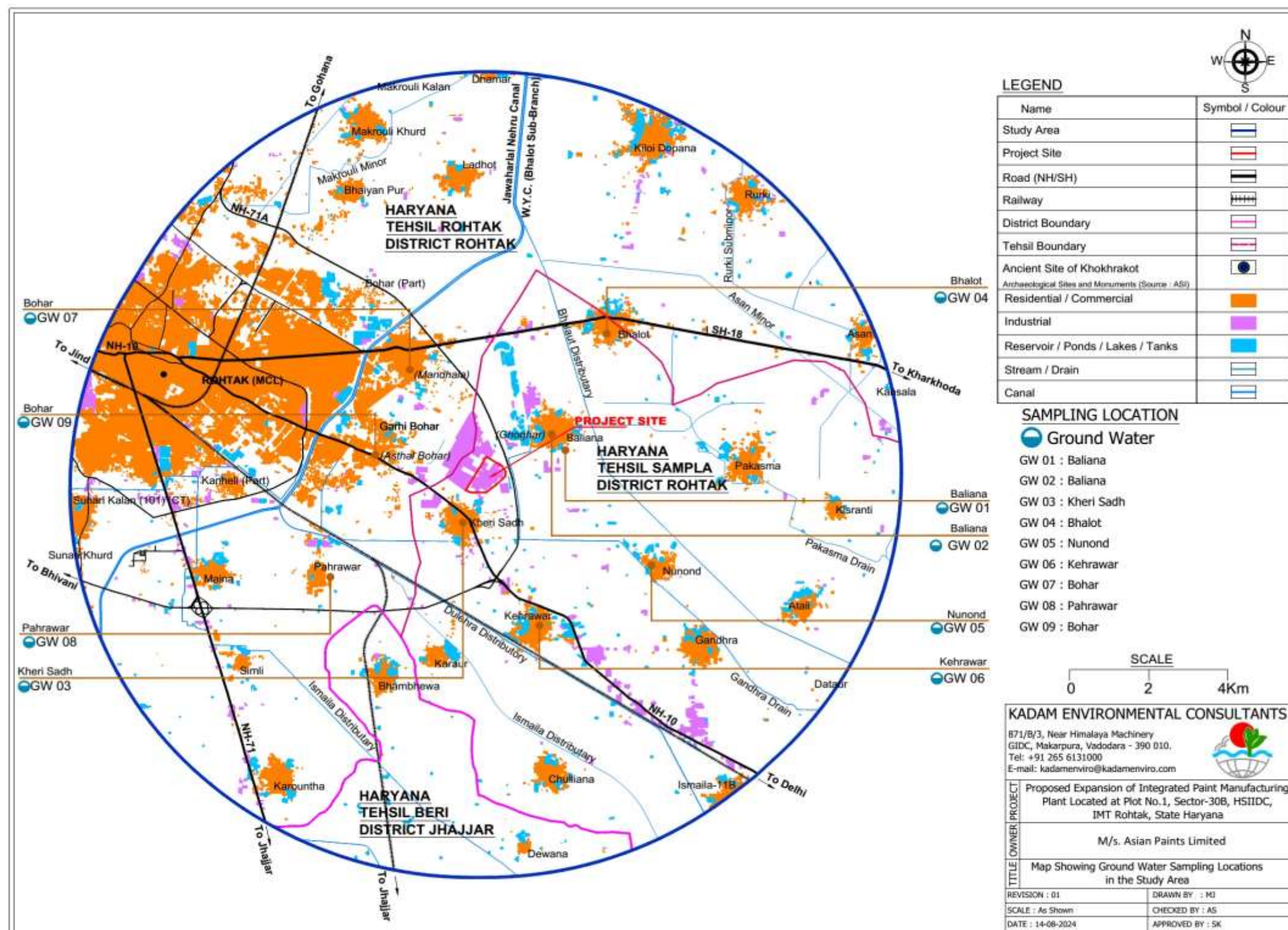
The sensitive ecological features for hydrogeology is given below:

**Table 3-36: Sensitive Ecological Features – Hydrogeology**

S. No.	Sensitive Ecological Features	Name of feature / Location			Distance (km)	Direction	Reason of Significance
1	Underground water	Open-well			--	--	As reported in EIA report for proposed 4 lakh KL/year paint manufacturing facility at IMT Rohtak, Haryana – Prepared by M/s. Asian Paints Limited
		Recharge-well					As per observation during site visit to M/s. Asian Paints Limited, IMT Rohtak in April-2024
2	Groundwater Conservation status under CGWA	State Haryana	District Rohtak	Taluka Rohtak	--	--	As given in <b>Table 3-30</b> , 'Safe' assessment unit as per Dynamic Ground Water Resource Estimation of India – 2023 by Central Ground Water Board (CGWB)
				Taluka Sampla			
			District Jhajjar	Beri	--	--	



Map 3-13: Ground water sampling location map



### 3.14.9 Ground Water Analysis Results

**Table 3-37: Ground Water Analysis Results**

Sample ID						GW-01	GW-02	GW-03	GW-04	GW-05	GW-06	GW-07	GW-08	GW-09
Sampling Location						Baliana	Baliana	Kheri Sadh	Bhalot	Nunond	Kehrawar	Bohar	Pahrawar	Asthal Bohar
S. No.	Parameters	Unit	Kadam Laboratory's Minimum Detection Limit	BIS:10500 (2012) Standard Limits for drinking water		Hand-Pump	Hand-Pump	Hand-Pump	Tube-well	Tube-well	Tube-well	Tube-well	Tube-well	Hand-Pump
				Desirable limit	Permissible limit									
1	pH	pH scale	1	6.5-8.5	No Relaxation	7.48	7.35	7.73	7.47	7.20	7.12	7.31	6.75	8.07
2	Temperature	°C	0.5	NS	NS	26.4	26.3	26.4	26.5	26.1	26.2	26.4	26.5	26.8
3	Turbidity	NTU	0.1	1	5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4	TDS	mg/lit	3	500	2000	1024	1672	508	1664	1172	1832	456	5488	472
5	Electrical conductivity	µmhos/cm	1	NS	NS	1692	2726	826	2823	1918	3030	670	9200	776
6	COD	mg/lit	5	NS	NS	<5	<5	<5	<5	<5	<5	<5	<5	<5
7	BOD	mg/lit	2	NS	NS	<2	<2	<2	<2	<2	<2	<2	<2	<2
8	Phenol	mg/lit	0.001	0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
9	Chlorides	mg/lit	NA	250	1000	315	585	102	594	323	576	62	1374	88
10	Sulphates	mg/lit	1	200	400	123	307	202	260	193	196	115	969	102
11	Total Hardness	mg/lit	2	200	600	650	550	220	730	750	1170	350	4100	410
12	Ca++ Hardness	mg/lit	2	NS	NS	34	28	50	34	26	34	102	620	244
13	Mg++ Hardness	mg/lit	2	NS	NS	616	522	170	696	724	1136	248	3480	166
14	Total Alkalinity	mg/lit	5	200	600	140	110	190	140	80	60	100	20	250
15	Fluoride	mg/lit	0.05	1	1.5	0.99	1.21	0.95	0.98	<0.05	0.36	0.50	1.00	0.50
16	Sodium	mg/lit	1	NS	NS	151.3	281	48.1	254	151	261	29.1	651	14.1
17	Potassium	mg/lit	1	NS	NS	14.6	29	3.9	24.1	14.6	24	3.25	21.2	1.80
18	Calcium	mg/lit	2	75	200	14	11	20	14	10	14	41	248	98
19	Magnesium	mg/lit	2	30	100	150	127	41	169	176	276	60	846	40
20	Salinity	mg/lit	NA	NS	NS	567	1054	184	1070	583	1038	112	2475	159
21	Total Nitrogen	mg/lit	0.05	0.5	NR	1.54	42.21	25.46	45.5	1.90	58.30	30.14	56.84	2.42
22	TKN	mg/lit	0.05	NS	NS	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
23	Nitrite	mg/lit	0.05	NS	NS	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
24	Nitrate	mg/lit	0.1	45	NR	1.54	42.21	25.46	45.5	1.90	58.30	30.14	56.84	2.42
25	Total Phosphorous	mg/lit	0.02	NS	NS	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
26	Dissolved Oxygen	mg/lit	0.2	NS	NS	3.1	2.4	2.6	2.3	2.5	2.7	3	2.7	3.1
27	Ammonical Nitrogen	mg/lit	0.05	NS	NS	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
28	SAR	-	0.01	NS	NS	2.57	5.18	1.40	4.06	2.38	3.30	0.67	4.40	0.30
29	Heavy Metals													
a	Arsenic (as As)	mg/l	0.01	0.01	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
b	Cadmium (as Cd)	mg/l	0.003	0.003	NR	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
c	Chromium (as Cr)	mg/l	0.02	0.05	NR	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
d	Copper (as Cu)	mg/l	0.03	0.05	1.5	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
e	Cyanide (as CN)	mg/l	0.03	0.05	NR	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
f	Iron (as Fe)	mg/l	0.05	0.3	NR	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
g	Lead (as Pb)	mg/l	0.01	0.01	NR	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
h	Mercury (as Hg)	mg/l	0.001	0.001	NR	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
i	Manganese (as Mn)	mg/l	0.02	0.1	0.3	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
j	Nickel (as Ni)	mg/l	0.02	0.02	NR	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
k	Zinc (as Zn)	mg/l	0.03	5	15	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03

Sample ID						GW-01	GW-02	GW-03	GW-04	GW-05	GW-06	GW-07	GW-08	GW-09
Sampling Location						Baliana	Baliana	Kheri Sadh	Bhalot	Nunond	Kehrawar	Bohar	Pahrawar	Asthal Bohar
S. No.	Parameters	Unit	Kadam Laboratory's Minimum Detection Limit	BIS:10500 (2012) Standard Limits for drinking water		Hand-Pump	Hand-Pump	Hand-Pump	Tube-well	Tube-well	Tube-well	Tube-well	Tube-well	Hand-Pump
				Desirable limit	Permissible limit									
31	Total Coliform	MPN	ND (1.8)	Shall not be detectable in any 100ml sample	Shall not be detectable in any 100ml sample	N.D(<1.8)	N.D(<1.8)	N.D(<1.8)	N.D(<1.8)	N.D(<1.8)	N.D(<1.8)	N.D(<1.8)	N.D(<1.8)	N.D.<1.8)
32	Faecal Coliforms	MPN	ND (1.8)	Shall not be detectable in any 100ml sample	Shall not be detectable in any 100ml sample	N.D(<1.8)	N.D(<1.8)	N.D(<1.8)	N.D(<1.8)	N.D(<1.8)	N.D(<1.8)	N.D(<1.8)	N.D(<1.8)	N.D(<1.8)

Notes:

ID = identification

GW = ground water

BIS = Bureau of Indian Standards

°C = degree Celcius

NS = not specified

NTU = nephelometric turbidity unit

< = values detected less-than IS & Lab limit

SS = suspended solids

mg/lit = milligram per liter

µmhos/cm = micro ohms per centimeter

COD = chemical oxygen demand

BOD = biological oxygen demand

NR = no relaxation

MPN = most probable number

ml = milligram

NA = not applicable

Ca++ = calcium ions

Mg++ = magnesium ions

SAR = sodium adsorption ratio

MPN = most probable number

N.D. (<1.8) = not detected beyond Kadam laboratory's minimum detection limit

Values in 'Bold' = higher in concentration than Kadam laboratory's minimum detection limit

Values in 'Bold' + 'Yellow Highlights' = higher in concentration than acceptable / desirable limit of BIS 10500:2012

Values in 'Bold' + 'Yellow Highlights' + 'Red Font' = higher in concentration than permissible limit (in absence of alternate source) of BIS 10500:2012

### 3.14.10 Inferences: Ground Water Analysis Results

- a) **pH:** the concentration of pH in ground water sample indicates alkaline conditions.
- b) **Total Dissolved Solids (TDS):** the distribution of TDS content in ground water sample ranging from 456 to 5488 mg/lit. Concentrations of TDS in most of the samples is above the acceptable/desirable limit & in GW-08 is above the permissible limit.
- c) **Electrical Conductivity (EC):** is ranging from 670 to 9200  $\mu\text{mhos/cm}$ . As per CGWA, if ground water having EC above 5000  $\mu\text{mhos/cm}$  at 25°C then it is considered to be saline water.
- d) **Chlorides:** is ranging from 62 to 1374 mg/lit indicates saline water quality in relation to the geological conditions. Also reflects higher ground water pumping quantity.
- e) **Total Hardness:** is ranging from 220 to 4100 mg/lit indicates hard nature of ground water. The water logging conditions also contributed to the ground water environment. As per site visit observations, the local water bodies were connected with the village storm water drainages. These storm water drainages were utilized for discharge of untreated domestic wastewater from local habitants, bathing of domestic animals, etc.
- f) **Fluoride:** is ranging from 0.50 to 1.21 mg/lit expect for GW-05 reported <0.05 mg/lit. The habitats in the study area were observed with pale yellow to yellow coloured teeth. Also the fly ash from the nearby brick industry may contribute to high fluoride concentrations.
- g) **Total Nitrogen:** is the sum of all forms of nitrogen, including nitrate, nitrite, ammonia and organic nitrogen. Though it is abundant naturally found in the environment, however the concentration level in ground water environment could be due to release of untreated or treated sewage or spread of fertilizer or other chemicals applied to the crop fields.
- h) **Nitrate:** The presence of high Nitrate contains in ground water at varying depth is indicating hydraulic connections between unconfined and semi-confined aquifer. The lateral as well as vertical distribution of such zone is extremely variable with respect to space and depth which could be one of the reason for distribution of Nitrate in varying proportion which is reflected in water quality data of collected water samples. Also, the anthropogenic conditions may contribute to the ground water quality.
- i) No heavy metals were observed in the laboratory tested results.

## 3.15 Soil Environment

### 3.15.1 Introduction

The project area falls under Eastern Agro-climatic Zone (HR-1). The annual average rain fall is 576.3 mm. The area represents sandy loam soils (100%). District area Rohtak is occupied by Indo-Gangetic alluvium. There are no surface features worth to mention. Physiographically the area is flat terrain. The area slopes towards northeast to southwest with an average gradient of 0.19 m/km. The general elevation in the district varies between 215 m to 222m above MSL. The soils of the district are fine to medium textured. It comprises sandy loam in Rohtak, Sampla, and Lakhan Majra blocks whereas it is loamy sand with occasional clay loam in Kalanaur and Meham Blocks. High potassium, medium phosphorus and low nitrogen occur in the soils. The soils of the district are classified as arid brown (Solemnized) and sierozem.

### 3.15.2 Objectives

- To know physical and chemical properties of soil.
- To identify soil pollution and suggest mitigation measures.
- To give monitoring plan for improving soil quality.



### 3.15.3 Methodology

To study site-specific soil quality and condition includes soil colour, texture mineralogical content, plasticity and any possible impact to the environmental setting due to project.

### Soil Sample Collection Methodology

Kadam Environmental Consultants has collected the soil samples and carried out their analysis in KEC laboratory to assess quality of soil within 10 km radius of the project site.

The locations for soil sample collection were randomly selected at the project site as well as from the surrounding areas namely Soil-1 to Soil-08. The soil samples from 0-15 cm depth were collected by using core cutter/post hole augur. The samples were homogenized and about 1 Kg soil sample was collected in the polyethylene bag. Labelled with sample ID which includes site numbers and project name. The samples were brought to the laboratory for analysis of physical (porosity, water holding capacity, permeability, and particle size distribution) and chemical properties (cation exchange, electrical conductivity, sodium adsorption ratio, pH, Ca, Mg, Na, K).

### Soil Sample Analysis Methodology

Methodology of soil sample analysis is given in **Table 3-38**.

**Table 3-38: Methodology of Soil Sample analysis**

Sr. No.	Sampling Parameters	Sample collection	Analytical Equipment	Methodology	Remark
1	Porosity	Manual sample collection using hammer and container tube for collecting undisturbed top soil.	-	IS: 2720 Part 7	Trial pit method for topsoil sample collection; disturbed samples
2	Water holding capacity		Keen Apparatus	HMSO, UK	
3	Permeability		-	IS: 2720 Part 17	
4	Moisture content		Electronic Balance	IS: 2720 Part 2	
5	Texture		-	IS: 2720 Part 4	
6	Particle size Distribution		Glass wares	IS: 2720 Part 4	5% Leachate to be made and analysed as per APHA, "Standard Methods"  All method numbers are as per APHA "Standard Methods" (21st edition, 2005)
7	Cation Exchange Capacity		Centrifuge	IS: 2720 Part 24 (1976)	
8	SAR		F. Photometer (Na, K) Titration (Ca & Mg)	Calculation	
9	pH		pH Meter	4500 H+B	
10	Electrical Conductivity		Conductivity Meter	As per IS 14767 -2000	
11	Calcium		Glass wares	3500 Ca B	
12	Magnesium		Glass Wares	3500 Mg B	
13	Sodium (Na)		F.Photometer	3500 Na B	
14	Potassium		F.Photometer	3500 K B	

### 3.15.4 Soil Sampling Locations

On the basis of standard ToR, the suggested nos. of sampling are 08 within 10 km radial distance from the project site.

Details of sampling locations are given in **Table 3-39** and map is presented in **Map 3-14**.

**Table 3-39: Soil Sampling Locations**

Code	Sampling location name	Latitude (N)	Longitude (E)	Dist. from Project Site (km)	Direction
ST01	Nr. Project site	28°52'30.10"N	76°41'08.64"E	0.89	NE
ST02	Baliana	28°52'43.15"N	76°41'24.21"E	1.47	NE
ST03	Kherisad Village	28°51'43.63"N	76°40'11.37"E	0.37	S
ST04	Bhalaat Village	28°54'17.92"N	76°41'58.57"E	4.25	NNE
ST05	Nonand Village	28°50'54.62"N	76°42'54.42"E	4.3	ESE

Code	Sampling location name	Latitude (N)	Longitude (E)	Dist. from Project Site (km)	Direction
ST06	Kharawar Village	28°50'14.26"N	76°41'03.00"E	3.33	SSE
ST07	Bohar Village	28°53'45.78"N	76°39'30.31"E	2.86	NNW
ST08	Pahrawar Village	28°50'50.87"N	76°37'54.99"E	4.08	WSW

**Photographs 3-7: Soil Sampling Photographs**

 <p>ST 01-Nr. Project Site</p>	 <p>ST 03- Kheri Sadh</p>
 <p>ST 04- Bhalaut</p>	 <p>ST 05-Nunond</p>



ST 06-Kharawar



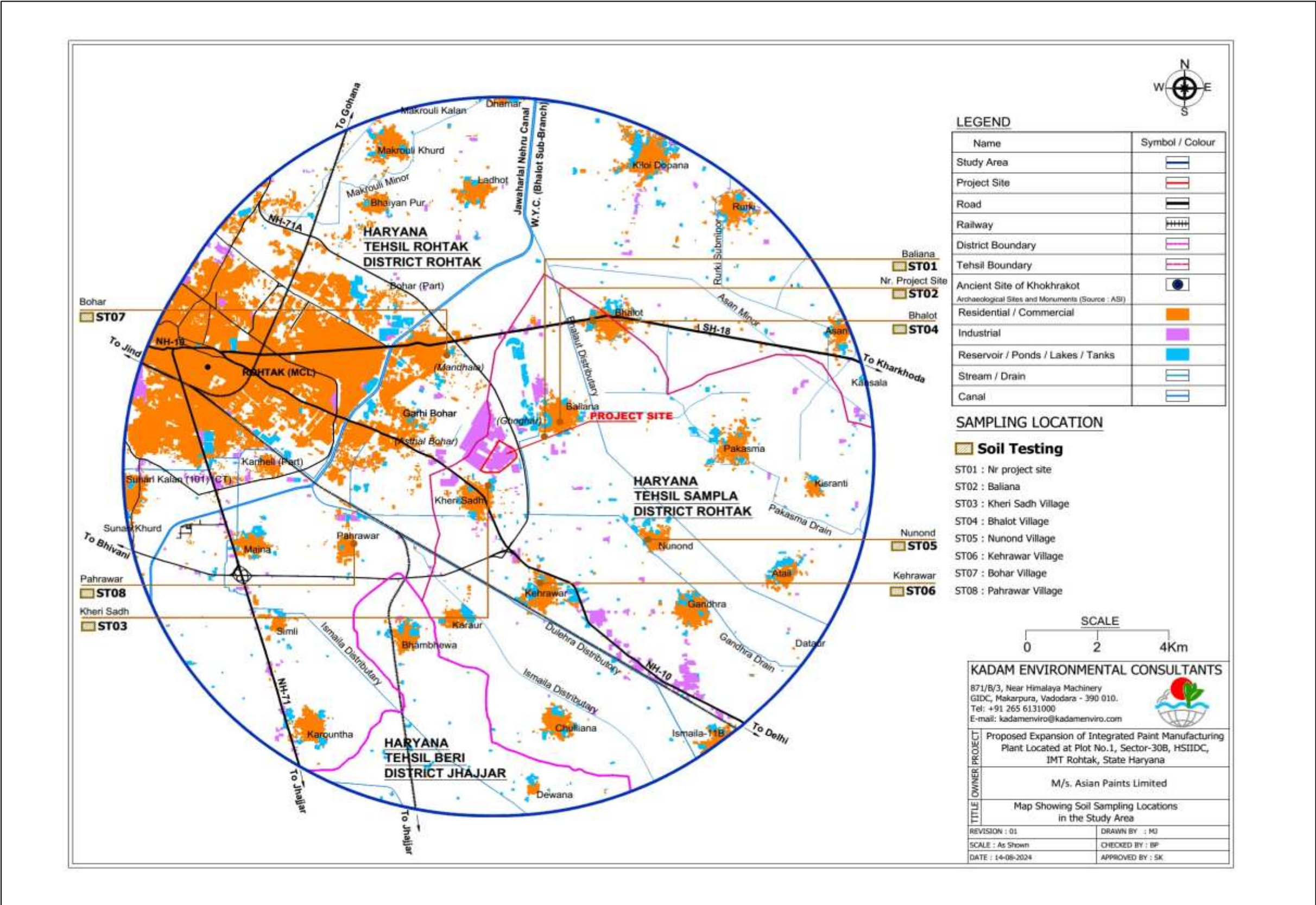
ST 07-Bohar



ST 08-Pahrawar



Map 3-14: Soil Sampling Location Map



### 3.15.5 Soil Quality Analysis

Results of soil analysis are given in **Table 3-40**.

**Table 3-40: Soil Analysis Result**

Sr. No	Parameter	Unit	ST01	ST02	ST03	ST04	ST05	ST06	ST07	ST08
1	Porosity	%	55	49	60	48	51	61	56	59
2	Water Holding Capacity	%	43.75	42.76	50.71	44.84	42.07	52.60	43.33	48.55
3	Permeability	mm/hr	14.94	20.63	12.74	23.90	19.69	12.17	19.22	13.03
4	Particle Size Distribution	-								
a	Sand	%	52	55	45	58	54	42	52	49
b	Clay	%	16	16	45	16	23	42	32	42
c	Silt	%	32	29	10	26	23	16	16	9
5	Texture	-	Loam	Sandy loam	Clay	Sandy loam	Sandy Clay loam	Clay	Sandy Clay loam	Clay
6	Cation Exchange Capacity	meq/100gm	17.27	17.09	22.37	18.81	19.01	20.96	20.70	21.58
7	Electrical Conductivity	μmohs/cm	4040	567	3460	3710	984	1356	4420	1858
8	Exchangeable Sodium	%	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
9	SAR		0.26	0.22	0.20	0.34	0.20	0.26	0.35	0.29
10	pH		6.79	7.60	7.03	6.92	6.98	7.67	6.87	7.54
11	Calcium	meq/100gm	9.70	8.74	11.30	8.98	10.90	10.42	9.30	10.82
12	Magnesium	meq/100gm	6.40	7.37	10.04	8.34	7.21	9.32	9.64	9.32
13	Sodium	meq/100gm	1.05	0.89	0.94	1.42	0.84	1.15	1.53	1.30
14	Potassium	meq/100gm	0.12	0.08	0.09	0.07	0.06	0.08	0.23	0.15
15	TOC	%	0.45	0.43	0.48	0.42	0.44	0.47	0.45	0.46

**Note:** NA - Not Applicable, NR - No Relaxation, NS - Not Specified

### 3.15.6 Observations on Soil Quality

The analysis of physicochemical properties of soil samples collected from the site and surrounding areas indicated that porosity ranged from 48 - 61 and WHC varied from 42.07 - 52.60 %, while permeability ranged from 12.17 – 23.90 mm/hr. High WHC and porosity is on account of sandy loam to clay texture of soils and permeability was moderate to good due to variations in soil texture. The CEC ranged from 17.09 – 22.37 meq/100 g soil, which is a moderate looking to the texture of soils. The EC (0.567 to 4.420 dS/m) was low (<0.80) to very high (>3.20 dS/m) and ESP (1.66 to 1.80) was well within the safe limit of <15.0. The pH ranged from 6.79 – 7.67, indicating that soils are normal (pH 6.5 to 7.8) to alkaline. Among water soluble cations predominance of Ca (1748 to 2260 mg/kg) was seen followed by Mg (768 to 1204.8 mg/kg), Na (0.19 – 0.35 g/kg) and K (0.02 to 0.09 g/kg). The fertility status of soils indicates that organic carbon (0.42 to 0.48 % OC) status of soils was low, which indicate that nitrogen status was low. The P status (13.9 to 26.8 kg/ha) was also low (<28 kg/ha), while K status (44.80 to 201.6 kg/ha) was low (<140 kg/ha) to medium (140 to 280 kg/ha). Similar findings were reported by Pankaj Kumar and Rohtas Kumar (2018) for soils of Industrial area of Rohtak district of Haryana (refer secondary data in the section below).

#### Soil Quality Interpretation:

Soils in the area are neutral in reaction, non-saline to highly saline. Soil fertility of the site soils was low with respect to N and P, but low to medium in potassium status.

Soils in the surrounding areas are having sandy loam to clay loam texture having moderately low permeability and non-saline to highly saline, but not-sodic. However, at site salinity is moderate. Soil should be monitored for EC, pH and ESP post monsoon in a greenbelt area.

#### Secondary data:

The soils of Industrial area of Rohtak district had pH, EC, Organic carbon, available nitrogen, available phosphorus and available potassium ranged from 7.90 to 8.40, 1.30 to 2.90 dS/m, 0.49 to 0.62 %, 210 to 266 kg/ha, 15-18 kg/ha and 324 to 351 kg/ha, respectively (Pankaj Kumar and Rohtas Kumar, 2018)).

**Ref:-** Pankaj Kumar and Rohtas Kumar (2018). Effect of Industries on Soils of adjoining areas of Rohtak District, Haryana. Int. J. Curr. Microbiol. App. Sci. (2018). 7(7):126-13

### 3.16 Ecology and Biodiversity

#### 3.16.1 Period of the study and Study area

Project site considered as a core zone and surrounding area up to 10 km radius from the project boundary considered as a buffer zone for biodiversity sampling.

A field study for biodiversity survey was carried out to understand biodiversity status during the month of March & July 2024.

#### 3.16.2 Scope, Aim and Objectives

- To inventories floral and faunal components of project area (project site or core zone and 10 km. radius / buffer zone).
- To locate / demarcate and understand ecological setting of the project area in terms of national parks / wildlife sanctuary / reserve forests / tiger reserve / Eco-sensitive Areas / wetlands etc. within 10 km. radius from project site (if any).
- To identify Schedule-I, rare, endemic and endangered species within the project study area and prepare conservation plan for same.

- To identify impact zone and evaluate the likely impact of the proposed project on floral and faunal components of the project study area.
- To suggest / prepare action plan to mitigate likely impacts on the biodiversity of the project area through plantation around project area to reduce / mitigate likely impacts.

### 3.16.3 Study Area

#### Delineation of the study area

##### *Project Site / Core Zone and Buffer Zone*

Project site as a core zone and surrounding 10 km. radius considered as a buffer zone for the study.

#### Ecological Sensitivity / Habitats of the Study Area

Buffer zone encompasses following different ecologically important features within 10 km radius from proposed project site boundary.

#### Forest / National Park / Sanctuary

There is no National Park or Wildlife Sanctuary or any reserve forest or protected area falls within buffer zone.

#### Eco sensitive areas

There is no Eco sensitive area within the project stretch.

**Table 3-41: Ecological Sensitive Areas within 15 km of the Project Site**

S. No.	Sensitive Ecological Features	Name of feature / Location	Distance (km)	Direction	Reason of Significance
1	Ramsar wetland (Ramsar Convention)	--	--	--	Not applicable
2	Wetlands as per National Wetlands Atlas	--	--	--	Not applicable
3	National park	--	--	--	Not applicable
4	Wildlife sanctuary	--	--	--	Not applicable
5	Tiger reserve	--	--	--	Not applicable
6	Biosphere reserve	--	--	--	Not applicable
7	Conservation reserve	--	--	--	Not applicable
8	Elephant reserve	--	--	--	Not applicable
9	Important Bird Areas (IBAs)	--	--	--	Not applicable
10	Eco-sensitive zone (EP Act)	--	--	--	Not applicable
11	Forest (Forest Conservation Act) (including protected forests and reserved forests)	--	--	--	Not applicable
12	Wildlife corridor	--	--	--	Not applicable
13	Coastal zones	--	--	--	Not applicable
14	Areas used by protected, important or sensitive species of flora or fauna for breeding, nesting, foraging, resting, over wintering, migration	--	--	--	Not applicable
15	Endemic species, if any	--	--	--	Not applicable
16	Mangroves	--	--	--	Not applicable



**Rivers/ Water Bodies****Table 3-42: Details of Water Bodies in the Buffer Zone**

River/Bandhara	Distance from Project Site (Km)	Direction
Kheri Sadh Pond	0.37	S
Baliana Pond	1	ENE
Jawaharlal Nehru Canal	3.63	WNW
Garhi Bohar Pond	1.91	WNW
Drain (Near Project Site)	0.16	E

**3.16.4 Methodology****Secondary Data Collection / Desktop Literature Review**

- Based on the project area information; compilation and study of available scientific literatures prior to field survey for better insight on species level identification, understanding their current status, and the distribution of species at local & regional level.
- In order to acquire project area information, Open series map (OSM), drawn Landuse/ Land cover map (LU/LC), and study area map were used for habitat assessment.
- Detailed checklist of flora and fauna from Regional/District Forest Department, information available on websites of Botanical Survey of India (BSI), Zoological Survey of India (ZSI), published literature, research papers and reports has been consulted.
- Local interventions/public surveys are also carried to acquire information pertaining to certain species.

**Primary / Field Data Collection (Fauna)**

- Primary information pertaining to the existing fauna from the study area were recorded through field surveys using standard methodologies. For birds, and mammals, the standard methodology adopted for survey consist of visual encounters (Using Olympus 8-16\*40 Binoculars) during Line transects, Vehicular transects, Point counts, and Vocal encounters.
- The primary data acquired from the field surveys were recorded in Field book and Field data sheets (Con-FMT-014). Indirect sightings/records such as Footprints, Scats, and Vocal encounters were also recorded along with primary data during the field surveys.
- For Identification (till Species Level) and validation of Primary data; Photographic documentation of recorded individual species were carried out using field camera.

**Primary / Field Data Collection (Flora)**

- For trees, herbs and shrubs, the standard methodology adopted for survey consist of visual encounters during line transects and vehicular transects.
- The primary data acquired from the field surveys are recorded in Field book and Field data sheets (Con-FMT-014).
- For Identification (Species Level) and validation of Primary data; Photographic documentation of individual species is carried out using field camera.

**Data Analysis**

- The acquired information/filled field datasheets are compiled along with the field photographs.
- Based on photographic records, vocals, and pugmarks; the identification of recorded individuals till species level were carried out using scientific literatures, field guides, regional checklists, Forest Working Plan and species database.

- In order to understand the current status of the recorded species, review on the past records of species distribution from the study area and the conservation status of the species as per IUCN Red List and Indian Wildlife (Protection) Amendment Act, 2022 were assessed.

### Threatened Biodiversity Assessment Criteria

Wildlife (Protection) Amendment Act, 2022, ENVIS Database, IUCN Red List of threatened species (IUCN, 2024), Botanical Survey of India (BSI) and Zoological Survey of India (ZSI).

### 3.16.5 Study Details

A field visit was carried out during the month of March & July 2024, covering all habitats of the study area. Details regarding area under study are mentioned as under

### 3.16.6 Baseline Status of Biodiversity

#### Terrestrial Environment

#### Floral

#### Core Zone

Core zone of the proposed expansion project i.e. 129.28 Acres i.e. 5,23,198 m<sup>2</sup> or 52.31 Hectare is situated at Plot No. 1 Sector 30-B, HSIIDC, IMT Rohtak Haryana. A total number of 133 plant species are present at the project site comprising 64 tree, 13 shrubs, 51 herbs and 05 climbers. Details of existing trees in green belt area has been provided in **Table 3-43**.

**Table 3-43: Shrubs, Herbs and Climbers observed from the project site**

S. No.	Scientific Name	Common Name	Family
<b>SHRUBS</b>			
1	<i>Bougainvillea glabra*</i>	Boogan Vel	Nyctaginaceae
2	<i>Calotropis procera*</i>	Aakhda	Apocynaceae
3	<i>Carissa carandus*</i>	Karonda	Apocynaceae
4	<i>Hamelia patens*</i>	Firebush	Rubiaceae
5	<i>Hibiscus rosa-sinensis *</i>	Gurhal/ China Rose	Malvaceae
6	<i>Lawsonia inermis*</i>	Mehendi	Lythraceae
7	<i>Nerium oleander*</i>	Kanher/ Oleander	Apocynaceae
8	<i>Phyllanthus reticulate*</i>	Makhi	Phyllanthaceae
9	<i>Rosa multiflora var.carnea</i>	Kunj/ Pink Multiflora Rose	Rosaceae
10	<i>Senna polyphylla*</i>	Desert Cassia	Caesalpiniaceae
11	<i>Tecoma stans*</i>	Piliya/ Yellow Bells	Bignoniaceae
12	<i>Trichaurus ericoides</i>	Jhau/ Fersah	Tamaricaceae
13	<i>Volkameria inermis</i>	Glory Bower/ Sankuppi	Verbenaceae
<b>HERBS</b>			
14	<i>Achyranthes aspera*</i>	Aghara/ Prickly Chaff Flower	Amaranthaceae
15	<i>Ageratum conyzoides*</i>	Goat Weed/ Jungli Pudina	Asteraceae
16	<i>Aloe vera*</i>	Gheekumari	Asparagaceae
17	<i>Alternanthera brasiliana*</i>	Joyweed	Amaranthaceae
18	<i>Bambusa vulgaris</i>	Golden Bamboo	Poaceae
19	<i>Boerrhavia diffusa*</i>	Punarvaa	Nyctaginaceae
20	<i>Cannabis sativa*</i>	Marijuana/ Bhang	Cannabaceae
21	<i>Catharanthus roseus*</i>	Sadabahar/ Periwinkle	Apocynaceae

S. No.	Scientific Name	Common Name	Family
22	<i>Cenchrus ciliaris</i> *	Buffel Grass/ Anjan/ Baiba	Poaceae
23	<i>Cenchrus pennisetiformis</i>	White or slender buffel grass	Poaceae
24	<i>Cenchrus setigerus</i>	Birdwood Grass	Poaceae
25	<i>Chenopodium album</i> *	Bathua	Chenopodiaceae
26	<i>Cirsium arvense</i>	Creeping Thistle	Asteraceae
27	<i>Cymbopogon citratus</i> *	Lemon Grass	Poaceae
28	<i>Cynodon dactylon</i> *	Doob/ Bermuda Grass	Poaceae
29	<i>Dahlia sp</i> *	Dahlia	Asteraceae
30	<i>Datura metel</i> *	Devil's Trumpet	Solanaceae
31	<i>Dendrocalamus sp. *</i>	Green Bamboo	Poaceae
32	<i>Dianthus barbatus</i> *	Sweet William	Caryophyllaceae
33	<i>Dianthus sp.</i>	Dianthus sp.	Caryophyllaceae
34	<i>Dichanthium annulatum</i> *	Marvel Grass/ Sheda Grass	Poaceae
35	<i>Erigeron sumatrensis</i>	Tall Fleabane	Asteraceae
36	<i>Furcraea foetida</i>	Giant Cabuya	Asparagaceae
37	<i>Glebionis coronaria</i>	Crown Daisy/ Gulchini	Asteraceae
38	<i>Hymenocallis speciosa</i>	Showy Spider Lily	Amaryllidaceae
39	<i>Launaea procumbens</i> *	Creeping Launaea/ Jangli Gobi	Asteraceae
40	<i>Lobularia maritima</i>	Sweet Alyssum	Brassicaceae
41	<i>Melilotus indicus</i> *	Ban Methi/ Indian Sweet Clover	Fabaceae
42	<i>Ocimum americanum</i> *	Kali Tulasi/ Wild Basil	Lamiaceae
43	<i>Oxalis corniculata</i>	Amrul/ Creeping Wood Sorrel	Oxadilaceae
44	<i>Oxalis debilis</i>	Large Flowered Pink Sorrel	Oxadilaceae
45	<i>Papaver rhoeas</i>	Common Poppy	Papaveraceae
46	<i>Petunia</i>	Petunia	Solanaceae
47	<i>Phyla nodifolia</i> *	Pippali	Verbenaceae
48	<i>Polypogon monspeliensis</i> *	Annual Beard Grass	Poaceae
49	<i>Pulicaria wightiana</i>	Sonela/ Sontikli	Asteraceae
50	<i>Rosa sp.</i>	Rose	Rosaceae
51	<i>Rumex dentatus</i> *	Ambavati/ Toothed Dock	Polygonaceae
52	<i>Saccharum spontaneum</i> *	Kaans	Poaceae
53	<i>Solanum nigrum</i> *	Mokoi/ Black Nightshade	Solanaceae
54	<i>Sonchus oleraceus</i> *	Dudhi/ Sow Thistle	Asteraceae
55	<i>Sphagneticola trilobata</i>	Yellow Dots	Asteraceae
56	<i>Syngonium sp. *</i>	Arrowhead Plant	Araceae
57	<i>Suaeda fruticosa</i> *	Shrubby Seablite	Amaranthaceae
58	<i>Tagetes erectus</i>	Marigold/ Genda	Asteraceae
59	<i>Tropaeolum majus</i>	Nasturtium	Tropaeolaceae
60	<i>Tridax procumbens</i> *	Kanphuli/ Tridax Daisy	Asteraceae
61	<i>Verbesina encelioides</i>	Golden Crownbeard	Asteraceae
62	<i>Vicia sativa</i> *	Akra/ Matari/ Common Vetch	Fabaceae
63	<i>Viola sp.</i>	Viola	Violaceae
64	<i>Withania somnifera</i> *	Ashwagandha	Solanaceae
<b>CLIMBERS</b>			
65	<i>Artabotrys hexapetalus</i>	Hari Champa/ Ylang Ylang Vine	Annonaceae
66	<i>Coccinia indica</i> *	Kundru/ Ivy Gourd	Cucurbitaceae
67	<i>Cuscuta campestris</i>	Golden Dodder	Cuscutaceae

S. No.	Scientific Name	Common Name	Family
68	<i>Ipomoea cairica</i> *	Railway Creeper	Convolvulaceae
69	<i>Oxystelma esculentum</i>	Rosy Milkweed Vine/ Dugdikhka	Apocynaceae
Source: (*) Species observed during the survey and rest of the information obtained from secondary evidences/ Rapid Biodiversity Assessment Report for Asian Paints, Rohtak			

### Buffer Zone

Overall 187 species were reported from buffer zone of the proposed site, out of which maximum species of trees (85) followed by herbs (55), shrubs (24), grasses (12) and climbers (11). Details of Floral species present in buffer zone has been provided in **Table 3-44**.

**Table 3-44: List of floral diversity from project study area (Buffer Zone)**

S. No.	Scientific Name	Common Name	Family
<b>TREES</b>			
1	<i>Acacia nilotica</i> *	Babool	Fabaceae
2	<i>Acacia auriculiformis</i> *	Vilayati Babul/ Australian Acacia	Mimosaceae
3	<i>Acacia nilotica</i> *	Babool	Mimosaceae
4	<i>Acacia planifrons</i> *	Chhatralo Baval	Fabaceae
5	<i>Aegle marmelos</i> *	Bel	Rutaceae
6	<i>Albizia lebbeck</i> *	Shirish	Mimosaceae
7	<i>Albizia julibrissin</i> *	Persian acacia	Fabaceae
8	<i>Alstonia scholaris</i> *	Saptarni/ Scholar tree	Apocynaceae
9	<i>Anogeissus latifolia</i>	Dhaora	Combretaceae
10	<i>Azadirachta indica</i> *	Neem	Meliaceae
11	<i>Bassia latifolia</i> *	Mahua	Sapotaceae
12	<i>Bauhinia tomentosa</i> *	Pila Kanchan	Caesalpiniaceae
13	<i>Bauhinia variegata</i> *	Kachnar/ Orchid tree	Caesalpiniaceae
14	<i>Bombax ceiba</i> *	Semal	Malvaceae
15	<i>Butea frondosa</i>	Palas	Leguminosae
16	<i>Caryota urens</i> *	Fishtail Palm	Arecaceae
17	<i>Cascabela thevetia</i> *	Pila Kanher/ Bitti	Apocynaceae
18	<i>Cassia fistula</i> *	Amaltas/ Bahava	Fabaceae
19	<i>Casuarina equisetifolia</i> *	Suru/ Whistling Pine	Casuarinaceae
20	<i>Citrus limon</i> *	Nimbu/ Lemon	Rutaceae
21	<i>Cordia dichotoma</i> *	Lasora/ Indian Cherry	Boraginaceae
22	<i>Dalbergia latifolia</i> *	Shisham	Leguminosae
23	<i>Dalbergia sissoo</i> *	Shisam/ Indian Rosewood	Fabaceae
24	<i>Delonix regia</i> *	Gulmohar	Fabaceae
25	<i>Emblica officinalis</i> *	Amla	Euphorbiaceae
26	<i>Erythrina variegata</i>	Pangara/ Indian Coral Tree	Fabaceae
27	<i>Eucalyptus species</i> *	Safeda	Myrtaceae
28	<i>Feronia elephantum</i>	Kaith	Rutaceae
29	<i>Ficus bengalensis</i> *	Barh/ Banyan Tree	Moraceae
30	<i>Ficus benjamina</i> *	Weeping Fig Tree	Moraceae
31	<i>Ficus elastica</i> *	Indian Rubber Tree	Moraceae
32	<i>Ficus glomerata</i> *	Goolar/ Cluster Fig Tree	Moraceae
33	<i>Ficus microcarpa</i>	Chinese Banyan Tree	Moraceae
34	<i>Ficus racemosa</i> *	Goolar	Moraceae
35	<i>Ficus religiosa</i> *	Peepal/ Sacred Fig	Moraceae

S. No.	Scientific Name	Common Name	Family
36	<i>Ficus virens</i> *	Pilkhan	Moraceae
37	<i>Gmelina arborea</i> *	Gamari	Verbenaceae
38	<i>Grevillea robusta</i> *	Silver Oak	Proteaceae
39	<i>Holoptelia integrifolia</i> *	Pahadi Papdi/ Indian Elm Tree	Ulmaceae
40	<i>Kigelia africana</i>	Sausage Tree/ Baalam Khira	Bignoniaceae
41	<i>Lagerstroemia speciosa</i> *	Pride of India/ Jarul	Lythraceae
42	<i>Leucaena leucocephala</i>	Subabul/ River Tamarind	Mimosaceae
43	<i>Mangifera indica</i> *	Aam/ Mango	Anacardiaceae
44	<i>Manilkara hexandra</i> *	Khirmi/ Ceylon Iron Wood	Sapotaceae
45	<i>Manilkara zapota</i> *	Chickoo/ Sapota	Sapotaceae
46	<i>Callistemon viminalis</i> *	Bottlebrush Tree	Myrtaceae
47	<i>Melia azedarach</i> *	Bakaneem/ Persian Lilac/ Chinaberry Tree	Meliaceae
48	<i>Millingtonia hortensis</i> *	Akasneem/ Indian Cork Tree	Bignoniaceae
49	<i>Mimusops elengi</i> *	Moulshri/ Bakul	Sapotaceae
50	<i>Polyalthia longifolia</i> *	Ashok/ False Ashok/ Mast Tree	Annonaceae
51	<i>Morinda tinctoria</i> *	Aal or Rangari	Rubiaceae
52	<i>Moringa oleifera</i> *	Sejan/ Drumstick Tree	Moringaceae
53	<i>Morus alba</i> *	Shahtoot/ Mulberry	Bignoniaceae
54	<i>Murraya koenigii</i> *	Curry patta	Meliaceae
55	<i>Murraya paniculata</i> *	Kamini/ Kunti	Myrtaceae
56	<i>Peltophorum pterocarpum</i> *	Copperpod/ Sonmohar	Caesalpiniaceae
57	<i>Phoenix sylvestris</i> *	Date Palm /Khajuri	Arecaceae
58	<i>Plumeria obtusa</i> *	White Frangipani/ Champa/ Gulchin	Apocynaceae
59	<i>Millettia pinnata</i> *	Karanj/ Papdi/ Pongam Tree	Fabaceae
60	<i>Populus ciliata</i> *	Popular	Salicaceae
61	<i>Prosopis cineraria</i> *	Khejadi	Mimosaceae
62	<i>Prosopis juliflora</i> *	Vilayati Keekar	Mimosaceae
63	<i>Psidium guajava</i> *	Amrud	Myrtaceae
64	<i>Pterospermum acerifolium</i> *	Kanak Champa	Sterculiaceae
65	<i>Punica granatum</i> *	Anaar/ Pomegranate	Lythraceae
66	<i>Putranjiva roxburgii</i>	Putranjiva	Putranjivaceae
67	<i>Ricinus communis</i>	Castor oil plant/ Arandi	Euphorbiaceae
68	<i>Roystonea regia</i> *	Royal Palm	Arecaceae
69	<i>Schleichera trijuga</i>	Kusum	Sapindaceae
70	<i>Senna siamea</i> *	Kassod/ Kashid	Caesalpiniaceae
71	<i>Spathodea campanulata</i> *	African Tulip Tree	Bignoniaceae
72	<i>Spondias pinnata</i>	Amra	Anacardiaceae
73	<i>Syzigium cumini</i> *	Jamun	Myrtaceae
74	<i>Tabebuia rosea</i> *	Pink Trumpet Tree	Bignoniaceae
75	<i>Tabernamontana divaricata</i> *	Crape Jasmine/ Chandni/ Tagar	Apocynaceae
76	<i>Tamarindus indica</i> *	Imli	Fabaceae
77	<i>Tectona grandis</i> *	Sagon	Verbenaceae
78	<i>Terminalia arjuna</i> *	Arjun	Combretaceae
79	<i>Terminalia belerica</i>	Bahera	Combretaceae
80	<i>Thespesia populnea</i> *	Paras Pipal/ Bhend/ Indian Tulip Tree	Malvaceae
81	<i>Trachycarpus fortunei</i>	Windmill Palm	Arecaceae
82	<i>Washingtonia filifera</i> *	Washington Palm	Arecaceae





S. No.	Scientific Name	Common Name	Family
83	<i>Wodyetia bifurcata</i> *	Foxtail Palm	Arecaceae
84	<i>Ziziphus mauritiana</i> *	Ber	Rhmanceae
<b>SHRUB</b>			
1	<i>Achyranthes aspera</i> *	Apamarg	Amaranthaceae
2	<i>Berberis spp.</i>	Kinjora	Berberidaceae
3	<i>Bougainvillea glabra</i> *	Boogan Vel	Nyctaginaceae
4	<i>Calotropis gigantea</i> *	Aak	Asclepiadaceae
5	<i>Calotropis procera</i> *	Aak	Asclepiadaceae
6	<i>Capparis decidua</i> *	Kareel	Brassicaceae
7	<i>Carissa carandus</i> *	Karonda	Apocynaceae
8	<i>Cassia alata</i> *	Dadmari	Fabaceae
9	<i>Eugenia heyneana</i> *	Jamun	Myrtaceae
10	<i>Hamelia patens</i> *	Firebush	Rubiaceae
11	<i>Hibiscus rosa-sinensis</i>	Gurhal/ China Rose	Malvaceae
12	<i>Lantana camara</i> *	Raimunia	Verbenaceae
13	<i>Lawsonia inermis</i> *	Mehendi	Lythraceae
14	<i>Nerium oleander</i>	Kanher/ Oleander	Apocynaceae
15	<i>Phyllanthus reticulata</i> *	Makoi	Phyllanthaceae
16	<i>Rosa multiflora var. carnea</i>	Kunj/ Pink Multiflora Rose	Rosaceae
17	<i>Senna polyphylla</i>	Desert Cassia	Caesalpiniaceae
18	<i>Smilax prolifera</i> *	Ramdaton	Liliaceae
19	<i>Tecoma stans</i>	Piliya/ Yellow Bells	Bignoniaceae
20	<i>Trichaurus ericoides</i>	Jhau/ Fersah	Tamaricaceae
21	<i>Volkameria inermis</i>	Glory Bower/ Sankuppi	Verbenaceae
22	<i>Woodfordia floribunda</i> *	Dhawai	Lythraceae
23	<i>Ziziphus nummularia</i> *	Jharber	Rhamnaceae
24	<i>Zizyphus rugosa</i> *	Churna	Rhamnaceae
<b>HERB</b>			
1	<i>Achyranthes aspera</i> *	Aghara/ Prickly Chaff Flower	Amaranthaceae
2	<i>Ageratum conyzoides</i> *	Goat Weed/ Jungli Pudina	Asteraceae
3	<i>Aloe vera</i> *	Gheekumari	Asparagaceae
4	<i>Alternanthera brasiliana</i>	Joyweed	Amaranthaceae
5	<i>Bambusa vulgaris</i> *	Golden Bamboo	Poaceae
6	<i>Boerhavia diffusa</i> *	Punarvaa	Nyctaginaceae
7	<i>Cannabis sativa</i> *	Marijuana/ Bhang	Cannabaceae
8	<i>Catharanthus roseus</i> *	Sadabahar/ Periwinkle	Apocynaceae
9	<i>Cenchrus ciliaris</i> *	Buffel Grass/ Anjan/ Baiba	Poaceae
10	<i>Cenchrus pennisetiformis</i>	Cloncurry or slender buffel grass	Poaceae
11	<i>Cenchrus setigerus</i>	Birdwood Grass	Poaceae
12	<i>Chenopodium album</i> *	Bathua	Chenopodiaceae
13	<i>Cirsium arvense</i>	Creeping Thistle	Asteraceae
14	<i>Cymbopogon citratus</i> *	Lemon Grass	Poaceae
15	<i>Cynodon dactylon</i> *	Doob/ Bermuda Grass	Poaceae
16	<i>Dahlia sp</i> *	Dahlia	Asteraceae
17	<i>Datura metel</i> *	Devil's Trumpet	Solanaceae
18	<i>Dendrocalamus sp.</i> *	Green Bamboo	Poaceae
19	<i>Dianthus barbatus</i> *	Sweet William	Caryophyllaceae



S. No.	Scientific Name	Common Name	Family
20	<i>Dianthus sp. *</i>	Dianthus sp.	Caryophyllaceae
21	<i>Dichanthium annulatum</i>	Marvel Grass/ Sheda Grass	Poaceae
22	<i>Erigeron sumatrensis</i>	Tall Fleabane	Asteraceae
23	<i>Furcraea foetida</i>	Giant Cabuya	Asparagaceae
24	<i>Glebionis coronaria*</i>	Crown Daisy/ Gulchini	Asteraceae
25	<i>Hymenocallis speciosa*</i>	Showy Spider Lily	Amaryllidaceae
26	<i>Launaea procumbens*</i>	Creeping Launaea/ Jangli Gobi	Asteraceae
27	<i>Lobularia maritima*</i>	Sweet Alyssum	Brassicaceae
28	<i>Melilotus indicus*</i>	Ban Methi/ Indian Sweet Clover	Fabaceae
29	<i>Ocimum americanum</i>	Kali Tulasi/ Wild Basil	Lamiaceae
30	<i>Oxalis corniculata</i>	Amrul/ Creeping Wood Sorrel	Oxalidaceae
31	<i>Oxalis debilis</i>	Large Flowered Pink Sorrel	Oxalidaceae
32	<i>Papaver rhoeas</i>	Common Poppy	Papaveraceae
33	<i>Petunia</i>	Petunia	Solanaceae
34	<i>Phyla nodifolia*</i>	Pippali	Verbenaceae
35	<i>Polypogon monspeliensis*</i>	Annual Beard Grass	Poaceae
36	<i>Pulicaria wightiana</i>	Sonela/ Sontikli	Asteraceae
37	<i>Rosa sp.</i>	Rose	Rosaceae
38	<i>Rumex dentatus*</i>	Ambavati/ Toothed Dock	Polygonaceae
39	<i>Saccharum spontaneum*</i>	Kaans	Poaceae
40	<i>Solanum nigrum*</i>	Mokoi/ Black Nightshade	Solanaceae
41	<i>Sonchus oleraceus*</i>	Dudhi/ Sow Thistle	Asteraceae
42	<i>Sphagneticola trilobata</i>	Yellow Dots	Asteraceae
43	<i>Syngonium sp. *</i>	Arrowhead Plant	Araceae
44	<i>Suaeda fruticosa*</i>	Shrubby Seablite	Amaranthaceae
45	<i>Tagetes erectus</i>	Marigold/ Genda	Asteraceae
46	<i>Tropaeolum majus</i>	Nasturtium	Tropaeolaceae
47	<i>Tribulus terrestris*</i>	Gokhru	Zygophyllaceae
48	<i>Tridax procumbens*</i>	Kanphuli/ Tridax Daisy	Asteraceae
49	<i>Verbesina encelioides</i>	Golden Crownbeard	Asteraceae
50	<i>Vicia sativa*</i>	Akra/ Matari/ Common Vetch	Fabaceae
51	<i>Viola sp. *</i>	Viola sp.	Violaceae
52	<i>Withania somnifera*</i>	Ashwagandha	Solanaceae
53	<i>Cassia occidentalis*</i>	Chakunda	Fabaceae
54	<i>Clerodendrum viscosum*</i>	Bhat	Verbenaceae
55	<i>Ocimum sanctum</i>	Tulasi	Lamiaceae
<b>GRASSES</b>			
1	<i>Cenchrus ciliaris *</i>	Anjan	Poaceae
2	<i>Chrysopogon fulvus*</i>	Kush	Poaceae
3	<i>Cymbopogon martini *</i>	Rusa / Saidar	Poaceae
4	<i>Cynodon dactylon*</i>	Doob	Poaceae
5	<i>Echinochloa colonum</i>	Sama	Poaceae
6	<i>Eragrostis tenella*</i>	Bhurbhusi	Poaceae
7	<i>Heteropogon contortus*</i>	Kusul	Poaceae
8	<i>Imperata cylindrica*</i>	Chhir	Poaceae
9	<i>Saccharum munja*</i>	Munj	Poaceae
10	<i>Saccharum spontaneum *</i>	Kansa	Poaceae

S. No.	Scientific Name	Common Name	Family
11	<i>Sehima nervosum</i>	Sain/Seta	Poaceae
12	<i>Setaria glauca</i> *	Vindra	Poaceae
<b>CLIMBERS</b>			
1	<i>Artabotrys hexapetalus</i>	Hari Champa/ Ylang Ylang Vine	Annonaceae
2	<i>Coccinia indica</i> *	Kundru/ Ivy Gourd	Cucurbitaceae
3	<i>Cuscuta campestris</i>	Golden Dodder	Cuscutaceae
4	<i>Ipomoea cairica</i>	Railway Creeper	Convolvulaceae
5	<i>Oxystelma esculentum</i> *	Rosy Milkweed Vine/ Dugdhikha	Apocynaceae
6	<i>Caesalpinia decapetala</i>	Alai	Fabaceae
7	<i>Combretum decandrum</i>	Kali bel	Combretaceae
8	<i>Phragmites karka</i>	Beensa	Poaceae
9	<i>Smilax prolifera</i> *	Ramdatun	Smilacaceae
10	<i>Vitis repanda</i>	Panibel	Vitaceae
11	<i>Zizyphus oenoplia</i> *	Makoha	Rhamnaceae
Source: (*) Species observed during the survey and rest of the information obtained from secondary evidences/ Rapid Biodiversity Assessment Report for Asian Paints, Rohtak			

**Photographs 3-8 : Photographs of the flora found in the study area**

	
Datura metel	Calotropis procera
	
Tribulus terrestris	Millingtonia hortensis

	
Pongamia pinnata	Alastonia scholaris

### 3.16.7 Agriculture Crops

The main agriculture crop in the study area is Wheat, Paddy, Jawar, Bajra, Mustard and Sugarcane.

### 3.16.8 Medicinal Plants

Among reported floral species some of the plants are used for medicinal purposes includes *Aegle marmelos*, *Datura metal*, *Mangifera indica*, *Moringa oleifera*, *Pongamia pinnata*, and *Ricinus communis* etc.

### 3.16.9 Faunal Biodiversity of the study area

#### Core Zone

No mammals were observed from the project site during the study. A total of 49 species were reported from the project site which includes i.e. 8 species of reptiles, 26 species of birds, 1 species of amphibian, 8 species of butterflies and 6 species of insects. Details of fauna of core zone /project site are shown in **Table 3-45**

**Table 3-45: Fauna Reported from Core Zone / Project Site**

Sr. No.	Scientific Name	Common/Local Name	IUCN Status	IWPA Status
<b>REPTILES</b>				
1	<i>Calotes versicolor*</i>	Indian Garden Lizard	LC	-
2	<i>Eryx johnii</i>	Red Sand Boa	I	NT
3	<i>Hemidactylus frenatus</i>	Common House lizard	-	LC
4	<i>Naja naja</i>	Indian Cobra	I	LC
5	<i>Bungarus caeruleus</i>	Common Indian Krait	II	LC
6	<i>Ptyas mucosus</i>	Rat snake	I	LC
7	<i>Lycodon aulicus</i>	Indian Wolf Snake	II	LC
8	<i>Macropisthodon plumbicolor</i>	Green Keelback	II	LC
<b>BIRDS</b>				
1	<i>Prinia socialis*</i>	Ashy Prinia	LC	II
2	<i>Dicrurus macrocercus*</i>	Black Drongo	LC	II
3	<i>Milvus migrans</i>	Black Kite	LC	II
4	<i>Phoenicurus ochruros</i>	Black Redstart	LC	II
5	<i>Himantopus himantopus*</i>	Black-winged Stilt	LC	II
6	<i>Oenanthe fusca</i>	Brown Rock Chat	LC	II

Sr. No.	Scientific Name	Common/Local Name	IUCN Status	IWPA Status
7	<i>Actitis hypoleucos</i>	Common Sandpiper	LC	II
8	<i>Psilopogon haemacephalus</i> *	Coppersmith Barbet	LC	II
9	<i>Merops orientalis</i> *	Green Bee-eater	LC	II
10	<i>Pavo cristatus</i>	Indian Peafowl	LC	I
11	<i>Anas poecilorhyncha</i>	Indian Spot-billed Duck	LC	II
12	<i>Burhinus indicus</i>	Indian Thick Knee	LC	II
13	<i>Argya striata</i> *	Jungle Babbler	LC	II
14	<i>Microcarbo niger</i>	Little Cormorant	LC	II
15	<i>Prinia inornata</i>	Plain Prinia	LC	II
16	<i>Cinnyris asiaticus</i>	Purple Sunbird	LC	II
17	<i>Pseudibis papillosa</i>	Red Naped Ibis	LC	II
18	<i>Ficedula parva</i>	Red-breasted Flycatcher	LC	II
19	<i>Pycnonotus cafer</i> *	Red-Vented Bulbul	LC	II
20	<i>Vanellus indicus</i> *	Red-wattled Lapwing	LC	II
21	<i>Columba livia</i> *	Rock Pigeon	LC	-
22	<i>Psittacula krameri</i> *	Rose-ringed Parakeet	LC	II
23	<i>Dendrocitta vagabunda</i>	Rufous Treepie	LC	II
24	<i>Accipiter badius</i>	Shikra	LC	I
25	<i>Orthotomus sutorius</i> *	Common Tailorbird	LC	II
26	<i>Motacilla flava</i>	Yellow Wagtail	LC	II
<b>AMPHIBIAN</b>				
1	<i>Duttaphrynus melanostictus</i>	Asian Common Toad	LC	-
<b>BUTTERFLY</b>				
1	<i>Ariadne merione</i>	Common Castor	LC	-
2	<i>Pieris canidia</i> *	Asian Cabbage White	LC	-
3	<i>Eurema hecabe</i> *	Common Grass Yellow	LC	-
4	<i>Papilio demoleus</i>	Lime swallowtail	LC	-
5	<i>Papilio polytes</i>	Common Mormon	LC	-
6	<i>Euploea core</i>	Common Crow	LC	-
7	<i>Danaus chrysippus</i> *	Plain Tiger	LC	-
8	<i>Graphium agamemnon</i>	Tailed Jay	LC	-
<b>INSECTS</b>				
1	<i>Buprestis aurulenta</i>	Jewel Beetle	Not listed	-
2	<i>Hippodamia variegata</i>	Variegated Ladybug	Not listed	-
3	<i>Orb Weaver Spider</i>	Orb Weaver Spider	Not listed	-
4	<i>Eumenes sp.</i>	Potter Wasp	Not listed	-
5	<i>Dysdercus koenigii</i> *	Red Cotton Bug	Not listed	-
6	<i>Erebus macrops</i>	Owl Moth	LC	-
Source: (*) Species observed during the survey and rest of the information obtained from secondary evidences/ Rapid Biodiversity Assessment Report for Asian Paints, Rohtak				

### Buffer Zone

A total of 104 species were reported based on field observations and consultation with local people including 12 species of mammals, 11 species of reptiles, 3 species of amphibians, 62 species of birds, 10 species of butterflies and, 6 species of other insect during the site visit.

**Table 3-46: Fauna in the study area**

S. No	Scientific Name	English Name	Conservation status as per Indian Wildlife (Protection) Amendment Act, 2022	Conservation status as per IUCN
<b>MAMMALS</b>				
1	<i>Bandicota bengalensis</i>	Lesser Bandicoot Rat	-	LC
2	<i>Boselaphus tragocamelus</i>	Bluebull	II	LC
3	<i>Canis aureus</i>	Golden Jackal	I	LC
4	<i>Canis lupus pallipes</i>	Indian Grey Wolf	I	LC
5	<i>Cynopterus sphinx</i>	Greater short-nosed Fruit Bat	-	LC
6	<i>Funambulus pennantii</i> *	Five Stripped Squirrel	-	LC
7	<i>Herpestes edwardsi</i> *	Indian Grey mongoose	I	LC
8	<i>Lepus nigricollis</i>	Indian hare	II	LC
9	<i>Macaca mulatta</i> *	Rhesus macaque	-	LC
10	<i>Mus musculus</i>	House Mouse	-	LC
11	<i>Rattus rattus</i>	House Rat	-	LC
12	<i>Vulpes bengalensis</i>	Indian Fox	I	LC
<b>REPTILES</b>				
1	<i>Hemidactylus flaviviridis</i> *	Northern house gecko	II	LC
2	<i>Calotes versicolor</i> *	Indian Garden Lizard	-	LC
3	<i>Eryx johnii</i>	Red Sand Boa	I	NT
4	<i>Hemidactylus frenatus</i>	Common House lizard	-	LC
5	<i>Naja naja</i>	Indian Cobra	I	LC
6	<i>Bungarus caeruleus</i>	Common Indian Krait	II	LC
7	<i>Bungarus fasciatus</i>	Banded Krait	II	LC
8	<i>Ptyas mucosus</i>	Rat snake	I	LC
9	<i>Lycodon aulicus</i>	Indian Wolf Snake	II	LC
10	<i>Macropisthodon plumbicolor</i>	Green Keelback	II	LC
11	<i>Fowlea piscator</i>	Chequered Keelback	I	LC
<b>AMPHIBIANS</b>				
1	<i>Hoplobatrachus tigerinus</i>	Indian Bull frog	II	LC
2	<i>Duttaphrynus melanostictus</i>	Asian Common Toad	-	LC
3	<i>Duttaphrynus stomaticus</i>	Indian Marbled Toad	-	LC
<b>BIRDS</b>				
1	<i>Accipiter badius</i> *	Shikra	I	LC
2	<i>Acridotheres fuscus</i>	Jungle Myna	II	LC
3	<i>Acridotheres tristis</i> *	Common Myna	II	LC
4	<i>Acridotheres ginginianus</i> *	Bank Myna	II	LC
5	<i>Actitis hypoleucos</i>	Common Sandpiper	II	LC
6	<i>Alcedo atthis</i>	Common Kingfisher	II	LC
7	<i>Anas poecilorhyncha</i>	Indian Spot-billed Duck	II	LC
8	<i>Apus nipalensis</i>	House Swift	II	LC
9	<i>Ardea alba</i> *	Great Egret	II	LC
10	<i>Ardea intermedia</i> *	Intermediate Egret	II	LC
11	<i>Argya striata</i> *	Jungle Babbler	II	LC
12	<i>Athene brama</i>	Spotted Owlet	II	LC
13	<i>Bulbulcus ibis</i> *	Cattle Egret	II	LC
14	<i>Burhinus indicus</i>	Indian Thick Knee	II	LC

S. No	Scientific Name	English Name	Conservation status as per Indian Wildlife (Protection) Amendment Act, 2022	Conservation status as per IUCN
15	<i>Cecropis daurica</i>	Red-rumped Swallow	II	LC
16	<i>Centropus sinensis</i> *	Greater coucal	II	LC
17	<i>Cinnyris asiaticus</i>	Purple Sunbird	II	LC
18	<i>Columba livia</i> *	Rock Pigeon		LC
19	<i>Coracias benghalensis</i> *	Indian roller	II	LC
20	<i>Corvus splendens</i> *	House Crow		LC
21	<i>Cuculus micropterus</i>	Indian Cuckoo	II	LC
22	<i>Cuculus varius</i>	Common Hawk Cuckoo	II	LC
23	<i>Dendrocitta vagabunda</i> *	Rufous Treepie	II	LC
24	<i>Dicrurus macrocercus</i> *	Black Drongo	II	LC
25	<i>Dinopium benghalense</i>	Black-rumped Flameback	II	LC
26	<i>Egretta garzetta</i> *	Little Egret	II	LC
27	<i>Eudynamys scolopacea</i> *	Koel	II	LC
28	<i>Ficedula parva</i>	Red-breasted Flycatcher	II	LC
29	<i>Francolinus francolinus</i>	Black Partridge	II	LC
30	<i>Gallinula chloropus</i>	Eurasian Moorhen	II	LC
31	<i>Gallus gallus</i>	Red Jungle Fowl	II	LC
32	<i>Glaucidium brodiei</i>	Pygmy Owlet	II	LC
33	<i>Halcyon smyrnensis</i> *	White-throated kingfisher	II	LC
34	<i>Himantopus himantopus</i> *	Black-winged Stilt	II	LC
35	<i>Hirundo rustica</i>	Barn Swallow	II	LC
36	<i>Psilopogon zeylanicus</i>	Green Barbet	II	LC
37	<i>Merops orientalis</i> *	Green Bee-eater	II	LC
38	<i>Microcarbo niger</i> *	Little Cormorant	II	LC
39	<i>Milvus migrans govinda</i> *	Black Kite	II	LC
40	<i>Monticola cinclorhyncha</i>	Blue-capped Rock thrush	II	LC
41	<i>Motacilla alba</i> *	White Wagtail	II	LC
42	<i>Motacilla flava</i>	Yellow Wagtail	II	LC
43	<i>Oenanthe fusca</i>	Brown Rock Chat	II	LC
44	<i>Orthotomus sutorius</i>	Common Tailorbird	II	LC
45	<i>Passer domesticus</i> *	House Sparrow	II	LC
46	<i>Pavo cristatus</i> *	Indian Peafowl	I	LC
47	<i>Perdica asiatica</i>	Jungle Bush Quail	II	LC
48	<i>Phoenicurus ochruros</i>	Black Redstart	II	LC
49	<i>Ploceus benghalensis</i>	Black-breasted Weaver	II	LC
50	<i>Ploceus manyar</i>	Streaked Weaver	II	LC
51	<i>Porphyrio porphyrio</i> *	Gray-headed Swampphen	II	LC
52	<i>Prinia inornata</i>	Plain Prinia	II	LC
53	<i>Prinia socialis</i>	Ashy Prinia	II	LC
54	<i>Pseudibis papillosa</i> *	Red Naped Ibis	II	LC
55	<i>Psilopogon haemacephalus</i>	Coppersmith Barbet	II	LC
56	<i>Psittacula krameri</i> *	Rose-ringed Parakeet	II	LC
57	<i>Pycnonotus cafer</i> *	Red-Vented Bulbul	II	LC
58	<i>Streptopelia decaocta</i>	Eurasian Collared Dove	II	LC
59	<i>Threskiornis melanocephalus</i> *	Black-headed ibis	I	NT








S. No	Scientific Name	English Name	Conservation status as per Indian Wildlife (Protection) Amendment Act, 2022	Conservation status as per IUCN
60	<i>Argya caudata*</i>	Common Babbler	II	LC
61	<i>Upupa epops</i>	Eurasian Hoopoe	II	LC
62	<i>Vanellus indicus*</i>	Red-wattled Lapwing	II	LC
<b>BUTTERFLY</b>				
1	<i>Ariadne merione</i>	Common Castor	-	LC
2	<i>Pieris canidia</i>	Asian Cabbage White	-	LC
3	<i>Eurema hecabe*</i>	Common Grass Yellow	-	LC
4	<i>Papilio demoleus*</i>	Common Lime	-	LC
5	<i>Papilio polytes</i>	Common Mormon	-	LC
6	<i>Euploea core</i>	Common Crow	-	LC
7	<i>Danaus chrysippus *</i>	Plain Tiger	-	LC
8	<i>Graphium agamemnon</i>	Tailed Jay	-	LC
9	<i>Leptosia nina</i>	Psyche	-	-
10	<i>Acraea terpsicore</i>	Tawny coster	-	-
<b>INSECTS</b>				
1	<i>Buprestis aurulenta</i>	Jewel Beetle	-	Not listed
2	<i>Hippodamia variegata</i>	Variiegated Ladybug	-	Not listed
3	<i>Orb Weaver Spider</i>	Orb Weaver Spider	-	Not listed
4	<i>Eumenes sp.</i>	Potter Wasp	-	Not listed
5	<i>Dysdercus koenigii*</i>	Red Cotton Bug	-	Not listed
6	<i>Erebus macrops</i>	Owl Moth	-	LC
Note: I, II, & IV are Schedules of Wildlife (Protection) Amendment Act, 2022. LC: Least Concern, NT: Near Threatened & VU: Vulnerable are the status assigned by IUCN				

Source: (\*) Species observed during the survey and rest of the information obtained from secondary evidences published literature and consultation with local people.

**Photographs 3-9: Photographs of Faunal species recorded from the study area.**

	
Acridotheres ginginianus (Bank myna)	House crow reported near site

	
Gray-headed Swampphen in the study area	Eurasian Moorhen, Black-headed Ibis and Little egret recorded from the study area
	
Indian Peafowl reported in the study area	Merops orientalis (Asian Green bee eater) in Study Area
	
Little Cormorant and Intermediate Egret Egretta intermedia recorded from the Study Area	Rose-ringed parakeet recorded from the Study Area

### Mangrove

No mangrove species is report within the study area.

### Status of Threatened and Endemic Biodiversity

In core zone / project site, no any threatened species was reported during survey. However, two species i.e. Shikra (*Accipiter badius*) and Indian Peafowl (*Pavo cristatus*) were reported under Schedule I of Indian Wildlife (Protection) Amendment Act, 2022 (as mentioned in Rapid Biodiversity Assessment Report for Asian Paints, Rohtak). From the buffer zone, total 2 species were reported under Near threatened category of IUCN Redlist

including *Eryx johnii* (Red Sand Boa), and *Threskiornis melanocephalus* (Black headed ibis). Conservation status of species classified under Schedule-I of Indian Wildlife (Protection) Amendment Act, 2022 & IUCN are provided in **Table 3-47.**

Table 3-47: Conservation status of Species classified under Schedule-I of Indian Wildlife (Protection) Amendment Act, 2022 & IUCN

S. No	Scientific Name	English Name	Conservation status as per Indian Wildlife (Protection) Amendment Act, 2022	Conservation status as per IUCN
1.	<i>Canis aureus</i>	Golden Jackal	I	LC
2.	<i>Canis lupus pallipes</i>	Indian Grey Wolf	I	LC
3.	<i>Herpestes edwardsii</i>	Indian Grey mongoose	I	LC
4.	<i>Vulpes bengalensis</i>	Indian Fox	I	LC
5.	<i>Eryx johnii</i>	Red Sand Boa	I	NT
6.	<i>Naja naja</i>	Indian Cobra	I	LC
7.	<i>Ptyas mucosus</i>	Rat snake	I	LC
8.	<i>Fowlea piscator</i>	Chequered Keelback	I	LC
9.	<i>Accipiter badius</i>	Shikra	I	LC
10.	<i>Pavo cristatus</i>	Indian Peafowl	I	LC
11.	<i>Threskiornis melanocephalus</i>	Black-headed ibis	I	NT

Although, every attempt has been made to document Schedule I species/threatened species from the project study area, the presence of more species cannot be ruled out. A separate species conservation plan for all Schedule I species present in the project study area shall be prepared along with budgetary provisions and submitted to the concerned State Forest Department for approval and further implementation.

### 3.17 Socio-Economics

#### 3.17.1 Introduction

This section analyses the existing socio-economic condition of the habitations as well as community residing in the project area. It also identifies the potential issues and problems in the area. For the design of project, stakeholder views were taken through the structured questionnaires and focus group discussion.

#### 3.17.2 Objectives and Methodology

The study aims to provide the following:

- Need assessment from community development angle.
- Social inputs of the project (Direct due to project footprints & indirect due to other issues such as AP/WP/SHW/NV & RH).
- Propose a CER plan, covering 1 & 2 above, also considering the broad possibilities covered in schedule VII of the Company's Act, 2013.
- The result of the study will feed the outcome of the EIA study from a socio-economic angle.
- The methodology and contents of this SE report are based on the approved Standard Operating Procedure (SOP) for Socio-Economic Studies that are part of Kadam's Integrated Management System, which is reviewed and assessed periodically by NABET.

The aim/objective of the study and how it was done (methodology) area given in

**Table 3-48.**

**Table 3-48: Approach and Methodology for Conducting the Socio-economic Study**

S. No.	Aim / Objective	Area		Methodology
		Study Area	Core Area Only	
1	To Identify and Assess			
1.1.	Social status of society in the focused area. To do this it is required to get reliable information with regards to:			
1.1.1	People residing in the study area along with key demographic figures as per the secondary data (mainly Census of India) giving information on: population, literacy, Sex and occupation	√		Secondary data collection and collation from Census of India
1.1.2	Main sub-communities dwelling in the core zone by caste and religion		√	From interviews with PRI representatives
1.1.3	People who are vulnerable classes such as: Below Poverty Line (BPL), Scheduled Castes (SC) and Scheduled Tribes (ST)		√	From interviews with PRI representatives and census
1.2	Economic status of society in the study area. To do this it is required to get reliable information with regards to:			
1.2.1	Occupational pattern from secondary data (mainly Census of India) giving information on: main workers / marginal workers / non-working population	√		Secondary data collection and collation from Census of India
1.2.2	Sources of revenue available to Panchayati Raj Institutions (PRIs)		√	From interviews with PRI representatives
1.2.3	Economic well-being of different classes by gaining an understanding of: prevailing daily wage rates for labor (male / female), status of land holding across different classes / landless households, major crops and farmer support, livestock and animal husbandry		√	From interviews with PRI representatives
1.3	Status of physical and social infrastructure within the core and buffer areas. To do this, it is required to get reliable information with regards to			-
1.3.1	Physical infrastructure - reliable information on availability and adequacy with respect to: educational facilities, road infrastructure, power, water for drinking and irrigation, sanitation, garbage / MSW, banking facilities	√		From interviews with PRI representatives
1.3.2	Social infrastructure – reliable information on availability and adequacy with respect to infrastructure associated with: sports, community events and community self-help / support group		√	From interviews with PRI representatives
1.3.3	Cultural heritage of the area	√		From published literature and site visits
1.4	Effects of			-
1.4.1	Ongoing impacts of other developments in the vicinity of the subject development on people and their lifestyle within the core impact zones, as determined by the EIAC in interaction with FAE (WP / AP&AQ / SHW / RH & NV)		√	From focus group discussions
1.4.2	Likely impacts of proposed operations (if a greenfield project) on people and their lifestyle within the core impact zones mentioned above		√	From focus group discussions
2.0	To Determine			-
2.1	Needs of different communities based on the work done in identification and assessment mentioned above		√	From data analysis, internal / client discussions
3.0	To Propose			-
3.1	A Social Management Plan with budgets, timelines and actionable items to achieve the expected outcomes		√	From data analysis, internal / client discussions

**3.17.3 Work done**

For conducting socio-economic study following work was done:

**Desktop Study**

Villages were sorted from the land use map and details regarding sorted villages were abstracted from the available Census, 2011.

**Field Survey**

On the basis of desktop study field survey were conducted in the villages. Focused group discussion were done with Sarpanch of the village, Anganwadi and Health centre. Their requirements were jotted down in the factsheets.

Based on the focus group discussion suggested activities for intervention were identified.

**3.17.4 Sensitive Ecological Features**

Sensitive ecological features of the study area is presented in **Table 3-49**.

**Table 3-49: Sensitive Ecological Features**

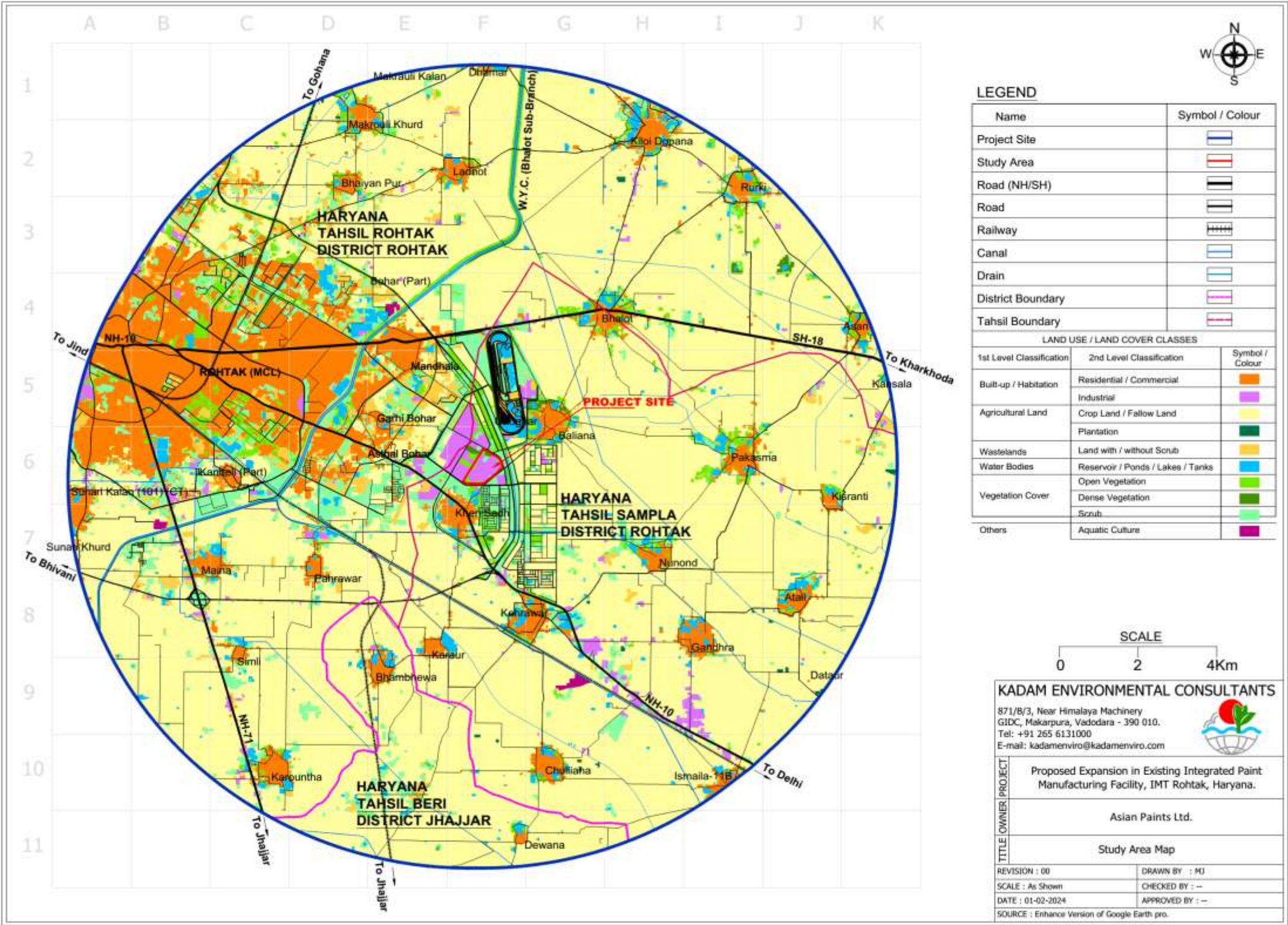
S. No.	Sensitive Ecological Features	Name of feature / Location	Distance (km)	Direction	Reason of Significance
1	Conservation and community reserves (State and Local Legislation)	-	-	-	-
2	Notified Archaeological sites	-	-	-	-
3	Any other Archaeological sites	-	-	-	-
4	Defence Installations	-	-	-	-
5	Densely populated or built-up area	Kheri Sadh	0.5 km	South	Household – 1056 Population – 5200
6	Areas occupied by sensitive man-made land uses (hospitals, schools, places of worship, community facilities)	Mentioned in Chapter 02			

**3.17.5 Socio-Economic Baseline**

Study area map for socio-economic studies is as presented in **Map 3-15**.



Map 3-15 Study Area Map for Socio-economics Studies





**Photographs 3-10: Photographs of Focused Group Discussion (FGD)**

 <p>06-Mar-2024 2:53:35 pm Unnamed Road Rohtak Division Haryana</p>	 <p>06-Mar-2024 2:34:57 pm Unnamed Road Rohtak Division Haryana</p>
<p>FGD with school Principal at Baliana Sr. Secondary school</p>	<p>FGD with school Principal at Baliana Girls High School</p>
 <p>06-Mar-2024 1:34:53 pm Bhalot Rohtak Division Haryana</p>	 <p>06-Mar-2024 1:34:53 pm Bhalot Rohtak Division Haryana</p>
<p>FGD with school Principal at Bhalot school</p>	<p>FGD with school Sarpanch at Bhalot Panchayat Office</p>
 <p>07-Mar-2024 10:37:37 am Rohtak - Sonapat Road Bohar Rohtak Division Haryana</p>	 <p>Jhajjar, Haryana, India Gndi - Bhanderawas - Khatap - Kharsawa Rd, Haryana 124307, India Lat 28.82967° Long 76.643896° 05/03/24 11:54 AM GMT +05:30 Note: Captured by GPS Map Camera</p>
<p>FGD with Municipal Counsellor, Bohar village</p>	<p>FGD with Sarpanch and Farmers at Chuliana</p>
 <p>06-Mar-2024 10:34:10 am Rohtak Division Haryana</p>	 <p>Nonand, Haryana, India Unnamed Road, Nonand, Haryana 124021, India Lat 28.845303° Long 76.710734° 06/03/24 11:22 AM GMT +05:30 Note: Captured by GPS Map Camera</p>
<p>FGD with school principal at Kheri Sadh village</p>	<p>FGD with Sarpanch and Farmers at Nonad village</p>

## Demographic Profile of Project District and Sub-District

**Table 3-50: Demographic Profile of project District and Sub-District**

Sl. No.	Particulars	Rohtak (District)	Rohtak (Sub-District)	Sampla (Sub-District)	Jhajjar (District)	Beri (Sub-District)
1	No of Household	2,06,988	1,44,512	23,709	1,85,334	29,974
2	Total Population	10,61,204	7,34,328	1,23,826	9,58,405	1,55,791
3	Male Population	5,68,479	3,92,188	66,872	5,14,667	83,420
4	% of Male Population	53.57	53.41	54.00	53.70	53.55
5	Female Population	4,92,725	3,42,140	56,954	4,43,738	72,371
6	% of Female Population	46.43	46.59	46.00	46.30	46.45
7	Sex Ratio	867	872	852	862	868
8	Total SC Population	2,16,889	1,49,160	21,918	1,70,448	30,036
9	% SC Population	20.44	20.31	17.70	17.78	19.28
10	Total ST Population	-	-	-	-	-
11	% ST Population	-	-	-	-	-
12	Household Size	5	5	5	5	5

Source: Primary census abstract 2011

The project falls under Haryana state, Rohtak district. The study area consists of Rohtak, Sampla and Beri sub districts of Rohtak and Jhajjar district respectively. The census details are however available for 2011.

Therefore, to create a baseline of the existing Study Area villages:

- From the land use map, the villages lying in the Study Area were first identified.
- Then the list of sub-districts lying under Rohtak and Jhajjar district were identified through the census details of 2011.
- The village data was then collected for the Study Area by referring the census data from the appropriate sub-districts

## Brief Profile of Study Area

The study area covers 34 habitations in Rohtak, Sampla and Beri, sub district of Rohtak and Jhajjar district. The entire area consists of rural and Urban population. The list of identified villages as mentioned, are provided

**Table 3-51.**

**Table 3-51: Villages in Study Area with Households and Population**

Sr. No.	District	Sub- district	Distance (Km)	Habitation	Household	Population
1	Rohtak	Sampla	0-3	Baliana(58)	1,532	7,697
2	Rohtak	Sampla	0-3	Kheri Sadh(42)	1,056	5,200
3	Rohtak	Rohtak	0-3	Garhi Bohar(135)	560	2,894
<b>Sub - Total</b>					3,148	15,791
4	Rohtak	Sampla	3-5	Nunond(43)	626	3,207
5	Rohtak	Sampla	3-5	Kehrawar(40)	1,447	7,415
6	Rohtak	Sampla	3-5	Karaur(41)	498	2,591
7	Rohtak	Rohtak	3-5	Pahrawar(69)	631	3,387
8	Rohtak	Rohtak	3-5	Bohar (Part)(68)	2,184	11,267
9	Rohtak	Rohtak	3-5	Bhalot(59)	1,398	7,231

Sr. No.	District	Sub- district	Distance (Km)	Habitation	Household	Population
<b>Sub – Total</b>					6,784	35,098
10	Rohtak	Rohtak	5-7	Maina(72)	871	4,599
11	Rohtak	Rohtak	5-7	Kanheli (Part)(73)	372	1,901
12	Rohtak	Sampla	5-7	Pakasma(57)	1,153	6,005
13	Rohtak	Sampla	5-7	Gandhra(44)	1,173	6,197
14	Jhajjar	Beri	5-7	Bhambhewa(1)	638	3,290
<b>Sub – Total</b>					4,207	21,992
15	Rohtak	Rohtak	7-10	Kiloi Dopana (61)	1,076	5,715
16	Rohtak	Rohtak	7-10	Rurki(54)	1,252	6,372
17	Rohtak	Rohtak	7-10	Kansala(49)	1,062	5,513
18	Rohtak	Rohtak	7-10	Asan(56)	893	4,295
19	Rohtak	Rohtak	7-10	Karountha(70)	1,139	5,802
20	Rohtak	Rohtak	7-10	Simli(71)	350	1,816
21	Rohtak	Rohtak	7-10	Sunari Khurd(102)	604	3,211
22	Rohtak	Rohtak	7-10	Makrouli Kalan(64)	1,196	6,157
23	Rohtak	Rohtak	7-10	Makrouli Khurd(75)	476	2,828
24	Rohtak	Rohtak	7-10	Bhaiyan Pur(66)	263	1,459
25	Rohtak	Rohtak	7-10	Dhamar(62)	873	4,551
26	Rohtak	Rohtak	7-10	Ladhot(65)	565	3,112
27	Rohtak	Rohtak	7-10	Sunari Kalan (101) (CT)	1,501	7,506
28	Rohtak	Rohtak	7-10	Rohtak (M CI)	75,528	3,74,292
29	Rohtak	Sampla	7-10	Kisranti(47)	379	1,952
30	Rohtak	Sampla	7-10	Dataur(45)	692	3,607
31	Rohtak	Sampla	7-10	Atail(46)	818	4,392
32	Rohtak	Sampla	7-10	Chulliana(39)	1,060	5,405
33	Rohtak	Sampla	7-10	Ismaila-11B(37)	1,418	7,826
34	Jhajjar	Beri	7-10	Dewana(3)	159	854
<b>Sub - Total</b>					<b>91,304</b>	<b>4,56,665</b>
<b>Grand -Total</b>					<b>1,05,443</b>	<b>5,29,546</b>

### 3.17.6 Social Profile

#### Population and Sex ratio details

The statistics regarding the Sex ratio in the study area are given in **Table 3-52**.

**Table 3-52: Population and Sex ratio details**

Distance (km)	2011		Sex Ratio
	Male	Female	
0 -3	8,462	7,329	866
3 - 5	18,892	16,206	858
5 - 7	11,890	10,102	850
7 - 10	2,43,085	2,13,580	879
<b>Total</b>	<b>2,82,329</b>	<b>2,47,217</b>	<b>876</b>

Source: Primary census abstract 2011

The above table shows that the total population of male is 2,82,329(53.31%) and female population is 2,47,217 (46.69%) and the Sex ratio is 876 females per 1000 males in the study area. The national Sex ratio in India is 940 as per latest reports of Census 2011, this indicates good Sex equality, then nationwide averages.

### Social Characteristics

The study area is predominantly Hindu belonging to General, OBC category. There is very small amount of population of Scheduled cast. There are Muslims as well. The statistics regarding the Social Characteristics of villages in the study area are given in **Table 3-53**.

**Table 3-53: Schedule Caste and Schedule Tribe Population Distribution in Study Area**

Distance (km)	2011					
	% Scheduled Caste			% Scheduled Tribe		
	Total	Male	Female	Total	Male	Female
0 - 3	26.25	53.80	46.20	-	-	-
3 - 5	20.87	52.95	47.05	-	-	-
5 - 7	16.75	53.28	46.72	-	-	-
7 - 10	16.52	53.17	46.83	-	-	-
<b>Total</b>	<b>17.11</b>	<b>53.19</b>	<b>46.81</b>	-	-	-

Source: Primary census abstract 2011

As per census 2011 average scheduled caste population in Study area is 17.11% of the total population. Out of the total scheduled caste population, males are 53.19% and female population is 46.81%, there is no Tribal population resides in the study area.

### 3.17.7 Literacy rate

The statistics regarding the literacy rate in the study area are given **Table 3-54**.

**Table 3-54 Literacy Rate in Study Area**

Distance (km)	% Literacy		
	Total	Male	Female
0 - 3	69.67	77.58	60.53
3 - 5	70.54	78.02	61.81
5 - 7	69.58	77.61	60.13
7 - 10	74.73	79.22	69.61
<b>Total</b>	<b>74.08</b>	<b>79.02</b>	<b>68.45</b>

### Basic Infrastructure Facility

#### Education facility

In the study area it was observed that each village has school up to primary level. For further education students have to travel to nearby villages. The basic infrastructure of school in some places well-constructed. School gets the electricity and water regularly. The education facilities that are prevailing in the study area are shown

**Table 3-55: Education Facility**

Distance (km)	Government						Private					
	Pre- Primary School	Primary School	Middle School	Secondary School	Senior Secondary School	College	Pre- Primary School	Primary School	Middle School	Secondary School	Senior Secondary School	College
0 - 3	0	4	4	4	2	-	5	1	1	1	1	2
3 - 5	0	10	9	9	7	-	14	11	9	7	5	1
5 - 7	0	8	6	6	6	-	9	6	2	1	0	0
7 - 10	0	26	19	17	15	-	23	22	20	19	9	5
<b>Total</b>	<b>0</b>	<b>48</b>	<b>38</b>	<b>36</b>	<b>30</b>	<b>-</b>	<b>51</b>	<b>40</b>	<b>32</b>	<b>28</b>	<b>15</b>	<b>8</b>

Source: Primary census abstract 2011

**Medical and Health facility**The statistics regarding the medical facilities in the study area is mentioned in **Table 3-56****Table 3-56: Medical Facility**

Distance	Community Health Centre	Primary Health Centre	Primary Health Sub Centre	Maternity And Child Welfare Centre	TB Clinic	Hospital Allopathic	Hospital Alternative Medicine	Dispensary	Veterinary Hospital	Mobile Health Clinic	Family Welfare Centre	Non-Government Medical facilities Out Patient
0 - 3	-	-	3	-	-	-	-	-	2	-	1	10
3 - 5	-	2	5	1	-	-	-	-	3	-	2	5
5 - 7	-	2	4	1	-	-	-	-	4	-	-	-
7 - 10	-	-	14	1	-	-	-	4	14	-	-	5
<b>Total</b>	<b>-</b>	<b>4</b>	<b>26</b>	<b>3</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>4</b>	<b>23</b>	<b>-</b>	<b>3</b>	<b>20</b>

Source: Primary census abstract 2011

**Source of water**

Main source of drinking water is tap water. Other water resources such as wells, lakes etc. are there as shown in

**Table 3-57.**



**Table 3-57: Water Facilities**

Distance (km)	Tap Water-Treated	Tap Water Untreated	Covered Well	Uncovered Well	Hand Pump	Tube Wells / Borehole	Spring	River/Canal	Tank/Pond/Lake	Others
0 - 3	A	A	NA	A	A	A	NA	A	A	NA
3 - 5	A	A	NA	A	A	A	NA	A	A	NA
5 - 7	A	A	NA	A	A	A	NA	A	A	NA
7 - 10	A	A	NA	A	A	A	NA	A	A	NA

Source: Primary census abstract 2011

**Means of communication**

The changing trends in technology have massively affected the people in the study area. The most important means of communication is mobile phones, which are possessed by most of the individuals in the locality. All other means of communication seem to be used less after the advent of mobile technology; details are given in **Table 3-58**.

**Table 3-58: Communication Facilities**

Distance (km)	Post Office	Sub- Post office	Telephone (landlines)	Public Call Office / Mobile (PCO)	Mobile Phone Coverage	Internet Cafes / Common Service Centre (CSC)	Private Courier Facility
0 - 3	NA	A	A	A	A	A	NA
3 - 5	NA	A	A	A	A	A	NA
5 - 7	NA	A	A	A	A	A	NA
7 - 10	A	A	A	A	A	NA	NA

Source: Primary Census Abstract 2011

**Transportation facility**

The study area is well connected with road. The nearest railway station is Rohtak, which is approximately 20 km. All the means of transportation like bus, Autoricksaw etc. are available in the study area. Details are given **Table 3-59**.

**Table 3-59: Transportation facility**

Distance (km)	Bus Service		Railway Station	Autoricksaw	Taxi
	Government	Private			
0-3	A	A	A	A	A
3-5	A	NA	A	A	A
5-7	A	A	NA	A	A
7-10	A	NA	A	A	A

Source: Primary Census Abstract 2011

**Economic profile****Agriculture in study area**

Agriculture is totally depended on monsoons in the study area. The major crops grown are Wheat, Paddy, Mustered, Tuver and sugarcane during the November to April, farmers also grow Jovar and Bajra for fodder.

Agriculture provides employment in the form of daily wage labour during the harvesting season. People who have less or no land do labour in others field on daily wage basis. The average wage for the male is Rs. 250 per day and for the female is Rs. 200 per day.

### Animal husbandry

Livestock rearing is common among the people of this region. Most of the animals reared by them are cows and buffaloes. Private veterinary doctors' visits based on the requirement of the local people. The private doctors carry out regular medical check-up of animals only. Milk produced is used for personal consumption and selling to cooperative dairies.

### Occupational pattern

The statistics regarding the Occupational Pattern in the study area are given in **Table 3-60**.

**Table 3-60: Occupational Pattern**

Distance (km)	% Occupational Status (2011)					
	Total Working Population	Cultivators	Agricultural Labour	Household Workers	Others	Marginal Workers
0 - 3	30.50	35.55	1.85	0.60	53.05	8.95
3 - 5	29.38	33.74	7.53	2.07	45.00	11.67
5 - 7	35.81	29.79	5.59	1.21	28.75	34.67
7 - 10	30.40	8.47	2.40	2.07	78.08	8.98
Total	30.56	11.92	2.86	1.99	72.83	10.40

Source: Primary Census Abstract 2011

As per the available Census Data 2011, there are total 30.56% working population. Out of the total working population there are 11.92% are cultivators, 2.86% Agricultural labour, 1.9% household workers, others 72.83% and 10.40% marginal workers in the study area.

### Historical and cultural profile

#### Places given protection under the ASI Ancient Monuments Act

##### Ancient site of Khokhrakot:

The ancient mound, locally known as Khokhrakot, is identified with the historical town of Rohitika-Rohtak, the present name is derived from its ancient identity. It finds mention in the great epic Mahabharata and the Painted Grey Ware, a class of pottery associated with epic age, was found in the archaeological excavations, is the testimony of its antiquity. This site was the capital of Yaudheya Republic. Sculptures, coins, terracotta figurines and other smaller objects ranging from 8<sup>th</sup> Century BC to 11<sup>th</sup> Century AD have been found here. As tradition goes, this town was re-established by a famous ruler. Prof Manmohan Kumar of Maharshi Dayanand University, Rohtak and Shri J.S.Khatri of the Department of Archaeology & Museums, Government of Haryana, jointly excavated this site.

#### Places given protection under the Haryana State protected monuments

There is no state protected monuments in the study area.

#### Places of tourist importance

There is no Places of tourist importance.

## 4 ANTICIPATED ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

### 4.1 Introduction

Objective of this chapter is to:

- Identify project activities that could beneficially or adversely impact the environment.
- Predict and assess the environmental aspects and impacts of the such activities.
- Examine each environmental aspect-impact relationship in detail and identify its degree of significance.
- Identify possible mitigation measures for these project activities and select the most appropriate mitigation measure, based on the reduction in significance achieved and practicality in implementation.

### 4.2 Methodology of Identification and Assessment of Environmental Impacts

#### Key Definitions

##### ***Environment***

Surroundings in which an organization operates, including air, water, land, natural resources, flora, fauna, humans, and their interrelation.

##### ***Environmental Aspect***

Element of an organization's activities (including those activities that occur during normal, abnormal, emergency and final decommissioning operations) or raw materials or products or services that can interact with the environment.

Environmental aspects selected for further study should be large enough for meaningful examination and small enough to be easily understood.

##### ***Environmental Impact***

Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspect.

##### ***Environmental Components***

The environment includes surroundings in which an organization operates such as air, water, land, natural resources, flora, fauna, humans and their interrelation.

The environmental components (or parts of the receiving environment on which impacts are being assessed) include: Land use/land cover, air quality, noise quality, surface water environment, ground water environment, soil, ecology and bio diversity, socio economics, occupational health, community health and safety.

After the identification of impacting activities, impacts require to be assessed based on subjective / objective criteria. This is done in the following steps:

#### Identification of Impacts

This entails employing a simple checklist method requiring:

- Listing of organisation's activities, raw materials, products and services

- Listing of environmental aspects (i.e. elements of an organization's activities or raw materials, products or services that can cause environmental impacts)
- Identifying applicable components of the environment on which the environmental aspects can cause an environmental impact
- Making notes of the reason / possible inter-relationships that lead to environmental impact creation
- Listing the environmental components likely to receive impacts, along with the key impacting activities on each component

### **Component Wise Environmental Impact Assessment and Mitigation**

A component wise approach to environmental impact assessment and mitigation is now applied. For each environmental component (Air Pollution and Air Quality, Noise, Water, Land, EB, RD, SE, OH&HS), this is carried through a series of steps as follows.

#### ***Step 1: Review and Assessment of the Specific Aspects Generating Environmental Impact***

Several scientific techniques and methodologies are also used to predict impacts on the environment. Mathematical models are useful tools (where applicable) to quantitatively describe the cause and effect relationships between sources of pollution and different components of environment. In cases where it is not possible to identify and validate a model for a particular situation, predictions have been arrived at based on logical reasoning / consultation / extrapolation or overlay methods. In any case, for each component of the environment, the methods used to arrive at the likely impacts require to be described.

#### ***Step 2: Arriving at the Environmental Impact Significance, Identifying Aspects Causing Unacceptable Levels of Environmental Impact Significance and Prioritizing Aspects Requiring Mitigation Measures***

Once a general understanding of the impacts has been obtained, efforts are made to compare significance of different impacts so as to prioritize mitigation measures, focusing on those impacting activities (i.e. aspects) that require urgent mitigation. For ease of comparison across different activities, a summary environmental significance score is calculated. Two key elements are taken into consideration based on standard environmental impact significance assessment methodologies:

- **Severity:** the seriousness or the extent of environmental impact due to an activity and its interaction with the physical, biological and/or socio-economic environments.
- **Likelihood of Occurrence:** the likelihood that an impact may occur due to the project activity/aspect.

A combination of severity and likelihood of occurrence gives a reasonable measure of environmental impact significance, which aids in decision making. It must always be kept in mind *that any scoring methodology however well-defined is subjective and different persons can arrive at different impact significance scores based on their understanding / opinion*. Therefore, end results should be evaluated against past experience, professional judgment as well as project and activity specific conditions to ensure adequacy and equity. Kadam has made an effort to ensure that the scoring does not change significantly assuming that different evaluators are equally well informed on the project as well as knowledgeable on the concerned issues.

In addition to above discussion, in the functional area of Land Use / Land Cover, it is observed that the likelihood of occurrence of impacts on Land Use / Land Cover is not a variable; the impact either happens or does not happen. Since we will only consider the impacts which are likely to occur, the conventional methodology will rank the likelihood at highest, in case of Land Use/Land Cover at 5, on a scale of 1 to 5. This fact artificially increases the *Significance* (Likelihood X Severity) of all impacts on Land Use / Land Cover. It has therefore been decided to dispense with the ranking on the basis of likelihood of occurrence (for LULC) and rank only severity of impacts in such a way that the *Significance* can span the full range, i.e. 1 to 25, as in the case of conventional assessment.

The steps in calculating the environmental impact significance for each environmental component are discussed in subsequent paragraphs.

### **Scoring the Impact Severity**

The impacts resulting from activities which need to comply with a legal requirement, EP Rules / NOC / Other Statutory permissions, shall not require scoring and shall be considered significant.

The severity of various environmental receptors has been ranked into 5 levels ranging from *Acceptable (1 point) to Unacceptable (5 points)* as given in **Table 4-1**.

**Table 4-1: Scoring System for Environmental Impacts due to the Proposed Project – Severity Assessment**

S. No.	Environmental Component Impacted	Impact Severity Levels and Scores <sup>19</sup>				
		Severity Level: Acceptable Points: ± 1	Severity Level: Minor Points: ± 2	Severity Level: Moderate Points: ± 3	Severity Level: Major Points: ± 4	Severity Level: Unacceptable Points: ± 5
C1	C2	C3	C4	C5	C6	C7
1	Land use / land cover	Duration				
		Very short term (up to 1 year)	Short term (>1 - 3 years)	Medium term (>3 - 5 years)	Long term (> 5-10 years)	Very long term (>10 years)
		Extent (Area affected)				
		Very Limited (Within core zone)	Limited (<1 km around core zone)	Medium Range (>1 – 3.0 km around core zone)	Long Range (>3 – 7 km around core zone)	Extensive (>7.0 km around core zone)
		Change in land Use/Cover (conversion to Industrial/ Residential from)				
		Non-agricultural land, Land without Scrub, Industrial area with scrub land/ Reversible	Scrub Land/ Change in Topography	Water Body	Agricultural land, Open and Close vegetation/ Change in Drainage pattern	Forest Area/ Irreversible
		Topography				
		Low (Flat) up to 5 m	-	Medium (Undulating) up to 10 m	-	High (Hilly) More than 10 m
		Reversible/ Irreversible				
		Reversible	-	-	-	Irreversible
2	Air Quality	Temporary nuisance due to controlled/uncontrolled release of air emissions, odour / dust or greenhouse gases	Minor environmental impact due to controlled/uncontrolled release of air emissions, odour / dust or greenhouse gases with no lasting detrimental effects	Moderate environmental impact due to controlled/uncontrolled release of air emissions, odour / dust or greenhouse gases leading to visual impacts, at significant nuisance levels	Significant environmental impact due to release of air emissions, odour / dust or greenhouse gases leading to exceedance of limits specified in EP Rules'	Unacceptable environmental impact due to release of air emissions, odour / dust leading to possibility of chronic / acute health issues, injuries or fatalities

<sup>19</sup> In case none of the impacts are applicable, Not Applicable (NA) is written in the appropriate cell. A '+' sign indicates a beneficial impact while '-' sign indicates a adverse impact.



S. No.	Environmental Component Impacted	Impact Severity Levels and Scores <sup>19</sup>				
		Severity Level: Acceptable Points: $\pm 1$	Severity Level: Minor Points: $\pm 2$	Severity Level: Moderate Points: $\pm 3$	Severity Level: Major Points: $\pm 4$	Severity Level: Unacceptable Points: $\pm 5$
C1	C2	C3	C4	C5	C6	C7
3	Ambient Noise - give the mean score from the three categories, rounded to the nearest decimal	Background Noise Levels, with respect to Applicable Limit <sup>20</sup> as per The Noise Pollution (Regulation and Control) Rules, 2000, as Measured at Boundary of Relevant Noise Generating Unit				
		10% of limit or less	Between 10% to 5% of limit	Between 5% and the limit	Up to 5% above the limit	5% or more above the limit
		Incremental Noise Levels due to Relevant Noise Generating Unit, as Predicted at Boundary				
		1 dB(A) or less	1 dB(A) – 2 dB(A)	2 dB(A) – 3 dB(A)	3 dB(A) – 4 dB(A)	4 dB(A) or more
		Incremental Noise Levels due to Relevant Noise Generating Unit, as Predicted at Boundary of Nearest Human Settlement / Sensitive Receptor				
		0.5 dB(A) or less	0.5 dB(A) – 1 dB(A)	1 dB(A) – 1.5 dB(A)	1.5 dB(A) – 2 dB(A)	2 dB(A) or more
4	Surface Water - give the mean score from the three categories, rounded to the nearest decimal	Water Consumption (KL/D)				
		< 50	51 - 100	101 - 250	251 – 500	> 500
		Water Consumption Duration (Years)				
		< 1	1 - 3	3 - 5	5 - 10	> 10
		Wastewater Discharge Quality				
		No wastewater generation	Zero Discharge	Discharge to an authorized, functional CETP	Other discharge within limits specified by the EP Rules	Other discharge, outside limits specified by the EP Rules
5	Ground Water - give the mean score from the three categories, rounded to the nearest decimal	Ground Water - give the mean score from the three categories, rounded to the nearest decimal				
		Safe	Semi-critical	Critical	Over-exploited	Notified
		Water Drawl (KL/D)				
		< 50	51 - 100	101 - 250	251 - 500	> 500
		Water Drawl Duration (Years)				
		< 1	1 - 3	3 - 5	5 - 10	> 10
		Wastewater Discharge Quality				
		No wastewater generation	Zero Discharge	Discharge to an authorized, functional CETP	Other discharge within limits specified by the EP Rules	Other discharge, outside limits specified by the EP Rules

<sup>20</sup> For  $l_{eq}$  (day) or  $l_{eq}$  (night), whichever is higher

S. No.	Environmental Component Impacted	Impact Severity Levels and Scores <sup>19</sup>				
		Severity Level: Acceptable Points: $\pm 1$	Severity Level: Minor Points: $\pm 2$	Severity Level: Moderate Points: $\pm 3$	Severity Level: Major Points: $\pm 4$	Severity Level: Unacceptable Points: $\pm 5$
C1	C2	C3	C4	C5	C6	C7
		Accidental Discharge				
		Negligible leakages of chemicals/oil that only require periodic maintenance for both storage / transport routes	Minor but frequent leakages of chemicals/oil that require provision safety measures and proper maintenance	Moderate leakages of chemicals/oil that may contaminate groundwater if proper safety measures not provided	Major leakages of chemicals/oil that contaminate groundwater if safety measures not provided	Heavy leakage that can adversely contaminate groundwater and must require urgent remediation actions
6	Soil Quality	Loss of up to 20% topsoil, or minor contamination of soil that can be easily restored close to original condition for volume $<10 \text{ m}^3$	Loss of up to 40% topsoil, or actual or possible contamination of soil volume $<25 \text{ m}^3$ but below Dutch Intervention Values	Loss of up to 60% topsoil, or actual or possible contamination of soil volume $<25 \text{ m}^3$ but above Dutch Intervention Values	Loss up to 80% topsoil, or actual or possible contamination of soil volume $>25 \text{ m}^3$ and above Dutch Intervention Values, but not deemed to require urgent remediation	Loss up to 100% topsoil, or actual or possible contamination of soil volume $>25 \text{ m}^3$ and above Dutch Intervention Values <sup>21</sup> , and deemed to require urgent remediation
7.1	Flora / Fauna Habitat / Ecosystem Terrestrial Flora Terrestrial Fauna Aquatic Flora Aquatic Fauna	<ul style="list-style-type: none"> <li>Site specific loss (removal) of common floral species (but not any tree or trees).</li> <li>Vegetation composition does not form a habitat character for any species of conservation significance.</li> <li>No short term or long term impacts are likely to adversely affect the</li> </ul>	<ul style="list-style-type: none"> <li>Site specific loss (removal) of some saplings of trees.</li> <li>Minor temporary impacts on ecosystem functioning or habitat ecology of common / general species.</li> <li>Minor short term / long term impacts on surrounding / immediate / adjacent</li> </ul>	<ul style="list-style-type: none"> <li>Site specific loss (removal) of some common well grown tree / trees species.</li> <li>Site specific loss of nesting / breeding habitat of common / general species of flora-fauna but will not result in permanent loss of habitat.</li> </ul>	<ul style="list-style-type: none"> <li>Site specific impact on threatened species but impacted species are widely distributed outside the project site. Short term impacts may lead to loss of abundance or extent, but unlikely to cause local population extinction.</li> <li>Site specific habitat loss of fauna listed in IUCN,</li> </ul>	<ul style="list-style-type: none"> <li>Impact on threatened species listed in as an endemic / Schedule-I as per IWPA 1972, Red Data Book, ZSI, BSI or literature published by any State Govt. Institute, University and College etc.</li> <li>Loss of habitat of above said flora-fauna.</li> </ul>

<sup>21</sup> Source: Ministry of Housing Spatial Planning and the Environment, Netherlands; Soil Remediation Circular 2009, Annex A.

S. No.	Environmental Component Impacted	Impact Severity Levels and Scores <sup>19</sup>				
		Severity Level: Acceptable Points: $\pm 1$	Severity Level: Minor Points: $\pm 2$	Severity Level: Moderate Points: $\pm 3$	Severity Level: Major Points: $\pm 4$	Severity Level: Unacceptable Points: $\pm 5$
C1	C2	C3	C4	C5	C6	C7
	Marine Flora Marine Fauna	<p>surrounding habitat / ecosystem.</p> <ul style="list-style-type: none"> <li>Site specific disturbance to common / general faunal species (e.g. movement pattern, displacement etc.).</li> <li>No negative impacts on surrounding ecosystem functioning or habitat ecology.</li> </ul>	<p>habitats and are resilient to changes in habitat structure or condition.</p> <ul style="list-style-type: none"> <li>Impact on surrounding agro-ecosystem / agriculture when environmental data / parameters are within permissible limits.</li> </ul>	<ul style="list-style-type: none"> <li>Short term or long term impacts are likely to adversely affect the surrounding habitat character/ habitat ecology/ functioning of ecosystem.</li> <li>Impact on surrounding agro-ecosystem / agriculture when physical parameters with marginal increase but can be mitigated.</li> </ul>	<p>WCMC, Birdlife International, or any other international literature - secondary information.</p> <ul style="list-style-type: none"> <li>Impacts on habitats / ecosystems of international importance.</li> </ul>	<ul style="list-style-type: none"> <li>Impact on genetic diversity of NP /PF /WLS /ESZ /IBA / tiger reserve / elephant corridor / wild life corridor.</li> <li>Impact on ecosystem like river, forest, wetland (e.g. RAMSAR site etc.) etc.</li> </ul>
7.2	Ecology and Bio-diversity: Aquatic	Occasional short term impact and / or disruption to aquatic flora and fauna.	Impact on aquatic ecosystem, including flora, fauna and habitat but not destruction of species diversity or density.	<p>Significant localised impacts but without long term impact on Phytoplankton, zooplankton habitat.</p> <p>Temporary impact on benthos ecosystem or fisheries ecosystem.</p> <p>Some loss of fisheries ecosystem.</p>	<p>Significant widespread impact on protected wildlife (corals/mangroves/turtles/ any marine mammals).</p> <p>Significant impact on mangroves habitat</p>	<p>Damage to an extensive portion of aquatic ecosystem resulting in severe impacts on aquatic population and habitats and / or long term impact on aquatic habitat.</p> <p>Permanent or long term impact on protected wildlife (corals/mangroves/turtles/</p>

S. No.	Environmental Component Impacted	Impact Severity Levels and Scores <sup>19</sup>				
		Severity Level: Acceptable Points: $\pm 1$	Severity Level: Minor Points: $\pm 2$	Severity Level: Moderate Points: $\pm 3$	Severity Level: Major Points: $\pm 4$	Severity Level: Unacceptable Points: $\pm 5$
C1	C2	C3	C4	C5	C6	C7
						any marine mammals) and mangroves
8.1	Socio-economic Environment: Social Aspects - give the mean score from the categories, rounded to the nearest decimal	Possible Temporary or Permanent Migration, Persons as a % of Population of Study Area				
		Less than 0.5%	Between 0.5% and 1%	Between 1% and 1.5%	Between 1.5% and 2%	More than 2%
		Possible Change in Ethnicity, vis-à-vis Major Existing Ethnicities Present in Study Area				
		Not likely	Possible	Limited	Significant	Severe
		Gender Imbalance, as a Proportion to Existing Sex-Ratio				
		Not likely	Possible	Limited	Significant	Severe
		Possibility of Return to Original Status in Terms of Any or All of the Above Changes				
		Less than 1 year	Between 1 and 2 years	Between 2 and 3 years	Between 3 to 5 years	Permanent change
8.2	Socio-economic Environment: Economic Aspects - give the mean score from the categories, rounded to the nearest decimal	No. of Jobs Gained or Lost				
		Less than 50	Between 50 and 75	Between 75 and 100	Between 100 and 250	More than 250
		Persons Having Loss or Gain in Income				
		Less than 50	Between 50 and 100	Between 100 and 250	Between 250 and 500	More than 500
		Land Losers				
		Less than 10	Between 10 and 20	Between 20 and 50	Between 50 and 100	More than 100
		Losers of Homesteads				
		Less than 5	Between 5 and 10	Between 10 and 25	Between 25 and 50	More than 50
8.3	Socio-economic Aspects: Cultural	Minor repairable damage to commonplace structures	Minor repairable damage to structures/ items of cultural significance, or minor infringements of cultural values	Moderate damage to structures/ items of cultural significance, or significant, infringement of cultural values/ sacred location	Major damage to structures/ items of cultural significance, or major infringement of cultural values/sacred locations	Irreparable damage to highly valued structures/ items/ locations of cultural significance or sacred value
		Consequence distance				
9.1	Impact on People	Slight injury or health effects (including first aid case and medical treatment case). Not affecting work	Minor injury or health effects- Affecting work performance, e.g. restriction to activities, or	Major injury of health effects (including permanent disability). Affecting work performance	Single fatality or permanent total disability- from an accident or occupational illness	Multiple Fatalities-From an accident of occupational illness

S. No.	Environmental Component Impacted	Impact Severity Levels and Scores <sup>19</sup>				
		Severity Level: Acceptable Points: $\pm 1$	Severity Level: Minor Points: $\pm 2$	Severity Level: Moderate Points: $\pm 3$	Severity Level: Major Points: $\pm 4$	Severity Level: Unacceptable Points: $\pm 5$
C1	C2	C3	C4	C5	C6	C7
		performance or causing disability	need to take a time off work to recover. Limited, reversible health effects e.g. skin irritation, food poisoning.	in the longer term, e.g. prolonged absence from work. Irreversible health damage without loss of life, e.g. noise induced hearing loss, chronic back injuries.		
9.2	Impact on Environment	Slight Effect- Local Environment damage. Within the fence and within system. Negligible financial consequences.	Minor effect- contamination. Damage sufficiently large to attack the environment. Single exceeding of statutory or prescribed criterion. Single complaint. No permanent effect on the environment.	Localized effect- Limited loss of discharges of known toxicity. Repeated exceeding of statutory or prescribed limit. Affecting neighbourhood. Spontaneous recovery of limited damage within one year.	Major effect- Severe environmental damage. The company is required to take extensive measures to restore polluted or damaged environment to its original state. Extended exceeding of statutory or prescribed limits.	Massive effect-Persistent severe environmental damage or severe nuisance extending over a large area. In terms of commercial or recreational use or nature conservation, a major economic loss for the company. Constant, high exceeding of statutory or prescribed limits.

### 4.3 Quantifying the Likelihood of Occurrence of the Impact

After identifying the severity as shown in **Table 4-1** the likelihood of occurrence also needs to be estimated to arrive at a complete picture of environmental impact significance. **Table 4-2** provides likelihood ratings on a scale of 1-5. These ratings are used for estimating the likelihood of each occurrence.

**Table 4-2: Likelihood of Occurrence**

Description	Environment/Health and Safety	Likelihood of occurrence
Frequent	Continuous occurrence or each day during the project life cycle	5
Regular	Occurs several times each year during the project life cycle	4
Periodic	Might occur annually during the project life cycle	3
Occasional	Might happen few times during the project life cycle	2
Rare	One time or one-off event during the project life cycle	1

### 4.4 Quantifying Environmental Impact significance except for Land use land Cover Component

The level of environmental impact significance is calculated by multiplying the consequence score and the probability of occurrence together. Thus,

Significance of Impact = Severity Score × Likelihood of Occurrence

The final score is in relative point score, rather than actual impact. The impact estimation is carried out on the assumption that all operations are carried out with standard safety measures.

### 4.5 Quantifying Environmental Impact Significance for Land Use Land Cover Component

The Significance of Environmental Impact is calculated by adding the severity score of all five components. Thus,

Significance of Impact = Addition of all five severity scores

**Table 4-3** below assigns significance criteria, based on the scale of 1-25, used for prioritizing mitigation measures for reducing the environmental impact significance and thereafter, formulating and implementing Environmental Management Plans.

To do this, environmental impact significance levels are first scored and identified as mentioned earlier and then evaluated on the evaluation scale that follows in **Table 4-3**.

**Table 4-3: Environmental Impact Significance Criteria**

Likelihood of Occurrence	Impact Significance				
	Insignificant (1)	Minor (2)	Moderate (3)	Major (4)	Catastrophic (5)
Rare (1)	1	2	3	4	5
Possible (2)	2	4	6	8	10
Likely (3)	3	6	9	12	15
Often (4)	4	8	12	16	20
Certain (5)	5	10	15	20	25



#### 4.6 Categorising Environmental Impact Significance

Environmental impacts are now categorised into five categories from extreme significance to low significance. Activities resulting into extremely significant impacts are unacceptable and therefore need to be either stopped or modified such that they are brought to a lower level of environmental impact significance.

Activities resulting into High and moderately severe impacts, although acceptable, require being evaluated and mitigated in a manner that significance of their impacts is lowered. Activities resulting into Low severe significant impacts do not require further mitigation. This is summarized in **Table 4-4**.

**Table 4-4: Categorization of Impact Significance**

Scoring Negative Impacts (-)			Scoring Positive Impacts (+)	
Colour Code and Score Range	Category of Significance	Inference	Colour Code and Score Range	Inference
25	Extremely Significant	Activity should not proceed in current form	21 - 25	Activity has Extensive Positive Benefits
15 - 20	Highly Significant	Activity should be modified to include remedial planning and actions and be subject to detailed ecological assessment	15 - 20	Activity has Major Benefits
8 - 12	Moderately Significant	Activity can operate subject to management and / or modification	9 - 14	Activity has Moderate Benefits
4 - 6	Less Significant	No action required unless escalation of risk is possible	4 - 8	Activity has Minor Benefits
1 - 3	Minor / Negligible	Negligible Risk of activity	1 - 3	Activity has mildly positive impacts

#### 4.7 Mitigation Measures

Mitigation measures require being formulated and implemented for all 'Highly Significant' and 'Moderately Significant' impact activities. Programmes to implement all mitigation measures are then prepared and presented as an Environmental Management Programme.

#### 4.8 Identification of Impacting Activities for the Proposed Project

As discussed earlier, environmental impacts have been identified based on an assessment of environmental aspects associated with the project. The symbol '●' indicates an adverse (negative) impact and 'o' indicates a beneficial (positive) impact.

Identified environmental impacts have been listed in the table below.

**Table 4-5: Impact Aspect Assessment**

S. No.	Project Activities / Aspects	Impact Type & Duration	Potential Environmental Impacts on Environment (● = Negative; ○ = Positive)											Impacts (+/-) with remarks
		(Type: O, N, A, E; Duration: T, P)	LU / LC	AP, AQ	NV	SW	GW	S	EB	SE	RH	SHW	OH/CH&S	
<b>1</b>	<b>Project Location</b>													
1.1	Brownfield project, land use is industrial	O, P								○				SE (+) : Generation of additional jobs to locals & availability of adequate infrastructure
<b>2</b>	<b>Project Design</b>													
2.1	Plant layout and P&IDs	O, P	●											LU(-): Change in open area of the project site only
<b>3</b>	<b>Project Construction (Expansion )</b>													
3.1	Clearance at site	O, P	●	●	●			●	●	○			●	LU/LC (-) : Change-in land cover due to clearance of vegetation; AP/AQ (-) : Dust generation & Gaseous emission due to site clearance work NV (-) : Noise generation due to movement of vehicles & site clearing works S (-) : Soil erosion; EB (-) : Site specific loss of floral, faunal & habitat diversity SE (+) : Employment for construction workers and Vendors OH (-) : Risk of occupational injuries
3.2	Excavation and paving of site (Cutting, filling & Site Levelling)	O, P	●	●	●			●		○			●	LU/LC (-) : Change in topography of land; AP/AQ (-) : Dust & Gaseous emission due to excavation work, use of various construction machinery NV (-) : Noise generation due to machinery used (JCB, Tractors and Trucks) S (-) : Loss of top soil; Soil erosion; SE (+) : Temporary job creation for excavation and site preparation work; OH (-) : Occupational risk involved in excavation work
3.3	Vehicle movement for transportation of construction materials and equipment	N, T		●	●					○			●	AP/AQ (-) : Vehicular exhausts and dust emissions on road; NV (-) : Noise generation; SE (+) : Hiring of vehicles for movement of materials; employment generation and wear and tear of roads. OH (-) : Risk involved in transportation activity such as accidents, damage to properties, etc.

S. No.	Project Activities / Aspects	Impact Type & Duration (Type: O, N, A, E; Duration: T, P)	Potential Environmental Impacts on Environment (•= Negative; o= Positive)											Impacts (+/-) with remarks
			LU / LC	AP, AQ	NV	SW	GW	S	EB	SE	RH	SHW	OH/ CH&S	
3.4	Plant Erection & Commissioning	N, T	•	•	•			•		o			•	LU/LC : Land cover(open land) change to built-up land for industrial use AP/AQ (-) : Dust generation & Gaseous emission from various activities NV (-) : Noise generation; S (±) : Soil compaction, soil erosion SE (+) : Employment generation; Hiring of vehicles for movement of materials; OH (-) : Occupational risk involved due to breaking of pulley, chains of cranes during lifting of equipment
3.5	Coating / Painting of structures	O&N,T		•			•	•		o		•	•	AP/AQ (-) : VOC emission because of coating/painting; GW, S (-) : GW contamination/ Soil Contamination due to leakage SE (+) : Temporary job creation; SHW (-) : Solid waste generation from containers of paint; OH (-) : Risk of occupational injuries
3.6	Generation of sewage during construction activities	N,T				•	•	•						SW (-) : possibility of contamination if leakage/ seepage; GW (-) : groundwater contamination if leakage/ seepage; S (-) : soil contamination if leakage/ seepage
3.7	Storage & handling of Construction materials	N,T		•			•	•			•		•	AP/AQ (-) : Dust generation GW/S (-) : Possibility of ground water and soil contamination if leakage/ spillage of material; RH/OHS (-) : Risk to community health due to spillage
3.8	Storage & handling and disposal of solid waste like MSW, packaging material include construction debris, plastic wrapping, containers, cardboard boxes, etc.	N,T				•		•				•		SW (-) : Surface water contamination if leakage/ spillage; S (-) : Soil contamination if leakage/ spillage SHW (-) : Generation of solid waste

S. No.	Project Activities / Aspects	Impact Type & Duration (Type: O, N, A, E; Duration: T, P)	Potential Environmental Impacts on Environment (● = Negative; ○ = Positive)											Impacts (+/-) with remarks
			LU / LC	AP, AQ	NV	SW	GW	S	EB	SE	RH	SHW	OH/CH&S	
3.9	Operation of D.G. & GG sets (as secondary source)	N,T		●	●			●						AQ (-) : Emission of PM, SO <sub>2</sub> & NO <sub>x</sub> NV (-) : Generation of noise S (-) : Possibility of soil contamination due to accidental spillage of diesel or oil
3.10	Water consumption	N,T				●								SW (-) : Natural resource depletion (use of fresh water )
3.11	Usage of energy and power	N,T		●	●									AQ (-) : Operation of DG Set during construction phase generated air emission, NV (-) : Noise generation due to operation of DG Set
3.12	Laying of underground & above ground pipelines	N,T		●	●						●	●	●	AP/AQ (-) : Dust generation, Air emission; NV (-) : Noise generation from machines; RH (-) : Spillage of chemicals; SHW (-) : Solid waste generation OH (-) : Risk of occupational injuries
<b>4</b>	<b>Operation Phase – Regular operations after expansion</b>													
<b>A</b>	<b>Paints &amp; Resin manufacturing</b>													
4.A.1	Manufacturing Process (pre-dispersion, dispersion, mixing & tinting, packing, etc).	A, P		●	●	●		●	●		●	●	●	AP/AQ (-) : emission of pollutants from process vents & flue gas stacks, odour generation; NV (-) : noise generation; SW (-) : usage of surface water/resource depletion, possibility of surface water contamination S (-) : possibility of soil contamination; EB (-) : impact on flora & fauna due to emission of various gases/pigment dust; SHW (-) : generation of solid and hazardous waste;

S. No.	Project Activities / Aspects	Impact Type & Duration (Type: O, N, A, E; Duration: T, P)	Potential Environmental Impacts on Environment (● = Negative; ○ = Positive)											Impacts (+/-) with remarks
			LU / LC	AP, AQ	NV	SW	GW	S	EB	SE	RH	SHW	OH/CH&S	
														RH/OHS (-) : safety issues due to operation of boiler, reactor & other electrical equipment, handling of Hazardous chemical odor generation,  process gas emission, possibility of leakage/spillage of chemical/materials/solvents, etc.;
4.A.2	Operation of Quality Control Laboratories	N, P		●		●					●	●	●	SW(-) : Generation of wastewater; Possibility of contamination if Spillages or leakages of chemicals OH/RH (-) : Risk to employees while handling chemicals & practicing the required experiments\ SHW(-): Generation of spent chemical containers, broken glassware AP/AQ(-): Generation of fumes from operation of fume extraction hood (for acid handling)
4.A.3	Water Consumption (domestic use, manufacturing process and landscape development)	N, P				●	●							GW/SW (-) : Natural resource depletion (prior permission / supplied )
4.A.4	Dispersion of pollutants – Gaseous, liquid, etc.	N, P		●	●	●								AP/AQ (-) : Dispersion of waste powder, burning of fuels & VOC Emission release to atmosphere during charging SW(-) : Generation of effluent NV (-) : Noise and vibration pollution from high speed dispersers (HSD)
4.A.5	Operation of Grinding, Blending & Tinting	N, P		●	●	●					●		●	AP/AQ (-) : Dispersion of waste powder release to atmosphere during filling and Emission of Heat; SW(-) : Possibility of contamination if spillages or leakages from vessels NV (-) : Generation of Noise & Vibration during grinding, blending & tinting process

S. No.	Project Activities / Aspects	Impact Type & Duration (Type: O, N, A, E; Duration: T, P)	Potential Environmental Impacts on Environment (● = Negative; ○ = Positive)											Impacts (+/-) with remarks
			LU / LC	AP, AQ	NV	SW	GW	S	EB	SE	RH	SHW	OH/CH&S	
														OH/RH (-) : High exposures to paint and paint fumes can cause headaches, trigger allergies and asthmatic reactions, irritate skin, eyes, etc.
4.A.6	Filtration Process	N, P									●	●		SHW(-) : Generation of spent filters RH (-) : Risk to employees while handling of SHW
4.A.7	Odour at unit due to manufacturing activity	A, T		●					●					AP/AQ (-) : Odour from raw materials, solvents used; EB (-) : Odour problem
4.A.8	Solvent handling, recycling	N, P		●								●		AP/AQ (-) : Generation of solvent fumes SHW(-) : Generation of spent solvents as hazardous wastes
		A, T												RH(-): Possibility of fire
<b>B</b>	<b>General &amp; Utilities Operations</b>													
4.B.1	Vehicular Movement for transportation of Raw Materials and Finished Products	N, P		●	●	●	●	●	●	○			●	AP/AQ (-) : Dust generation & Vehicular exhausts emissions in to air; NV (-) : Noise Generation SW/GW/S (-): possibility of contamination if accidental leakage/spillage of materials during transportation EB (-) : Impact of Noise Generation, Air emission during vehicular movement on flora, fauna OH (-) : Risk involved in transportation activity such as accidents, damage to properties
4.B.2	Handling & storage of raw materials - Chemical and fuel storage and products,	A, T		●		●	●	●				●	●	AP/AQ (-) : dust generation from loading-unloading; GW (-) : Possibility of ground water contamination due to spillage of chemicals and fuel S (-) : Possibility of soil contamination due to spillage if any SHW (-) : generation of solid waste, hazardous waste; OH (-) : Occupational risk due to handling of material, heavy item movement, fall/damage to material/person.
4.B.3	Temporary Storage, handling of hazardous waste within premises, and disposal/	A, E					●	●			●		●	GW (-) : Possibility of Ground water contamination if leakage/spillage S (-) : Possibility of soil contamination if improper handling, storage, disposal and/or transportation of waste



S. No.	Project Activities / Aspects	Impact Type & Duration (Type: O, N, A, E; Duration: T, P)	Potential Environmental Impacts on Environment (● = Negative; ○ = Positive)											Impacts (+/-) with remarks
			LU / LC	AP, AQ	NV	SW	GW	S	EB	SE	RH	SHW	OH/CH&S	
	transportation of solid/hazardous waste													OH (-) : Risk to workers and community in surrounding area if spillage
4.B.4	Treatment & disposal of wastewater - operation of ETP, Operation of ZLD units	N,P		●	●	●	●	●			●	●	●	AQ (-) : odour generation NV (-) : Noise generation; SW, GW (-): possibility of water contamination due to accidental leakage/spillage; Possibility of surface water and soil contamination due to improper disposal/storage of waste water S (-) : Leakage/spillage resulting soil contamination; SHW (-) : Generation of PVC solids, generation of precipitated salts RH/OHS : Risk to employees while handling electrical equipment, motors, pumps etc. & due to odour Generation SHW (-) : Generation of used RO membranes
4.B.5	Operation of DG set	N, P		●	●			●				●		AQ (-) : Emission of PM, SO <sub>2</sub> & NO <sub>x</sub> NV (-) : Generation of noise & Vibration S (-) : Possibility of soil contamination due to accidental spillage of diesel or oil SHW (-) : Used oil generation
4.B.6	Operation of ETP laboratory	N,P				●	●	●						SW/GW, S (-) (-) : Generation of wastewater; Possibility of water, soil contamination if Spillages or leakages of chemicals OH/RH (-) : Risk to employees while handling chemicals & practicing the required experiments\ SHW(-): Generation of spent chemical containers, broken glassware AP/AQ(-): Generation of fumes from operation of fume extraction hood (for acid handling)
4.B.7	Influx of people (employees)	N, P					●			○			●	GW (-) : Possibility of ground contamination due to improper sewage management SE (+) : Generation of employment (direct & indirect) OH (-) : Occupational risk to persons working in factory
<b>C</b>	<b>Non-Routine Operation</b>													

S. No.	Project Activities / Aspects	Impact Type & Duration (Type: O, N, A, E; Duration: T, P)	Potential Environmental Impacts on Environment (•= Negative; o= Positive)											Impacts (+/-) with remarks
			LU / LC	AP, AQ	NV	SW	GW	S	EB	SE	RH	SHW	OH/CH&S	
4.C.1	Start-up and shutdown activities including washing of process equipment, pipeline, tanks etc., Venting in case of pressurized operation or Vessel, Sludge removal, storage and disposal.	N, T		•	•		•	•	•			•	•	AP (-) : Emission due to venting of gases NV (-) : Noise Generation GW (-) : Draining material mixed with ground water and Soil EB (-) : Damage to Flora/ Fauna found in soil S (-) : Leachate of sludge mixed in ground water and Soil OH/OH&S (-): Risk during venting of pressurized gas/ liquid, Risk to worker during venting process SHW(-): Generation of hazardous / solid wastes
4.C.2	Equipment repair & maintenance	N, T			•								•	NV (-) : Noise Generation; OH (-) : Occupational risk due to injuries to workers attending the repairs
<b>5</b>	<b>Emergency Operations – Possible Accidents</b>													
5.1	Fire	E, T		•		•			•				•	AQ (-) : Emission of PM, SO <sub>2</sub> & NO <sub>x</sub> EB (-) : Damage to Flora/ Fauna in fire affected area OH (-) : Occupational risk, inhalation of PM, SO <sub>2</sub> & NO <sub>x</sub> SW: Generation of contaminated firewater i.e. wastewater
<b>6</b>	<b>Final Decommissioning</b>													
6.1	Washing of process equipment, pipeline, tanks etc.	N, P					•	•						GW (-) : Treated effluent may leak in SW, GW, S (-) : Generation of wastewater; Water / soil Contamination if washed water leakage and spillage
6.2	Dismantling of plant machinery & equipment	N, P		•			•	•					•	AQ (-) : Venting of residual gases, Dust generation GW (-) : Contamination of GW due to dismantling activities in open area; S (-) : Soil contamination due to leaching of contaminated water due to vessel wash or improper handling & storage of hazardous waste OH (-) : OH Risks & Injuries to workers
6.3	Disposal of Inventory like raw material, treated	N, P										•	•	SHW (-) : Handling, transportation and disposal of inventory as per Hazardous waste rules OH/OH&S (-) : Risk to worker during handling of inventory

S. No.	Project Activities / Aspects	Impact Type & Duration (Type: O, N, A, E; Duration: T, P)	Potential Environmental Impacts on Environment (• = Negative; o = Positive)											Impacts (+/-) with remarks
			LU / LC	AP, AQ	NV	SW	GW	S	EB	SE	RH	SHW	OH/CH&S	
	effluent, rejects or partly processed material													
6.4	Final site clean-up	N, P	•	•	•									LU/LC (-) : Change in land use from Industrial to undeveloped AQ (-) : Dust Generation NV (-) : Noise Generation EB(+): Increase in greenbelt, increase in fauna
6.5	Loss of employment	N, P							o	•				SE (-) : Job loss of employees and workers
<b>Type of Impact – O:</b> One Time; <b>N:</b> Normal; <b>A:</b> Abnormal; <b>E:</b> Emergency; <b>Duration of Impact – T:</b> Temporary; <b>P:</b> Long-Term/ Permanent														
<b>LU/LC:</b> Land use/ Land cover; <b>AQ:</b> Air Quality; <b>NV:</b> Noise and Vibration; <b>SW:</b> Surface Water; <b>GW:</b> Ground Water; <b>S:</b> Soil; <b>EB:</b> Ecology & Bio-diversity; <b>SE:</b> Socio-Economic & <b>OH/CH&amp;S:</b> Occupational Health, Community Health & Safety, <b>SHW:</b> Solid Hazardous Waste														

**Note:** Impact Type: O = One Time, N = Normal, A = Abnormal, E = Emergency. Impact Duration: T = Temporary, Long-term/Permanent = P

## 4.9 Measures for minimizing and / or offsetting adverse impacts identified

Based on this above identification of impacts, environmental indices that are likely to be impacted due to the project are Land use/Land cover, Air Environment, Noise Environment, Water Environment – Surface Water quality and Ground Water Quality, Soil Environment, Ecology and Biodiversity, Socio – Economic Environment, Occupational health, Community Health and Safety. These are discussed further in subsequent sections in detail.

## 4.10 Land Use (LU) and Land Cover (LC)

### 4.10.1 Identification of Impacting Activities

Environmental aspects and impacts have been identified based on an assessment of environmental aspects associated with the project. Potential impacts on land use and land cover are given in **Table 4-6**.

**Table 4-6: Aspect – Impact Identification for Land Environment**

S. No.	Project Activity	Impact (Type: O, N, A, E; Duration: T, P)	Identified Aspect	Potential Environmental Impacts on land use land cover (LULC) (● = Negative; ○ = Positive)	Remarks
C1	C2	C3	C4	C5	C6
3	<b>Project Construction (For Expansion)</b>				
3.2	Clearance at site	O, P	Change-in effective area topography within the build-up land area of existing industry	●	Generation of debris/wastes Removal of soil
6	<b>Final Decommissioning</b>				
6.1	Final site clean-up	N, P	Change in land use from Industrial to undeveloped	●	Generation of debris/wastes
<i>Type of Impact – O: One Time; N: Normal; A: Abnormal; E: Emergency; Duration of Impact –T: Temporary; P: Long-Term/ Permanent</i>					

Based on this above identification of impacts, environmental indices that are likely to be impacted due to the project are:

### Land use/Land cover

The project proponent intends to optimize and utilize the existing facility at plot no. 1, Sector 30-B, HSIIDC, IMT Rohtak, Haryana State to increase the overall production of water and solvent-based paints, intermediates, resins & polymers along with the production of putty. No additional land requirement is envisaged and hence impacts associated with the land acquisition are ruled out.

As per the information, no green-belt area or open area is to be utilized for the proposed expansion hence impacts associated with the clearance of the site are ruled out.

### Final Decommissioning

#### Final Site Clean-Up

This activity will lead to a change in land cover from industrial to barren. Also, the generation of debris/waste is envisaged.

#### 4.10.2 Impact Scoring

Considering the above impact as well as the operating and other conditions mentioned above, the likely impact scores on the land environment are mentioned in **Table 4-7**.

**Table 4-7: Impact Scoring – Land Use Land Cover**

Code	Impacting Activity	Identified Impact	Impact Scoring			Mitigation Measures
			Severity (S)	Likelihood (L)	Final Score (S×L)	
C1	C2	C3	C4			C5
6	Final Decommissioning					
6.1	Final site clean-up	Change in land cover from industrial to barren	-8	1	-8	Moderately Significant: On completion of dismantling works, all wastes will be completely removed 1-2m below the ground surface

#### 4.10.3 Mitigation Measures

The following mitigation measures are suggested to manage the anticipated environmental impacts:

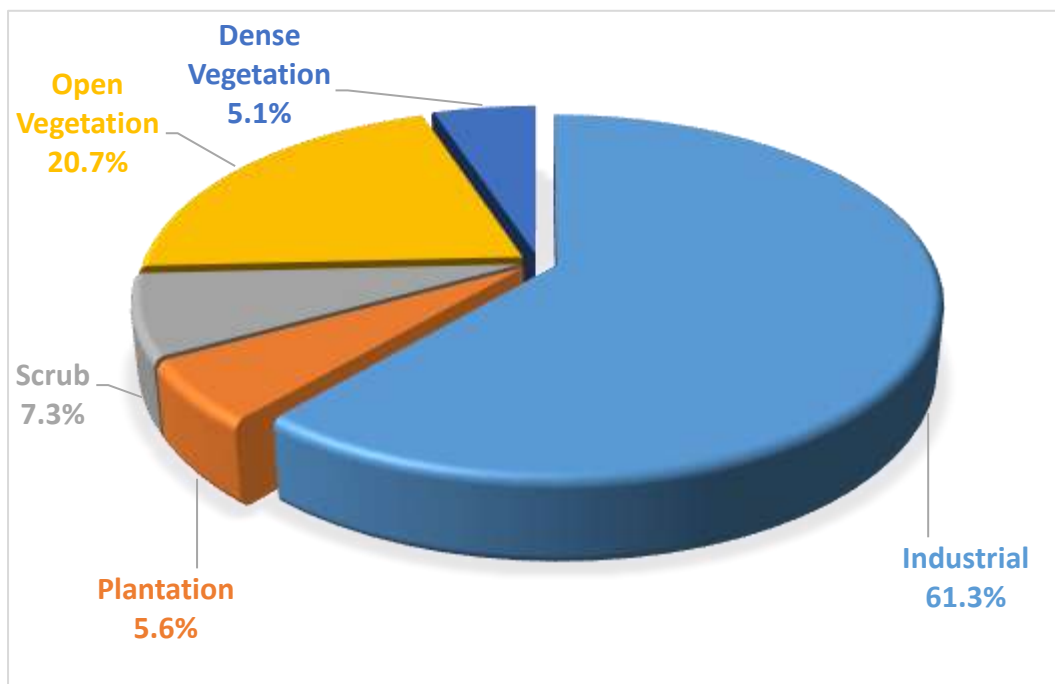
- The proposed activity will be carried out on the existing ~130 acres of land parcel allotted to M/s. Asian Paints Limited, Rohtak as given in

- **Annexure 3.**
- Necessary efforts will be made to minimize disruption of current land use to the extent possible.
- Existing roads will be used wherever possible for movement of personnel as well as materials and machineries; all transportation of hazardous materials will be done as per applicable laws and using drivers qualified to transfer such materials safely and with suitable permits and training including spill control training.
- Optimization of land requirement through proper site layout design will be basic criteria at the design phase.
- Proposed expansion will be done in existing site premises hence no adverse impact on Land use / land cover.
- The project site land area land cover is given below:

**Table 4-8: Land use / Land cover categories within Plant Premises**

Sr. No.	Level 1 Classification	Level 2 Classification	Area, Level 2 Class			Area, Level 1 Class		
			Ha	~km2	~%	Ha	~km2	~%
1	Built-up Land or Habitation	Industrial	32	0.32	61.30	32	0.32	61.30
2	Agricultural Land	Plantation	3	0.03	5.64	3	0.03	5.64
3	Vegetation Cover	Scrub	4	0.04	7.27	17	0.17	33
		Open Vegetation	11	0.11	20.68			
		Dense Vegetation	3	0.03	5.12			
Total			52	0.52	100	52	0.52	100



**Figure 4-1: Pie Chart of LULC classes within Plant Premises**

#### 4.11 Air Environment

The purpose of impact prediction on air environment, emission sources can be classified as point source and line source. Emission from these sources will be predicted for its impacts on the Ground Level Concentration (GLC) at various distances using the dispersion modelling guidelines given by the Central Pollution Control Board, New Delhi and by using AERMOD view software.

**4.11.1 Impact Scoring – Air Environment**

Potential impact on Air Environment/nearby ambient air quality are tabulated in **Table 4-9**.

**Table 4-9: Impact Scoring – Air Environment**

Sr. No.	Project Activity	N/AN/E Situations	Identified Aspect	Legal	Impact Scoring			Significance / Consequence	Operation Controls / Mitigation Measures	EMP Required
					Severity, S	Likelihood, L	Final Score, S x L			
C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
1	Operation Phase after Expansion									
1.1	Transportation of Raw materials and products	N	Dust generation from vehicular movement, Gaseous emission from vehicular exhaust	No	-2	4	-8	Moderately Significant	Checking of PUC papers of vehicles, preventive check and maintenance of vehicles, Adequate safety measures along with spill control mechanism	No
1.2	Handling & storage of raw materials and products	N	Dust generation from loading-unloading and odour generation.	No	-2	5	-10	Moderately Significant	Seal checking by supplier as well as APL during receiving any material/chemicals; Keep container tightly closed and sealed until ready for use; Avoid all possible sources of ignition; Use of PPEs (nose mask, safety goggles, safety shoes, hand gloves, breathing apparatus); preventive check & maintenance; ensure use of close feed system to reduce odour nuisance.	No
1.3	Manufacturing Process, Utilities operations (boiler, reactor, mills etc.)	AN	Emission of pollutants from process vents & flue gas stacks, odour generation	No	-2	5	-10	Moderately Significant	Adequate stack height and APCMs for air emission control; Scrubbers, dust collectors (Bag filters) etc.; ensure well working of APCMs & other equipment/ machineries used in manufacturing process; regular preventive check & maintenance of machineries; use of PPEs (nose mask, safety goggles,	Yes

Sr. No.	Project Activity	N/AN/E Situations	Identified Aspect	Legal	Impact Scoring			Significance / Consequence	Operation Controls / Mitigation Measures	EMP Required
					Severity, S	Likelihood, L	Final Score, S x L			
C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
									safety shoes, hand gloves, breathing apparatus); Odour levels control by applying various engineering controls.	
1.4	Treatment & Disposal of wastewater - Operation of ETP	AN	Odour generation	No	-2	5	-10	Moderately Significant	Odour levels control by applying various engineering controls, use of PPEs (nose mask, breathing apparatus)	Yes
1.5	Operation of DG Sets	N	Emission of SPM, SO <sub>2</sub> , NO <sub>x</sub> , HC & CO	Yes	-1	3	-3	Minor Significant	GG set & DG set with adequate stack height are use during power failure only,	Yes
1.6	Green belt development	N	Dust control, improvement in air quality	No	+3	+5	+15	Major Benefits	Proper & regular maintenance of Green belt.	Yes

#### 4.11.2 Dispersion modelling

Emission from all the stack were analysed for their impacts on the GLC for various distances using the dispersion modelling guidelines of AERMOD, developed by the AERMIC (American Meteorological Society/Environmental Protection Agency Regulatory Model Improvement Committee).

##### About AERMOD

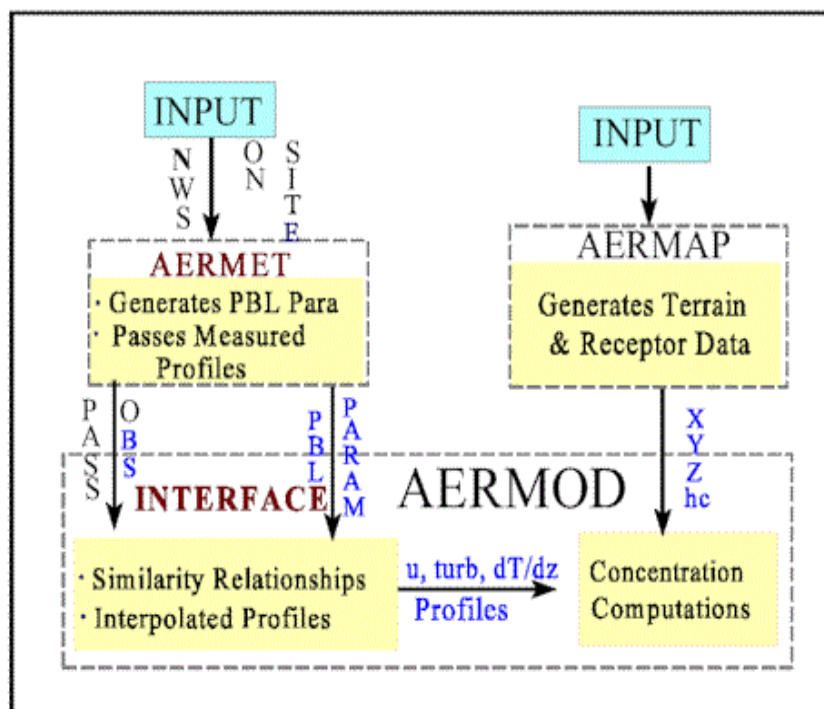
AMS/EPA Regulatory Model (AERMOD) is a steady-state plume model. It is designed to apply to source releases and meteorological conditions that can be assumed to be steady over individual modeling periods (typically one hour or less). AERMOD has been designed to handle the computation of pollutant impacts in both flat and complex terrain within the same modeling framework.

The American Meteorological Society/Environmental Protection Agency Regulatory Model Improvement Committee (AERMIC) was formed to introduce state-of-the-art modeling concepts into the EPA's air quality models. Through AERMIC, a modeling system, AERMOD, was introduced that incorporated air dispersion bases on planetary boundary layer turbulence structure and scaling concepts, including treatment of both surface and elevated sources, and both simple and complex terrain.

AERMET is an input data processor that is one of the regulatory components of the AERMOD modeling system. It incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts.

Data flow in AERMOD modeling system is shown in **Figure 4-2**.

**Figure 4-2: Data flow in AERMOD modelling system**



##### Sources of Air Emission

Air Emission sources can be classified as point sources and line sources. Emissions from these sources will be predicted for its impact on the Ground Level Concentration (GLC) at various distances using the dispersion modelling guidelines given by the Central Pollution Control Board, New Delhi and by using AERMOD view software.

## Meteorological Parameters

The hourly meteorological data considered were wind speed, wind direction, ambient atmospheric temperature, cloud cover, relative humidity & rainfall.

### Following parameters were considered for dispersion modelling – point source

- Quantity of fuel
- Emission rate of pollutants
- Stack;
  - Internal diameter at top of stack
  - Height of stack;
  - Exit gas velocity

Details of existing and proposed stack is given in **sub heading 2.7.7** of **Table 2-23** of **Chapter- 0**.

- Length of road
- Width of road
- Silt content %
- No. of Car trip/day

The impact prediction has been done for operation phase in subsequent sections.

### 4.11.3 Impact on Air Environment

Impact on ambient air during operation phase of proposed expansion would be due to:

- Emission of pollutants SO<sub>2</sub>, NO<sub>x</sub>, from operation of additional three GG set which will use PNG as fuel after expansion;
- Pollutants HC, CO, NO<sub>x</sub>, PM<sub>10</sub>, PM<sub>2.5</sub> emissions from vehicular movement.

### 4.11.4 Point Source Emission

**Table 4-10: Emission Rate of VOCs from Stack (Scrubber)**

S. No.	Vent Attached to	Stack Details						Pollutant Details			
		Vent Height (m)	Exit Velocity (m/s)	Dia (m)	Temp (°K)	Airflow (m <sup>3</sup> /s)	Airflow (nm <sup>3</sup> /s)	Pollutant	Inlet (Qty), g/s	Removal Efficiency (98%)	Outlet (Qty), g/s
C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
1	Water-based paint plant	22	9.0	0.2	328	0.0628	0.04	VOC	45.310	0.010	0.45
2	Polymer plant	22	9.0	0.2	328	0.0628	0.04	VOC	143.800	0.010	1.44

**Table 4-11: Emission Rate of pollutants from Stack (GG Set)**

S. No.	Description	Stack 1	Stack 2	Stack 3
1	~Capacity	2875 kVA	2875 kVA	2875 kVA
2	Source	GG Sets	GG Sets	GG Sets
3	Type of Fuel	PNG	PNG	PNG
4	Fuel Consumption Rate (Ltr/Hr)	777	777	777
5	Fuel Consumption Rate (Kg/Hr)	544.00	544.00	544.00
6	Stack Ht., m	30.00	30.00	30.00

S. No.	Description	Stack 1	Stack 2	Stack 3
7	Stack Dia. (Top), m	0.45	0.45	0.45
8	Stack Exit Velocity, m/s	14.00	14.00	14.00
9	Stack Exit Temp, °K	596.00	596.00	596.00
10	Stack Exhaust, m3/s	2.23	2.23	2.23
11	Stack Exhaust, Nm3/s	1.11	1.11	1.11
12	Emission of SO <sub>2</sub> , gm/sec	0.02	0.02	0.02
13	Emission of PM, gm/sec	0.01	0.01	0.01
14	Emission of NO <sub>x</sub> , gm/sec	0.74	0.74	0.74

**Table 4-12: Emission Rate of PM from Process Stack**

S. No.	Description	Stack Nos.	Stack Nos.	Stack Nos.	Stack Nos.	Stack Nos.	Stack Nos. 30
1	Source	Dust Collector 1	Dust Collector 2	Dust Collector 3	Dust Collector 4	Dust Collector 5	RJF
2	APCM						
3	Stack Ht., m	22	22	22	22	22	22
4	Stack Dia. (Top), m	0.3	0.3	0.3	0.3	0.3	0.3
5	Stack Exit Velocity, m/s	4	4	4	4	4	1
6	Stack Exit Temp, °K	318	318	318	318	318	306
7	Stack Exhaust, m3/s	0.28	0.28	0.28	0.28	0.28	0.07
8	Stack Exhaust, Nm3/s	0.26	0.26	0.26	0.26	0.26	0.07
9	PM Emission (g/s)	0.013	0.013	0.013	0.013	0.013	0.003



#### 4.11.5 Line Source Emission

The emission rate of vehicular exhaust for PM, CO, HC & NOx are as given in **Table 4-13**.

**Table 4-13: Emission rate of Pollutants due to (Diesel-based) Vehicular Exhaust**

Pollutants			PM			CO			HC			NOx		
S. No.	Description	Unit	Route-1	Route-2	Route-3	Route-1	Route-2	Route-3	Route-1	Route-2	Route-3	Route-1	Route-2	Route-3
1	Type of road	-	Paved	Paved	Paved	Paved	Paved	Paved	Paved	Paved	Paved	Paved	Paved	Paved
2	Vehicle Type	-	Trucks	Trucks	Trucks	Trucks	Trucks	Trucks	Trucks	Trucks	Trucks	Trucks	Trucks	Trucks
3	No. of vehicles return trips on Stretch	Nos.	250	250	250	250	250	250	250	250	250	250	250	250
4	Total Time of Vehicular movement, Hr	Hour	24	24	24	24	24	24	24	24	24	24	24	24
5	Number of Vehicles per Hour	Nos.	10	10	10	10	10	10	10	10	10	10	10	10
6	Length of Road within the study area	(km)	1.320	0.460	0.410	1.320	0.460	0.410	1.320	0.460	0.410	1.320	0.460	0.410
7		(mtr)	1320	460	410	1320	460	410	1320	460	410	1320	460	410
8	Width of Road, m	(mtr)	10.66	10.66	10.66	10.66	10.66	10.66	10.66	10.66	10.66	10.66	10.66	10.66
9	Area of Vehicle Movement	(m <sup>2</sup> )	422136	147108	131118	422136	147108	131118	422136	147108	131118	422136	147108	131118
10	Speed of Vehicle,	(km/hr)	30	30	30	30	30	30	30	30	30	30	30	30
11	Capacity of Truck KW	(KW)	237	237	237	237	237	237	237	237	237	237	237	237
12	Emission from trucks	gm/m <sup>2</sup> .s	1.6E-08	4.7E-08	5.2E-08	2.4E-06	7.0E-06	7.8E-06	2.1E-07	6.1E-07	6.8E-07	6.5E-07	1.9E-06	2.1E-06

**Table 4-14: Emission rate of Pollutants due to (CNG-based) Vehicular Exhaust**

Parameter			PM			CO			HC			NOx		
S. N o.	Descrip tion	Unit	Rout e-1	Rout e-2	Rout e-3	Rout e-1	Rout e-2	Rout e-3	Rout e-1	Rout e-2	Rout e-3	Rout e-1	Rout e-2	Rout e-3
1	Type of road	-	Pave d	Pave d	Pave d	Pave d	Pave d	Pave d	Pave d	Pave d	Pave d	Pave d	Pave d	Pave d
2	Vehicle Type	-	Truck s	Truck s	Truck s	Truck s	Truck s	Truck s	Truck s	Truck s	Truck s	Truck s	Truck s	Truck s
3	No. of vehicles Return Trips on Stretch	-	50	50	50	50	50	50	50	50	50	50	50	50
4	Total Time of Vehicul ar movem ent	Hou r	24	24	24	24	24	24	24	24	24	24	24	24
5	Number of Vehicles per Hour	Nos/hr	2	2	2	2	2	2	2	2	2	2	2	2
6	Length of Road within the study area	(km)	1.320	1.320	1.320	1.320	1.320	1.320	1.320	1.320	1.320	1.320	1.320	1.320
7		(mtr)	1320	1320	1320	1320	1320	1320	1320	1320	1320	1320	1320	1320
8	Width of Road, m	(mtr)	10.66	10.66	10.66	10.66	10.66	10.66	10.66	10.66	10.66	10.66	10.66	10.66
9	Area of Vehicle Movem ent	(m2)	4221 36	4221 36	4221 36	4221 36	4221 36	4221 36	4221 36	4221 36	4221 36	4221 36	4221 36	4221 36
10	Speed of Vehicle,	(km/hr)	30	30	30	30	30	30	30	30	30	30	30	30
11	Emissio n from trucks	gm/ m <sup>2</sup> .s	2.7E-09	2.7E-09	2.7E-09	1.1E-06	1.1E-06	1.1E-06	4.4E-08	4.4E-08	4.4E-08	1.3E-07	1.3E-07	1.3E-07

**Assumptions:** The dispersion modeling assumptions considered are as follows:

- The efficiency of APCM attached to the Incinerator is considered to be around 95% and accordingly calculated emission rate of PM<sub>10</sub> and SO<sub>2</sub> pollutants.
- The terrain of the study area was considered as FLAT.
- Stability class was evaluated based on solar insolation and cloud cover.
- The mathematical equations used for the dispersion modeling assume that the earth's surface acts as a perfect reflector of the plume and physic-chemical processes such as dry and wet deposition and chemical transformation of pollutants are negligible.

The study has been conducted for the summer season from 2<sup>nd</sup> February 2023 to 10<sup>th</sup> May 2023. The stack emission concentrations used for dispersion modeling were taken as per CPCB guidelines.

## Prediction of Incremental GLC Pollutants on Air Environment

Air dispersion modeling results with predicted GLC & Isopleths of all the parameters from proposed project activities are provided in **Annexure 17**.

### Predicted Maximum Incremental GLC (any one single day i.e. 24-hour Maximum)

The worst-case scenario of air emissions, from proposed stacks (point sources) and Line source i.e. vehicular exhaust from the engine at the proposed project is predicted as the sum of baseline (single day maximum) and Predicted Incremental GLC (Single Day Maximum) at the monitoring locations. This is a conservative estimate and the probability of such occurrence is unlikely.

### Predicted Study Period Average Incremental GLC

In this scenario, air emissions from proposed stacks (point sources) and Line sources i.e. vehicular exhaust from the engine at the proposed project are predicted as the sum of the Baseline (Study Period Average) and Predicted Incremental GLC (Time Weighted Average) at the monitoring locations.

**Table 4-15: Hourly Average Incremental Increase in GLC**

S. No.	Name of AAQM location (Distance in Km/ Direction from Site)	Pollutant	CPCB Limit (24 hour basis unless mentioned) Concentration ( $\mu\text{g}/\text{m}^3$ )	Average Monitored Baseline Concentration ( $\mu\text{g}/\text{m}^3$ )	Incremental GLC due to Point sources ( $\mu\text{g}/\text{m}^3$ )	Incremental GLC due to Line sources ( $\mu\text{g}/\text{m}^3$ )	Total Predictive GLC ( $\mu\text{g}/\text{m}^3$ )
1.	AAQ1 At site (0/-)	PM <sub>10</sub>	100	92	0.15358	0.00234	92.15592
		SO <sub>2</sub>	80	8.5	0.04081	-	8.54081
		NO <sub>x</sub>	80	12.4	1.50993	0.09512	14.00505
		HC	NS	955	-	0.00003	955.00003
		CO	4	1.04	-	0.00039	1.04039
		VOC	NS	<1	0.00281	-	0.00281
2.	AAQ2 Bohar village (3.10/ NW)	PM <sub>10</sub>	100	77	0.06007	0.00059	77.06066
		SO <sub>2</sub>	80	8.0	0.0028	-	8.0028
		NO <sub>x</sub>	80	11.4	0.10366	0.02381	11.52747
		HC	NS	984	-	0.0	984
		CO	4	1.01	-	0.00009	1.01009
		VOC	NS	<1	0.00069	-	0.00069
3.	AAQ3 Gandhra village (6.30/ SE)	PM <sub>10</sub>	100	80	0.03174	0.00093	80.03267
		SO <sub>2</sub>	80	7.9	0.00264	-	7.90264
		NO <sub>x</sub>	80	16.4	0.09758	0.03218	16.52976
		HC	NS	1028	-	0.00001	1028.00001
		CO	4	1.11	-	0.00015	1.11015
		VOC	NS	<1	0.00062	-	0.00062
4.	AAQ4 Sector-28, Rohtak (4.0/ W)	PM <sub>10</sub>	100	72	0.11673	0.00132	72.11805
		SO <sub>2</sub>	80	8.2	0.00451	-	8.20451
		NO <sub>x</sub>	80	16.2	0.16702	0.05333	16.42035
		HC	NS	1033	-	0.00001	1033.00001
		CO	4	1.09	-	0.00021	1.09021
		VOC	NS	<1	0.00153	-	0.00153
5.	AAQ5 Paksma village (5.79/ E)	PM <sub>10</sub>	100	92	0.08757	0.00036	92.08793
		SO <sub>2</sub>	80	8.2	0.00564	-	8.20564
		NO <sub>x</sub>	80	15.4	0.20872	0.01475	15.62347

S. No.	Name of AAQM location (Distance in Km/ Direction from Site)	Pollutant	CPCB Limit (24 hour basis unless mentioned) Concentration ( $\mu\text{g}/\text{m}^3$ )	Average Monitored Baseline Concentration ( $\mu\text{g}/\text{m}^3$ )	Incremental GLC due to Point sources ( $\mu\text{g}/\text{m}^3$ )	Incremental GLC due to Line sources ( $\mu\text{g}/\text{m}^3$ )	Total Predictive GLC ( $\mu\text{g}/\text{m}^3$ )
		HC	NS	988	-	0.00000	988
		CO	4	1.04	-	0.00006	1.04006
		VOC	NS	<1	0.0012	-	0.0012
6.	AAQ6 Garhi Bohar village (0.46/ SW)	PM <sub>10</sub>	100	83	0.27947	0.05338	83.33285
		SO <sub>2</sub>	80	8.4	0.01162	-	8.41162
		NOx	80	14.9	0.40007	2.18457	17.48464
		HC	NS	956	-	0.00072	956.00072
		CO	4	1.08	-	0.0095	1.0895
		VOC	NS	<1	0.00309	-	0.00309
7.	AAQ7 Baliana village (0.9/ NE)	PM <sub>10</sub>	100	85	0.05007	0.00125	85.05132
		SO <sub>2</sub>	80	7.8	0.01507	-	7.81507
		NOx	80	14.4	0.26029	0.0508	14.71109
		HC	NS	966	-	0.00001	966.00001
		CO	4	1.12	-	0.00021	1.12021
		VOC	NS	<1	0.00156	-	0.00156
8.	AAQ8 Ladhaut Bhaiyanpur (7.21/ N)	PM <sub>10</sub>	100	90	0.01165	0.00004	90.01169
		SO <sub>2</sub>	80	9.3	0.00078	-	9.30078
		NOx	80	16.9	0.02875	0.00154	16.93029
		HC	NS	1005	-	0.0000	1005
		CO	4	1.06	-	0.00000	1.06
		VOC	NS	<1	0.00015	-	0.00015
9.	AAQ9 Chuliana village (7.0/ S)	PM <sub>10</sub>	100	74	0.01026	0.00029	74.01055
		SO <sub>2</sub>	80	8.2	0.00039	-	8.20039
		NOx	80	15.2	0.0145	0.01181	15.22631
		HC	NS	993	-	0.00000	993
		CO	4	1.11	-	0.00004	1.11004
		VOC	NS	<1	0.0001	-	0.0001

#### 4.11.6 Mitigation measures

Mitigation Measures to minimized impacts on air quality during operational phase:

- Dust and air emission can be controlled by greenbelt/green cover development. Greenbelt shall be maintained properly.
- Periodic air quality monitoring shall be carried out at project site and other location within study area.
- DG sets shall be operated during power failure only.
- Ensure well working of APCMs & other equipment/machineries used in manufacturing process.
- Regular preventive check & maintenance of machineries shall be done.
- Use of PPEs (nose mask, safety goggles, safety shoes, hand gloves, breathing apparatus etc.) by all workers and employees.
- Odour levels control by applying various engineering controls.
- Closed feed system shall be maintained to reduce the chances of odour nuisance.
- Vehicles used shall be PUC certified from time to time.

## 4.12 Traffic Survey & Incremental Traffic

For traffic flow towards APL (Up) & towards IMT Chock (Down) (7 m wide each lane) – A traffic survey was done at APL to IMT Chock Road

The vehicle count was recorded at every 15-minute interval for 24 hours.

Details of the traffic survey with total vehicle count per hour time duration, and a summary of existing traffic survey (peak hourly) for up & down traffic flow are presented in **Annexure 19**.

The proposed PCU/hr as per incremental traffic due to the proposed project is summarised in **Table 4-16**.

**Table 4-16: Incremental Traffic flow in PCU/Hr due to the proposed project**

Sr No	Vehicle Type	Equivalent PCU Factors**	No. of Vehicle count / Hr	Share %	Calculated PCU/Hr
<b>Fast Vehicles</b>					
1	Motorcycle or Scooter etc.	0.50	0	0.0	0
2	Passenger Cars, Pick-up Van, Auto-rickshaw	1.00	0	0.0	0
3	Agricultural Tractor, Light Commercial vehicles	1.50	0	0.0	0
4	Truck or Bus	3.00	450	100.0	1350
5	Truck-trailer, Agricultural Tractor-Trailer	4.50	0	0.0	0
<b>Slow Vehicles</b>					
6	Cycle	0.50	0	0.0	0
7	Cycle-Rickshaw	2.00	0	0.0	0
8	Hand Cart	3.00	0	0.0	0
9	Horse-drawn vehicle	4.00	0	0.0	0
10	Bullock Cart	8.00	0	0.0	0
<b>Total</b>			<b>450</b>	<b>100.0</b>	<b>1350</b>
<b>**To calculate PCU-Passenger Car Unit, for proposed trucks, Equivalent PCU Factors considered from Guidelines for Capacity of Roads IRC, Table 1: Recommended PCU (Passenger Car Unit) factor for various types of vehicles in urban areas.</b>					

**Table 4-17: Final Scenario of Incremental Traffic due to the Proposed in Project & Capacity of Roads**

Road name	Width (m)	Existing		Proposed		Total Service Volume (PCU/ Hr)	*Total design Service Volume (PCU/ Hr and Type of Carriage Way
		Vehicle Count Per Hr	Vehicles Count in PCU/Hr as per IRC	Vehicle Count per Hr	Vehicles Count in PCU/Hr as per IRC		
C1	C2	C3	C4	C5	C6	C7 = C4 + C6	C8
APL to IMT Chock	7 m	37	24	450	1350	1374	2,400 Two Lane roads

### Conclusion/Inference:

#### 4.12.1 Impact due to Road Transportation

- Increase in transportation will lead to increase in road traffic;
- Generation of dust;
- Emission of pollutants like HC, SO<sub>2</sub>, CO, CO<sub>2</sub>;
- Noise generation from vehicular movement;

- Spillage or leak of raw materials/products during transportation may lead to soil/water contamination.

#### 4.12.2 Mitigation Measure

- Vehicles shall be PUC certified.
- Vehicles conforming to latest Bharat stage (BS) exhaust emission norms will be utilized.
- Traffic will be regulated through proper signage, instruction & parking spaces.
- Internal roads with 6 m width for movement of vehicles / people.
- Parking spaces will be provided.
- Speed limit within the premises will be minimum to reduce traffic congestion.
- Signpost will be/are provided for smooth traffic flow and also inculcate residents to follow traffic rules.

#### 4.13 Noise Environment

The proposed project capacity expansion related activities that will lead to emission of noise may have adverse impact on noise on the surrounding communities in terms of increase in ambient noise levels.

As per **Table 4-18** identified adverse impacts-aspects on noise environment that will lead to noise pollution during operation phase of the project are mainly includes vehicle movements for transportation of Raw Materials and products, operation of DG set, Boiler, pumps, & compressor etc.

The potential impacts on noise level may arise out of the following;

##### Noise from Machinery

During construction phase, operation of earth movers like crane, dumper, roller, bulldozers etc. will be used. The machinery will be used during daytime and will emit noise within permissible limits. Thus, there will not be any adverse impact on nearby habitation due to proposed activity.

During operation phase, due to chiller, dust collection system, packing area machinery, Reactor and from machinery noise will be generated.

##### Noise from Vehicles/Traffic

Vehicle movement for transportation of materials and work force to the site will cause minor noise emission as the frequency of vehicular movement is few times in a week.

##### Noise from DG Set, Boiler, etc.

Noise generated from DG Set, Boiler, Pump, etc. will have a permanent effect to the workers working in the nearby vicinity, if they will work for more hours in a day.

#### 4.13.1 Impact Scoring – Noise Environment

Considering the above conditions, the impact scores on noise environment are likely to be as mentioned in **Table 4-18**.

**Table 4-18: Environmental Impact Scoring for Noise Environment**

S. No.	Project Activities / Aspects	Impacts Aspect	Impact (Type: O, N, A, E; Duration: T, P)	Impact Scoring			Significance/Consequence	Operation Controls/Mitigation Measures	EMP required
				Consequence C	Probability P	Final Score C×P			
C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
<b>1</b>	<b>Pre-Construction Phase</b>								
1.3	Vehicle movement for transportation of construction materials and equipment	Noise generation	N, T	-2	3	-6	Less Significant	Periodic Maintenance and servicing of vehicles used for site clearing	Yes
1.4	Plant Erection & Commissioning	Noise generation	N, T	-2	4	-8	Moderately Significant	Proper PPE's to be worn by the workers at all time.	No
1.5	Usage of energy and power	Noise generation due to operation of DG Set	N,T	-2	4	-8	Moderately Significant	Equipment's shall be equipped with Acoustic enclosures	No
1.6	Laying of underground & above ground pipelines	Noise generation from machines	N,T	-2	3	-6	Less Significant	Proper PPE's to be worn by the workers at all time.	No
<b>2</b>	<b>Operation Phase – Regular operations</b>								
<b>2.A</b>	<b>Paints &amp; Resin manufacturing</b>								
2.A.1	Manufacturing Process (pre-dispersion, dispersion, mixing & tinting, packing, etc.).	Noise generation	A, P	-2	4	-8	Moderately Significant	Proper PPE's to be worn by the workers at all time and mechanized and rotary equipment's shall be equipped with Acoustic enclosures	Yes
2.A.2	Dispersion of pollutants – Gaseous, liquid, etc.	Noise from high speed dispersers (HSD)	N, P	-2	4	-8	Moderately Significant	Proper PPE's to be worn by the workers at all time and mechanized and rotary equipment's shall be equipped with Acoustic enclosures	No
2.A.3	Operation of Grinding, Blending & Tinting	Noise generation	N, P	-2	4	-8	Moderately Significant	Proper PPE's to be worn by the workers at all time and mechanized and rotary equipment's shall be equipped with Acoustic enclosures	Yes
<b>2.B</b>	<b>General &amp; Utilities Operations</b>								
2.B.1	Vehicular Movement for transportation of Raw Materials and Finished Products	Noise generation	N, P	-2	4	-8	Moderately Significant	Periodic Maintenance and servicing of vehicles used for site clearing. PUC certified vehicles will be used.	Yes
2.B.2	Treatment & disposal of wastewater - operation of ETP, Operation of ZLD units	Noise generation	N, P	-2	4	-8	Moderately Significant	Proper PPE's to be worn by the workers at all time.	No
2.B.3	Operation of DG set	Noise generation	N, P	-2	4	-8	Moderately Significant	Equipment's shall be equipped with Acoustic enclosures	No
<b>2.C</b>	<b>General &amp; Utilities Operations</b>								
2.C.1	Start-up and shutdown activities including washing of process equipment, pipeline, tanks etc., Venting in case of pressurized operation or Vessel, Sludge removal, storage and disposal.	Noise generation	N, T	-2	3	-6	Less Significant	SOP's will be followed. Acoustic enclosures will be provided. Earplugs and Earmuffs will be provided to workers.	No
2.C.2	Equipment repair & maintenance	Noise generation	N, T	-2	4	-8	Moderately Significant	Proper PPE's to be worn by the workers at all time.	No
<b>3</b>	<b>Final Decommissioning</b>								
3.1	Final Decommissioning	Noise Generation	N, P	-2	4	-8	Moderately Significant	Erection of temporary barriers. Proper PPE's to be worn by the workers at all time.	No
Type of Impact – O: One Time; N: Normal; A: Abnormal; E: Emergency; Duration of Impact – T: Temporary; P: Long-Term/ Permanent									



#### 4.13.2 Assessment of Noise using Sound Plan Modelling

Noise modeling study was done using the Software tool called "SoundPLAN" which predicts the Noise Map generated due to the sources present at the project site, and predicts the Noise Levels at various receiver points due to the sources present at the project site.

To analyze the Noise Map of the project site, first, the geometrically coordinated Google Earth images of the Project site were imported into the software. Various Sources of noise were added with their approximate Sound Pressure Levels, and the "Receiver points" were added at various locations where Noise Monitoring was conducted.

"SoundPLAN" generates the Noise Map with colored pattern isopleths, which indicate whether or not the SPL in that particular region is above the limits mentioned by CPCB or not. If the Limit for Sound Pressure Level indicated by CPCB for that particular area is 75 dB during the day, and if the predicted SPL is below that, the Noise Map will show Green color for that area. But if the SPL is above the "user set" allowable limit, the same will be shown in Red color depending upon the Difference between then Predicted SPL and the Allowable SPL, and the "Conflict" in SPL is mentioned in the table if any conflict is predicted.

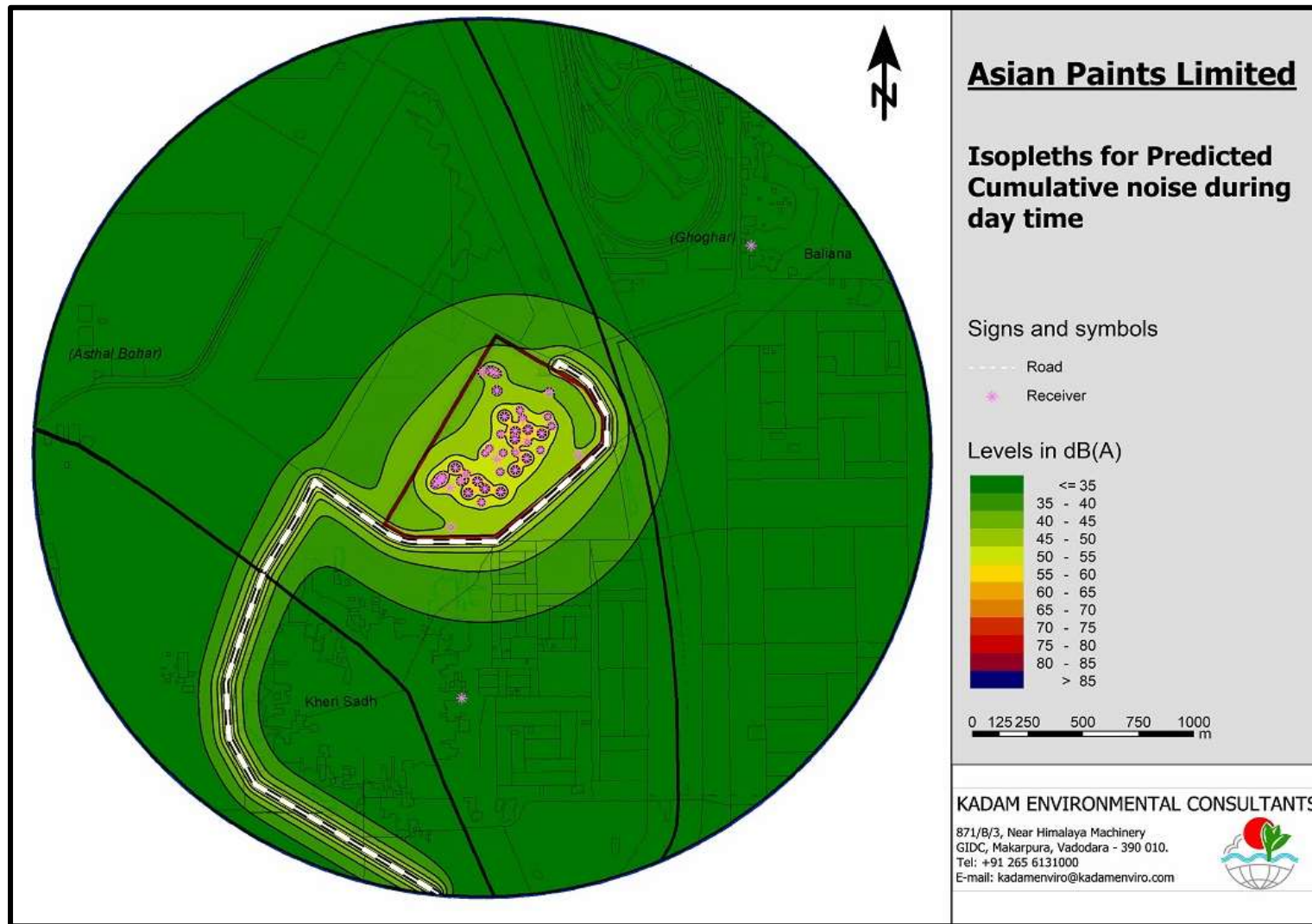
#### Consideration during the Analysis

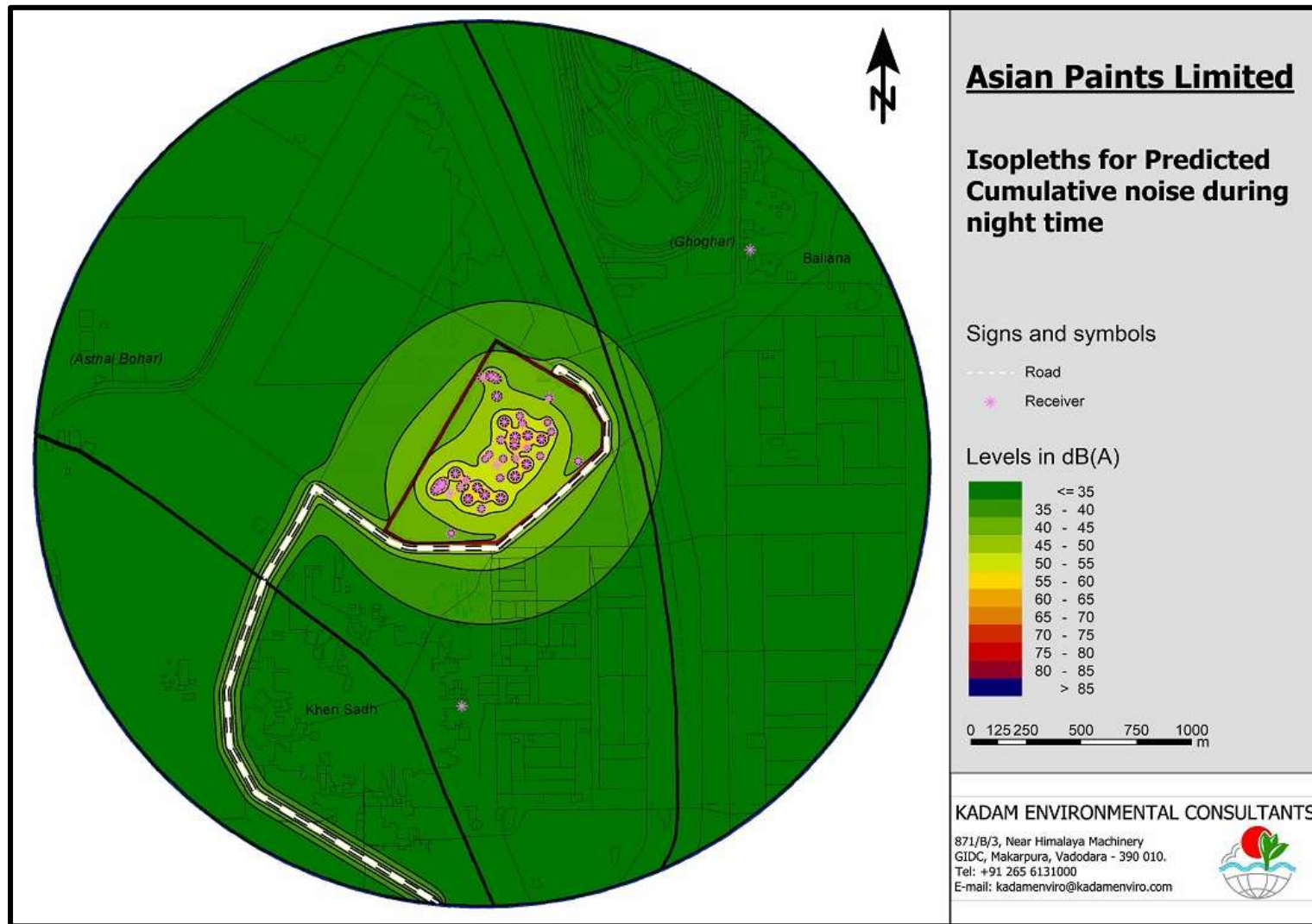
The sources considered at the project site for the analysis with their approximate Sound Pressure Levels are considered slightly on the higher side for more critical analysis. The sources of noise considered are as **Table 4-19**.

**Table 4-19: Sources of noise with their Sound Pressure Levels**

S. No.	Sources	Levels dB(A)
1.	DG Set	85
2.	Pump	85
3.	Boiler	95
4.	Cooling Tower	90
5.	Mixer	85
6.	Scrubber	95
7.	Blender	85
8.	Reactor	95
9.	Compressors	90
10.	Vehicular Movement	70

Sound Plan has been run by using area source to cover noise-generating areas and cumulative noise of all machineries at each section has been considered for Sound Level in dB (A). Using above consideration the isopleths generated during daytime and night time are as given in **Figure 4-3** and **Figure 4-4**.

**Figure 4-3: Isopleth for Incremental Noise Generated during Day Time**

**Figure 4-4: Isopleth for Incremental Noise Generated during Night Time**

## Observations

The sound pressure levels were predicted at different sources as mentioned above. The observations are:

1. The project site is located in a designated industrial area, where the CPCB limits defined for Noise Levels are 75 dB during the day and 70 dB during the night. However, sound pressure levels are considered on higher side for more critical analysis.
2. Since the sources of noise are present within the project site, and the boundary wall of the project site being present, increase beyond 75 dB at the site was not observed.
3. From **Figure 4-3** and **Figure 4-4**, it can be observed at project site, noise is predicted in the range of 72.5 dB(A) – 74.7 dB(A) in day time and 68.1 dB(A) – 69.8 dB(A) in night time which is within the permissible limit for industrial area and 53.5 dB(A) – 54.2 dB(A) in day time and 43.9 dB(A) to 44.6 dB(A) in night time which is within the permissible limit for residential area.

The predicted noise level along with the conflict are as given in **Table 4-20**.

**Table 4-20: Noise levels at receptor locations**

S. No.	Receiver Name	Category	Baseline Average Noise levels in dB (A)		Predicted Cumulative Noise level dB (A)		Incremental Noise level dB (A)	
			Day time	Night time	Day time	Night time	Day time	Night time
			A		B		C	
					Algorithmic Calculation		C=B-A	
1	At Site - Main Gate (East)	Industrial	72.3	69.6	72.5	69.8	0.2	0.2
2	Material Gate (South)	Industrial	73.4	68.0	73.5	68.1	0.1	0.1
3	Plant Area (Near Tank Farm)	Industrial	73.0	68.7	73.1	68.8	0.1	0.1
4	Plant Area (Near Silo)	Industrial	74.6	69.6	74.7	69.7	0.1	0.1
5	Plant Area Near BCY Read Zone (North)	Industrial	73.8	69.7	73.9	69.8	0.1	0.1
6	Plant Area Near PMG Park	Industrial	73.9	69.8	73.9	69.8	0.0	0.0
7	Baliana Village	Residential	54.1	43.8	54.2	43.9	0.1	0.1
8	Kheri Sadh Village	Residential	53.5	44.4	53.5	44.6	0.0	0.2

### 4.13.3 Conclusion

From above, during the day time and night time only 0.1 dB to 0.2 dB increase are noticed in the Industrial area and in Residential area during the day time and night time 0.1 dB to 0.2 dB increase noticed day time and night time which is nominal.

From the noise level prediction conducted using SoundPLAN software, it is observed that no significant increase will be caused in the ambient noise levels due to the proposed project expansion activities. The cumulative noise levels after expansion will remain within the permissible limits. SoundPLAN analysis is carried out assuming that there are no obstructions (such as trees, buildings, walls etc.) in between the receiver locations and the sources of sound, which is not true in real conditions. Therefore, the actual ambient noise levels will be much lower than that predicted by SoundPLAN as presented in above table.

### 4.13.4 Mitigation Measures

Although there was no increase beyond the allowable limit predicted at any of the noise monitoring locations outside the project site, the noise environment also includes the people who are working within the project site, and who may face permanent hearing damage in case they face the Noise Dosage beyond the allowable level of Noise. Therefore, it is important to implement the following mitigation in order to avoid any permanent hearing damage to the people working inside the project site.

Asian Paints Limited will be adopting necessary noise control measures as given below in the proposed project.

- Provision of Acoustic Enclosures on major noisy stationary equipment in the plant.
- Provision of suitable personal protective equipment (PPE) such as earmuffs and earplugs to Workers exposed to high noise generating operations/area.
- Job Rotation of workers working in the high noise area.
- Identification of High noise generating areas and marking with display board for warning.
- Development of thick Green belt within the plant premises and along project boundary to screen noise.
- Provision of Acoustic mufflers / enclosures in large engines/machinery.
- All equipment operated within specified design parameters.
- Equipment to be maintained in good working order.
- Implement good working practices (equipment selection) to minimize noise and reduce its impacts on human health (earmuffs, safe distances, and enclosures).
- Periodic monitoring of ambient noise levels in the plant premises and Noise Exposure levels for workers deputed in different sections in the plant. Based on the monitoring results, effectiveness of noise control measures will be identified and additional noise control measures will be adopted, if required.

#### 4.13.5 Vibrations

##### Impacts due to Vibrations

Vibrations are generated in the machines due to moving/rotating parts.

Hand arm vibration (HAV) is a potential hazard for employees who work with hand held tools, hand guided machinery or feed work by hand to a machine where this exposes their hands and arms to high levels of vibration. Prolonged and regular exposure to excessive levels of HAV can affect the operator's health in particular causing Hand Arm Vibration Syndrome (HAVS), of which the best-known condition is Vibration White Finger (VWF). The other impacts of HAV are decreased grip strength, decreased hand sensation and dexterity and Carpal tunnel syndrome.

Whole body vibration (WBV) is mainly concerned with large shocks or jolts when there is a risk of injury to the back and usually applies to workers in the sitting or standing position when travelling in mobile machinery over rough surfaces for extended periods. The major health problem associated with WBV is back pain.

Prolonged exposure to excessive levels of vibration can cause incurable conditions and severely affect the sufferer's ability to continue work and the quality of their life. The amount of injury is related to the magnitude of vibration generated by the work equipment, the duration of the exposure and other factors such as the method of work, workplace temperature and damp or windy conditions.

##### Exposure Limit Values<sup>22</sup>

- For Hand Arm Vibration:
  - a) The daily exposure Limit value is 5 m/s<sup>2</sup>
  - b) The daily exposure action value is 2.5 m/s<sup>2</sup>
- For Whole Body Vibration:
  - a) The daily exposure Limit value is 1.15 m/s<sup>2</sup>
  - b) The daily exposure action value is 0.5 m/s<sup>2</sup>

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<sup>22</sup> Reference: Schedule XXIV, Model Factory Rules 120

### Proposed Vibration Control Measures

The following control measures are being adopted and will be further improved in expansion project to minimize the impacts due to vibrations:

- Procurement of less vibration generating machines/equipment.
- Periodic preventive maintenance of all the machines/equipment.
- Provision of suitable hand gloves & safety shoes to operators.
- Use vibration dampeners for all the equipment.
- Provision of vibration absorbing seats in transportation and other heavy vehicles.
- Periodic training to operators on how to prevent health problems caused by vibration.

### 4.14 Geology, Hydrogeology & Groundwater

#### 4.14.1 Impacts on Geology

- i. Physiographically, the study area is a flat terrain with saucer type of topographic depression which becomes conspicuous during rainy season and results in water logging and flooding.
- ii. The study area falls in Zone IV: High Damage Risk Zone. Hence the area is susceptible to earthquake disaster due to major sub-surface Mahendragarh-Dehhradun geological fault line and nearness to Himalayan Range (tectonic plates). Also the aftershock of an earthquake are possible to be felt/perceived due to seismic intensity.

#### 4.14.2 Impacts on Hydrogeology, Ground Water and Water Conservation

- i. In case any unforeseen earthquake or flooding happen it may impact the overall environment and result in increase in environmental pollution leading to soil, water contamination which likely reflects in local geological/hydrological issues.
- ii. As informed by project proponent there will be no ground water abstraction since fresh water to be utilized from existing HSIIDC water pipeline facility. Therefore, to some extent the area will devoid this additional source of surface water to recharge under the ground water.
  - a) The study area is facing stress over quality of ground water resources and any abstraction or pollution may lead to pollution.
  - b) In case any ground water abstraction is proposed/carried out the project proponent must apply for ground water under the 'The Haryana Water Resources (Conservation, Regulation and Management) Authority Act, 2020' known as HWRA.
  - c) As reported in EIA report prepared by M/s. Asian Paints Limited, the site has presence of open-well and as per site visit observation in April-2024 recharge-well facilities were noticed.
- iii. Considering the proposed project site's activities:
  - a) Laying of above/in ground interconnecting pipelines may contribute to ground water contamination due to leakage of wastewater due to compromise on the quality of construction work, the resilience of infrastructure is likely to be affected
  - b) Soil & ground water contamination is likely in case of leak to spillage of:
    - Possibility of increase in anthropogenic pollution due to influx of people / employees
    - Handling of storage and disposal of construction materials and waste
    - Erection and commissioning of equipment's such as pumps, piping, etc.
    - Unauthorized disposal, maintenance ignorance, etc.
    - Dismantling of plant machinery & equipment due to demolition or spillage of chemicals / waste / effluents directly through the sub-surface soil and ground water environment
    - Leaks or overflow on account of any pressure or corrosion or other issue during discharge of wastewater through proposed pipeline

- iv. As per site visit, the water bodies observed polluted and utilized under sewage type condition may also contribute pollution to the underneath ground water environment.
- v. In this area rainfall is the main source of recharge and clay formation restrict infiltration rate.

Considering the above impact as well as the operating and other conditions mentioned above, the likely impact scores on the land environment are mentioned in **Table 4-21**.

**Table 4-21: Impact Scoring – Ground Water**

Code	Project Activity	Identified Impact	Impact Scoring			Remarks / Activity for Further Study
			Severity (S)	Likelihood (L)	Final Score (S×L)	
C1	C2	C3	C4			C5
3	Project Construction (Expansion)					
3.5	Coating/Painting of structures	Possibility of leak or spillage of draining materials into ground water through seepage from soil	-2	1	-2	Minor / Negligible: secondary containment & impervious basement shall be facilitate to restrict any leakage to the underneath ground water environment
3.6	Generation of sewage during construction activities	Possibility of leak or spillage of draining materials into ground water through seepage from soil	-2	1	-2	Minor / Negligible: secondary containment & impervious basement shall be facilitate to restrict any leakage to the underneath ground water environment
3.7	Storage and disposal of construction materials and waste	Possibility of leak or spillage of draining materials into ground water through seepage from soil	-2	1	-2	Minor / Negligible: secondary containment & impervious basement shall be facilitate to restrict any leakage to the underneath ground water environment
4	Operation Phase – Regular Operations After Expansion					
A	Paints & Resin Manufacturing					
4.A.3	Water Consumption (domestic use, manufacturing process and landscape development)	Possibility of leak or spillage of draining materials into ground water through seepage from soil	-2	1	-2	Minor / Negligible: secondary containment & impervious basement shall be facilitate to restrict any leakage to the underneath ground water environment
B	General & Utilities Operations					
4.B.1	Vehicular Movement for transportation of Raw Materials and Finished Products	Possibility of leak or spillage of draining materials into ground water through seepage from soil	-2	1	-2	Minor / Negligible: secondary containment & impervious basement shall be facilitate to restrict any leakage to the underneath ground water environment
4.B.2	Handling & storage of raw materials - Chemical and fuel storage and products,	Possibility of leak or spillage of draining materials into ground water through seepage from soil	-2	1	-2	Minor / Negligible: secondary containment & impervious basement shall be facilitate to restrict any leakage to the underneath ground water environment
4.B.3	Temporary Storage, handling of hazardous waste within premises, and disposal/	Possibility of leak or spillage of draining materials into ground water through seepage from soil	-2	1	-2	Minor / Negligible: secondary containment & impervious basement shall be facilitate to restrict any leakage to the underneath ground water environment



Code	Project Activity	Identified Impact	Impact Scoring			Remarks / Activity for Further Study
			Severity (S)	Likelihood (L)	Final Score (S×L)	
C1	C2	C3	C4			C5
	transportation of solid/hazardous waste					
4.B.4	Treatment & disposal of wastewater - operation of ETP, Operation of ZLD units	Possibility of leak or spillage of draining materials into ground water through seepage from soil	-2	1	-2	<b>Minor / Negligible:</b> secondary containment & impervious basement shall be facilitate to restrict any leakage to the underneath ground water environment
4.B.6	Operation of ETP laboratory	Possibility of leak or spillage of draining materials into ground water through seepage from soil	-2	1	-2	<b>Minor / Negligible:</b> secondary containment & impervious basement shall be facilitate to restrict any leakage to the underneath ground water environment
4.B.7	Influx of people (employees)	Possibility of leak or spillage of draining materials into ground water through seepage from soil	-2	1	-2	<b>Minor / Negligible:</b> secondary containment & impervious basement shall be facilitate to restrict any leakage to the underneath ground water environment
C	<b>Non-Routine Operation</b>					
5.1	Raw water intake during operation of plants	In case abstraction of ground water without obtaining CGWA NOC	-2	1	-2	<b>Minor / Negligible:</b> secondary containment & impervious basement shall be facilitate to restrict any leakage to the underneath ground water environment
4.C.1	Start-up and shutdown activities including washing of process equipment, pipeline, tanks etc., Venting in case of pressurized operation or Vessel, Sludge removal, storage and disposal.	Possibility of leak or spillage of draining materials into ground water through seepage from soil	-2	1	-2	<b>Minor / Negligible:</b> secondary containment & impervious basement shall be facilitate to restrict any leakage to the underneath ground water environment
4.C.2	Equipment repair & maintenance	Possibility of leak or spillage of draining materials into ground water through seepage from soil	-2	1	-2	<b>Minor / Negligible:</b> secondary containment & impervious basement shall be facilitate to restrict any leakage to the underneath ground water environment
6	<b>Final Decommissioning</b>					
6.1	Washing of process equipment, pipeline, tanks etc.	Possibility of leak or spillage of draining materials into ground water through seepage from soil	-2	1	-2	<b>Minor / Negligible:</b> secondary containment & impervious basement shall be facilitate to restrict any leakage to the underneath ground water environment
6.2	Dismantling of plant machinery & equipment	Possibility of leak or spillage of draining materials into ground water	-2	1	-2	<b>Minor / Negligible:</b> secondary containment & impervious basement shall be facilitate to restrict any leakage to the

Code	Project Activity	Identified Impact	Impact Scoring			Remarks / Activity for Further Study
			Severity (S)	Likelihood (L)	Final Score (S×L)	
C1	C2	C3	C4			C5
		through seepage from soil				underneath ground water environment

#### 4.14.3 Suggested Mitigation Measures

The following mitigation measures are suggested to manage the anticipated environmental impacts:

##### Mitigation Measures for Geology

- i. The project proponent must carry out topographical survey using DGPS to identify the low-lying area to check the suitability of proposed expansion of integrated paint manufacturing at existing unit.
  - a) Before any excavation, the underground pipeline to be identify using GPR (ground penetration radar) so that minimum surface area is excavated, effective surface area topography is disturbed, minimum waste generation, etc. is carried out.
  - b) It is assumed, in absence of further clarity that construction of proposed project site will involve cut and fill of the earth.
  - c) Designers & Planners will able to calculate cut & fill quantity and utilization of debris.
- ii. Since the existing project site is located over Mahendragarh-Dehhradhun geological fault-line and presence of Zone IV seismic zone.
  - a) Thus it is suggested to take appropriate adequate measures in consideration to seismicity while designing the foundation structures in order to nullify any impact.
  - b) For guidance on precautions to be observed in the construction of buildings, structures, etc. reference may be made to BIS:4326 (1993), BIS:13827 and BIS:13828.
- iii. Geotechnical soil investigation must be carried out as per BIS:2131-1981, IS:1882-1982, BIS:15736-2007 to identify soil/rock physical properties along with estimation of foundation type, capacity of load, etc.
  - a) Geotechnical soil bore immediate & must be backfill using bentonite soil to avoid any contamination from oil & grease, gasoline, chemicals, materials, fatal accidents of animals, fatal accidents of small children falling into open or abandoned bore-wells/tube-wells (23CGWA Public Notice dated 13th July 2021), etc.
  - b) For guidance on precautions to be observed in the construction of buildings, structures, etc. reference may be made to BIS:4326 (1993), BIS:13827 and BIS:13828.

##### Mitigation Measures for Hydrology, Ground Water and Water Conservation

- i. The project proponent must carry out specific flood study and topographic study to identify flood prone area and low-lying area so that appropriate solution to be carried out to avoid any unforeseen flood impact over the project site.
- ii. Considering the project site is a part of Ganga Basin, any mean of contamination must be restricted and controlled by the project proponent.
- iii. Water requirement will be source from existing HSIIDC facility, therefore:
  - a) Records of water consumption at each stage to be carried out.
  - b) The project proponent is carrying out rain water conservation at existing facility, however it must identify various other sources to initiate by adopting rain water harvesting using water

23 Source: <https://cgwa-noc.gov.in/landingpage/LatestUpdate/public%20notice%2013th%20july%2021.pdf>

- conservation & recharging outside the unit and at existing or underdeveloped government admin buildings, school, abandoned wells, etc. along with the maintenance & service cost.
- c) The various government scheme can also be taken up by the project proponent such as Mission Water Conservation, Integrated Watershed Management Programme, Command Area Development & Water Management, Atal Bhujal Yojana, Sujalam-Sufalam Yojana, Jal Shakti Abhiyan, Haryana Sheri Vikas Pradhikaran, State Water Conservation scheme, etc.
  - d) Rainwater harvesting should be in accordance to Model Building Bye Laws 2016.
- iv. It is assumed that project site will facilitate impervious layer, however any spill or leak from storing raw material, hazardous waste, chemical, wastewater, etc. will lead to surface contamination and in case no proper treatment is carried out.
- a) However, the manpower need to be trained regularly and action plans for handling of materials & management shall be executed adequately in order to control any mean of subsurface water contamination.
  - b) The project site shall have various chemicals, liquid storage, etc. hazardous & toxic in nature and in case of any leakage or spillage or accidently damage to the environment, adequate environmental audits such as environmental site assessment (ESA) or due diligence (EDD) Phase I, ESA / EDD Phase II, etc. to be performed at regular interval as suggested in **Table 6-1**.

#### 4.15 Surface Water Quality

As discussed earlier, environmental impacts have been identified based on an assessment of environmental aspects associated with the project. Identified environmental aspects and impacts for surface water quality & Solid/hazardous waste have been listed in **Table 4-5**. Based on this preliminary identification, environmental indices that are likely to be impacted on surface water quality during the operation phase are discussed in further detail.

##### 4.15.1 Impact Scoring – Surface Water

Likely impact scores on surface water environment are presented in **Table 4-22**.

**Table 4-22: Impact Scoring for Surface Water**

S. No.	Impacting Activity	Impact Scoring			Remarks
		Severity, S	Likelihood, L	Significance, S x L	
C1	C2	C3	C4	C5	C6
1.	Operation & Maintenance phase				
1.1	Transportation of Raw material, Fuel, etc.	-2	1	-2	Minor impact as proper spill control measures will be proposed.
1.2	Storage, handling & transportation of Raw material and final products	-2	2	-4	Low impact as proper care shall be taken during handling to products to avoid spillage and leakage.
1.3	Manufacturing Process	-2	5	-10	Moderate impact as wastewater will be treated in ETP followed by RO and treated water will be completely reused in plant which reduce the fresh water demand.
1.4	Equipment cleaning	-2	2	-4	Low impact, washing water will be further reuse in washing activities and then treated in ETP followed by RO.
1.5	Treatment & Disposal of wastewater - Operation of ETP	-2	2	-4	Minor impact as regular maintenance will be done to ensure meeting specified standards. There is a zero liquid discharge system will be adopted hence no wastewater will dispose outside the premises.
1.6	Water consumption due to domestic use, manufacturing process and landscape development	-3	4	-12	Moderate impact. Fresh water demand will be reduced by reuse of treated water form RO. More ever, the fresh water demand also reduced during monsoon season by collecting and using the rainwater for process and washing activities.
1.7	Operation of Utilities	-2	5	-10	Moderate impact as wastewater will be treated in ETP followed by RO and treated water will be completely reused in plant which reduce the fresh water demand.

##### 4.15.2 Mitigation Measures for Impact on Surface Water Quality

Following mitigation measures will be implemented to reduce surface water related impacts:

- Fresh water demand will be reduced by recycling and reuse of treated water through partial ZLD system and avoiding the leakage of raw water at various source.
- Explore the possibility of condensate recovery from the boiler which will reduce the overall water demand.
- For greenbelt development, treated sewage will be used to reduce the fresh water requirement.

- Use of spill control measures, mechanical handling, PPE's shall be mandatory while handling the chemicals as well as handling and treatment of liquid and solid waste.
- Separate drainage for storm water and effluent will be provided to avoid any contamination of surface water sources.
- All chemical and fuel storage, handling areas will be provided with proper bunds to avoid runoff contamination during rainy season.

#### 4.16 Solid Waste Management

##### 4.16.1 Impact Scoring – Solid & Hazardous Waste Management

Likely impact scores on Solid & Hazardous Waste Management are presented in **Table 4-23**.

**Table 4-23: Impact Scoring for Solid & Hazardous Waste Management**

S. No.	Impacting Activity	Impact Scoring			Remarks
		Severity S	Likelihood, L	Significance, S x L	
C1	C2	C3	C4	C5	C6
1.	<b>Operational &amp; Maintenance Phase</b>				
1.1	Manufacturing Process, Utilities operations (boiler, reactor, mills etc.)	-2	5	-10	Moderate impact as waste generation will be segregated at source and disposed at approved landfill site as per hazardous waste management and trans boundary rules 2016.  Recyclable waste will be handed over to authorized recyclers
1.2	Treatment & Disposal of wastewater - Operation of ETP	-1	5	-5	Low impact as proper storage facility with impervious flooring will be provided to store ETP sludge and it will be disposed at nearest TSDF facility along with MEE salt.
1.3	Use of DG sets	-1	2	-2	Minor impact as DG set will be operate during power failure only and used oil generated from the DG set will store in a drum and handed over to authorized recyclers.

##### 4.16.2 Mitigation Measures for Solid and Hazardous Waste Management

Following mitigation measures will be implemented to reduce hazardous waste management related impacts:

- Hazardous wastes will be properly handled in closed containers and properly stored in hazardous waste storage areas provided with impervious flooring.
- Majority of hazardous wastes will be sent for pre/co processing to cement plants and only ETP sludges will be disposed to TSDF site.
- Bunding will be provided around all hazardous waste handling areas in order to avoid any spillage water to contaminate the surroundings.
- All solid and hazardous waste will be disposed as per the conditions /rules given by the HSPCB/ CPCB  
Necessary membership will take from approved vendors for disposal of hazardous waste.
- Recyclable waste will be handed over to authorized recyclers.
- The other solid wastes will be handed over to authorized reprocesses.

## 4.17 Soil Environment

Based on the preliminary identification of environmental indices that are likely to be impacted on soil quality during operation phase are discussed in further detail.

### 4.17.1 Impact Scoring – Soil Environment

Likely impact scores on soil are presented in **Table 4-24**.

**Table 4-24: Impact Scoring – Soil Environment**

S. No.	Impacting Activity	Impact Scoring			Remarks
		Severity, S	Likelihood, L	Final Score, S x L	
C1	C2	C3	C4	C5	C6
3	<b>Project Construction (Preparation of Site)</b>				
3.4	Plant Erection & Commissioning	1	-1	-1	No impact on soil due to erection of plant machinery
3.5	Coating / Painting of structures	2	-2	-4	Spillage of paints/coating materials, if not done on cemented floor, will impact soil quality moderately
3.6	Generation of sewage during construction activities	2	-2	-4	Moderate impact due to spillage of solid/liquid waste may contaminate soil
3.7	Storage & handling of Construction materials	2	-3	-6	If spillage of cement occurs on soil it will make soil sodic, hence impact is of great magnitude
3.8	Storage & handling and disposal of solid waste like MSW, packaging material include construction debris, plastic wrapping, containers, cardboard boxes, etc.	2	-2	-4	Moderate impact due to spillage of solid waste and construction materials
3.9	Operation of D.G. & GG sets (as secondary source)	2	-1	-2	Spillage of oil may moderately affect soil fertility
4.A	<b>Paints &amp; Resin manufacturing</b>				
4.A.1	Manufacturing Process (pre-dispersion, dispersion, mixing & tinting, packing, etc).	2	-3	-6	Spillage of manufacturing materials on soil will greatly impair soil permeability as well as soil fertility
4.B	<b>General &amp; Utilities Operations</b>				
4.B.1	Vehicular Movement for transportation of Raw Materials and Finished Products	2	-2	-4	Accidental spillage of raw/finished product may deteriorate soil fertility and productivity
4.B.2	Handling & storage of raw materials - Chemical and fuel storage and products,	2	-2	-4	Improper handling and accidental spillage may hamper soil quality to a moderate extent
4.B.3	Temporary Storage, handling of hazardous waste within premises, and disposal/ transportation of solid/hazardous waste	2	-1	-2	Storage will be in a cemented area, which unlikely to impact greatly on soil quality
4.B.4	Treatment & disposal of wastewater - operation of ETP, Operation of ZLD units	2	-3	-6	Disposal of waste water, ETP may greatly impact soil quality of a greenbelt area
4.B.5	Operation of DG set	2	-1	-2	Spillage of oil may moderately affect soil fertility
4.B.6	Operation of ETP laboratory	2	-1	-2	Improper disposal of laboratory waste, if spilled on soil may

					deteriorate soil quality to a limited extent
C	<b>Non-Routine Operation</b>				
4.C.1	Start-up and shutdown activities including washing of process equipment, pipeline, tanks etc., Venting in case of pressurized operation or Vessel, Sludge removal, storage and disposal.	2	-2	-4	Washing of equipment/tanks etc., if not handled properly may affect soil productivity
6	<b>Final Decommissioning</b>				
6.1	Washing of process equipment, pipeline, tanks etc.	2	-2	-4	Washing of equipment/tanks etc., if not handled properly may affect soil productivity
6.2	Dismantling of plant machinery & equipment	2	-1	-2	May not have great impact on soil quality, if it is restricted to factory premises.
3.14	Greenbelt development	3	4	12	Positive impact due to reduction in soil loss due to water erosion

#### 4.17.2 Mitigation Measures

1. Spillage of construction material may affect soil quality. Handle the same in way that it does not fall on landscape site
2. Spillage of liquid and solid hazardous wastes may affect soil quality- dispose it off at the earmarked site.

#### 4.18 Ecology & Biodiversity

##### 4.18.1 Likely Impacts on Ecological Components & Mitigation Measures.

As discussed earlier in **Table 4-5** environmental aspects and impacts have been identified based on an assessment of environmental aspects associated with the project.

As discussed earlier, environmental aspects and impacts have been identified based on an assessment of environmental aspects associated with the project. Potential impacts on Ecology and Biodiversity are given in



Table 4-25

Impacts on the flora, fauna and habitats have assessed in the following table on the basis of multiplication of consequence and probability scorings. Two major activities found to be impacting to the ecological components. Final scores are obtained for impacting activities and they are tabulated below. Looking towards the likely impacts mitigation measures as mentioned in below table will be implemented. Details regarding plantation scheme and plant species have been described in the EMP section.

**Table 4-25: Aspect – Impact Identification, Impact Scoring and Mitigation Measures – Ecology & Biodiversity**

S. No.	Project Activity	Impact (Type: O, N, A, E; Duration: T, P)	Aspects	Impacts	Potential Environmental Impacts on Environment		Impact Scoring		Significance / Consequence	Operation Controls / Mitigation Measures
					EB	Severity, S	Probability, P	Final Score, S x P		
2	Operational Phase									
2.1	Manufacturing Process (pre-dispersion, dispersion, mixing & tinting, packing, etc).	A, P	Impact on flora & fauna due to emission of various gases/pigment dust;	Deposition of pollutants will result in impaired health of fauna and loss of floral diversity.	•	-3	5	-15	Very Severe	Thick Green belt will be developed around project site to avoid any such depositions outside the project premises. Gas absorbing plant species (OGE – Absorb Gas emission) and VOCs absorbing plant species will be planted along with dust absorbing broad leaf species.
2.2	Odour at unit due to manufacturing activity	A, T	Odour problem	Effect on Flora	•	-2	5	-10	Moderately severe	Thick Green belt will be developed around project site to avoid any such depositions. Odour absorbing plant species will be planted
3	General & Utilities Operations									
3.1	Vehicular Movement for transportation of Raw Materials and Finished Products	N, P		Effect of noise generation and dust emission during vehicular movement on flora & fauna;	•	2	5	10	Moderately severe	Thick Green belt will be developed around project site to avoid any such depositions.
4	Non-Routine Operation									
4.1	Start-up and shutdown activities including washing of process equipment,	N, T	Contamination of nearby area due to dust emission from raw materials	Deposition of pollutants will result in impaired health of fauna and loss	•	-2	4	-8	Moderately severe	Thick Green belt will be developed around project site to avoid any such depositions.

S. No.	Project Activity	Impact (Type: O, N, A, E; Duration: T, P)	Aspects	Impacts	Potential Environmental Impacts on Environment		Impact Scoring		Significance / Consequence	Operation Controls / Mitigation Measures
					EB	Severity, S	Probability, P	Final Score, S x P		
	pipeline, tanks etc., Venting in case of pressurized operation or Vessel, Sludge removal, storage and disposal.			of floral diversity. Damage to Flora/ Fauna found in soil						
5	Emergency Operations – Possible Accidents									
5.1	Fire	E, T	Damage to Flora/ Fauna in fire affected area	Fauna Diversity destruction and long term negative impact to fauna	•	-4	1	-4	Less severe	Redevelopment of thick Green belt will be developed around project site
6	Final Decommissioning									
6.1	Final site clean-up	N, P	Natural growth of trees	Increase in green cover	o	+2	5	+10	Moderate Benefit	A substantial green belt will be built up around the project site to benefit the environment.
Type of Impact – O:One Time; N: Normal; A: Abnormal; E: Emergency; Duration of Impact –T: Temporary; P: Long-Term/ Permanent, EB: Ecology & Bio-diversity Potential Impact - ●= Negative; o= Positive										

Note: Impact Type: O = One Time, N = Normal, A = Abnormal, E = Emergency. Impact Duration: T = Temporary, Long-term/Permanent = P.

## 4.19 Socio-Economic Environment

### 4.19.1 Impact Identification

Environmental impacts have been identified based on an assessment of environmental aspects associated with the project. Identified social impacts have been listed in **Table 4-5**.

### 4.19.2 Mitigation Measures

The **thematic focus areas** of Asian Paints Limited CSR programme are as follows:

- **Health & Hygiene:** Community health and hygiene is one of the key focus areas of our CSR activities. We aspire to deliver primary health care support through diagnosis and treatments to our communities. Our interventions are aimed at promoting preventive healthcare, building awareness about hygiene, sanitation, maternal and child health care. These interventions are carried out in the vicinity of manufacturing units of APL.
- **Water Security:** We acknowledge the significant problem of water scarcity in India, affecting millions of people. As a socially responsible company, we have placed a high priority on leaving a *Watermark* through holistic approach around water. We have been making efforts to address the challenges of water by not only reducing our consumption but also replenishing more than what we consume in our production processes. These interventions are carried out in the vicinity of manufacturing units of APL. For exp. Canal lining along various villages will be carried out to facilitate local farmers.
- **Skilling:** Asian Paints *Colour Academy* empowers communities with specialized skills by providing vocational training in the paint application trade. We have expanded our horizons in this segment to also include carpentry, plumbing and masonry trainings for the further benefit of our local communities to ensure enhanced livelihood. This is a Pan India intervention by Asian Paints with a presence in 24 states with a total of 47 Mobile colour academies and 24 fixed colour academies.

### 4.19.3 Impact Scoring

Considering the above mitigation measures as well as the other conditions, the impact scores on socio economic environment are likely to be as mentioned in **Table 4-26**.

**Table 4-26: Impact Scoring – Socio-Economic Environment**

Code	Impacting Activity	Impact Scoring			Remarks
		Consequence, C	Probability, P	Final Score C x P	
C1	C2	C3	C4	C5	C6
A	<b>Project Pre- Construction/ Construction</b>				
3	Vehicular movement for transportation of raw materials and finished goods	+3	+3	<b>(+9)</b>	Local vehicles will be hired temporary for transportation of material. Jobs gained up to 80 (+3); loss of income (0); land losers (0); Homestead losers (0); <b>Total = +3</b>
4	Influx of workers	+3	+2	<b>(+6)</b>	Social Consequences - Local or persons from outside can be employed temporarily, so there can be 2.5% increase in migration of the study area (-5); there will

Code	Impacting Activity	Impact Scoring			Remarks
		Consequence, C	Probability, P	Final Score C x P	
C1	C2	C3	C4	C5	C6
					be no change in the ethnicity (-1); not likely Sex imbalance in the study area (-1); possibility to return the status (0); Total = (-7); Economic Consequences – 1500 (temporary) jobs gained (+5); Gain in income (+5); land losers (0); Homestead losers (0); Total=+10 <b>Grand Total = +3</b>
<b>B</b>	<b>Commissioning / Project Operation</b>				
5	Vehicular Movement for transportation of Raw Materials and Finished Products	+4	+5	<b>(+20)</b>	Local vehicles will be hired for the transportation of material and finished goods. Jobs gained up to 200 (+4); loss of income (0); land losers (0); Homestead losers (0); <b>Total = +4</b>
6	Influx of workers	+1	+5	<b>(+5)</b>	Social Consequences - Local or persons from outside can be employed temporarily, so there can be 1% increase in migration of the study area (-2); there will be no change in the ethnicity (-1); not likely Sex imbalance in the study area (0); possibility to return the status (0); Total = (-3); Economic Consequences 10 (Permanent) and 50 (temporary) jobs gained (+2); Gain in income (+2); land losers (0); Homestead losers (0); Total=+4 <b>Grand Total = +1</b>
7	Contribution to state and central exchequers by way of taxes and duty	+5	+5	<b>(+25)</b>	Likely tax revenue to state and central Government
<b>C</b>	<b>Decommissioning of plant</b>				
8	Dismantling of plant	-2	+1	<b>(-2)</b>	Economic Consequences – 10 (Direct) 50 (Indirect) jobs lost (-1); loss in income (-1); land losers

Code	Impacting Activity	Impact Scoring			Remarks
		Consequence, C	Probability, P	Final Score C x P	
C1	C2	C3	C4	C5	C6
					(0); Homestead losers (0); Total=-2

#### 4.19.4 Key Issues and Needs – Focused Area

##### Identification of Focused Area

The main impact of paints industries is through soil, air and water. Considering the impact due to Land use/land cover, Noise and vibration and air the focus area for social studies was taken within 3 Kms from the proposed project site.

Detailed description of the focused area with reference to the socio economic study was carried out based on focus group discussions with the public. Community consultation results in identification of relevant issues identified by residents, and a lack of it can result in missed data, in addition to missed opportunities to share experiences and identify solutions to resolve concerns / issues.

The nature of the villages in the focused area based on discussions with the Village Sarpanches / PRI representatives.

##### Focused Group Discussion Details and their Findings

The basic FGD was done in the Gram Panchayat, Anganwadi, School and Primary Health Centre. The people are aware about the project as proponent is having existing unit.

##### Baliana

##### FGD at School

Focused group discussion was conducted at Government Senior secondary school with Principal and teachers. Following points emerged during the discussion.

- Senior secondary school is a Hindi medium government school. In all there are 380 students and 20 teachers. The student teacher ratio is 1:19. All the teachers come from nearby villages and are having average 20 years of experience in teaching.
- They are having the provision of separate toilets for girls and boys, library, playground etc.
- Books are provided by State Government.
- During the conversation Principal demanded School Building Painting, Paver Blocks in school premises, Renovation of toilet, Roof repairing – 2 Classroom, School main gate, Solar System, Focus and tube light, Flooring of corridor

##### FGD at School (Girls High School)

Focused group discussion was conducted at Government Senior secondary school with Principal and teachers. Following points emerged during the discussion.

- Senior secondary school is a Hindi medium government school in all there are 238 students and 14 teachers. The student teacher ratio is 1:17. All the teachers come from nearby villages and are having average 15 - 20 years of experience in teaching.
- They are having the provision of separate toilets for girls, library, playground etc.
- Books are provided by State Government.

- During the conversation Principal demanded Toilet for staff and Girls, Kitchen and Dining table for Mid-Day Meal, Indoor hall for Sports and other activities, Garden and tree plantation, cooler, Fan, Library Cupboard, Podium.

## **Bhalot**

### **FGD at Panchayat**

The FGD was conducted with Sarpanch. Following points were highlighted during the discussion:

- The main source of income of gram panchayat is Government Grant and House Tax.
- Mostly people earn their livelihood by working on contract basis in the nearby industries and farming.
- Panchayat supplies water to the entire village through Canal.
- Village is having Primary health centre.
- During the conversation the Sarpanch has demanded Waste management system, Solar Panel in school and building, Anganwadi Building and Toilet, Water supply pipeline, Canal Lining, Drainage System

### **FGD at School**

Focused group discussion was conducted at Government senior secondary school with Principal and teachers. Following points emerged during the discussion.

- Primary school is a Hindi and English medium government school in all there are 400 students and 12 teachers. The student teacher ratio is 1:34. All the teachers come from nearby villages and are having average 20 years of experience in teaching.
- They are having the provision toilets for girls, library, playground etc.
- Books are provided by State Government.
- During the conversation Principal demanded School building painting, Teachers for Science, Maths and English, Scholarship for students, Shed on stage, Solar System, Sweeper for school.

## **Kheri Sadh**

### **FGD at School**

Focused group discussion was conducted at Government Senior secondary school with Principal and teachers. Following points emerged during the discussion.

- Senior secondary school is a Hindi and English medium government school in all there are 500 students and 21 teachers. The student teacher ratio is 1:23. All the teachers come from nearby villages and are having average 20 years of experience in teaching.
- They are having the provision of separate toilets for girls and boys, library, playground etc.
- Books are provided by State Government.
- During the conversation Principal demanded Toys and Playing equipment, Computer Lab, Toilet block for boys, Science Projects, Bore well, Mic and Sound system, Projector and Smart Class, Uniform, Table and Chairs for Teachers.

## **Bohar**

### **FGD at School (Girls Senior Secondary School)**

Focused group discussion was conducted at Government Senior secondary school with Principal and teachers. Following points emerged during the discussion.



- Senior secondary school is a Hindi medium government school in all there are 510(Including 60 boys up to 5th standard) students and 22 teachers. The student teacher ratio is 1:23. All the teachers come from nearby villages and are having average 20 years of experience in teaching.
- They are having the provision of separate toilets for girls and boys, library, playground etc.
- Books are provided by State Government.
- During the conversation Principal demanded Renovation of toilet, Painting of school building, Solar System installation at school building, Water filter and cooler, Fans – 30 No, Mosquito net on window and door.

### Suggested community development activities

**Table 4-27: Suggested Activities**

Sr. No.	Name of Village	Suggested activities
1	Bhalot	<b>Gram Panchayat</b> Waste management system Solar Panel in school and building Anganwadi Building and Toilet Water supply pipeline Canal Lining Drainage System <b>Government School (Girls School)</b> School building painting Teachers for Science, Maths and English Scholarship for students Shed on stage Solar System
2	Baliana	<b>Government School (Girls High school)</b> Toilet for staff and Girls Kitchen and Dining table for Mid-Day Meal Indoor hall for Sports and other activities Garden and tree plantation cooler Fan Library Cupboard Podium <b>Government School (Senior Secondary school)</b> School Building Painting Pawer Blocks in school premises Renovation of toilet Roof repairing – 2 Classroom School main gate Solar System Focus and tube light Flooring of corridor
3	Kheri Sadh	<b>Government School</b> Renovation of toilet Painting of school building Solar System installation at school building Water filter and cooler Fans – 30 No Mosquito net on window and door
4	Bohar	<b>Government School (Girls Sr.Sec School)</b> Water filter and cooler

Sr. No.	Name of Village	Suggested activities
		Solar System installation at school building Stage and Shed for outdoor activities Toilet Grills for corridor Rain Water Harvesting

**Note :** Photographs of Group discussion is given as **Photographs 3-10**

## **5 ANALYSIS OF ALTERNATIVES (TECHNOLOGY & SITE)**

### **5.1 Analysis of Site Alternative**

APL is proposing this project for capacity expansion in existing integrated paint manufacturing facilities by increasing the production capacity (Paints & Intermediates) and adding Putty. The existing facility is already in operation and expansion will be done within the existing area and no additional land will be acquired for the proposed expansion.

### **5.2 Analysis of Technology Alternative**

World-wide proven & tested technology for manufacturing of above products will be used for manufacturing proposed products.

## 6 ENVIRONMENTAL MONITORING PROGRAM

### 6.1 Introduction

The regular monitoring of environmental parameters is of immense importance to assess the status of environment during project operation. With the knowledge of baseline conditions, the monitoring program will serve as an indicator for any deterioration in environmental conditions due to operation of the project, to enable taking up suitable mitigation measures in time to safeguard the environment. Monitoring is as important as that of control of pollution since the efficiency of control measures can only be determined by monitoring. The study has also examined the extent to which the adverse impacts identified can be controlled through the adoption of mitigation measures.

### 6.2 The objectives of monitoring

- Measure effectiveness of operational procedures
- Confirm statutory and mandatory compliance
- Identify unexpected changes

### 6.3 Environment Monitoring Plan

Environment monitoring plan is presented in **Table 6-1**.

**Table 6-1: Environmental Monitoring Plan**

S. No.	Parameters	Measurement Methodology	Frequency	Location	Data Analysis	Reporting Schedule	Fixed Cost, INR	Recurring Budget in INR
Air								
1	Ambient air monitoring of parameters specified by PCB consents from time to time (PM10, PM2.5, SO2, NOx) – 4 Locations	IS 5182 CPCB Guidelines Vol. 1 (Gravimetric Method)	Twice a Month	At Site		Compliance report of EC to MOEF&CC on 6 monthly basis and Compliance report of consent to PCB Reports sent to top management and the process manager as well.	Ambient Air Samplers – 5 Lacs	2500 per location x 120 = 3,00,000 per Annum
2	Stack monitoring of parameters specified by PCB consents from time to time	Stack monitoring by Isokinetic sampling IS: 11255.	Every Month for the operating Boiler/GG/DG's	Boiler/GG/DG's		Compliance report of EC to MOEF&CC on 6 monthly basis and Compliance report of consent to PCB Reports sent to top management and the process manager as well.	Online Monitoring system installed on stacks. Stack Monitoring done by third party	INR 925 per stack x 96 per year = INR 88,800 per Annum
3	Stack monitoring of Process vents	Stack monitoring by Isokinetic sampling IS: 11255.	Once in Quarter	Process vents		For internal purpose Reports to be sent to top management and the process manager as well.	Stack Monitoring done by third party	INR 2800 per stack x 24 stacks x 4 times per year = INR 2,68,800/- per Annum
Water								
3	Maintaining record of water consumption and wastewater generation and analysis of inlet and outlet	SOP of maintaining record of flow meter for water consumption and wastewater generation	Daily Basis/Monthly for external lab	Near fresh water consumption tank and treated effluent collection tank	Comparison with allowed water consumption and effluent generation as per Consents	Compliance report of EC to MOEF&CC on 6 monthly basis and Compliance report of consent to PCB Reports sent to top management and the process manager as well.	Lab Setup for basic parameter testing – INR 15 Lacs	Analysis costs – Inlet and outlet 12*36=48 qty 2750 Rs/sample INR 132,000/-

S. No.	Parameters	Measurement Methodology	Frequency	Location	Data Analysis	Reporting Schedule	Fixed Cost, INR	Recurring Budget in INR
								Daily Internal Sampling Cost = 70,000 INR
4	Ambient Noise level	IS 9989 : 1981 8525	6 monthly	Different locations at Site	Comparison with specified limits	Compliance report of EC to MOEF&CC on 6 monthly basis and Compliance report of consent to PCB	-	INR 600 x 128 locations in a year = INR 76,800/- per Annum
5	Workplace air monitoring	NIOSH 2549 GCMS	6 monthly	5 locations at site	Comparison with specified limits	Compliance report of EC to MOEF&CC on 6 monthly basis and Compliance report of consent to PCB	-	VOC:
								INR 3450 x60 locations months = INR 207000/- per annum
								Dust: INR 800 per sample x 40 locations = INR 32,000/- per annum
6	Maintaining record of Hazardous Waste Generation, Storage and Disposal	SOP of Hazardous waste management	Maintain hazardous waste generation, disposal and stock data as and when generated and disposed.	Hazardous waste storage facility		Maintain Form-5, Form-10 annually t	Cost of construction of Scrap Yard and Hazardous Waste Storage = INR 150 Lacs	Disposal costs around INR 42 Lakh / per annum
						Compliance of Consent to PCB, reporting to higher authority as per company procedure		
						Reports sent to top management and the process manager as well.		
7	Greenbelt development	As per CPCB Guideline	Daily Basis	At site	Survival rate, water consumption as well as photographs (before and after every 6 months)	Compliance report of EC to MOEF&CC on 6 monthly basis and Compliance report of consent to PCB	Capex Cost for development of green belt mentioned separately in green belt cost	Mentioned separately in green belt cost on Environmental matters in Chapter 10.

S. No.	Parameters	Measurement Methodology	Frequency	Location	Data Analysis	Reporting Schedule	Fixed Cost, INR	Recurring Budget in INR
8	Soil Quality	As per CPCB Guidelines	Once in a year Post monsoon	Greenbelt	EC, pH and ESP (exchangeable sodium per cent)	-	-	-
9	Readiness for Emergency Response /	Conduct mock drill in presence of observer	Twice in a year	Various location in mining area	Mock drill report for identifying deficiency and opportunities for improvement	Mock drill report sent to Management and regulatory authority as and when mock drills are conducted	-	INR 25,000/- per mock drill (Consumables) x 2 times per year = INR 50,000/- per Annum
	Fire & Safety							
10	Occupational Health check-up	Qualified medical professional	Twice a year	Project site	Identify abnormalities (Occupational Health Issues) found and maintain records.	Advise individual employee and information to Chief Medical Offices and Head (HR) on completion of every schedule. Report to Factories Inspectorate as per requirements of Factories Act	-	INR 2100 x 430 employees (for annual checkups) and INR 540 x 430 (Half Yearly) INR 1135200/- OHC running cost:
	(Complete Blood Count; Routine Urine; Vision Test; Physical Examination)							

#### 6.4 Statutory Clearance as other Permissions

M/s. Asian Paints Limited shall obtain required statutory permissions & clearances from concerned authorities. Details of applicable rules & regulations to this project are presented in **Table 6-2**.

**Table 6-2: List of Applicable EHS Legislation**

S. No.	Legal Requirements
1	The Environmental Impact Assessment Notification, 2006
2	The Factories Act, 1948 and The Punjab Factories Rules, 1952 (As applicable in the state of Haryana) Regulation made thereunder



S. No.	Legal Requirements
3	The Water (Prevention and Control of Pollution) Act, 1974 and Rules 1975
4	The Air (Prevention and Control of Pollution) Act, 1981 and Rules, 1982
5	The Environment (Protection) Act, 1986 and Rules, 1986, Rules, Regulation made thereunder
6	The Manufacture, Storage and Import of Hazardous Chemical rules, 1989
7	The Hazardous & Other Waste (Management, Handling and Trans boundary Movement) Rules, 2016
8	The Indian Boiler Act, 1923 and Rules, Regulations made thereunder
9	The Chemical accidents (Emergency Planning, preparedness and response) Rules, 1996
10	The Motor Vehicles Act, 1988 & The Central Motor Vehicle Rules, 1989
11	The Public Liability Insurance Act, 1991 and Rules 1991
12	The Noise Pollution (Regulation and Control) Rules, 2000
13	The E-waste (Management) Rules 2022
14	The Plastic Waste Management Rules, 2016
15	The Solid Wastes Management Rules, 2016
16	The Battery Waste Management Rules, 2022
17	The Bio-Medical Waste Management Rules, 2016
18	The Electricity Act, 2003 and Rules, Regulations made thereunder
19	The Petroleum Act, 1934 and Rules, Regulations made thereunder
20	The Contract Labour (Regulation & Abolition) Act, 1970 and Rules, Regulations made thereunder
21	The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 and Rules, Regulations made thereunder
22	The Building & Other Construction Workers' Welfare Cess Act, 1996 and Rules, Regulations made thereunder
23	The Minimum Wages Act, 1948 and Rules, Regulations made thereunder
24	The Payment of Wages Act, 1936 and Rules, Regulations made thereunder
25	Employees' Provident Funds and Miscellaneous Provisions Act, 1952 and Rules, Regulations, Schemes made thereunder
26	Employee's State Insurance Act, 1948 and Rules, Regulations made thereunder

## 7 ADDITIONAL STUDIES

### 7.1 Public Consultation

Public consultation is not required for the proposed expansion project as the project site falls in Notified Industrial Area of HSIIDC IMT Rohtak.

Total area of the project is 5,23,198.00 m<sup>2</sup> which is allotted by HSIIDC to APL for development of integrated paint manufacturing facility. The existing facility is already in operation and expansion will be within the existing area. No additional land is acquired for the proposed expansion.

### 7.2 Risk Assessment (Hazard Identification and Consequence Analysis, ERP / DMP)

#### 7.2.1 Methodology of Risk Assessment

The methodology includes;

- Hazard identification,
- Selection of potential loss scenarios,
- Simulation of release source model on DNV's PHAST,
- Plotting the damage contour on site map

These steps undertaken to carry out risk assessment for this project are described in subsequent sections.

#### 7.2.2 Hazard Identification

The project description, and other project related data provided by the project proponent have been comprehensively reviewed to identify the hazardous operations. Also the information on the hazardous properties (MSDS) of all the chemicals handled at the site has been reviewed to identify the hazards associated with the same. The properties of all raw materials and products including hazardous chemicals handled at site are attached as **Annexure 14**.

At present APL is going for expansion of existing integrated paint manufacturing facility at HSIIDC IMT Rohtak. This involves storage of hazardous chemicals which can lead to uncontrolled release of hazardous material causing hazard. On the basis of this, the important hazards that can lead to accident in the proposed project are described in **Table 7-1**.

**Table 7-1: Important Hazardous Events**

Type of Event	Explanation
BLEVE	Boiling Liquid Evaporating Vapor Explosion; may happen due to catastrophic failure of refrigerated or pressurized gases or liquids stored above their boiling points, followed by early ignition of the same, typically leading to a fire ball.
Deflagration	Is the same as detonation but with reaction occurring at less than sonic velocity and initiation of the reaction at lower energy levels.
Detonation	A propagating chemical reaction of a substance in which the reaction front advances in the unreacted substance at or greater than sonic velocity in the unreacted material.
Explosion	A release of large amount of energy that form a blast wave.
Fire	Fire
Fireball	The burning of a flammable gas cloud on being immediately ignited at the edge before forming a flammable/explosive mixture.
Flash Fire	A flammable gas release gets ignited at the farthest edge resulting in flash-back fire
Jet Fire	A jet fire occurs when flammable gas releases from the pipeline (or hole) and the released gas ignites immediately. Damage distance depends on the operating pressure and the diameter of the hole or opening flow rate.

Type of Event	Explanation
Pool Fire	Pool fire is a turbulent diffusion fire burning above a horizontal pool of vaporizing hydrocarbon fuel, where the fuel has zero or low initial momentum.
Spill Release	'Loss of containment'. Release of fluid or gas to the surroundings from unit's own equipment / tanks causing (potential) pollution and / or risk of explosion and / or fire.
Structural Damage	Breakage or fatigue failures (mostly failures caused by weather but not necessarily) of structural support and direct structural failures.
Vapor Cloud Explosion	Explosion resulting from vapour clouds formed from flashing liquids or non-flashing liquids and gases.

### Hazard and Damage Assessment

Toxic, flammable and explosive substances released from sources of storage as a result of failures or catastrophes can cause losses in the surrounding area in the form of;

- Toxic gas dispersion, resulting in toxic levels in ambient air;
- Fires, fireballs and flash back fires, resulting in a heat wave (radiation), or;
- Explosion (vapours Cloud Explosions) resulting in blast waves (overpressure).

### Consequence of Fire/Heat Wave

The effect of thermal radiation on people is mainly a function of intensity of radiation and exposure time. The effect is expected in term of the probability of death and different degree of burn.

The consequence effects studied to assess the impact of the events on the receptors are provided in **Table 7-2**.

**Table 7-2: Damage due to Radiation Intensity**

Radiation (kW/m <sup>2</sup> )	Damage to Equipment	Damage to People
4.0	-	Causes pain if duration is longer than 20 sec. But blistering is unlikely.
12.5	Minimum energy to ignite wood with a flame; melts plastic tubing.	1% lethality in one minute. First degree burns in 10 sec.
37.5	Severe damage to plant	100% lethality in 1 min. 50% lethality in 20 sec. 1% lethality in 10 sec.

### Consequences of Overpressure

The effects of the shock wave vary depending on the characteristics of the material, the quantity involved and the degree of confinement of the vapour cloud.

The peak pressures in an explosion therefore vary between a slight over-pressure and a few hundred kilopascals (kPa). Whereas dwelling is demolished and windows and doors broken at overpressures as low as 0.03- 0.1 bar. Direct injury to people occurs at greater pressures.

The pressure of the shock wave decreases rapidly with the increase in distance from the source of the explosion.

The overpressure damage is shown in **Table 7-3**.

**Table 7-3: Overpressure Damage**

Overpressure (bar)	Damage
0.02068	Limited minor structural damage.
0.21	Corrugated asbestos shattered; corrugated steel or aluminium panels, fastenings fail, followed by buckling, wood panels (standard housing) fastenings fail, panels blown in.
1	Fatality

**Source:** CCPS consequence Analysis of Chemical Release

## Consequences of Toxic Release

The effect of exposure to toxic substance depends upon the duration of exposure and the concentration of the toxic substance. Short-term exposure to high concentration give Acute Effects while long term exposures to low concentrations result in chronic effects.

Only acute effects are considered under hazard analysis, since they are likely credible scenarios. These effects are:

- Irritation (respiratory system, skin, eyes)
- Narcosis (nervous system)
- Asphyxiation (oxygen deficiency)
- System damage (blood organs)

Following are some of the common terms used to express toxicity of materials:

**Threshold Limit Value (TLV):** It is the permitted level of exposure for a given period on a weighted average basis (usually 8 hr/day, 40h/week)

**Short Time Exposure Limit (STEL):** It is the permitted short term exposure limit usually for a 15 minute exposure.

**Immediately Dangerous to Life and Health (IDLH):** It represents the maximum concentration of a chemical from which is likely to cause death or immediate or delayed permanent adverse health effects or prevent escape from such an environment.

**Lethal Concentration Low (LCLo):** It is the lowest concentration of a material in air, other than LC50, which has been reported to cause a death in human or animals.

**Toxic Concentration Low (TCLo):** It is the lowest concentration of a material in air, to which humans or animals have been exposed for any given period of time that has produced a toxic effects in humans or produced carcinogenic, neoplastigenic or tetratogenic effect in humans or animals.

**Emergency Response Planning Guidelines1 (EPRG1):** The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hour (without a respirator) without experiencing other than mild transient adverse health effects or without perceiving a clearly defined objectionable odor.

**Emergency Response Planning Guidelines2 (ERPG2):** The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hour without experiencing or developing irreversible or other serious health effects or symptoms that could impair their abilities to take protective action.

**Emergency Response Planning Guidelines3 (ERPG3):** The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hour without experiencing or developing life-threatening health effects.

## Selection of Maximum Credible Loss Scenarios (MCLS')

Following important points should be considered for the selection of release scenarios;

- Flammability and the flash point of the material
- Phase of material i.e. liquid or gas
- Threshold quantity of the chemicals as prescribed in MSHIC Rule
- Operating temperature and pressure of the material
- Total inventory of the material

Based on above criteria; following chemicals have been selected to carry out consequence analysis. Chemical properties and handling details are given in

**Table 7-4.** All the solvents are stored in underground storage tank, hence consequence analysis is carried out for the pipelines from tank to pump and pump to process area.

**Table 7-4: Hazardous Chemicals Selected for Simulation**

Sr. No.	Chemical	Means of Storage	Storage capacity of Tank		Qty. of Storage Tank (Nos.)	Volume in Tank (90% of capacity)		Total Storage Capacity		Storage Temperature (°C)	Storage Pressure (bar)
			Qty.	Unit		Qty.	Unit	Qty.	Unit		
1	Iso-Octane (95%)	Storage Tank	50	KL	1	45	KL	45	KL	22-25	Atmospheric
2	Methyl Methacrylate (MMA)	Storage Tank	600	KL	1	540	KL	540	KL	22-25	Atmospheric
3	Styrene	Storage Tank	500	KL	2	450	KL	900	KL	18-20	Atmospheric
4	Butyl Acrylate	Storage Tank	700	KL	1	630	KL	630	KL	22-25	Atmospheric
5	Ethyl Acrylate	Storage Tank	100	KL	1	90	KL	90	KL	Ambient	Atmospheric

On the basis of the information provided in

**Table 7-4** and as discussed over failures sceneries, given in publications like World Bank Technical Paper 55 and TNO Purple Book and the experience of the consultant, MCLS' which may take place, are presented in **Table 7-5**.

**Table 7-5: Scenario Selected for Simulation of Pipeline**

S. No.	Chemical	Type of Storage	Storage Capacity of Tank (m <sup>3</sup> )	Maximum Credible Scenario*	Failure mode
1	Iso-Octane (95%)	Atmospheric Storage Tank	50	75 mm hole leak	Small hole leading to loss of the contents over 30 minutes
				250 mm hole leak	Large hole leading to loss of the contents over 5 minutes
				Catastrophic failure	Instantaneous release, or release of the contents over a few seconds
2	Methyl Methacrylate (MMA)	Atmospheric Storage Tank	600	75 mm hole leak	Small hole leading to loss of the contents over 30 minutes
				250 mm hole leak	Large hole leading to loss of the contents over 5 minutes
				Catastrophic failure	Instantaneous release, or release of the contents over a few seconds
3	Styrene	Atmospheric Storage Tank	500	75 mm hole leak	Small hole leading to loss of the contents over 30 minutes
				250 mm hole leak	Large hole leading to loss of the contents over 5 minutes
				Catastrophic failure	Instantaneous release, or release of the contents over a few seconds
4	Butyl Acrylate	Atmospheric Storage Tank	700	75 mm hole leak	Small hole leading to loss of the contents over 30 minutes
				250 mm hole leak	Large hole leading to loss of the contents over 5 minutes
				Catastrophic failure	Instantaneous release, or release of the contents over a few seconds
5	Ethyl Acrylate	Atmospheric Storage Tank	100	75 mm hole leak	Small hole leading to loss of the contents over 30 minutes
				250 mm hole leak	Large hole leading to loss of the contents over 5 minutes
				Catastrophic failure	Instantaneous release, or release of the contents over a few seconds

Note: \* as per IOGP Guidelines

Also, the risk assessment is considered using certain internationally recognized yardsticks for measuring risk. These first need to be explained and this is presented in **Table 7-6**.

**Table 7-6: Broadly Accepted Frequency**

Annual Fatality Risk Level per Year	Conclusion
10-3	Unacceptable to everyone. Immediate action shall be taken to reduce the hazards
10-4	Willing to spend public money to control hazards, such as traffic signs, fire departments etc.
10-5	People still recognize. Safety slogans have precautionary rings. Such as never swim alone, never point a gun, avoid air travels
10-6	Not of great concern to everyone. People are aware of these hazards but feel that they cannot happen to them. Such as Lightning Never Strikes twice an Act of God.

### 7.2.3 Meteorology

Atmospheric stability plays an important role in the dispersion of the chemicals. "Stability means, its ability to suppress existing turbulence or to resist vertical motion".



Variations in thermal and mechanical turbulence and in wind speed are greatest in the atmospheric layer in contact with the surface. The air temperature has influenced these turbulences greatly and air temperature decreases with the height. The rate at which the temperature of air decreases with height is called Environment Lapse Rate (ELR). It will vary from time to time and from place to place. The atmosphere is said to be stable, neutral or unstable according to ELR less than, equal to or greater than Dry Adiabatic Lapse Rate (DALR), which is a constant value of 0.98 °C per 100 meters.

When the atmosphere is unstable and wind speeds are moderate or high or gusty, rapid dispersion of vapors will occur. Under these conditions, air concentrations will be moderate or low and the material will be dispersed rapidly. When the atmosphere is stable and wind speed is low, dispersion of material will be limited and air concentration will be high

### **Weather parameter**

Weather parameters play a significant role in dispersion analysis. The notable parameters for assessing the atmosphere are wind speed, atmospheric stability, ambient temperature, humidity and topographic parameters. Atmospheric stability represents the vertical turbulence in the air due to temperature differentials caused by heating of the earth by solar radiation. Atmospheric stability effects are represented through Pasquill parameters as follows shown in **Table 7-7**.

**Table 7-7: Pasquill parameters**

Stability Class	Atmospheric Condition
A	Very Unstable
B	Unstable
C	Slightly Unstable
D	Neutral
E	Stable
F	Very Stable

The relationship between wind speed and atmospheric stability is shown in **Table 7-8**.

**Table 7-8: Relationship between Wind Speed and Atmospheric Stability**

Surface wind speed	Daytime incoming solar radiation			Night-time cloud cover	
m/s	Strong	Moderate	Slight	> 50%	< 50%
< 2	A	A – B	B	E	F
2 – 3	A – B	B	C	E	F
3 – 5	B	B – C	C	D	E
5 – 6	C	C – D	D	D	D
> 6	C	D	D	D	D

**Note: Class D applies to heavily overcast skies, at any wind speed day or night**

### **Weather Conditions**

Following Weather categories are selected for consequence analysis.

**Table 7-9: Weather Condition Selected**

Time	Remarks	Weather Condition		
		Temperature °C	Wind speed m/s	Stability Class
Night Time	Prevalent during the night, most times of the year	20	2	E
Day Time	Prevalent during the day, most times of the year	27	2	B
Monsoon Period	Prevalent during the monsoon months	21	5	D

### **7.2.4 Simulation of Release and Development of Contours**

As the MCLS' were developed for the selected set of chemicals, the next step is to carry out the consequence analysis.

The consequence analysis results of all chemicals are summarized in the following **Table 7-10**.

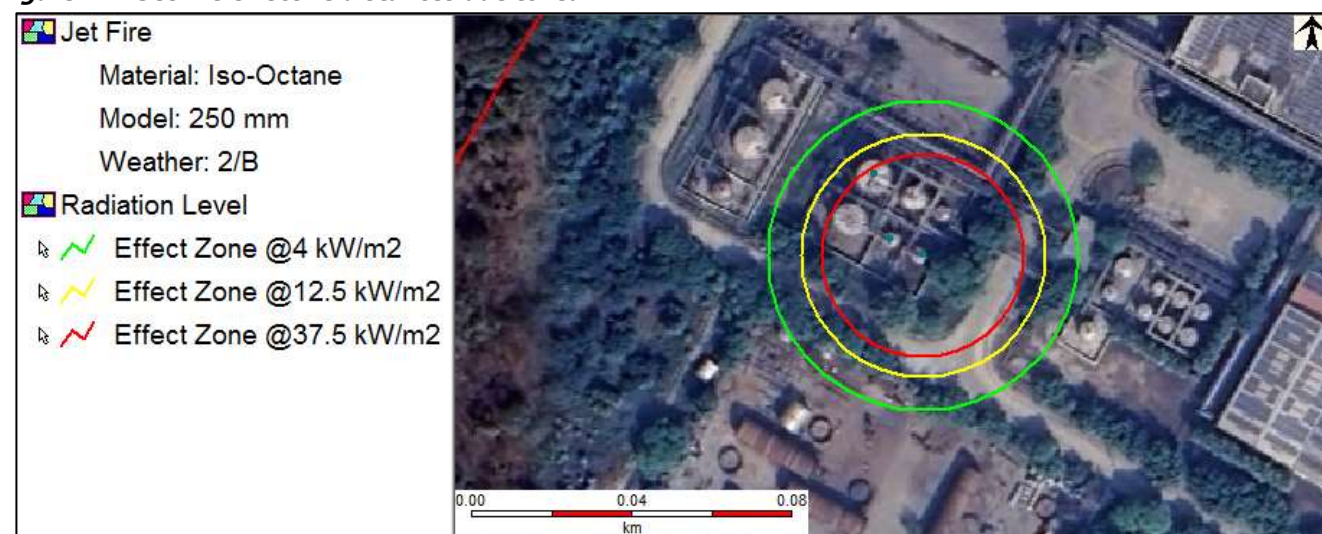
**Table 7-10: Summary of Consequence analysis results**

Chemical	Scenario	Weather Condition	Radiation Level Effective distance (meter)									Flash Fire effective distance (meter)		Overpressure effective distance (meter)			Toxic Effective distance (meter)
			Jet Fire			Pool fire			Fire ball								
			4 kW/m <sup>2</sup>	12.5 kW/m <sup>2</sup>	37.5 kW/m <sup>2</sup>	4 kW/m <sup>2</sup>	12.5 kW/m <sup>2</sup>	37.5 kW/m <sup>2</sup>	4 kW/m <sup>2</sup>	12.5 kW/m <sup>2</sup>	37.5 kW/m <sup>2</sup>	0.5 LFL	LFL	0.02 bar	0.21 bar	1 bar	IDLH (ppm)
Iso-Octane (95%)	75 mm leak	2/E	15	12	10	64	40	25	-	-	-	12	5	17	11	11	-
		2/B	15	12	10	63	39	25	-	-	-	11	3	14	11	10	-
		5/D	13	10	8	62	41	27	-	-	-	13	5	19	12	11	-
	250 mm leak	2/E	36	28	24	64	40	25	-	-	-	32	23	76	39	34	-
		2/B	38	30	25	63	39	25	-	-	-	32	23	71	38	33	-
		5/D	37	28	23	62	41	27	-	-	-	29	19	56	27	23	-
	Catastrophic rupture	2/E	-	-	-	64	40	25	-	-	-	33	24	75	31	24	-
		2/B	-	-	-	63	39	25	-	-	-	34	25	77	31	24	-
		5/D	-	-	-	62	41	27	-	-	-	38	24	83	31	24	-
Methyl Methacrylate (MMA)	75 mm leak	2/E	13	10	NR	78	49	23	-	-	-	20	13	42	16	13	-
		2/B	13	10	NR	79	49	22	-	-	-	19	12	22	12	11	-
		5/D	11	9	8	81	53	27	-	-	-	14	8	29	14	11	-
	250 mm leak	2/E	28	23	19	78	49	23	-	-	-	27	18	69	30	24	-
		2/B	31	25	21	79	49	22	-	-	-	26	17	55	27	23	-
		5/D	30	24	20	81	53	27	-	-	-	21	12	51	26	22	-
	Catastrophic rupture	2/E	-	-	-	78	49	23	-	-	-	48	26	88	34	25	-
		2/B	-	-	-	79	49	22	-	-	-	47	25	87	33	25	-
		5/D	-	-	-	81	53	27	-	-	-	45	23	58	20	14	-
Styrene	75 mm leak	2/E	6	4	NR	45	18	NR	-	-	-	15	9	22	12	11	31
		2/B	6	4	NR	45	17	NR	-	-	-	15	9	23	13	11	29
		5/D	5	4	NR	52	20	NR	-	-	-	11	5	19	12	11	24
	250 mm leak	2/E	14	11	9	45	18	NR	-	-	-	18	10	26	13	11	38
		2/B	15	12	10	45	17	NR	-	-	-	18	10	26	13	11	34
		5/D	15	12	10	52	20	NR	-	-	-	14	6	20	12	11	30
	Catastrophic rupture	2/E	-	-	-	45	18	NR	-	-	-	14	14	31	14	12	51
		2/B	-	-	-	45	17	NR	-	-	-	13	13	34	15	12	60
		5/D	-	-	-	52	20	NR	-	-	-	15	15	33	15	12	81
Butyl Acrylate	75 mm leak	2/E	5	4	NR	43	17	NR	-	-	-	10	5	20	12	11	96
		2/B	5	4	NR	43	17	NR	-	-	-	10	5	20	12	11	51
		5/D	5	3	NR	48	20	NR	-	-	-	7	2	-	-	-	60
	250 mm leak	2/E	13	10	9	43	17	NR	-	-	-	12	4	17	11	11	109
		2/B	14	11	10	43	17	NR	-	-	-	12	5	14	11	10	56
		5/D	14	11	9	48	20	NR	-	-	-	8	3	-	-	-	70
	Catastrophic rupture	2/E	-	-	-	43	17	NR	-	-	-	14	14	35	15	12	122
		2/B	-	-	-	43	17	NR	-	-	-	13	13	38	16	12	89
		5/D	-	-	-	48	20	NR	-	-	-	14	14	36	15	12	104
Ethyl Acrylate	75 mm leak	2/E	12	10	NR	32	17	8	-	-	-	17	11	29	14	12	72
		2/B	12	10	NR	32	17	8	-	-	-	16	10	18	12	11	46
		5/D	11	8	7	34	22	8	-	-	-	12	6	20	12	11	51
	250 mm leak	2/E	28	23	19	32	17	8	-	-	-	26	18	52	26	23	97

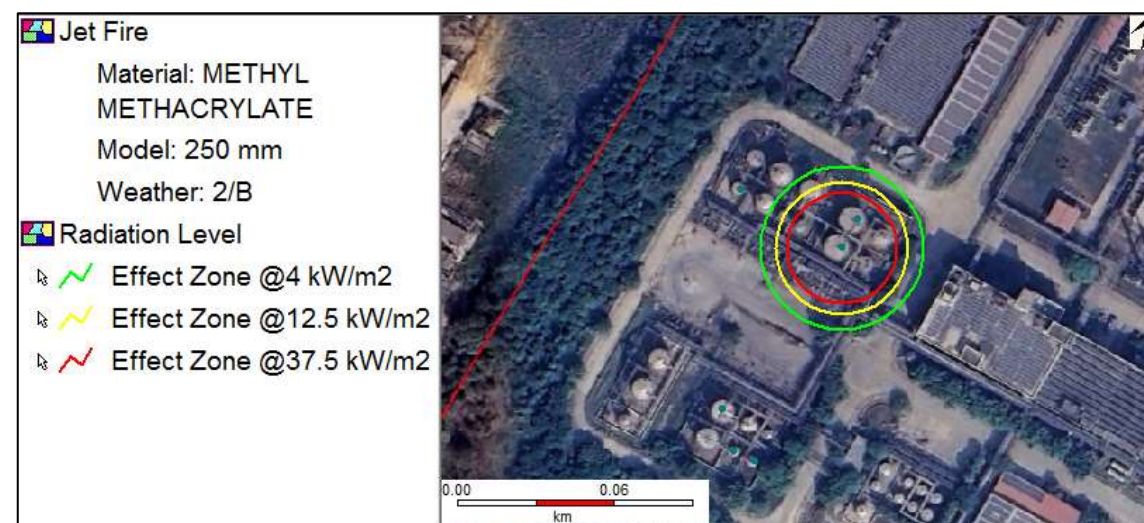
Chemical	Scenario	Weather Condition	Radiation Level Effective distance (meter)									Flash Fire effective distance (meter)		Overpressure effective distance (meter)			Toxic Effective distance (meter)
			Jet Fire			Pool fire			Fire ball			0.5 LFL		0.02 bar			IDLH (ppm)
			4 kW/m <sup>2</sup>	12.5 kW/m <sup>2</sup>	37.5 kW/m <sup>2</sup>	4 kW/m <sup>2</sup>	12.5 kW/m <sup>2</sup>	37.5 kW/m <sup>2</sup>	4 kW/m <sup>2</sup>	12.5 kW/m <sup>2</sup>	37.5 kW/m <sup>2</sup>	0.5 LFL	LFL	0.02 bar	0.21 bar	1 bar	
	Catastrophic rupture	2/B	31	25	21	32	17	8	-	-	-	26	18	52	26	23	68
		5/D	30	24	20	34	22	8	-	-	-	22	13	44	25	22	79
		2/E	-	-	-	32	17	8	-	-	-	30	19	59	22	21	101
		2/B	-	-	-	32	17	8	-	-	-	30	18	60	23	21	98
		5/D	-	-	-	34	22	8	-	-	-	29	15	60	20	14	99

The contours for effect distance generated for the release of above chemicals are presented in below figures.

**Figure 7-1: Jet fire effective distances due to leak**



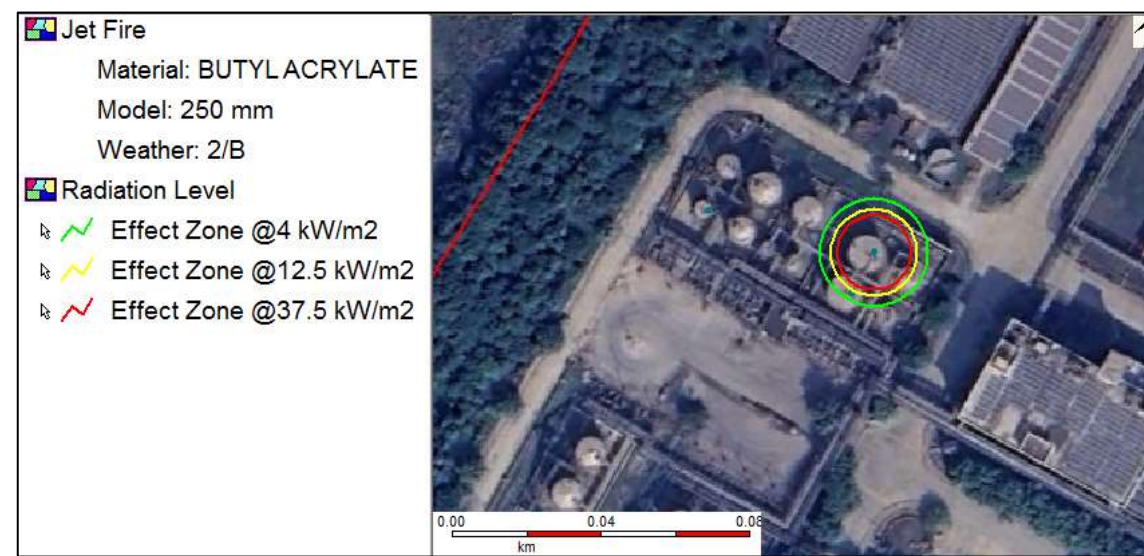
**Release of Iso-Octane from Tank**



**Release of Methyl methacrylate from Tank**

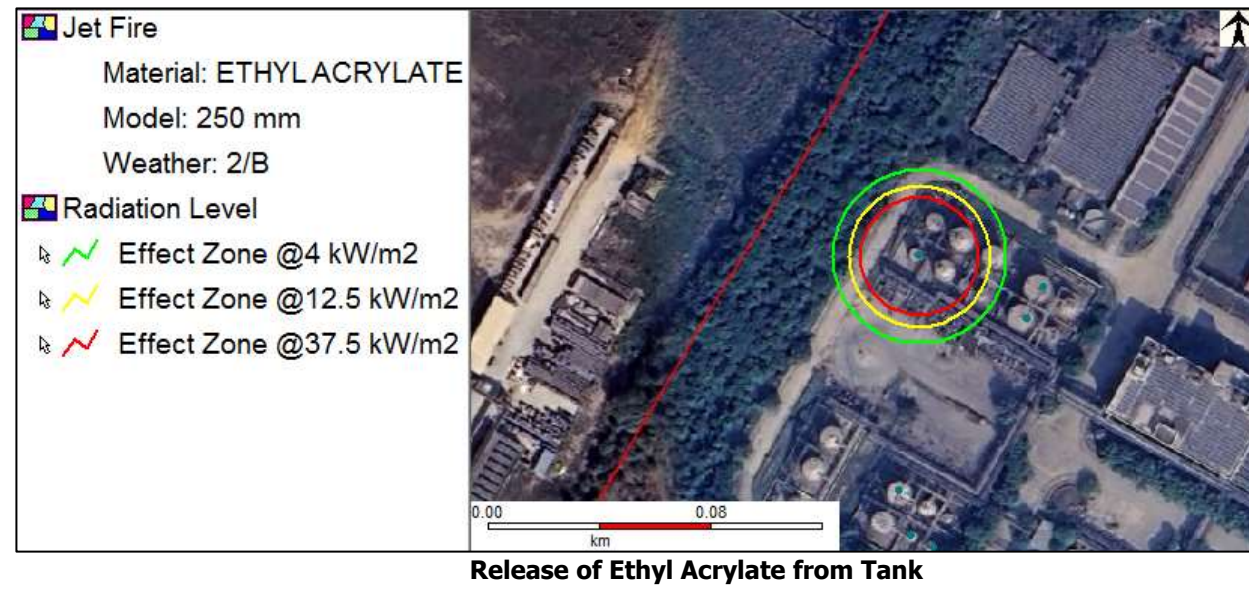


**Release of Styrene from Tank**

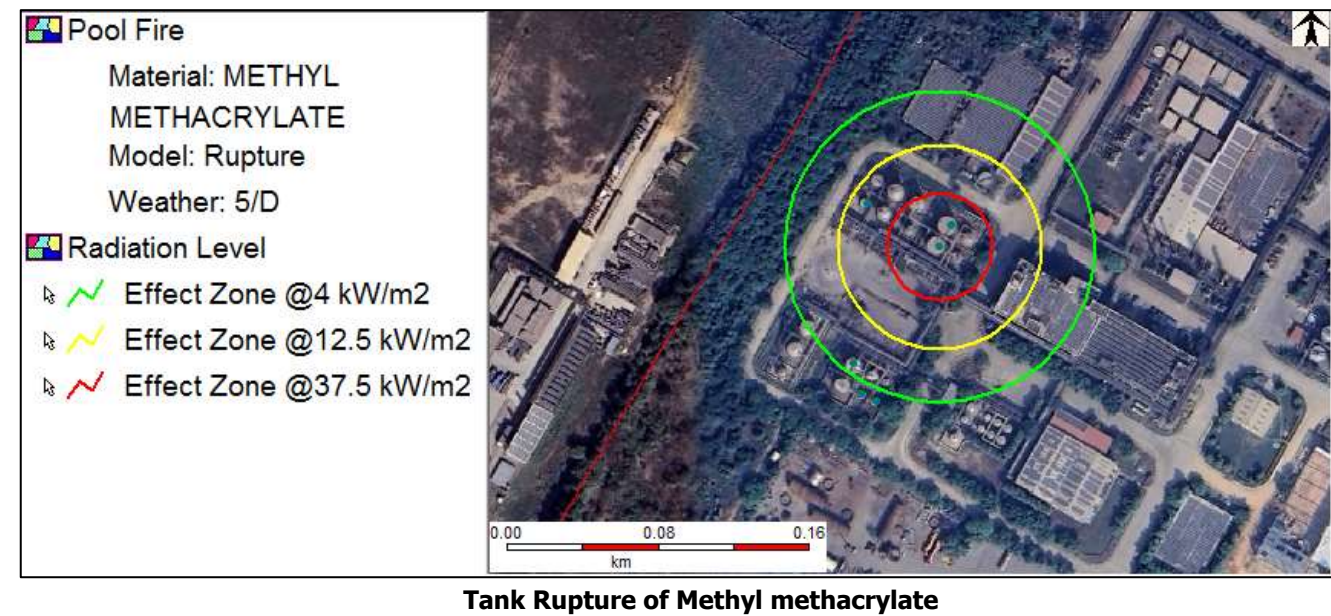


**Release of Butyl Acrylate from Tank**





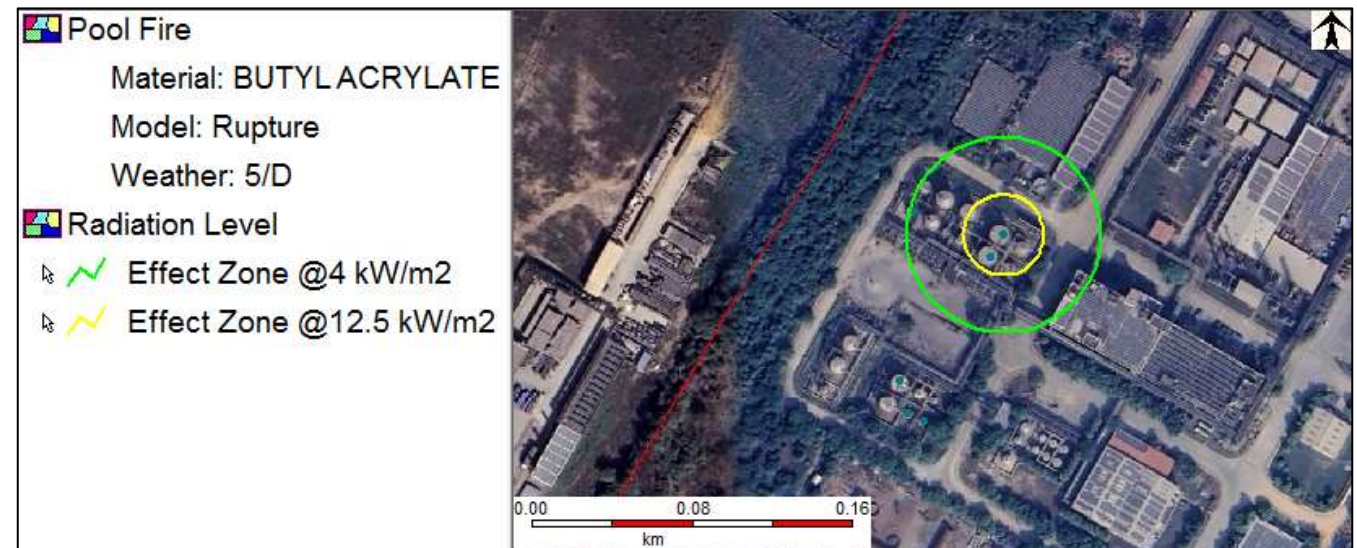
**Figure 7-2: Pool fire effective distances due to catastrophic rupture of tank**



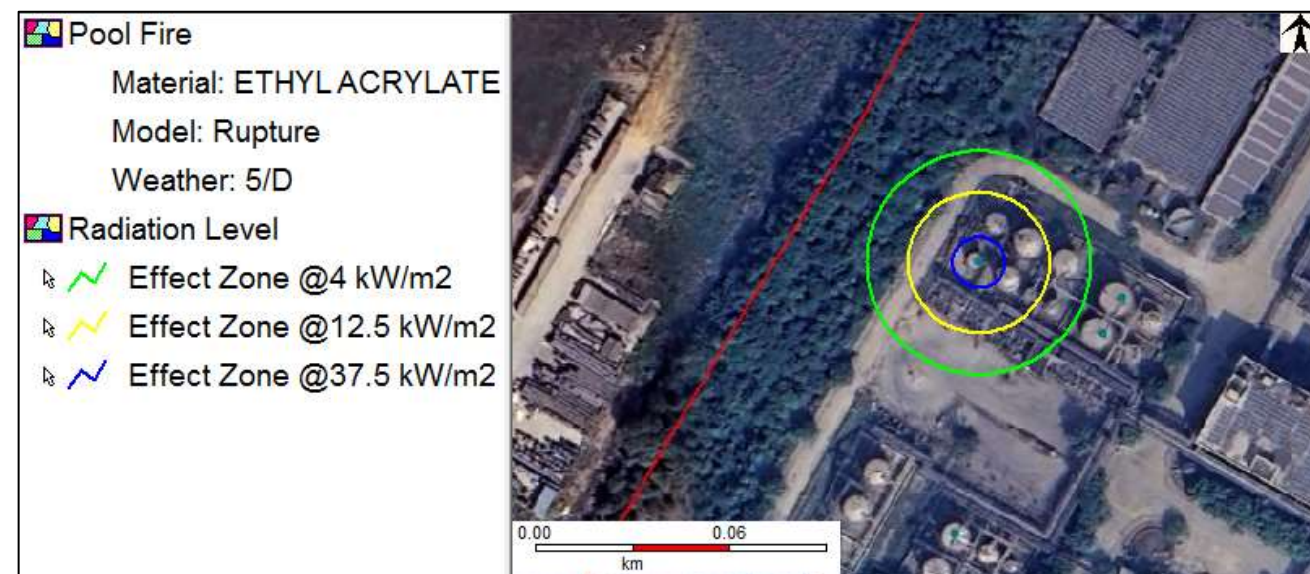




Tank Rupture of Styrene



Tank Rupture of Butyl Acrylate



Tank Rupture of Ethyl Acrylate

### 7.2.5 Conclusion of consequence analysis study

- The maximum damage distance of 81 m is observed for 4 kW/m<sup>2</sup> heat radiation due to Pool fire of Methyl Methacrylate which is well within the site premises as per shown in **Figure 7-2**.
- The major flammable consequence is pool fire. In case of catastrophic failure of tanks, the released liquid will be contained inside the dyke and pool is formed.
- All plant areas and other buildings are more than 20m away from tank farm area. Hence the risk from maximum radiation which may cause damage to steel structure is eliminated.



### 7.2.6 Estimate Risk

Risk can be defined as a measure of economic loss, human injury or environmental damage both in terms of likelihood and magnitude of loss, injury or damage. Risk is expressed as the product of frequency of an event and the magnitude of the consequences that results each time the event occurs. The mathematical expression for risk is:

$R = FC$  Where,

R = risk (loss or injury per year)

F = frequency (event per year)

C = consequence (loss or injury per event)

#### Individual Risk

Individual risk is the annual risk of death or serious injury to which specific individuals are exposed. Whether the risk is tolerable can be judged relatively easily as individuals knowingly take and accept risks all the time by, for example, travelling in a car. By reference to known statistics about such risks, it is generally accepted that risk of death or serious injury to third parties should not exceed 1 in 10,000 in any year and that risk below 1 in 100,000 is negligible in relation to other accepted risks<sup>1</sup>. Between these limits, the risk arising from a hazard must be made "as low as reasonably practicable" (ALARP).

The iso-risk contours representing Location specific individual risk (LSIR) in APL Rohtak site is shown in the following Figure 7-3.

**Figure 7-3: Iso-Risk Contour for Individual Risk of APL Rohtak Site.**



#### Societal Risk

Individual risk does not, however, completely describe situations where a single accident could kill or injure large numbers of people. Decision makers are aware that there is a big public reaction when, for example, a train crash kills a number of people while the fact that a greater number die on the road everyday goes largely unnoticed. The cost effectiveness of risk reduction measures must be assessed in relation to the likely number of casualties.

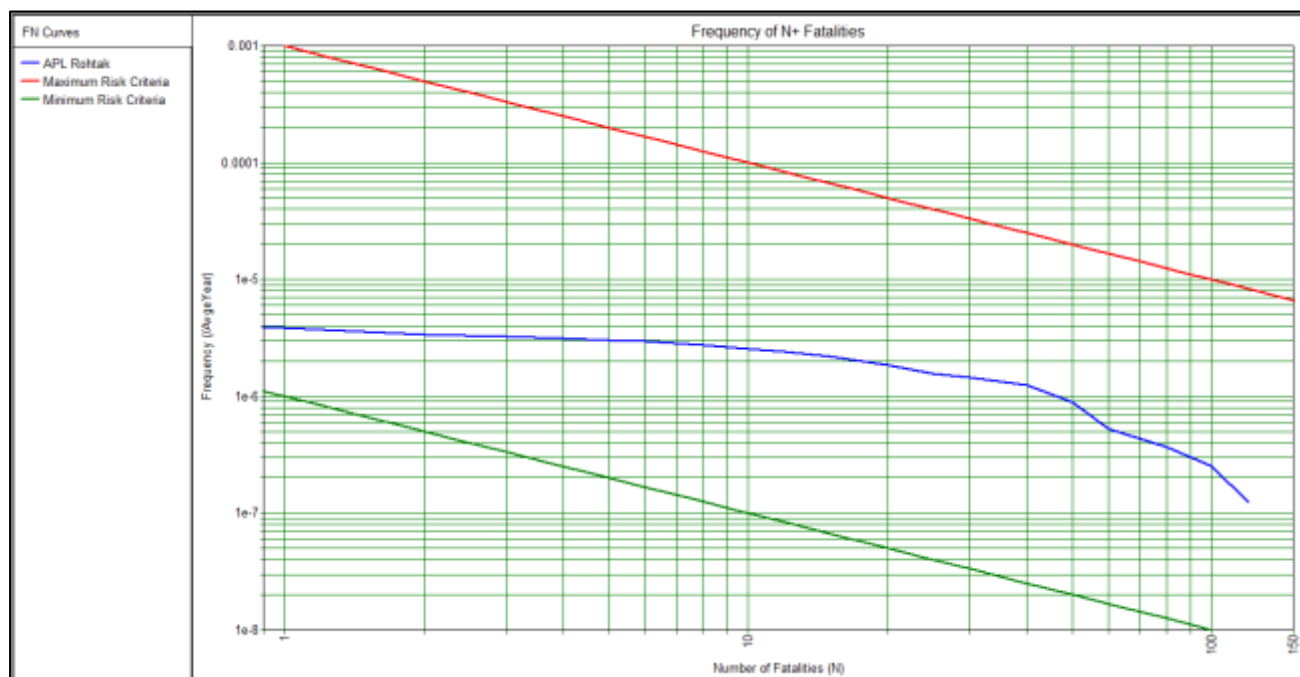


These situations are addressed by estimating societal risk which is expressed as the relationship between the probability of a catastrophic incident, expressed as the average frequency with which it can be expected to occur, and its consequences. It is usually represented as an F-N curve.

This graph plots the expected annual frequency (F) of the number (N or more) of casualties in the whole surrounding area arising from all possible dangerous incidents at a hypothetical hazardous site. Note that the number of casualties (N) is cumulative so the curve can only increase towards the left of the graph.

The FN Curve representing Location specific societal risk for storage tank in APL Rohtak site is shown in the **Figure 7-4**.

**Figure 7-4: FN Curve for Societal Risk (Using HK standard from Societal Risk Estimation, Hall and Floyd)**



## Risk Criteria

Risk criteria are the acceptable levels of risk that can be tolerated under a particular situation, 'In many countries the acceptable risk criteria has been defined for industrial installations and are shown in below photograph. These criteria are yet to be defined in the Indian context, but values employed in other countries can be used for comparison.

RISK CRITERIA IN SOME COUNTRIES		
Authority and Application	Maximum Tolerable Risk (Per Year)	Negligible Risk (Per Year)
VROM, The Netherlands (New)	1.0E - 6	1.0E - 8
VROM, The Netherlands (existing)	1.0E - 5	1.0E - 8
HSE, UK (existing hazardous industry)	1.0E - 4	1.0E - 6
HSE, UK (New nuclear power station)	1.0E - 5	1.0E - 6
HSE, UK (Substance transport)	1.0E - 4	1.0E - 6
HSE, UK (New housing near plants)	3 × 1.0E - 6	3 × 1.0E - 7
Hong Kong Government (New plants)	1.0E - 5	Not used

Source: Clause 7.5, Page 21, IS 15656:2006, Hazard identification and risk analysis-code of practice

### 7.2.7 Conclusion of Risk Assessment

#### ***Individual Risk Assessment***

The risk to the public from plant and nearby rural area is within 1.0E – 5 per year which is in 'Acceptable' region.

#### ***Societal Risk Assessment***

As per HSE, UK (Existing Hazardous Industry), it is Acceptable.

### 7.3 Disaster Management Plan

M/s. Asian Paints Limited has prepared On-Site / Off-Site Disaster (Natural & Man-made) Emergency Plan and the same shall be followed right from the project activities.

#### 7.3.1 Objectives

- To outline the responsibilities and functions of the key members of the On-site emergency response team, to safeguard other employees, the people living in the surrounding area & environment
- To conduct regular emergency response drills to train employees as per the responsibilities assigned to them to ensure prompt emergency response
- To provide information to local authorities, local fire brigade, hospitals, factory inspectorate and all the concerned govt. agencies regarding the plant hazards and equipment, facilities and procedures provided by the management in case of any emergency.

#### 7.3.2 Site Critical Emergencies

##### **Emergency Scenarios**

An emergency situation can occur in the event of:

- Fire & Explosion
- Accidental release of toxic vapors
- Major Loss of Containment (Chemical leakage / Spillage)
- Serious Injury to person(s)
- Natural Disaster (Earthquake, Lightning, etc.)
- Failure of Effluent Treatment plant

##### ***Fire & Explosion***

A major fire/explosion can take place at the following locations:

- Main plant building
- Due to leak of Iso-octane, Methyl Methacrylate, Styrene, Butyl Acrylate, Ethyl Acrylate etc. from tank.
- Warehouse

##### ***Major Loss of Containment***

- Chemical storage tanks

##### ***Failure of Effluent Treatment plant***

Major breakdown of machinery in ETP

### 7.3.3 Emergency Control Centre

An Emergency Control Centre is provided to control and direct all emergency operations. Following equipment / facilities and Information is available at the centre.

- Telephone
- Public Address System at main gate
- Fire Alarm Addressable and Control panel at all three gates
- Components of the Fire Alarm System (viz. Public Address System, Emergency Siren, Hooter, and Visual Emergency Siren) are provided with alternate power supply to ensure availability of uninterrupted power supply, even in case of power outage during emergency
- SCBA and Proximity suit along with additional firefighting equipment
- List of Regulatory agencies with names and telephone Nos.
- List of Essential persons responsible for shut down
- Operating Instructions for total safe shut down
- First Person to be contacted in case of Emergency
- List of Trained Fire Fighters and First Aiders
- Fire Emergency and Communication Flow Chart

### 7.3.4 Identification of Hazards

Any of the below-mentioned incidents that can lead to disaster scenarios shall qualify for raising an Alarm:

Table 7-11: Possible Hazard events

Sr. No.	Hazard	Particulars
1	Fire & Explosions	All types of fires, smoking insulation & auto ignition
2	Major Spillage	Liquid RM like Ropaque, etc, Fuel like HSD Solvent, Monomer, Toxic and Corrosive material including HCL and Toilet Cleaner.
3	Tanker Toppling	Toppling of tanker leading to spillage.
4	Fuming	Evolution of Large quantities of fumes/smoke due to organic fires.
5	Structure Collapse	Major collapse of equipment/building has the potential to cause severe loss of life & property
6	Floods	Water logging above 2 feet results in machinery/utilities getting submerged in water
7	Earthquake	Natural calamities have the potential to cause severe loss of life & property
8	PNG leak	Leakage of gas from flanges due to failure of gaskets or over-pressurization
9	Increasing Tank Temperature	Rise in Monomer storage tank temperature above the set point.
10	Sabotage & Agitation	The situation in which people protest or argue, especially in public to achieve a particular type of change. It also includes damage or destruction of equipment, and harm to employees by internal or external public.
11	Runaway Reaction	Runaway reaction during batch processing
12	Bomb Threat	Bomb Threat in the plant
13	Lightning & Thunderstorm	Lightning & Thunder in Plant
14	Snake Bite	Snake Bite
15	Food poisoning	Food poisoning in plant

## 7.4 Emergency Response Procedure

### 7.4.1 Fire /Explosion: (In case of explosion in Boiler, LPG bullet, SILO & Tanker):

- On receiving information from the fire marshal/ fire person, the Sectional Supervisor informs the Site Controller and the Shift Engineer.
- The sectional Fire Marshal initially takes lead in firefighting and tries to prevent the spread of fire using all the locally available firefighting equipment's, till arrival of Fire Officer and Incident Controller
- On receiving fire signal on the fire alarm panel (either through breaking of Manual call point or indication due to smoke/ heat detection system), SO/ ASO/ SS along with all the Security Personnel except one at each gate, reach the site and assess the condition.
- Personnel at all gates immediately close the gates and ensure that no personnel / vehicles except those required for the control of the incident are allowed to go out / come in.
- Personnel at Gate inform the Telephone Operator, who in turn informs the Site Main Controller, the Incident Controller and all other key persons mentioned in the Onsite Emergency Plan
- Incident Controller takes charge of the situation along with Site Main Controller.
- If Incident is in control, normalcy is restored.
- The Power and Utility Officer gives clearance for restart of the Section.  
If the Incident is not in control, the Incident Controller advises the Site Main Controller to declare an Emergency.
- Site Main Controller arranges to inform Main Gate Personnel to blow Emergency Siren and declare emergency for entire plant.
- The Incident Controller decides the Evacuation Plan and communicates to the entire plant through the Public Address System / Megaphone.
- On blowing of the emergency siren, all work permits are suspended.
- Site Main Controller instructs SO/ ASO/ SS to call for Fire Brigade if required.
- The entire firefighting squad of the plant goes to the affected site and takes up firefighting activities under the guidance of the Incident Controller.
- In case of fire near the Monomer / solvent tank farm area, cooling is provided to the outer side of the tanks, to prevent generation of solvent vapors which on ignition will further aggravate the situation
- Foam dumping inside the dyke to be operated manually.
- In case of fire in MTF tank farm the foam pouring system inside the tank to be activated
- The entire First Aid team goes to OHC and reports to the Medical Officer on Duty.
- Use of SCBA and Proximity Suit is made wherever necessary.
- Security personnel arranges for an Ambulance to reach the site
- Medical Officer/ Male Nurse keeps necessary equipment, medicines, etc. in ready condition to treat the affected persons. -
  - He contacts local hospitals regarding the emergency and alerts them to receive the affected persons
  - He calls for additional ambulances from local hospitals as per instructions of Incident Controller
- On instructions of the Incident Controller, the Power and Utility Officer shut down the power supply to the affected area and deputes one Technician/Fire Officer to the pump house.
- On instruction from Incident Controller, Security Personnel along with Fire Pump Attendant starts the hydrant pump.
- Incident Controller asks the Site Main Controller to arrange for the evacuation of the sectional persons (other than Fire Fighters) if required.
- The Superior / Superior's superior takes the employee having special needs other than mobility impairment to the local assembly point. Security personnel do the same in the absence of Superior/ Superior's superior.
- The employee who hosts the visitor / visiting employee with special needs other than those with mobility impairment takes him to the local assembly point.

- The Superior / Superior's superior guides the emergency response team to locate the employee having mobility impairment. Security personnel do the same in the absence of Superior / Superior's superior.
- The employee who hosts the visiting employee and visitor with special needs having mobility impairment guides the emergency response team to locate the visitor having mobility impairment.
- The emergency response team takes the employee, visiting employee and visitor who have mobility impairment to the local assembly point by using stretcher.
- Site Main Controller stays back to bring the section to safe shutdown.
- In case of any causality, the Site Main Controller arranges to evacuate them.
- All Section Persons assemble at Local Assembly Points.
- Section Officer takes Headcount.
- Site Main Controller guides all people assembled at Local Assembly point to move to Central Assembly Point.
- Section Officer in all other sections instructs staff and technician in their respective sections to safely shutdown their areas to bring sections to safe shutdown condition and assemble in Local Assembly Point.
- After taking headcount at Local Assembly Point, Section Officer along with all technicians moves to Central Assembly Point.
- At Central Assembly Points, Section Officer along with their technician, wait for instructions from Key Persons for carrying out various duties such as
  - Control of Traffic
  - Communication
  - Relief, Refreshment / catering facility
  - Additional Transport arrangements
- Power and Utility Officer gives clearance for restart of the Section

#### **7.4.2 Major Spillage / Tanker Toppling / Monomer Spillage:**

- On receiving information, the Sectional Supervisor informs the Site Controller and the Shift Engineer.
- On receiving signal on the fire cum emergency alarm panel, Security supervisor along with all the Security Personnel except one at each gate, reaches the site and assesses the condition.
- Security Personnel at each gate immediately close the gates and ensure that no personnel /vehicles except those required for the control of the incident are allowed to go out / come in.
- Security Personnel inform Telephone Operator who in turn informs Site Main Controller Incident Controller and all other Key Persons.
- Incident Controller takes charge of the situation along with Site Controller.
- They ensure:
  - That the spillage does not catch fire or enter storm water lines and help in arranging for housekeeping / other contract personnel to clean up the same
  - Caution sign board "CAUTION! HAZARDOUS SPILLAGE" is displayed at the site
  - That all energized equipment such as pumps, motors, mixers, grinding equipment in the vicinity is switched off
  - All Hot work activities are immediately stopped
  - That the cloth used for cleaning spillages is wet with water before being disposed of in the scrap yard
  - That the waste cloth used for cleaning spillages is not stored on the shop floor in waste bins
  - Use of spill management kit and vermiculite powder for containment of spills
  - That the collected spilled material is correctly identified and properly segregated (all flammable liquid spills are collected in closed containers).
  - That in case of spillage in solvent Tank farm area
  - The outlet of the bund wall is in closed condition.
  - The source of leakage is attended.
  - 3-inch layer of foam is made over the spilled solvent layer with the help of foam generator.

- That in case of spills from a tanker, the area is immediately cordoned off and no vehicles are allowed in the area
- That the caustic solution being used for cleaning by housekeeping is diluted enough so as not to create a fire hazard because of generation of heat due to concentrated caustic solution.
- That in case of Monomer spillage/ Sanitizer, if it is not possible to collect the spilled material then 10-15% sodium hydroxide solution is sprayed on the spilled material.
- That in case the spilled material enters storm water / effluent line, then the Section Officer immediately informs the Officer – EHS at the ETP Laboratory to take appropriate mitigating action to prevent any adverse impact on the environment.
- Guidance is provided to the Section Officer in carrying out the control of leakage and containment of the spilled material.
- The Manager - EHS / Manager - Production upon reaching the site takes appropriate steps to mitigate the environmental impact of the spillage / leakage.
- If the Incident is under control, normalcy is restored
- Power and Utility Officer gives Clearance for restart of the Section.
- If Incident is not in control, Incident Controllers will advise Site Main Controller to Declare Emergency.
- Site Main Controller informs Security Personnel at Main Gate to blow Emergency Siren and declare emergency for entire plant.
- Incident Controller decides the evacuation plan and communicates to the entire plant through the Public Address System
- Site Main Controller instructs ASO/ ASO/ SS to call for Fire Brigade if required.
- The Fire Wardens reach the affected site and take up firefighting activities under the guidance of Incident Controller.
- The First Aid team reaches the OHC and reports to the Medical Officer on Duty.
- Incident Controller instructs Fire Wardens to use SCBA and Proximity suit wherever applicable
- Security personnel arrange for an Ambulance to reach the site
- Medical Officer keeps necessary equipment and medicines in ready condition to treat the affected persons. -
- He contacts local hospitals regarding the emergency and alerts them to receive the affected persons
- He calls for additional ambulances from local hospitals as per instructions of Incident Controller.
- On instructions of Incident Controller, the Power and Utility Officer shuts off the power supply to the affected area and deputes one Fitter to the pump house.
- Incident Controller instructs Site Controller to arrange for evacuation of the sectional persons (other than Fire Marshals) if required.
- The Superior / Superior's superior takes the employee having special needs other than mobility impairment to the local assembly point. Security personnel do the same in the absence of Superior / Superior's superior.
- The employee who hosts the visitor / visiting employee with special needs other than those with mobility impairment takes him to the local assembly point.
- The Superior / Superior's superior guides the emergency response team to locate the employee having mobility impairment. Security personnel do the same in the absence of Superior / Superior's superior.
- The employee who hosts the visiting employee and visitor with special needs having mobility impairment guides the emergency response team to locate the visitor having mobility impairment.
- The emergency response team takes the employee, visiting employee and visitor who have mobility impairment to the local assembly point by using stretcher.
- Site Controller stays back to bring the section to safe shutdown.
- All sectional persons assemble at Local Assembly Points.
- Section Officer takes headcount.
- Site Controller guides all people assembled at Local Assembly Point to move to Central Assembly Point.
- In case there are any casualties, the Site Controller arranges to evacuate them.

- Incident Controller arranges for firefighting in the area by laying water and foam hose lines in case a fire occurs in the area and in case a fire has already occurred in the area, carry out the fire fighting activity.
- Section Officer in all other sections instructs the staff and technician in their respective sections to safely shutdown their areas to bring sections to safe shutdown condition and assemble in Local Assembly Point.
- After taking headcount at Local Assembly Point, section Officer along with all technicians moves to Central Assembly Point.
- At Central Assembly Points, section Officer along with the technician, wait for instructions from Key Persons for carrying out various duties such as
  - Control of Traffic
  - Communication
  - Relief, Refreshment / catering facility
  - Additional Transport arrangements
- In case of tanker toppling following activities are also carried out
  - Extricate the driver and cleaner if they are trapped
  - Hospitalize them if needed
  - Close the tanker valves if they are open
- B. Power and Utility Officer gives Clearance for restart of the Section.

#### **7.4.3 Emergency involving Styrene monomer**

Styrene monomer stabilized appears as a clear colourless to dark liquid with an aromatic odour. Vapours heavier than air and irritating to the eyes and mucous membranes. Subject to polymerization. If the polymerization takes place inside a closed container, the container may rupture violently. Less dense than water and insoluble in water.

#### **General Response action for Vapour leak**

##### **On-Site:**

- Wear Self Contained Breathing Apparatus (SCBA)
- Stop styrene polymerization and leakage of vapours by adding 100% dosage inhibitor in styrene tank near Catch Pot (available at unloading pump).
- Use water spray/fog to disperse and dilute vapours.
- Collect runoff for disposal as potentially hazardous waste.

In case situation goes out of control off site emergency plan needs to be activated which is explained in off-site Emergency prepared page

##### **Offsite emergency handling of Styrene:**

- Site main controller will first inform the police station as appropriate about the 'Off-site emergency'.
- Site main controller will inform District Collector or his office, the DSP and SP, about the Off-site Emergency situation.
- Site main controller will reach out to the mutual aid group for getting/ extending help in firefighting facilities, special firefighting agents, trained manpower etc.
- Neighbouring communities identified as Vulnerable Zones will be informed.
- Village Sarpanch will be informed through Phone call
- Separate team with Portable siren / Megaphone will be used for communication at village site.
- Toxic Release Siren: - Long Siren followed by short Siren

For evacuation the following criteria to be considered:

An early decision will be required in many cases on the advice to be given to people living within range of the accident whether they should be evacuated or told to go indoors. In the latter case, the decision can regularly be reviewed in the event of an escalation of the incident. Consideration of evacuation may include the following factors:



- (A) In case of major fire but without explosion risk (e.g., on oil storage tank), only houses close to the fire are likely to need evacuation. Although a severe smoke hazard may require this to be reviewed periodically.
- (B) If a fire is escalating and in turn threatening a store of hazardous material, it might be necessary to evacuate people nearby, but only if there is time; if insufficient time exists, people should be advised to stay indoors and shield themselves from the fire. This latter case particularly applies if the installation at risk could produce a fireball with very severe thermal radiation. (e.g., LPG Storage)
- (C) For releases or potential releases of toxic materials, limited evacuation may be appropriate downwind if there is time. The decision would depend partly on the type of housing at risk,

Conventional housing of solid construction with windows closed offers substantial protection from the effects of a toxic cloud, shanty houses which can exist close to factories.

#### **7.4.4 Emergency Response Procedure for Structure Collapse**

- On receiving fire signal on the fire alarm panel, SO/ ASO/ SS along with all the Security personnel except one at each gate, reach the site and assess the condition.
- Security personnel at each gate immediately closes the gates and ensure that no personnel /vehicles except those required for the control of the incident are allowed to go out / come in.
- Security personnel at Gate inform Telephone Operator who in turn informs Site Main Controller, Incident Controller, and all other Key Persons.
- Incident Controller takes charge of the situation along with Site Controller.
- If Incident is in control, normalcy is restored.
- Power and Utility Officer gives Clearance for restart of the Section.
- If Incident is not in control, Incident Controller advises Site Main Controller to declare Emergency.
- Site Main Controller informs Main Gate Personnel to blow Emergency Siren and declare emergency for entire plant.
- Incident Controller decides the evacuation plan and communicates to the entire plant through the Public Address System.
- Site Main Controller instructs SO/ ASO/ SS to call for Fire Brigade if required.
- The Fire Wardens reach the affected site and take up firefighting activities under the guidance of Incident Controller.
- The entire First aid team reaches the OHC and report to the Medical Officer on Duty.
- Security personnel at Gate arranges for an Ambulance to reach the site
- Medical Officer keeps necessary equipment, medicines in ready condition to treat the affected persons-
  - He contacts local hospitals regarding the emergency and alerts them to receive the affected persons
  - He calls for additional ambulances from local hospitals as per instructions of Incident Controller.
- On instructions of Incident Controller, the Power and Utility Officer shuts off the power supply to the affected area and deputs one shift Technician to pump house.
- Incident Controller asks Site Controller to arrange for evacuation of the sectional persons (other than Fire Marshals) if required.
- The Superior / Superior's superior takes the employee having special needs other than mobility impairment to the local assembly point. Security personnel do the same in the absence of Superior / Superior's superior.
- The employee who hosts the visitor / visiting employee with special needs other than those with mobility impairment takes him to local assembly point.
- The Superior / Superior's superior guides the emergency response team to locate the employee having mobility impairment. Security personnel do the same in the absence of Superior / Superior's superior.
- The employee who hosts the visiting employee and visitor with special needs having mobility impairment guides the emergency response team to locate the visitor having mobility impairment.
- The emergency response team takes the employee, visiting employee and visitor who have mobility impairment to local assembly point by using stretcher.

- Site Controller stays back to bring the section to safe shutdown.
- In case of any Casualties, Site Controller arranges to evacuate them.
- All Sectional Personnel assemble at Local Assembly Points.
- Section Officer takes headcount.
- Site Controller guides all people assembled at Local Assembly Point to move to Central Assembly Point.
- Section Officer in all other sections instructs staff and technician in their respective sections to safely shutdown their areas to bring sections to safe shutdown condition and assemble in Local Assembly Point.
- After taking headcount at Local Assembly Point, Section Officer along with all technicians moves to Central Assembly Point.
- At Central Assembly Points, sectional Officer along with their technician, wait for instructions from key persons for carrying out various duties such as
  - Control of Traffic
  - Communication
  - Relief, Refreshment / catering facility
  - Additional Transport arrangements
- Power and Utility Officer Section gives Clearance for restart of the Section

## **7.5 Key Persons and their responsibilities**

### **7.5.1 Site Main Controller**

- Assesses the magnitude of the situation and decides if employees need to be evacuated to Assembly Point
- Exercises direct operational control over areas other than those affected
- Maintains a continuous review of possible development and assess in consultation with Site Controller and Incident Controller and other key personnel to shut down the plant or section and evacuation of persons
- Liaises with senior officials of the company, police, fire brigade, Medical and factories Inspectorate and provides information on possible effects to areas outside the factory premises
- Controls rehabilitation of affected areas on discontinuation of emergency
- Ensures evidence is preserved for enquires to be conducted by statutory authorities.

### **7.5.2 Incident Controller**

- Rushes to the affected site in case of Emergency and take over all charge and reports to Site Main Controller
- Assesses the scale of emergency and decides if major emergency exists or is likely, informs other Section Managers and Communication Officer for possible help required
- Directs all operations with the priorities for safety of personnel, minimize damage to the plant, property and environment and minimize loss of material
- Assumes duties of Site Main Controller, till his arrival, and
  - Directing the shut down and Evacuation of affected plant
  - Coordinating with areas likely to be adversely affected by the emergency
  - Ensuring that all the key personnel and outside help is called in
  - Providing advice and information to the Local Fire services as and when arrived
  - Ensuring that all non-essential personnel are evacuated, and areas are searched for casualties
- Reports all significant developments to the Communication Officer
- Sets up communication point, upon failure of power supply and establishes contact with emergency control center
- Ensures evidence is preserved to facilitate any enquiry into the cause.

**7.5.3 Administration Officer**

- Proceed to Emergency Control Centre upon hearing emergency siren and maintains communication with the Incident Controller
- Controls traffic movement into and out of the plant premises and ensures alternate transport is arranged when need arises
- Receives reports about the Rollcall at the Central Assembly Points and informs Site Main Controller about the same.

**7.5.4 Communication Officer**

- Works as Liaison Officer and reports to the Site Main Controller
- Recommends, if necessary, evacuation of personnel from Assembly Point as per information received from the Incident Controller.
- Handles all communications to other agencies and Head Office in case of a major accident
- Handles all communications to external agencies and statutory authorities such as the Police Department, Local Authorities, Hospital, and other statutory officials
- Receives and replies to inquiries from Media or other agencies
- Ensures that casualty cases receive adequate attention arranges additional help if required and informs their relatives
- Arranges for the relief of personnel and organize refreshment/catering facility in case the emergency is prolonged.
- Appoint suitable staff to act as runners between the Incident Controller and himself if the telephone and other communication systems fail.

**7.5.5 Site Controller**

- Ensures safe shutdown of the affected area or section
- Ensures segregation and removal of flammable material from the affected site
- Provides necessary guidance and help to Firefighting squads and Security personnel
- Evacuate other employees to assemble in Local Assembly Point
- Takes headcount at Local Assembly Point and
- Subsequently evacuates all to the Central Assembly Point

**7.5.6 Fire Officer**

- Rushes to the affected area upon hearing the Fire Alarm and instructs staff at the location of the incident to cancel the alarm.
- Communicates with the Communication Officer / Incident Controller / Site Main Controller by way of announcement on the Telephone or Public Address system or through messengers, about the specific location of the incident.
- Directs the emergency services to the affected area to begin operations in controlling the emergency
- Calls the Fire Brigade from the Local Fire Station on the instructions of the Site Main Controller or Incident Controller.

**7.5.7 Medical Officer**

- Keeps necessary equipment, and medicines in ready condition to treat the affected persons upon hearing the emergency siren
- Ensures that ambulance is sent to affected areas on advice of Incident Controller for pick up affected persons
- Contact local hospitals regarding the emergency and alert them to receive the affected persons
- Calls for additional ambulances from local hospitals, if needed.

## 7.6 Off-site Emergency Plan

### 7.6.1 Need for Off-Site Emergency Plan

- In case of major incidents, it may affect areas outside the works. Explosions can scatter debris over wide areas, the effects of blast can cover considerable distance's wild can spread burning brands of toxic gases. In some cases, e.g., as the result of an explosion, outside damage will be immediate and part of the available resources of the Emergency Services may need to be developed in the affected area.
- In any event, the possibility of further damage any remain, e.g., as the result of further explosion or by the effect of wind spreading burning brands of hazardous materials. Perhaps the most significant risk to outside areas is that associated with a large release of toxic vapours.
- Management will usually need expert advice in drawing up plans so that if such a release occurs, they will be able to collaborate with Emergency services to estimate as far as practicable which downwind areas are at the risk. It may be necessary to prepare in advance simple charts or tables relating the likely spread of the vapour cloud considering its expected buoyancy, the local topography and all possible conditions during the time of release. It may also be desirable to install instruments indicating wind speed and direction. Advice on all these matters can be obtained from the Meteorological office.
- The fact of the major emergency and the spread or potential spread of its effects outside the work may require that road and rail traffic past the works has to be halted or diverted. The police, taking account of the advice of the Site Main Controller. They will also, where necessary, inform the Rail.
- The problem is almost always exacerbated by members of the public driving to the scene to view the situation. The net effect can be cause problems to those who have a real need to get to the works, including the key personnel who will have been called out.
- All emergency plans should consider the possible effects of incidents on the neighbouring population and the remedial measures should be devised in consultation with the local authority and emergency services.
- The off-site emergency plan should be based on those events identified by the manufacturer that could affect people and the environment outside his premises.
- The manufacturer should provide the necessary information on the nature, extent, and likely effects of such incidents.
- The plan should cater in detail for those events identified as being the most likely but should be sufficiently flexible to allow the remedial measures to be able to be extended and increased to deal with extremely adverse combinations of circumstances and consequences.
- The factory inspectorate and the local authority should be satisfied that the information provided is sufficiently detailed unambiguous and clearly stated to be comprehensible and for the dangers to be provided. several different planned responses may be necessary at a single site depending on the size and characteristics of the incidents.

## 8 PROJECT BENEFITS

### 8.1 Improvements in the physical infrastructure

The plant is located in the Notified Industrial Area & the proposed expansion activity is being executed within the existing premises, no human displacement or habitat loss is envisaged.

### 8.2 Improvements in the social infrastructure

This project will positively impact the lives of people living in nearby villages which will lead to improvement in locale-specific socio-economic aspects.

Under CER activities the company will focus on locale-specific aspects such as education & skill development, Health awareness of the people, and various social activities. The CER activities planned by the company can be considerably beneficial for health & hygiene, education, the development of poor people, etc.

### 8.3 Employment potential –skilled; semi-skilled and unskilled

Paint manufacturing requires skillful handling by expert manpower as per the operation condition of the plant.

- The proposed project will generate direct and indirect employment during the construction phase around 1500 Mandays will be hired for various construction activities for the proposed expansion.
- During the operation phase existing permanent workers/Direct Employment are 420 nos. and the project will generate more employment after expansion which is around 10 persons thus total employment will be 430 persons after expansion.
- There are 735 existing temporary/indirect workers and for the proposed expansion around 50 persons will get employment, the total worker after expansion will be 785 people.
- It is the endeavor of the company to utilize local manpower meeting the qualifications, to the extent possible.

### 8.4 Other tangible benefits

The project will also contribute an increase in revenue in the form of various taxes which will be paid to the government from time to time. Thus, a significant benefit to the socio-economic environment is likely to be created due to the expansion project and the project will help in developing the national income.

## 9 ENVIRONMENTAL COST-BENEFIT ANALYSIS

Environmental Cost benefit analysis is a core tool which includes the systematic process of calculating the effectiveness & benefits due to establishment of the proposed project. Environmental costs include internal and external costs along with internal and external benefits. The internal benefit is mainly the economic benefits brought by project output and the benefits of employment personnel & the external benefits are the economic benefits of environmental impact (environmental improvement).

### 9.1 Environmental Cost

Environmental Cost Benefit analysis produces more efficient decision by increasing monetary values of the life, health and natural resources. In order to assess the pros and cons of any particular regulatory standard for proposed expansion activity, cost-benefit analysis seeks to translate all relevant considerations into monetary terms. In present study Environmental Cost Benefit Analysis was done by considering financial value of Environmental Monitoring Cost. Thus Cost Benefit Analysis, for carrying out of annual environmental monitoring and the benefits of doing so.

Total capital Investment of proposed expansion project is INR 125 Crore. Total expenditure to be spent on environmental matter is INR 52.39 Crore/-.

### 9.2 Environmental / Health and Safety Benefits

- A zero liquid discharge system will be followed at the site, which will not allow any untreated/ polluted water to be discharged outside the premises. Hence, it will not impact any surface & groundwater sources & will also not lead to soil and groundwater contamination.
- Solid & Hazardous Waste generated from the proposed expansion project will be stored in separate areas where impervious flooring and HDPE liner are below the RCC & storage sheds. This will avoid any soil and groundwater contamination.
- Air Pollution Control Measures are provided in a manner that it will keep the pollution levels well within the prescribed limits.
- Existing greenbelt at site is in 1,82,666.44 m<sup>2</sup> (>33%) of area and unit has carried out plantation of various species at site and as a result today existing project premises encompasses well developed greenbelt including trees/Large shrubs and shrubs, herbs and climbers within the project premises which will also help in abating noise, air pollution and will also improve social aesthetics.
- All plant safety measures including firefighting with hydrant and sprinklers (in buildings) are provided as per design standards and Occupational Health Monitoring Is being regularly followed as per applicable rules and the Factories Act which will prevent any accidents/incidents on the site. A proper Onsite and Offsite Disaster Management Plan is prepared to ensure the utmost safety and security of personnel working in site premises and periodic health checkups are being carried out for all the employees and workers staff to monitor and maintain their own health and well-being.
- The proposed expansion project will generate employment opportunity during the construction as well as operation phase & local people will be given preference, which lead to improve socio-economic conditions in the surrounding areas.

### **9.3 Conclusion**

In view of number of environmental / health and safety benefits as compared to nominal environmental costs, the proposed brownfield project of Integrated Paint manufacturing of paints will have no adverse effect on environment and ecology at large.



## 10 ENVIRONMENTAL MANAGEMENT PLAN (EMP)

### 10.1 Introduction

The EIA study for the proposed project has identified impacts that are likely to arise during different phases of the project. The study has also examined the extent to which the adverse impacts identified can be controlled through the adoption of mitigation measures. An EMP, presented in the following sections, describes generic good practice measures as well as site-specific measures, the implementation of which is aimed at mitigating potential impacts associated with the proposed activities.

The EMP is prepared with a view to facilitate effective environmental management of the project in general and implementation of the mitigation measures in particular. The EMP describes a delivery mechanism for implementing the suggested mitigation measures aimed at addressing the potential adverse impacts and to introduce standards of good practice to be adopted for all project works. For each stage of the program, the EMP lists all the administrative aspects necessary to ensure effective implementation of the mitigation measures. It also lists the parameters which needs to be monitored to ensure effective implementation. The detailed description of the Environmental Monitoring Program appears in **Table 6-1**.

### 10.2 Purpose of the Environmental Management Plan

The EMP provides a delivery mechanism to address potential adverse impacts, to instruct contractors and to introduce standards of good practice to be adopted for all project works. For each stage of the programme, the EMP lists all the requirements to ensure effective mitigation of every potential biophysical and socio-economic impact identified in the EIA. For each activity or operation, which could otherwise give rise to impact, the following information is presented.

A comprehensive listing of the mitigation otherwise give rise to impact, the following information is presented: measures (actions) that APL shall implement include;

- The parameters that will be monitored to ensure effective implementation of the action;
- The timing for implementation of the action to ensure that the objectives of mitigation are fully met.

Before the plant start-up, the EMP for operation phase will be prepared incorporating various environmental management aspects and requirements relevant to the plant operating processes and its impact on the environment. This EMP would also be revised in accordance with the requirement of additional impact mitigation measures due to change in site conditions, natural calamities, unforeseen eventuality, etc.

APL is committed to the adoption & implementation of these measures and will carry out ongoing inspection to ensure their implementation and effectiveness by its contractors.

### 10.3 Environmental Management Plan

The proposed EMP for operation phase after expansion in the project is described in the subsequent section

### 10.3.1 Air Quality Environment

Details of activities responsible for impact on air environment with its mitigation measures and management plan is shown in **Table 10-1**.

**Table 10-1 Environment Management Plan for Air Quality**

Impacting Activities	Mitigation Measures and Rationale	Implementation and Management					Remarks
		Location	Timing	Responsibility	Monitoring/ Data Analysis	Records	
Transportation of raw materials and products	It will be ensured that all our vehicles will have valid PUC all the time, and they will undergo periodic maintenance as per a schedule. PUC and fitness certificates will be checked for all other vehicles at the entry gate.  There will be separate activities for own vehicles at employees' entry/exit gate and for contractors'/ vendors'/ customers' at material entry/exit gate	Along the vehicle movement track	During operation phase at all time	APL's Safety Department	Checks by security staff at the entry gate	PUC Certificate	--
	Adequate safety measures along with spill control mechanism	At Site	During Transportation	EHS Team	Periodic monitoring by a party acceptable to regulatory authority	Type of chemicals, operating condition of chemical transported, periodic workplace monitoring record of leak detection	It will be ensured that the workers wear appropriate PPE at all times.
Handling & storage of raw materials and products	Seal checking by supplier as well as APL during receiving any material/chemicals; Keep container tightly closed and sealed until ready for use;  Avoid all possible sources of ignition; Use of PPEs (nose mask, safety goggles, safety shoes, hand gloves, breathing apparatus), preventive check & maintenance; ensure use of close feed system to reduce odour nuisance,	At Site	Monthly/ quarterly During operation phase	EHS Team	Ambient Air Quality Monitoring	Record of Ambient air quality monitoring at site	It will be ensured that the workers wear appropriate PPE at all times.
Manufacturing Process, Utilities operations (boiler,	Adequate stack height and APCMs for air emission control, for dust control like Scrubbers, dust collectors (Bag filters) etc., Ensure well working of APCMs & other equipment/ machineries used in	At process area	Monthly/ quarterly During operation phase	EHS Team	Periodic stack monitoring, ambient air quality monitoring,	Stack & ambient air quality monitoring reports, work place monitoring report	It will be ensured that the workers wear appropriate PPE at all times in process area; it will

Impacting Activities	Mitigation Measures and Rationale	Implementation and Management					Remarks
		Location	Timing	Responsibility	Monitoring/ Data Analysis	Records	
reactor, mills etc.)	manufacturing process, regular preventive check & maintenance of machineries, Use of PPEs (nose mask, safety goggles, safety shoes, hand gloves, breathing apparatus), Odour levels control by applying various engineering controls.				work place monitoring		be ensure that regular health check-ups of the employees/ workers to be carried out.
Treatment & Disposal of wastewater - Operation of ETP	Odour levels control by applying various engineering controls, use of PPEs (nose mask, breathing apparatus)	At site (Nr. ETP area)	Monthly/ quarterly During operation phase	EHS Team	Ambient Air Quality Monitoring near ETP Area	Record of Ambient air quality monitoring near to ETP area	It will be ensured that the workers wear appropriate PPE at all times.
Operation of DG Sets	DG set with adequate stack height and use during power failure only.	At site	Monthly/ quarterly During operation phase	EHS Team	Periodic stack monitoring,	Stack air quality monitoring reports,	

### 10.3.2 Traffic Management Plan

Details of activities responsible for traffic at project site with its mitigation measures and traffic management plan is presented as **Table 10-2**.

**Table 10-2: Traffic Management Plan**

Impacting Activities	Mitigation Measures and Rationale	Implementation and Management					Remarks
		Location	Timing	Responsibility	Monitoring/ Data Analysis	Records	
Movement of vehicles throughout the operation phase	Traffic will be regulated through proper signage, instruction & parking spaces. Separate entry & exit will be provided. Internal roads with 6 m width for movement of vehicles and also for fire tender (in case of emergency) will be provided. Ample parking spaces will be provided. Speed limit within the premises will be minimum to reduce traffic congestion. Signpost will be provided for smooth traffic flow and also inculcate residents to follow traffic rules.	At site	During operation phase	EHS officer/ security in-charge	Random check by EHS officer	Vehicle log record register	-

**10.3.3 Noise Quality Environment**

Details of activities responsible for impact on Noise level with its mitigation measures and Management Plan is presented in **Table 10-3**.

**Table 10-3: Environment Management Plan for Noise Environment**

Objective	To reduce noise level due to the proposed project								
Benefit of EMP	Noise environment of the area will not be impacted by the proposed activity								
Impacting Activity	Mitigation Measures	Implementation and Management							Remark
		Data Analysis	Measurement Methodology	Frequency	Location	Reporting Schedule/ Responsibility	Emergency Procedure	Procurement Schedule	
C1	C2	C3	C4	C5	C6	C7	C8	C11	C12
Vehicular movement for transportation of materials and equipment	Vehicles trips during daytime only fixing route by avoiding populated area	Vehicle movement records	Manual	Daily	At material gate	Security officer	Route for safe exit will be in place.	During construction and operation phase	PUC certified vehicles shall be used within the premises
Operation of pre-dispersion, dispersion, mixing & tinting, packing, etc.	Acoustic enclosures will be used. Ear plugs and Ear muffs will be provided to workers	Noise Levels	SLM	Once during week (Hourly reading for 24 hours at each location)	Inside plants	Plant in charge & Third Party/Contractor	Regular Maintenance of equipment to be done.	During operation phase	Ear plugs/Ear muffs to be worn by workers at all times.

### 10.3.4 Ground Water Quality Environment

Rain water harvesting & conservation is the activity of direct collection of rain water with storing or direct use and re-charging into the ground water in order to prevent loss through evaporation and seepage. The rain water harvesting & conservation aims at optimum utilization of the natural resource, that is, rain water, which is the first form of water that we know in the hydrological cycle and hence is a primary source of water for us. The rivers, lakes, pond, ground water, etc. are the secondary sources of water.

### 10.3.5 Computation of Rain Water Harvesting Facility at Project Site

#### Area Break-up

As per **Table 2-4**, the safe area for rain water harvesting at project site is consider and it is suggested to utilized roof top method as below:

**Table 10-4: Consider Land Area Break-up**

Area Type	Total Roof-top Area (m <sup>2</sup> ) for Rain water run-off
Administrative Building, Security Cabin	6,491.00
Roads	1,01,691.80
<b>Total Area (m<sup>2</sup>)</b>	<b>1,08,182.80</b>

#### Rainfall Data

The annual total rainfall of IMD Rohtak Station is 613.5mm (i.e. 0.61 m) for the long-term period of 1991-2020.

#### Computation of Run-off

The tentative rain water computation is as follows:

**Table 10-5: Tentative Run-off Computation**

Sr. No.	Area Type	Area Break-up (in m <sup>2</sup> )	Run-off Co-efficient Consider	Annual Rainfall (in m)	Effective Run-off Generation (in m <sup>3</sup> )
1	Roof top area	6,491.00	0.85	0.61	3,384.89
2	Roads	1,01,691.80	0.65	0.61	40,552.15
<b>Total area consider for estimating run-off</b>		<b>1,08,182.80</b>	<b>Total quantum of available run-off per annum</b>		<b>43,937.04</b>

- The above calculation is based on Manual of Artificial Recharge of Ground Water by CGWB (2007)
- Considering 0.80 as constant *24co-efficient for evaporation loss, spillage and first flush wastages* then,  
 $\diamond 43,937.04 \text{ m}^3 \times 0.80 = \sim 35,149.63 \text{ m}^3$  is the maximum rain water available at project site

The summary of rainwater generated is given in **Table 10-6**

**Table 10-6: Summary of Rainwater Generation**

Sr. No.	Content	Quantity	Unit
A	Maximum rain water available at proposed project site	35,149.63	m <sup>3</sup> /annum
B	Number of rainy days per annum (IMD Rohtak Station) for period of 1991-2020	31.8	days
C	Annual Total or Mean rain water availability per rainy day (A÷B)	1105.33	m <sup>3</sup> /day

24As per Central Public Work Department (CPWD) 2019

Sr. No.	Content	Quantity	Unit
D	Max number of Rainy days/in month (as per IMD Rohtak for period of 1991-2020)	7.2	July/August
E	Max rainwater received in month of July (C×D)	7,958.40	m <sup>3</sup>

As per the above summary,

- Tentatively ~7,958.40m<sup>3</sup> (round-off ~8,000m<sup>3</sup>) of rain water shall be available in the month of July
- Tentatively ~1105.33 m<sup>3</sup> of maximum rain water shall be available for one-day (in rainy season)
- And so that it is advisable to collect, divert and conserve the rainwater run-off wherever possible in order to reduce dependency on ground water supply

### Rain Water Harvesting through Water Conservation

Whereas as per Annexure-III given under The Haryana Water Resources (Conservation, Regulation and Management) Authority Act (2020 & 2022), paint industry is listed among the industries which are likely to pollute ground water through rain water recharge.

It is suggested that industry must carry out rain water harvesting using water conservation utilizing existing rain water collection tank located in the NE/ENE corner of the industrial plot adjacent to the storm water storage tank. Since it is paint industry, discharge of overflow storm water or rain water shall be carried out carefully by taking appropriate measures of required stages of water treatment as per stipulated norms.

#### 10.3.6 Rain Water Harvesting in the Study Area

##### Deeping of Existing Water Bodies

As per site visit in pre-monsoon, the local water bodies were observed in sewage conditions as per evidences from the disposal of village sewage pipes, odour, colour, bathing of domestic animal, etc. It is suggested to carry out detailed hydrological assessment for the feasibility of rain water harvesting at existing water bodies. As given the total land area cover by water body in the form of reservoir / lake / pond / tank is ~529 Hectare or ~1.5% of total 10km study area. Hence considering water need and supply to the study area and project site, rain water harvesting is a need. Hydrological assessment must be carried out under the guidance of local government body or experienced hydro-geologist only. The existing water bodies can be identified as per the criteria given under *25'The Haryana Pond and Waste Water Management Authority Act, 2018'*.

#### 10.3.7 Artificial Recharge through Existing Wells

As per site visit, it was identified that local people are depends on ground water for agriculture, domestic and drinking purposes. Whereas wells observed to be abandoned at Asthal Bohar (**Photograph 3-1**) and nearby areas due to salinity ingress or poor infiltration rate due to rapid urbanization. Since the study area has rain water availability and wells so the recharging of existing wells can be executed for the improvement of ground water quality and depth to water level. The project proponent should identify such dug/open/bore-wells and installed recharge well along with maintenance & service cost.

The details of expected aspect due to proposed activities in project and its management plan are given in the tables on following page:

[25https://hpwwma.org.in/impdoc/ACT%20LegislativeSupplementPartI.pdf](https://hpwwma.org.in/impdoc/ACT%20LegislativeSupplementPartI.pdf)

**Table 10-7: Environment Management Plan for Ground Water**

Objective	To reduce ground water pollution or contamination						
Concern	Pollution to the ground water from proposed activities under site preparation, site operation, decommissioning phase						
Benefits of EMP	Preventing ground water pollution due to proposed manufacturing unit						
Impacting Activities	Mitigation measures and Rationale	Implementation Monitoring and Management					
		Location	Timing	Responsibility	Monitoring	Records	Administrative Aspects
<b>3</b>	<b>Project Construction (Expansion)</b>						
Generation of sewage during construction activities	Quantity & Quality of water intake to be checked regularly	At Project Site	Raising of disposal quantity as applicable	Site in charge, EHS department	standard drinking water parameter as per IS:10500 (2012) from NABL accredited laboratory	To check disposal quantity as estimated	To keep records and to informed EHS or environment or concerned department for variation in quantity & quality
Storage and disposal of construction materials and waste	Quantity & Quality of water intake to be checked regularly	At Project Site	Raising of disposal quantity as applicable	Site in charge, EHS department	standard drinking water parameter as per IS:10500 (2012) from NABL accredited laboratory USEPA 13 priority metals, COD, BOD, etc.	To check disposal quantity as estimated	To keep records and to informed EHS or environment or concerned department for variation in quantity & quality
<b>4</b>	<b>Operation Phase – Regular Operations After Expansion</b>						
<b>A</b>	<b>Paints &amp; Resin Manufacturing</b>						
Water Consumption (domestic use, manufacturing process and landscape development)	Quantity & Quality of water intake to be checked regularly	At project site	Raising of disposal quantity as applicable	Site in charge, EHS department	standard drinking water parameter as per IS:10500 (2012) from NABL accredited laboratory USEPA 13 priority metals, COD, BOD, etc.	To check disposal quantity as estimated	To keep records and to informed EHS or environment or concerned department for variation in quantity & quality
<b>B</b>	<b>General &amp; Utilities Operations</b>						



Objective	To reduce ground water pollution or contamination						
Concern	Pollution to the ground water from proposed activities under site preparation, site operation, decommissioning phase						
Benefits of EMP	Preventing ground water pollution due to proposed manufacturing unit						
Impacting Activities	Mitigation measures and Rationale	Implementation Monitoring and Management					
		Location	Timing	Responsibility	Monitoring	Records	Administrative Aspects
Vehicular Movement for transportation of Raw Materials and Finished Products	Quantity & Quality of water intake to be checked regularly	At project site	Raising of disposal quantity as applicable	Site in charge, EHS department	--	To check disposal quantity as estimated	To keep records and to informed EHS or environment or concerned department for variation in quantity & quality
Handling & storage of raw materials - Chemical and fuel storage and products,	Quantity & Quality of water intake to be checked regularly	At project site	Raising of disposal quantity as applicable	Site in charge, EHS department	--	To check disposal quantity as estimated	To keep records and to informed EHS or environment or concerned department for variation in quantity & quality
Temporary Storage, handling of hazardous waste within premises, and disposal/ transportation of solid/hazardous waste	Quantity & Quality of water intake to be checked regularly	At project site	Raising of disposal quantity as applicable	Site in charge, EHS department	--	To check disposal quantity as estimated	To keep records and to informed EHS or environment or concerned department for variation in quantity & quality
Treatment & disposal of wastewater - operation of ETP, Operation of ZLD units	Quantity & Quality of water intake to be checked regularly	At project site	Raising of disposal quantity as applicable	Site in charge, EHS department	--	To check disposal quantity as estimated	To keep records and to informed EHS or environment or concerned department for variation in quantity & quality
Operation of ETP laboratory	Quantity & Quality of water intake to be checked regularly	At project site	Raising of disposal quantity as applicable	Site in charge, EHS department	--	To check disposal quantity as estimated	To keep records and to informed EHS or environment or concerned department for variation in quantity & quality
Influx of people (employees)	Quantity & Quality of water intake to be checked regularly	At project site	Raising of disposal quantity as applicable	Site in charge, EHS department	--	To check disposal quantity as estimated	To keep records and to informed EHS or environment or concerned

Objective	To reduce ground water pollution or contamination						
Concern	Pollution to the ground water from proposed activities under site preparation, site operation, decommissioning phase						
Benefits of EMP	Preventing ground water pollution due to proposed manufacturing unit						
Impacting Activities	Mitigation measures and Rationale	Implementation Monitoring and Management					
		Location	Timing	Responsibility	Monitoring	Records	Administrative Aspects
							department for variation in quantity & quality
<b>C</b>	<b>Non-Routine Operation</b>						
Start-up and shutdown activities including washing of process equipment, pipeline, tanks etc., Venting in case of pressurized operation or Vessel, Sludge removal, storage and disposal.	Quantity & Quality of water intake to be checked regularly	At project site	Raising of disposal quantity as applicable	Site in charge, EHS department	--	To check disposal quantity as estimated	To keep records and to informed EHS or environment or concerned department for variation in quantity & quality
Equipment repair & maintenance	Quantity & Quality of water intake to be checked regularly	At project site	Raising of disposal quantity as applicable	Site in charge, EHS department	--	To check disposal quantity as estimated	To keep records and to informed EHS or environment or concerned department for variation in quantity & quality
<b>6</b>	<b>Final Decommissioning</b>						
Dismantling of plant machinery & equipment	Quantity & Quality of water intake to be checked regularly	At project site	Raising of disposal quantity as applicable	Site in charge, EHS department	--	To check disposal quantity as estimated	To keep records and to informed EHS or environment or concerned department for variation in quantity & quality

### 10.3.8 Surface Water Quality Environment

Details of activities responsible for impact on Surface Water Quality, impact due to solid and Hazardous waste generation, storage, disposal with its mitigation measures and Management Plan is presented in **Table 10-8**.

**Table 10-8: Environment Management Plan for Surface Water Quality**

Impacting Activities	Mitigation Measures and Rationale	Implementation and Management				
		Location	Timing	Responsibility	Monitoring/ Data Analysis	Records
Usage of water	Water conservation plan shall be done like explore the condensate recovery from the boiler which shall reduce fresh water demand. Online flow meter shall be installed at each of raw water intake points. Care shall be taken to avoid leakage of water sources and it will be maintained by continuous monitoring by flow measurement.	At site	All time	Site EHS Manager / EHS team	Monitoring of raw water consumption. Parameters as per IS 10500, 2012 and Methodology will be followed as per as IS method.	Records of Water consumption at each unit to be carried out. Water Auditing at regular intervals to be carried out in order to conserve fresh water resources
Wastewater generation and disposal	The effluent generation from the proposed unit shall be treated in proposed ETP followed with RO and treated and treated water shall be completely recycled and reused in plant area.  Online flow meters shall be installed at inlet and outlet of the ETPs.  Use of spill control measures, mechanical handling, PPE's shall be mandatory while handling the chemicals in ETP to avoid spillages. ETP Sludge shall be disposed into approved Landfill /TSDF site	AT site	All time	Site EHS Manager / EHS team	Inlet & outlet characteristics as per consent condition and methodology will be followed as per IS method	Records of wastewater generation and reuse quantity in gardening to be maintained.
Storage of hazardous chemicals	Dyke wall shall be provided to avoid runoff contamination and leaked fuel shall be immediately transferred to the spare tank.  Use of spill control measures, mechanical handling, PPE's shall be mandatory while handling the chemicals to avoid spillages.	At site	At all time (during loading & unloading of chemicals)	Site EHS Manager / EHS team	Periodic workplace monitoring	Record of chemical storage shall be maintained

### 10.3.9 Solid & Hazardous Waste Management

Details of activities responsible for impact due to solid and Hazardous waste generation, storage, disposal with its mitigation measures and Management Plan is presented in **Table 10-9**

**Table 10-9: Environment Management Plan for Solid & Hazardous Waste Management**

Impacting Activities	Mitigation Measures and Rationale	Implementation and Management	Impacting Activities	Mitigation Measures and Rationale	Implementation and Management	Impacting Activities
Storage, Handling and disposal of Hazardous waste	<p>Hazardous waste shall be segregated at source and stored in hazardous waste storage area.</p> <p>Proper area shall be demarcated for the storage of hazardous waste facilitate with impervious flooring to avoid leakage problem.</p> <p>Spill control mechanism shall be in place.</p> <p>PPE's shall be mandatory while handling the hazardous waste during loading &amp; unloading of wastes. Necessary membership shall be taken from the approved authority for safe disposal of hazardous waste.</p>	At site	At all time	Site EHS Manager / EHS team	Periodic workplace monitoring shall be carried out	<p>Records of hazardous waste generation and disposal quantity to be maintained.</p> <p>All hazardous wastes will be transported as per Manifest System</p>

### 10.3.10 Soil Quality Environment

Details of activities responsible for impact on Soil quality with its mitigation measures and Management Plan is presented in **Table 10-10**.

**Table 10-10: Environment Management Plan for Soil Quality**

Impacting Activities	Mitigation Measures and Rationale	Implementation and Management					Remarks
		Location	Timing	Responsibility	Monitoring / Data Analysis	Records	
Top soil loss	Preserve the same at the earmarked place	-	Till it is used for landscape	Store Manager/ Security in-charge	Checks by security staff at the entry gate	Keep Records of vehicles/ PUC certificate/Log book of vehicle entry-exit	

Impacting Activities	Mitigation Measures and Rationale	Implementation and Management					Remarks
		Location	Timing	Responsibility	Monitoring / Data Analysis	Records	
Soil erosion	Level the land by cutting & filling	Soil WHC & porosity	Prior to vegetation & site clearance as well as completion of work	Production Manager/ Store manager	Visual inspection	Record of leakage, if any	
Soil contamination due to spillage of construction material/ETP waste	Check the soil quality	EC, pH and ESP	During construction and operation of the project	Production Manager-operation/ EHS Team	Visual inspection	Record of leakage, if any	

### 10.3.11 Land Use and Land Cover

The environmental management plan for land use/land cover is given as **Table 10-11**.

**Table 10-11: Environment Management Plan for Land use and Land cover**

Impacting Activities	Mitigation Measures and Rationale	Implementation and Management					Remarks
		Location	Timing	Responsibility	Monitoring / Data Analysis	Records	
Construction Activities – Excavation and filling of foundation	Excavated earth will be used for backfilling and care will be taken that natural drainage pattern remains unchanged	At Site	For the construction period	Site Engineer	Visual inspection	Periodic records in form of photographs	

### **10.3.12 Ecology and Biodiversity**

#### **Greenbelt Development**

Green Belt design and development has been attributed a great importance and became an essential element of planning policy. The main objective of the green belt is to provide a buffer/barrier between the sources of pollution and the surrounding areas.

The green belt helps to capture the fugitive emissions and attenuate the noise apart from improving the aesthetics quality of the region. APL have developed green belt in more than 33% of the project area. Existing green belt will be further improved through additional plantation in green belt area using appropriate plant species as suggested by CPCB guidelines to mitigate air pollution and to improve biodiversity status of the study area.

#### **Green Belt Designing**

##### ***Identification of Impact Zone***

Though the concentration of PM, SO<sub>2</sub>, NO<sub>x</sub>, SO<sub>2</sub>, HC, CO is found within permissible limits, dispersion modelling shows that these gases have likely impact on ecology/ecosystem at West & North west directions.

##### ***Selection of Plant Species***

Facts considered during selection of plant species for greenbelt development are:

- Type of pollutant (mainly air) likely to disperse from project
- The project area falls in Indo-Gangetic alluvium plain area
- Biological-filter Efficiency: Absorption of gases, Dust capturing and Noise control

#### **Locations of Green Belt**

Existing Green belt area of 1,82,666.44 m<sup>2</sup> (i.e. 18.26 Ha or 45.12 Acre; >33%) out of total plot area 5,23,198 m<sup>2</sup> (i.e. 129.28 Acres or 52.31 Hectare) . Green belt has been developed in periphery of project location and in various ecosystems falling in the identified impact zone. Plantation will be carried out as per CPCB guidelines (CPCB 2000)26.

#### **Existing Greenbelt at Site**

Likely impacts due to gaseous pollutants can be reduced by growing multi layers of vegetation cover around the project boundary. The existing unit already has well developed greenbelt area of 1,82,666.44 m<sup>2</sup> or 18.26 ha (>33%). Of which, the canopy area of 1,46,066.00 m<sup>2</sup> or 14.06 ha (26.87%) exist.

The industry already has greenbelt area (>33%) with a plantation of ~25000 trees and shrubs within the project premises. Additional plantation of 4000 trees are proposed to be planted at site for Gap filling on boundaries and block plantation with suggested tree species.

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26 CPCB 2000. Guidelines for developing green belts, Programme Objective Series PROBES/75/1999-2000nCentral Pollution Control Board, New Delhi, pp. 195.

Greenbelt includes periphery plantation, road side plantation and plantation around various buildings which is shown in **Photographs 10-1** and map showing area under greenbelt at site is shown in **Map 2-6**. Details of existing greenbelt at project site are given in **Table 2-29**.









Types of tree planted are Eucalyptus, Neem, Ashoka etc.

Detail of Existing Greenbelt/plantation at project site is as shown in **Table 2-29**. Photographs of existing greenbelt at project site are as presented in **Photographs 10-1**.

**Photographs 10-1: Existing Greenbelt at Site**





		
<i>Washingtonia filifera</i>	<i>Ficus virens</i>	<i>Azadirachta indica</i>
		
<i>Caryota urens</i> (Fishtail palm)	<i>Morus alba</i> (Mulberry)	<i>Dalbergia sisso</i>
		
<i>Acacia nilotica</i>	<i>Thespesia populnea</i> (Paras Pipal)	<i>Phyla nodiflora</i> (Pippali)



		
<i>Leucaena leucocephala</i>	<i>Ficus racemosa</i> (Gular/Cluster Fig)	<i>Neltuma juliflora</i>
		
<i>Plumeria obtusa</i>	<i>Ficus religiosa</i>	<i>Albizia julibrissin</i> (Persian acacia)
		
<i>Syzygium cumini</i>	<i>Ficus benamina</i> and <i>Cascabela thevetia</i> (Yellow kaner)	<i>Phoenix sylvestris</i> and <i>Washingtonia filifera</i>

### Proposed green belt in the project premises

Existing greenbelt at site is in 1,82,666.44 m<sup>2</sup> (>33%) of area and unit has carried out plantation of various species at site and as a result today existing project premises encompasses well developed greenbelt with a total plantation of ~25,000 plants including trees and shrubs, within the project premises. Post expansion, minimum 33% of greenbelt area will be maintained with increased plantation. Additional plantation of 4000 trees are proposed to be planted at site for Gap filling on boundaries and block plantation with suggested tree species.

Details of the Species for proposed plantation area given in **Table 10-12**.

**Table 10-12: Details of Proposed Green belt Plantation at Project Site**

Plant Species	Local/Hindi Name	Height (m)	Type	Ecological and Environmental Performances of Plant Species	No. of trees to be planted
<i>Bauhinia variegata</i>	Kachnar	5	Tree	T,DC,NC	4,000
<i>Bougainvillea spectabilis</i>	Bougainvillea	8	Shrub	T,DC,NC	
<i>Emblica officinalis</i>	Amla	5	Tree	T,DC,NC	
<i>Nerium indicum</i>	Kaner	5	Shrub	T,DC	
<i>Saraca asoka</i>	Asoka	5	Tree	T,DC,NC	
<i>Butea monosperma</i>	Palas	10	Tree	NC, OGE, DC	
<i>Polyalthia longifolia</i>	Ashoka	15	Tree	DC, OGE, NC, AG.	
<i>Albizia lebbek</i>	Siris	20	Tree	DC, NC, AG, DR, SR, FR.	
<i>Azardirachta indica</i>	Neem	20	Tree	DC, OGE, NC, AG, DR, SR, FR.	
<i>Derris indica</i>	Karanj			NC, DR, SR, FR.	
<i>Ficus bengalensis</i>	Banyan	20	Tree	NC, DC	
<i>Ficus religiosa</i>	Peepal	20	Tree	NC, OGE, DC	
<i>Mangifera indica</i>	Aam	15	Tree	DC	
<i>Syzygium cumini</i>	Jamun	20	Tree	NC, DC	
<b>Ecological performance:</b> CN –Control Noise level, OGE – Absorb Gas emission (Sexena 1991) <sup>27</sup> and (Abbasi & Khan 2000) <sup>28</sup> , DC - Dust Controller (CPCB 2007) <sup>29</sup> , Environmental Adaptation (DR - Drought resistance, SR - Salinity resistance, FR - Fire Resistance, T- Tolerant to Air Pollution).					

27 Saxena, V.S. 1991. Afforestation as a tool for environmental improvement. In: Executive development program on greening the townships. Vaniki Prashikshan Sansthan, Jaipur. Pp 13-44.

28 Greenbelts for Pollution Control: Concepts, Design, Applications. 2000. Abbasi, S.A. and F.I. Khan. Discovery Publishing House, New Delhi.

29 Phytoremediation of particulate matter from ambient environment through dust capturing plant species. Published 2007 by Central Pollution Control Board, Ministry of Environment & Forests, Govt. of India in Delhi.

### Budget Allocation for proposed Green belt

Table 10-13: Overhead for Proposed Greenbelt Development & Annual Maintenance of Existing and proposed Greenbelt

S. No	Work or Activity	1st year	2 <sup>nd</sup> year	Capital cost (INR)	Recurring cost/year (INR) (considering 20% mortality rate)
1	Proposed plantation inside Project boundary , totally 4,000 saplings will be planted (Approx. Cost @ INR 500 per sapling / year)				
Saplings Required		2000	2000	INR 20,00,000	INR 4,00,000 [for 4000 plants (20%)]
Amount		INR 10,00,000	INR 10,00,000		
2	Maintenance of existing Greenbelt within project premises includes periphery plantation, road side plantation and plantation around various buildings, totally 4000 trees				
Total Budget				INR 24,00,000	
Note: All other costs like soil filling dressing; irrigation etc. costs will be barred by client /proponent. The plantation cost is mentioned in first year, as per the TOR condition: Greenbelt development should be carried out during the first year					

### Plantation Technique and Care

- Following basic procedures need to be followed for greening the area.
- Since the project area fall under semi-arid condition and having poor soil quality, plantation of tree species required approx. 1m<sup>3</sup> pit for soil enrichment
- Pit should be filled with imported soil with 3:1:1 the ratio of sand, silt and farm yard manure
- Procure well grown saplings of recommended species from the nearby Forest Department nursery
- Make 1m diameter ring bund around the planted saplings for water retention
- Watering of sapling is species specific, therefore watering need to be done once in 2 or 3 days for a period of two years
- Soil work and weeding need to be done once in a two months.

### Monitoring Protocol/ Maintenance

The plantations need to be managed by regular watering, soil enrichment work, applying manure, weeding and provide proper protection.

Replacement of sapling (replanting) required whenever mortality occurs in the plantation during the growth stage.

Plantation requires after care for a period of minimum five years till the saplings attain matured tree stage.

Any damage to the developed greenbelt due to any natural or cattle activity should be redeveloped and maintained by the agency.

### Biodiversity / Ecological Monitoring

Project site encompasses common species of plants so clearing of these species will not have significant impact on the floral diversity and associated faunal diversity at ecosystem level. Moreover, floral and faunal species reported during this survey are common and generally found in many habitats in the project study area. So, it can be stated that the proposed project and associated

activities are unlikely to influence any floral and faunal components significantly provided that the suggestions / recommendations in this report are implemented. Strict implementations of EMP / mitigation measures are required to ensure that the biodiversity of the study area should not impacted negatively.

### **10.3.13 Conservation Plan for Schedule – I and Threatened Species**

#### **Need of Conservation Plan**

As per Standard ToR letter issued by SEAC Haryana vide letter no. TO24B2601HR5419231N dated 31.05.2024 (Annexure 1) a conservation plan is to be prepared for Schedule 1 fauna, if any exists in the study area.

#### **Conservation Action Plan for Schedule-I Species**

Biodiversity conservation plan is developed with the aim to reduce adverse impact on the natural habitat of various wild animals. Day by day issues related to threats to natural terrestrial and aquatic ecosystems arises due to high anthropogenic activities and loss of natural habitat due to climate change. A conservation plan is needed for the conservation of critical habitats of wildlife for endangered and Schedule-I species along with their scientific management strategy. During the mining/industrial/developmental activities and conservation activities, natural resources (Land, Biodiversity, Forest).

Animals and Humans are likely to exert tremendous pressure due to various activities in the respective region, while the present management plan will ensure mitigation of such impacts. A separate Wildlife Conservation Plan is proposed for M/s Asian Paints Limited at Plot No. 1 Sector 30-B, HSIIDC, IMT Rohtak Haryana.

A detailed biological field survey of the core zone (project site) and buffer zone (10 km radius) has been carried out in the study area. In case of fauna, the schedule of Wild Life (Protection) Amendment Act, 2022 has been referred.

From the buffer zone, total 2 species were reported under threatened category of IUCN Redlist including *Eryx johnii* (Red Sand Boa), and *Threskiornis melanocephalus* (Black headed ibis). 11 species are classified under schedule I of Indian Wildlife (Protection) Amendment Act, 2022 including *Canis aureus* (Jackal), *Canis lupus pallipes* (Indian Grey Wolf), *Herpestes edwardsii* (Indian Grey Mongoose), *Vulpes bengalensis* (Indian Fox), *Eryx johnii* (Red Sand Boa), *Naja naja* (Indian Cobra), *Ptyas mucosus* (Oriental Rat Snake), *Folwea piscator* (Chequered Keelback), *Accipiter badius* (Shikra), *Pavo cristatus* (Indian Peafowl) and *Threskiornis melanocephalus* (Black-Headed Ibis).

**Table 10-14: Conservation status of the Schedule I fauna present in study area**

S. No.	Scientific Name	Common Name	Habit & Habitat	Food & Feeding Habit	Breeding Habit
1.	Canis aureus	Golden Jackal	The golden jackal is a medium-sized canid, wide spread, terrestrial carnivore. It is fairly common throughout its range. Due to their tolerance of dry habitats and omnivorous diet, they can live in a wide variety of habitats. In India, the golden jackal is found in most protected areas, open grassland habitats, and mangroves, semi-urban and rural landscapes of the country, except in the high elevation regions of the Himalaya. Certain pastoral areas in western and northern India, which have abundant livestock also support high Golden jackal densities.	Golden jackals are opportunistic and often venture into human habitations at night to feed at garbage dumps, or scavenge on livestock carcasses.	In India, reproductive behavior begins in February–March. Gestation is about 63 days. Litter size ranges from 1 to 9, average 5.7 and actation lasts for 8–10 weeks.
2.	Canis lupus pallipus	Indian Grey Wolf	Grey wolf, is a large canine native to Eurasia and North America. The wolf is the largest extant member of the family Canidae, and is further distinguished from other Canis species by its less pointed ears and muzzle, as well as a shorter torso and a longer tail.	The wolf is mainly a carnivore and feeds on large wild hooved mammals as well as smaller animals, livestock, carrion, and garbage.	It travels in nuclear families consisting of a mated pair accompanied by their offspring. Wolves become mature at the age of two years and sexually mature from the age of three years. The age of first breeding in wolves depends largely on environmental factors: when food is plentiful, or when wolf populations are heavily managed, wolves can rear pups at younger ages to better exploit abundant resources. Females are capable of producing pups every year, one litter annually being the average.
3.	Herpestes edwardsii	Indian Grey Mongoose	Mongoose are terrestrial, diurnal solitary hunters that search during the day and into late evening. They can be seen any time of the day, but Indian Grey Mongooses is especially active in the early morning and early evening in search of reptiles. They use a quick trot, moving constantly, scanning the area for food. They are rarely seen climbing trees.  Indian gray mongooses have been observed in areas of thickets, in cultivated fields or in broken, bushy vegetation. They also occupied open areas, grasslands, and scrub. They sleep in holes in the ground or hollow trees to escape the mid-day sun.	Indian gray mongooses are opportunistic hunters feeding mainly on mice, rats, lizards, snakes, and beetles. Ground birds, their eggs, and parts of plants: fruits, berries, and roots have become a part of their diet. In India, they have been seen chasing a hare and running away with a cattle egret. In India, the Indian Grey Mongoose feeds on the eggs and chicks of the Red Junglefowl, Indian Peafowl, and the partridges. They have been known to prey in grasslands in search of snakes and small mammals	Herpestes edwardsii reproduces rapidly, with females giving birth to two or three litters per year. Litters typically contain from 2 to 4 young. The gestation period is 60 to 65 days with parturition occurring in May or June and October to December. Females have four to six mammae.
4.	Vulpes bengalensis	Indian Fox	Indian foxes generally prefer foothills and non-forested regions such as open grassland, thorny scrub, semi-desert and arid environments. They can also be found in agricultural fields, as they are not generally fearful of humans. Bengal foxes inhabit burrows built approximately two to three feet below ground surface. These burrows have several openings converging towards the center burrow area. Many of these openings are blind while others lead towards a large, central breeding space.	Vulpes bengalensis is an omnivorous, opportunistic species that feeds mainly on insects, birds and their eggs, small rodents, reptiles, and fruits. While the primary diet of adults is insects. Common prey includes orthopterans, termites, ants, Beetle grubs, Spiders, Soft-furred rats, little Indian field mice, Indian gerbils, Indian mynahs (Acridotheres tristis), Grey Francolin (Francolinus ponticerianus), and Ashy-crowned finch larks (Eremopterix griseus). Less common prey items include ground lizards, Oriental Rat snakes (Ptyas mucuosa), hedgehogs (Parantechinus nudiventris), and Indian hares (Lepus nigricollis). They feed on fruits of ber (Ziziphus), Neem (Azadirachta indica), Mango (Mangifera indica), Jamun (Syzigium cumini), and Banyan (Ficus bengalensis).	Indian foxes are believed to live in long-term monogamous pairs, but this supposition is based on little evidence. During the breeding season, males vocalize intensely during the night and at dusk and dawn.  Bengal foxes remain near dens during the period from February to June, when they are raising pups. They breed from December to January with an average litter size of two. Birth occur from January to March. The breeding season is announced by re-excavation of old dens or the digging of new dens. Bengal foxes have also been known to appropriate gerbil burrows and show significant site fidelity, with dens being used year after year.
<b>REPTILES</b>					
5.	Eryx johnii	Red Sand Boa	Red sand boa is found from Iran through Pakistan into western, southern, and northwestern India. It is found in dry, semi-desert scrub plains and rocky dry foothills up to 200 m (660 ft) elevation. It prefers loose sand, or sandy soil that crumbles easily, into which it burrows, living underground.	The diet of E. johnii consists mainly of mammals such as rats, mice, and other small rodents that are killed by constriction. Some specimens have apparently fed exclusively on other snakes.	E. johnii is ovoviviparous, with females giving birth to up to 14 young at a time in late summer to monsoon.
6.	Naja naja	Cobra	The Indian cobra is large highly venomous snake and is a member of the "big four" species that inflict the most snakebites on humans in India. It finds their shelter in holes in embankments, tree hollows, termite mounds, rock piles, and small mammal dens. Indian cobras inhabit a wide range of habitats throughout their geographical range. They can be found in dense or open forests, plains, agricultural fields, rocky terrain, wetlands, and they can even be found in heavily populated urban areas, such as villages and city outskirts. Indian cobras are often found in the vicinity of water.	It is carnivores and feed on rodents, frogs, and lizards.	It is oviparous and lay their eggs between the months of April and July. Females usually lay between 10 and 30 eggs in rat holes or termite mounds and will fiercely guard them during the incubation period until they hatch. The incubation period lasts around 48-69 days. The hatchlings measure between 20 and 30 cm (8 and 12 in) in length.

7.	Ptyas mucosus	Oriental Rat Snake	Rat snakes are solitary creatures. They are diurnal and semi-arboreal. Although these snakes are harmless to humans, they are fast-moving and very excitable. They eat a variety of prey and are frequently found in urban areas where rodents thrive.	Ratsnakes are carnivores. They prey upon small reptiles, amphibians, birds, and mammals	The reproduction of this species includes 4 main periods: copulation, gestation, and oviposition and after oviposition. The mating season of Ptyas mucosus begins from April to October, mainly at the beginning of April, May, June and July.
BIRDS					
8.	Accipiter badius	Shikra	Found in forests, farmland & urban areas; usually seen singly or in pairs; flight is typical with flaps & glides.	Feeds rodents, squirrels, small birds, small reptiles and insects.	Breeding: March to June. The usual clutch is 3 to 4 eggs.
9.	Pavo cristatus	Indian Peafowl	Found in moist and dry-deciduous forests, but can adapt to live in cultivated regions and around human habitations; lives mainly on the ground in open forest or on land under cultivation	Plant parts, flower petals, seed heads, insects and other arthropods, reptiles and amphibians.	Breeding: April to September; breeds once per year, and more often if clutch is lost.
10.	Threskiornis melanocephalus	Black Headed Ibis	The species is a widespread breeding bird in India, Sri Lanka, Nepal and Myanmar, and has declined considerably to few locations or breeding colonies in Cambodia, Indonesia, Malaysia, Thailand, and Vietnam. The black-headed ibis is very versatile being able to use a large variety of natural and man-made habitats. These include freshwater and salt-water marshes, lakes and ponds, as also rice fields, freshly ploughed crop fields, irrigation canals, riversides, reservoirs, urban lakes, open sewage gutters, grazing lots, and garbage dumping sites.	Diet includes frogs, tadpoles, snails, adults and larvae of insects, and worms; also fish and crustaceans, probably more commonly when feeding in coastal areas; occasionally plant matter.	Breeding Period: in the rainy season approximately in August and September. It builds several nests together on the same tree. The nest is made of the small branches weaving together on the tree which is not very far from the swamp. It lays 2 to 4 eggs each time.



### Threats in the Study Area for these species

No perceptible threats were identified in the villages surveyed except lack of awareness among public about wildlife conservation.

### Study Area as a Habitat for Schedule I fauna (Buffer Zone)

Present survey in the buffer zone of the project site cleared that these species use both, village adjacent habitats and forest habitats within the buffer zone. However, the following points can give an insight on the overall status of species in the study area and thereby plan for better management strategies related to proposed project activities.

In the buffer zone, these species use agriculture (adjacent to village) and forest habitats near to river or water body as a feeding and breeding ground.

From above study, it has been visualized that, the proposed project will not have any significant impact on both species in terms of their normal movements and other activities. However, it is necessary to take some management options like habitat improvement, awareness campaign/ workshops in the villages located in the vicinity of the project site.

### Conservation Measures

#### Conservation through Habitat Improvement and Awareness

Habitat improvement programme (plantation of local plant species) and awareness campaign/ workshops will be undertaken in different villages located in the close vicinity of the project area. Under this programme saplings will be distributed in the nearby villages with the consultation of the local forest department. Habitat improvement programme will be undertaken through plantation of suitable tree species. Saplings of *Ficus religiosa* (Peepal), *Mangifera indica* (Aam), *Azadirachta indica* (Neem), *Tectona grandis* (Sagwan), *Tamarindus indica* (Imli), *Moringa oleifera* (Sehjan) will be distributed in the nearest five villages (as per year wise schedule). Species recommended by local forest department will also be added in the present plantation program.

In consultation of the forest department, following Conservation Measures will be adapted for Schedule I species present in the study area:

- Habitat improvement programme for Schedule I species in the different villages will be undertaken in the buffer zone area. This will be achieved by plantation of locally adapted species near villages in buffer area.
- School/college level awareness programmes will be conducted for conservation of Schedule I species by organizing competitions during "Wildlife Week" and "Van Mahotsav" celebrations and placing hoardings showing awareness slogans for wildlife at public places.

#### Plantation of local plant species

Plants species / varieties will be suggested by the local forest department and plant saplings will be distributed in project villages as per the above mentioned schedule (year wise).

Awareness programme these species conservation will be scheduled in a year in five (nearest to project site) schools every year. For these species awareness will be created among public through awareness workshops and by placing signboards and hoardings at public places.

During awareness programme following activities will be arranged at the various village level schools as mentioned above (year wise),

- Awareness programme regarding Herpetofauna and other Scheduled reptiles along with basic identification on Venomous and non-venomous snakes, Rescue and release procedures, Interaction with wildlife rescuers, and Safe Practices to minimize snake bites and casualties.

- General awareness regarding Wolves, Jackals and Foxes in regional schools and education centres. Interactions of Locals with Forest Officials and Wildlife Expert on Conservation initiatives and measures.
- Awareness regarding indigenous trees and their benefits in Wildlife conservation
- Awareness through documentaries and shows in rural areas on successful conservation of species for implementation.

#### **Further Suggestions/recommendations:**

- By making provision of veterinary care and cages for injured or sick deformed birds and animals and reptiles.

### **Financial Projection**

#### **Introduction**

Protected areas and threatened species could most effectively be safeguarded if local people considered it in their own interest to do so. Working with rather than against local people has become a major working principle for IUCN. For the protection of habitat sensitive wildlife and other living form need proper action plan and budgetary allocation which will be a roadmap for the success of conservation scheme.

#### **Budgetary Provision**

For activities mentioned in Chapter 3 Section 3.5, budget has been proposed for the Schedule-I species (Table 10-14) conservation plan eg. Awareness programmes in the Community and Schools on Schedule-I species Conservation. Plantation programmes in the nearby villages, Public places, near waterbodies, etc.

These activities will be carried out with the consultation of the local forest department and Gram panchayat of respective villages. The total Budget for the Conservation plan is INR. 10,00,000 in five years.

#### **10.3.14 Rainwater Harvesting**

APL has installed a rainwater harvesting system to conserve rainwater and use it for various project activities whenever required. Rainwater harvesting is done in 02 storage tanks with a capacity of 8120 KL each. The harvested rainwater is used during the rainy season in various processes after necessary treatment.

The details of usage of rainwater in process in last three years is given in **Table 10-15**.

**Table 10-15: Yearwise Quantity of rainwater reused in process**

Sr. No.	During (Year)	Rain water reused in process (KL)
1.	2021-2022	5804
2.	2022-2023	4113
3.	2023-2024	5655

#### **10.3.15 Social Management Plan**

The social management plan proposes to improve the quality of life of inhabitants of potentially affected villages directly.

The goal is "a pollution free area with improved quality of life and empowered community" and the three key pillars on which this would be developed are – social, health, infrastructure improvements with efforts on minimal disruptions present life style and any ensuing negative impacts.

Social – Awareness on project benefits, Sex empowerment, increases livelihood opportunities during implementation of technical and social remediation plans and generating community participation.

Health - Awareness on health, hygiene, environmental sanitation and generic issues related to improving quality of life with specific emphasis on potable drinking water, HIV/AIDS/STI mitigation)

Infrastructure - Developing prioritized infrastructure facilities, which are related to the continuum of project benefits to the local communities and area.

### Implementation Arrangement

The social management plan and its activities will be implemented by NGO under the close supervision and monitoring of the CSR division of the company or any consultant appointed by the company.

### Monitoring and Evaluation

Two-time (Mid-term and after completion of the work) monitoring will be done by the third party appointed by the company.

### Environment Social Commitment

#### Existing CSR Activities

##### During FY 2023-2024

Theme	Intervention	Utilized Fund (INR)
Health	Nutrition Project	4,324,588
Health	SAFAR Programme for Truck Drivers	6,604,982
Health	Mobile Medical Unit	3,181,798
Water	Tree Plantation	1,720,020
Water	Construction of Canal Lining	26,362,052
Skilling	Upskilling the workers	7,795,622
<b>Total</b>		<b>49,989,062</b>

##### During FY 2022-2023

Theme	Intervention	Utilized Fund (INR)
Health	Nutrition Project	4,339,386
Health	SAFAR Programme for Truck Drivers	6,347,707
Health	Mobile Medical Unit	3,187,738
Health	Eye Care Programme	2,000,000
Water	Tree Plantation	3,643,563
Water	Rain Water Harvesting Structure Maintainance	857,030
Water	Construction of Canal Lining and Pond Rejuvenation	13,000,149
Skilling	Upskilling the workers	5,508,530
<b>Total</b>		<b>38,884,103</b>

##### During FY 2021-2022

Theme	Intervention	Utilized Fund (INR)
Health	Nutrition Project	464,625
Health	SAFAR Programme for Truck Drivers	4,844,115
Health	Donation of Mobile Health Van	1,933,195
Health	Mobile Medical Unit	2,641,726
Health	Infrastructure Development Kharwar PHC	1,476,847
Health	Supporting community member on welfare schemes	100,000
Water	Water Conservation & Sanitation with Sustainable MHM in Schools	1,498,200
Water	Rain Water Harvesting Structure Maintainance	953,512
Water	Construction of Canal Lining and Pond Rejuvenation	10,925,297

Theme	Intervention	Utilized Fund (INR)
Disaster Management	Covid Relief Fund	200,000
Skilling	Upskilling the workers	6,531,108
<b>Total</b>		<b>31,568,625</b>

**Photographs 10-2: Photographs of Existing CSR Activities**



**Corporate Environment Responsibility**

According to the CER office memorandum dated 25<sup>th</sup> February, 2021 CER budget will be included with EMP cost. Hence, the CER budget for 5 years comes to INR 0.9375 crores i.e. 0.75% of project cost INR 125 crores. However, the plant has already been investing a significant amount in CER projects in the past few years and will continue to do so in similar line.

**Table 10-16 : Budget for CER Activities for upcoming 5 years**

Sr. No.	Activity	Amount INR (Crore)
1	Water conservation projects	0.95
<b>Total</b>		<b>0.95</b>

\*The activities based on Focus Group Discussion. The upcoming CER Budget will be similar to the proposed thrust areas.

**Table 10-17: The amount released during 2021-2025 under CER**

Year	Thrust Area	Name of the project	Amount Released FY 21-25
2021-2022	Water	Canal channel lining in Kharawar & Baliyana villages (1833 RM)	1,09,25,297
2021-2022	Water	Maintenance of existing Rainwater Harvesting structures in FDDI, MDU and B. D. Sharma institute (209 structures)	9,53,512
2021-2022	Water	Water Conservation & Sanitation with Sustainable MHM in Schools	14,98,200
2021-2022	Disaster Management	Covid Fund	2,34,590
2022-2023	Water	Tree Plantation around Water Bodies and Public Places (2300 trees)	36,43,563.00
2022-2023	Water	RWH Maintenance - Rohtak 111 Nos (FDDI and PGIMS)	8,57,030.00

Year	Thrust Area	Name of the project	Amount Released FY 21-25
2022-2023	Water	Canal Lining Project 1500 Nonad and Pond Rejuvenation at Gandhara Village	1,30,00,149.00
2022-2023	Water	Govt. Scheme Linkages - Water	1,60,000
2023-2024	Water	Irrigation canal Lining, Nonand (2200 RM) and Chuliana (2350 RM)	2,63,62,052
2023-2024	Water	Maintenance of Tree Plantation	17,20,020.00
2024-2025	Water	Canal Lining Nonand (2000 RM), Kharwar (2000 RM), Chuliana (3620 RM)	3,51,06,927
2024-2025	Water	Maintenance of Tree Plantation	10,18,596
2024-2025	Water	Demand Side Interventions	32,03,703

**Note:** RM stands for Running Meters

## Conclusion

The social management plan therefore concentrates on mitigation of perceived impacts during the running of Port. The plan emphasises on health, hygiene, drinking water, Public infrastructure like (Community hall, Anganwadi) and girl's education issues and includes awareness generation amongst the community on fire hazard.

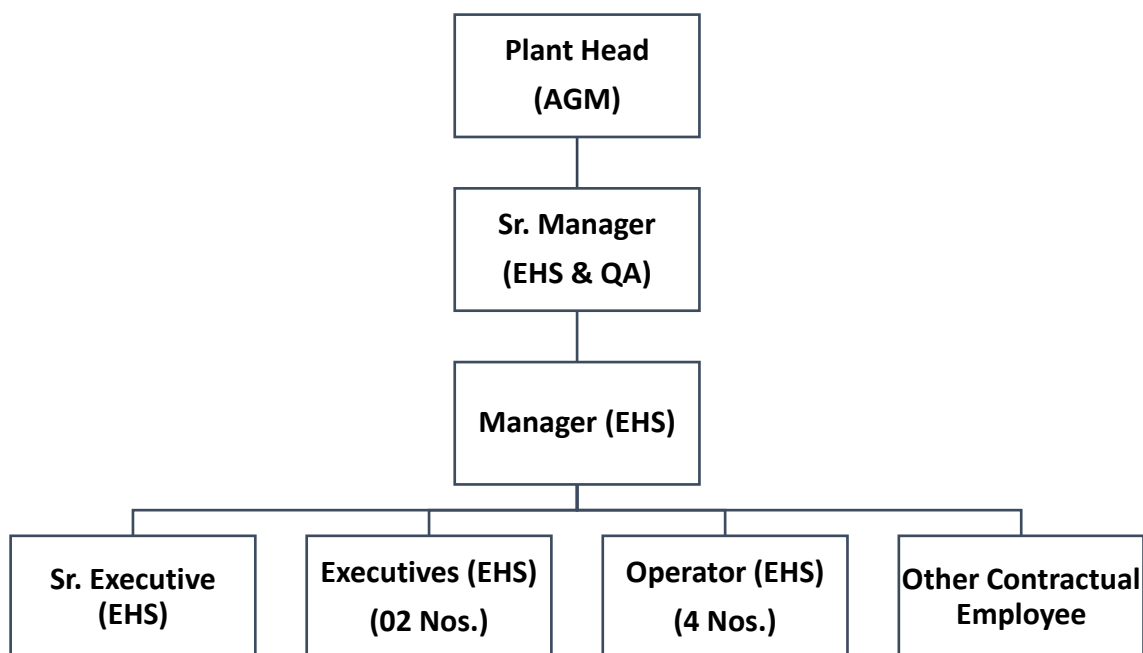
The SMP encourages community participation through formation of a Grievance Redressal Group to minimize and mitigate any grievance that may arise during the period of CSR projects implementation. An NGO would be appointed by the company to ensure community participation, mitigate potential adverse impacts and help in resolving any disputes and grievances that may arise. It would also engage in awareness programmes with community and encourage selected community members specifically the poorer sections and women to get employed in the Contractor's activities. This is expected to accrue several benefits - the Contractor would gain from local wisdom and knowledge and nuances that need to be taken care of and the community would get access to gainful employment closer to home.

Overall, the project would improve quality of life of the surrounding villages in study area.

## 10.4 Environment Management Cell

All the Environmental Issues pertaining to the organization are immediately highlighted by the Manager-EHS and Sr. Manager-Environment of the plant to the General Works Manager who in turn shares the details along with the necessary actions to be taken to the Sr. Manager -Environment of the Corporate office, Head of Manufacturing and Head of Supply Chain. Also regarding the compliance of the EC conditions, the compliance status of the plants is updated on the company's website

The organogram showing various members of the environment management cell are given in **Figure 10-1**

**Figure 10-1: Organogram of Plant Environment Management Cell****10.4.1 System of reporting of Non-compliance/ violation of environmental norms to the Board of Directors**

All the Environmental non-compliances/violations (if any) about the organization are compiled monthly and submitted to the Legal and the Corporate Secretarial cells which report directly to the Chief Financial Officer (CFO) who in turn reports to the Chief Executive Officer (CEO) and Managing Director (MD) of the company. The consolidated report on environmental issues is submitted and discussed in the board meeting quarterly. The Board of Directors also provides suggestions and feedback to proactively stay ahead of the regulatory requirements to avoid non-compliance. There is also an Internal Audit department for conducting non-commercial and statutory audits every year to proactively identify if there are any concerns and actions are taken immediately to address these concerns

**10.5 Expenditure on Environmental Matters**

The expenditure to be incurred by M/s. Asian Paints Limited on environmental matters is given in **Table 10-18**.

**Table 10-18: Expenditure on Environmental Matters**

S. No.	Head	Approximate Capital cost (INR, Lakhs)	Proposed CAPEX (INR, Lakhs)	Approximate recurring cost per annum (INR, lakhs)	Basis for cost estimates
1.	Air pollution control	Incinerator: <b>120</b> DG: <b>520</b> , Accessories DG: <b>130</b> Reverse Jet Filter: <b>600</b> Dust collector: <b>86</b> Scrubber System and Accessories: <b>100</b>	Dust Collector, RJF, Scrubber etc: <b>100</b>	Air Monitoring: <b>13</b> AMC: <b>10</b>	Capital Cost: include cost of proposed stack, ESP, Multi cyclone, bag filter, Tail gas absorber. Recurring cost: Manpower, Monitoring, operation of APCM
2.	Water pollution control	Effluent treatment plant construction: <b>900</b> RO: <b>200</b> MEE: <b>53</b>	Refurbishing: <b>50</b>	Operations: <b>25</b> Effluent Testings: <b>1.48</b> , OCEMS: <b>1.2</b>	Capital Cost: include cost of Proposed ETP including RO and MEE Augmentation cost,

S. No.	Head	Approximate Capital cost (INR, Lakhs)	Proposed CAPEX (INR, Lakhs)	Approximate recurring cost per annum (INR, lakhs)	Basis for cost estimates
		Wash water reuse projects and Scheme: <b>100</b>		Calibration, Manpower Cost: <b>40</b>	Recurring cost: Manpower, Chemical, Running cost, Monitoring cost
3.	Noise pollution	DG Acoustic Enclosure cost: <b>9.41</b>	Nil	Noise Monitoring: <b>3</b>	Capital Cost: Acoustic Enclosure cost, Recurring Cost: Cost of noise monitoring
4.	Solid and hazardous waste management	Membership Fees: <b>0.05</b> , Storage: <b>150</b>	Nil	Cost of Disposal: <b>75</b>	Capital Cost: 1) Membership fee of TSDF Site and CHWIF/Coprocessing, 2) Cost of Membership for Fly ash Disposal, 3) storage of hazardous waste, Recurring cost: Transportation cost, Disposal Cost
5.	Environment monitoring and management	As and when required	As and when required	As and when required	The recurring cost would be incurred on hiring of consultants and payment of various statutory fees to regulatory agencies.
6.	Green belt	Landscape Irrigation System: <b>24</b> , Landscaping, trees etc: <b>2100</b> (on basis cost 100rs/ft)	Proposed: <b>20</b>	Recurring plantation: <b>4</b> , Maintenance cost: <b>30</b>	Capital Cost: Proposed Greenbelt Development Cost, Recurring Cost: Greenbelt Maintenance cost
7.	Occupational Health & Safety	OHC Infra: <b>25</b> , O <sub>2</sub> Cylinder: <b>1.5</b> , Bp Instrument's, First Aid and other devices: <b>1</b> , Ambulance: <b>19</b> , AED MACHINE: <b>0.32</b> , Fire Safety Equipment's: <b>5</b>	Nil	Reoccurring cost: <b>81</b> Eq calibration: <b>0.3</b> Medical health Checkup: <b>18</b>	Capital Cost: Installation of OHC Building, examination table, O <sub>2</sub> Cylinder, BP Instruments, First Aid Box, Ambulance etc. For safety installation of PPEs, Fire Extinguisher, Fire Hydrant system (Pressure Boos up pump, Electric Operated pump & Diesel Operated Pumps, Lines, Hydrant monitor, sprinkler system, fire water tank) Detectors, Sensors, etc. Recurring Cost (per annum): Cost of Doctor & Nurses, Maintenance of medical equipment, Maintenance of safety measures
8.	CER Cost	<b>250</b>	95	19	0.75% of Total project cost will be utilized under heads such as Water conservation & other ecological conservation projects
<b>Total</b>		<b>5394.28</b>	<b>265</b>	<b>320.98</b>	



## 10.6 Occupational Health Management Plan & Fund Allocation

### Noise

Noise will be regularly monitored at plant boundary for checking compliance against environmental noise parameters as per CPCB norms. It will also be monitored near noise generating equipment to ensure that all noise generating equipment do not emit noise in excess of the statutory norms.

All workmen (including contract and casual workers) will be provided with required set of PPEs like ear plug, ear muff etc. where noise levels in excess of 80 dB (A) are regularly generated.

Preventive maintenance of noise generating equipment shall be regularly carried out to ensure that noise levels are minimized to the extent possible. To the extent feasible, equipment will be purchased considering noise generation as one of the parameters.

### Heat

The project does not envisage conditions that could lead to excess heating. Consequently, special requirements for protection against heat stress are not anticipated. However, the following shall be carried out:

- Ventilation shall be provided to take care of heat evacuation.
- Drinking water availability shall be ensured at several locations within the plant to ensure workers have easy access to the same.
- In case of occasional handling of heated equipment or materials, suitable PPEs such as heat resistant gloves will be used.

### Dust and other Chemicals being suspended in the Environment

The possibility of suspended particles going into the body of the workmen, either in the form of inhalation, ingestion or through skin absorption are least and negligible as because the entire operation at the plant will be performed under closed loop condition, right from charging till discharging, hence it's a rare possibility that the workmen will come in direct contact with raw material or final goods.

At the same time the level of SPM and RPM will definitely be of least and nominal value. But even though the same will be under close monitoring and periodic surveillance as per applicable legislations and any minor deviation from the same will be dealt immediately and will be corrected.

Further to this all of the workmen will be provided with complete set of appropriate PPEs, like nose mask / nose respirator, gloves, helmet, protective uniform and clothing, eye protections etc.

### Occupational Hazards Specific Pre-placement and Periodic Monitoring

As per policy and norms all of the workmen are put to medical examination and testing periodically and at set interval and based on the medical report actions are taken, if at all anything is necessary and required. Even based on the medical examination report/feedback, workmen are counselled and put in different area /job rotation kind of activities. Following are the periodic tests conducted by APL. Annual and Half-yearly medical check-up list is provided as **Annexure 21**.

- Lab investigations, like fasting blood sugar, post prandial blood sugar, urine routine
- Hematology profiles including, complete blood count, ESR, blood grouping and RH type,
- Lipid profiles including, Cholesterol, Triglycerides
- Liver Function Test including, SGOT, SGPT, Total Bilirubin, Direct Bilirubin, Total Protein, Albumin, A/G Ratio, AIKP GGT.
- Renal Function Tests including, BUN, Creatinine, Electrolytes, Uric Acid, Inorganic Phosphorus, Calcium,

- Non-Invasive Investigations including, Chest X-ray, ECG, ECHO, Pulmonary Function Test, USG Abdomen-Screening, Vision Test, Audiometry.

### Medical Facilities

Medical aid and services are available and to be pressed into service at short notice including action plan for medical management to deal with medical emergencies.

APL takes care about the health of their employees. It begins even before their joining the company. Besides comprehensive pre-employment medical examinations, periodical medical examination of all employees is carried out depending upon the nature of the job.

A full-fledged Occupational Health Center (OHC) is established at the site in accordance with Haryana Factories rules with the required services and facilities.

- The OHC is equipped with First Aid boxes, examination table, stretcher, Oxygen cylinder, resuscitator, B P apparatus bag, decontamination facility of syringes, needle burner, emergency tray, anti-snake bite medicine etc.
- The OHC is under the control of a qualified Medical Practitioner (FMO), who is assisted by qualified paramedical staff, to provide service on working days. The FMO visits Factory on daily and his service is readily available during the medical emergencies.
- First aid boxes are available at designated place in each section to attend first aid injury. The First aider team trained in First aid from recognized institute is available at the site in each shift to attend medical emergency.
- Ambulance is kept in readiness, with a standby driver available round the clock, in the event of an emergency.
- Medical Facilities provided inside the factory is sufficient in case of First Aid cases. Company takes services from outside medical facilities. An ambulance and other transport modes are available for reapid transfer of the victim(s) as & when required.

### Facilities/Activities at Medical Centre:

- First aid to victims
- Pre-employment medical examinations
- Record keeping
- Lifesaving drugs administration
- Periodical Medical Examination is carried out as per the state Factories Rules. The test parameters are
  - Pathological: CBC, Urine (routine & microscopic), Blood Sugar (Random), BUN (Renal test), SGPT (Liver test). X-ray: chest, audiometry, Vision test
  - Clinical examination by medical officer
- The equipment for Occupational Health Centre:
  - OHC at the factory is provided with all the necessary equipment as specified in the schedule.
- Safety showers and eye fountain
  - Safety showers and eye fountains are provided at strategic location in the plant area.
- Material Safety Data Sheet (MSDS):
  - MSDS of all raw materials are available at OHC for ready reference. Accordingly, antidotes shall be kept ready for emergency.

### Fund Allocation

The capital investment of INR 51.82 Lakh (OHC Infra, Ambulance, Medical Equipments, etc.). Additonal revenue expenditure for periodic Medical check-up of regular employees, pre-employment check-up of new joiners,

operational and maintenance cost for Occupational Health Centre (OHC), ambulance, etc. are estimated approx. INR 1.0 Crore.

## 10.7 Workplace monitoring protocol

### 10.7.1 Fugitive Emission

Fugitive emissions are unintentional release of process fluid from equipment. Any equipment that allows contact between process fluid and air (eg. Pumps, valves, and flanges) is a source of fugitive emissions.

The fugitive emissions from the solvents would be tested as per Factories Act, 1948 and the results would be incorporated into Form no. 37. The predicted source of fugitive emission will be from storage tanks and unloading lines.

### 10.7.2 Prevention and Control of Fugitive Air Emissions

To prevent fugitive emissions, documented procedures shall be developed and facilities shall implement good housekeeping and best environmental practices. These would, for example, include:

- Hoods and/or enclosure of process equipment,
- Use of covered or enclosed conveyors and transfer points, and
- Implementation of action plans to prevent fugitive emission.

### 10.7.3 Workplace Monitoring

Weekly VOC monitoring would be conducted by MoEFCC approved laboratory and six-monthly workplace VOC monitoring would be carried out to identify areas with VOC levels greater than the threshold limits. In case of any identified area appropriate controls would be put in to identify the reasons for VOC /fugitive emissions and rectify the same. Documentation of procedures for the monitoring and inspecting of emission control equipment will be developed. Details regarding workplace monitoring is provided in **Table 10-19** and Environmental monitoring is provided in **Table 10-20**. Workplace Monitoring reports are provided in **Annexure 18**.

**Table 10-19: Workplace Monitoring**

S. No	Workplace Monitoring	Unit	Report
1	RSPM	micro/m <sup>3</sup>	External MoEF Approved Lab
2	Organic solvents	micro/m <sup>3</sup>	External MoEF Approved Lab
3	Noise Level	db(A)	External MoEF Approved Lab
4	VOC	Ppm	VOC Meter

**Table 10-20: Environment Monitoring – Operation Phase**

Item	Location	Parameters	Frequency
DG set emissions	DG stacks	SPM, SO <sub>2</sub> , NO <sub>x</sub>	Once in a month /as per CTO requirements
DG set noise	At 1 m outside DG room	Noise level	As per CTO requirements
Stack Emission	At all the stacks	SPM, SO <sub>2</sub> , NO <sub>x</sub>	Once in a month /as per CTO requirements
ETP Performance	Inlet and Outlet	BOD, COD, TDS, TSS, Oil and Grease, Heavy metals, like Pb, Cd, Zn, Hg, Cr, As etc./ as per CTO requirements	Once in a month /as per CTO requirements
Ambient Air Quality	4 locations.	As per NAAQ standards	As per NAAQ standards/ as per CTO requirements
Ambient Noise	(Different locations within the plant premises)	Day and night equivalent noise level	Once in a season/ as per CTO requirements

#### 10.7.4 Work Zone Monitoring for Hazardous Chemicals

Work zone monitoring will be carried out by independent competent third party.

Records of internal work zone monitoring will be kept as per Form No. 37 Factory's Act. Location for samplings shall be identified.

Following information will be incorporated in the format for maintaining records of work zone monitoring:

Location/Operation monitored

- Identified contaminant
- Sampling instrument used
- Number of Samples
- Range of contaminant concentration as measured in sample
- Average concentration
- TWA concentration of contaminant (As given in Second Schedule of Factories Act)
- Reference method used for analysis
- Number of workers exposed at the location being monitored
- Signature of the person taking samples
- Other relevant details

#### 10.7.5 Arrangements for ensuring Health & Safety Of Workers engaged In Handling Of Toxic Materials

Company shall make various plans & arrangements to ensure health and safety of workers engaged in handling of toxic materials.

Summary of the same is as follows :

- Each workplace shall be evaluated and monitored.
- Unsafe Act & Unsafe Practices shall be identified.
- Unsafe equipment's, unsafe areas, etc., shall be identified.
- Area shall be checked for proper Ventilation and Illumination.
- Air-borne concentration of toxic chemicals shall be measured; mitigation measures shall be followed to keep them under PEL and the same will be documented.
- Periodic Medical check-up & Health evaluation shall be done.
- Adequate funds shall be allotted for the Health & Safety Management System

## 11 SUMMARY AND CONCLUSIONS

### 11.1 Introduction

M/s. Asian Paints Limited ('APL') has proposed expansion in the existing integrated paint manufacturing facility located at Plot No. 1 Sector 30-B, HSIIDC, IMT Rohtak Haryana. APL intends to optimize & utilize its existing facility to increase the overall production of water and solvent-based paints, Intermediates- resin & Polymer along with the production of putty.

As per the EIA Notification dated 14<sup>th</sup> September 2006 and subsequent amendments, the proposed project falls under Category "B", Project or Activity 5(h).

APL has Environmental Clearance for the existing facility vide letter no. SEIAA/HR/2012/286 dated 30<sup>th</sup> August, 2012. APL also has valid consent to operate (CTO) from HSPCB vide Consent order no.: "HSPCB/Consent: 313096423ROHCTO5463972" dated 22<sup>nd</sup> February 2023 valid up to 30<sup>th</sup> September 2027.

### 11.2 Project Description

#### 11.2.1 Project Location

The proposed expansion of the project will be implemented in the APL existing premises located at plot no. 1, Sector 30-B, HSIIDC, IMT Rohtak Haryana an integrated industrial unit for manufacturing of paint and intermediate products. The site is well connected with the Khedisadh, Rohtak, & other major cities.

Total plot area of the plant is 52.0 Ha. (523,198.00 m<sup>2</sup>). which is allotted by HSIIDC to APL for development of integrated paint manufacturing facility. The existing facility is already in operation and expansion will be within the existing area. No additional land is acquired for the proposed expansion. The current land use is Industrial.

Geographically the site is located at 28°52'25.75"N latitude and 76°40'23.30"E longitude.

Project site is located close to National Highway no. 352 which is further connected with NH-9 at 1.80 Km in south direction.

The site is at a distance of about 6.1 km from Kharwar railway station in SE direction & ~ 9.9 km from Asthal Bohar Junction in WSW direction. Nearest Airport from the project site is Indira Gandhi International Airport, which is 70 km in SE direction.

#### 11.2.2 Land Distribution at Site

Total plot area of the project is 523198 m<sup>2</sup>. Out of total plot area 34.9% i.e. 182,666.44m<sup>2</sup> area is developed as green belt area, Plant area is 23,114.72 m<sup>2</sup>, Open space will be 155,823.51 m<sup>2</sup> after expansion and road area is 101,691.80 m<sup>2</sup>.

#### 11.2.3 Production Capacity

The production capacity of the project for existing and after expansion is as given below:

S. No.	Name of Products	Production capacity					Remarks
		Unit	Existing quantity		Additional quantity	Total after expansion	
			As per EC	as per CTO			
1	Water based & Solvent based Paint	KL/ Annum	4,00,000	-	1,25,000	5,25,000	-

S. No.	Name of Products	Production capacity					Remarks
		Unit	Existing quantity		Additional quantity	Total after expansion	
			As per EC	as per CTO			
2	Intermediates	KL/ Annum	1,60,000	-	1,02,500	2,62,500	Intermediates will be mostly used inside the plant through pipelines in a closed loop. May be transferred to other facilities through road & rail, on need-basis
3	Putty	MT/ Annum	0	1,60,000	65,000	2,25,000	Non-EC Product. Existing quantity as per valid Consent to operate (CTO) issued by Haryana State Pollution Control Board
Total Proposed (Paint + Putty)						7,50,000	

#### 11.2.4 Cost of the Project

The existing facility is already in operation and capacity expansion will be within the existing area. The Existing cost of the project is INR 1111.82 Crore and estimated cost of proposed expansion is: INR 125 Crore, Total cost of the project is INR 1236.82 Crore.

#### 11.2.5 Technology and Process Description.

Type of paints shall be manufactured in the proposed unit are Water Based Paints, Solvent Based Paints, Resin & Putty. The manufacturing process description of each type of paints is as given below:

##### Water & Solvent Based Paints

Unlike several other chemical industries, the paint manufacturing process does not involve any chemical reactions and the operation are basically mechanical in nature. The complexity in the industry is at the stage of formulating the recipe of the product and selection of equipment and process to be used.

The actual manufacturing process consist of the following four stages:

- Pre- dispersion
- Dispersion
- Mixing & Tinting
- Packing

##### Alkyd Resin manufacturing

Synthetic resins of alkyd type are manufactured by chemical reaction of polyol, oil and polyacid in presence of catalyst and certain additives in thermic fluid heated reaction vessel. The reaction is monitored by checking temperature, viscosity, acid value and percent solids. Time required for reaction varies from 18 hrs to 48 hrs. this is followed by thinning in blender with solvent to the.

Desired percentage solids and filtration take place in a plate type pressure filter and after filtration the product is pumped in to storage tank.

##### Polymer Manufacturing

The following steps are involved in the production of Polymer

##### Preparation of Pre-polymer kettle

De-mineralized water is charged & stirring is started. The prepared surfactant solution along with monomer & catalyst is utilized for the preparation of Pre-polymer.

**Reactor charge:**

De-mineralized water is charged into the reactor at ~85-degree temperature. Charge surfactants followed by catalyst solution into the reactor. Charge X % of the prepared pre-polymer into the reactor. Additives if prescribed are added at this stage. The reactor temperature is raised (~78 degrees). Wetting is checked.

**Pre-Polymer addition:**

Prepared Pre-polymer is added to the reactor at a uniform rate utilizing a metering pump. Maintain the temperature at  $78 \pm 10$  degrees throughout the addition. Wetting is checked at every defined frequency of pre-polymer addition. After the addition of pre-polymer, the vessel is flushed with DM water.

**Digestion:**

DM water is added to the digestion catalyst & mixed well to form the solution. After the complete addition of monomer & flushing, the digestion catalyst solution is charged at a uniform rate. Digest the batch for the time specified as per formulation. Maintain a temperature of ~80 degrees during digestion.

**In-process check:**

The polymer sample is taken out, cooled to room temperature, neutralized, and strained through adequate-sized mesh. A film is drawn on a clean glass plate using a 150-micron applicator and observed for the absence of cissing. If cissing is observed digestion is continued till the film is cissing free. % Non-volatiles are checked at the end of digestion.

**Discharge:**

Batch is cooled down (50-70 degrees). It is discharged to a Let Down Vessel (LDV). After complete transfer flushing of the reactor is done with DM water.

**Addition of additives:** LDV Additives are added in LDV below 50 degrees. Additives include biocide, defoamer & pH adjuster. It is ensured that pH is within 8.5 – 9.5.

**Preparation of PVA solution:**

Take water into the separate vessel equipped with an agitator and heat it to 70 °C. Add PVA granules slowly into the hot water under continuous stirring to form a homogenous mixture and filter the solution.

**Blending of emulsion and PVA solution (Spray feed liquid):**

Take emulsion in feed vessel with agitator and add emulsion into it. Start stirring with an agitator and add PVA solution slowly into the vessel under constant stirring.

**Spray Drying:**

Feed the feed tank material into the spray dryer and evaporate the water by heating the spray mix with hot air. Dry powder needs to be collected through the cyclone separator and packed in bags.

**11.2.6 Manpower Requirement**

The proposed expansion will generate direct & indirect employment opportunities during the Construction Phase as well as in the operation phase during the construction phase temporary workers/In-direct Employment will be around 1500 Mandays and during the operation phase of the project existing permanent workers/Direct employees are 420 Nos and for proposed expansion 10 nos. of persons will be hired thus after expansion total employees will be 430 persons.



Existing temporary workers/In-direct Employment are 735 Nos and for the proposed expansion: 50 persons will be hired thus, the total temporary workers/In-direct Employment after expansion will be 785 persons.

#### **11.2.7 Power/Energy Requirement**

Power will be supplied from Uttar Haryana Bijlee Vitran Nigam Ltd (UHBVNL). Power requirement details are as follows:

**Power requirement:** 8MW.

**Power backup:** Existing DG sets: 2 x 1010 KVA; 2 x 2000 KVA, (Tertiary Source of power) GG; 2 x 2875 KVA, (Secondary Source of Power) Proposed additional GG; 3 x 2875 KVA (Secondary Source of Power) capacity during power failure & emergency use.

#### **11.2.8 Water Requirement, Wastewater Generation & Management Details**

##### **Water Requirement**

Existing permission for Fresh water supply by HSIIDC: 1312 KLD.

Fresh Water requirement: Existing- 1312 KLD Proposed 638 KLD Total after Expansion 1950 KLD.

Recycled water Existing 140 KLD.

Recycled water proposed: 178 KLD.

##### **Wastewater Treatment Facility (ETP)**

During paint manufacturing process, various effluent streams will be generated at various sources viz., effluent streams are generated from manufacturing of water based paint, Putty & Water Based Polymer/ Emulsions, during activities such as cleaning of mixers, cleaning of reactor and blender, during calibration of vessels, cleaning of barrels and containers. The various process water and washing streams along with utilities blow downs, regeneration and backwash water is treated combined in proposed ETP consisting of primary, secondary and tertiary treatment.

The domestic waste water i.e. sewage water from various blocks such as administration building, canteens, toilets & washrooms for truck drivers & cleaners etc. is treated in ETP.

#### **11.2.9 Fuel Consumption**

Existing: HSD for DG sets @196.67 LPH for 1000 KVA and 392.08 LPH for 2000 KVA DG set; PNG for GG 392.08 LPH for 2875 KVA GG set.

Proposed additional GG: 3 x 2875 KVA, PNG 392.083 LPH for each.

#### **11.2.10 Air Emission**

##### **Point Source emission and control**

Existing Point source emission of pollutants into air from the project are flue gas stacks attached to boilers, DG & GG sets of different capacities and various process vent. Likely air pollutants of VOCs and PM from process vents and PM, SO<sub>x</sub>, NO<sub>x</sub> from flue gas stack. The flue & process stack emissions are being maintained as per HSPCB/CPCB norms. There will no addition of Boiler and DG set in Proposed Expansion only 3 Nos. of GG (2875 KVA x 3 nos.) are proposed for Secondary Source of power. Only to be used as and when required, in case of grid failure.

**Line source emission (fugitive emission)**

Line source emission from the proposed expansion project will be fugitive emissions due to vehicular movement for transportation. There are negligible fugitive emissions at plant premises due to vehicular movement for transportation of raw materials & products. Vehicular emissions ( $PM_{10}$ ,  $PM_{2.5}$ ,  $NO_x$ , CO & HC) from the exhaust of vehicles is envisaged.

During construction phase, emissions will be from use of construction machinery and transportation of vehicles. Apart from it, application of heavy machinery and earth movers will generate emissions.

Suitable dust suppression techniques such as water sprinkling will be taken at these times as relevant.

**Emission control measures from emergency backup DG sets, Boilers & GG**

- The control of air pollution from stacks of diesel generators, steam boilers, are provided with adequate stack height to attain maximum dispersion of flue gases containing SPM,  $SO_2$ ,  $NO_x$  and CO.

**Emission control from Process gas stacks/ Vents**

- Process Stacks/vents with height of 3 m above roof top level will be provided.
- Necessary APCMs to control of air emission of pollutants VOCs/Hydrocarbons from process stacks/vents will be provided in respective blocks i.e. counter current wet scrubber in water based block, two stage activated carbon bed scrubber in solvent based block, Vent condenser & two stage activated carbon bed scrubber in Resin block and counter Current Wet Scrubber cum Two Stage Activated Carbon Bed Scrubber in Emulsion blocks.
- To control PM emissions, Cartridge/ bag filters - reverse flow pulse cleaning will be attached to dust collector in bulk powder handling area and bag filter/reverse jet filter will be attached to dust collector with silos.
- Apart from these, APL will carry out ambient air quality & stack monitoring on regular basis to ensure that there will be no emission that exceed the prescribed standard limits of regulatory authorities.
- Ambient air quality monitoring for fugitive emissions (total dust emissions) at different work zone areas of the plant will also be carried out regularly.

**11.2.11 Noise generation**

Sources of noise generation will be from plant machinery i.e. pumps, boilers, GG and DG set, scrubber, Dust Collector etc during operation phase. Vehicle movement for transportation of materials and work force during construction as well as operation phase.

**11.2.12 Solid and Hazardous Waste Management**

The Solid/Hazardous waste is collected and temporarily stored in Hazardous waste storage area as per hazardous waste rules within the plant premises. Area of hazardous waste storage is 970.95 m<sup>2</sup> within the plant in line with Hazardous Waste Management Rules. The Solid/Hazardous waste is properly handled in closed containers/ drums/ HDPE bags with proper PPEs ensuring safety of the individuals working with the solid waste handling.

Hazardous waste is categorized as per Hazardous and other wastes (Management and Transboundary movement) Rules, 2016. Hazardous waste generating from the project such as used/spent oil, spent solvent and discarded container/drums are sold to authorised recycler, whereas ETP sludge, waste oil from ETP trap (skimming residue), solvent recovery residue/distillation sludge, process waste & residue, filter residue, cotton waste/contaminated liner are sent to CHW-TSDF.

Non-hazardous wastes such as wooden scrap, plastic bags, paper bags, MS scrap, miscellaneous garbage, gunny bags generating from the project are collected, stored at scrap yard area in the plant premises and sold to authorized vendors. organic wastes and other biodegradable wastes is being sent for vermicomposting at present. .

Manure to be generated from bio-composting will be used for gardening within project premises for gardening purposes and excess manure will be given to farmers.

Very small quantity of waste comprises of discarded medicines, solid waste such as dressing, bandages and material contaminated with blood is generated from Occupational Health Centre and periodically handed over to nearest authorized vendors as per SPCB regulations and Bio-Medical Waste Management Rules, 2016. Bio-medical waste is disposed at nearest common biomedical waste management facility S.D. Bio-medical Waste Management Co., Rohtak.

E-Waste comprises of discarded computers, copiers, fax machines, inverters, cell phones, CD's, LAN Cables, Keyboards, Mouse, SMPS, Fuses, Data cables, mobile/laptop peripherals like earphones, chargers, circuit boards, printer cartridges etc. is mainly generated from the computer lab and administrative buildings. E-wastes will be disposed as per the provisions of the E-Wastes (Management and Handling) Rules, 2016 and till amendment.

#### **11.2.13 Fire-Fighting System**

Fire-Fighting System has been provided in handling and storage of raw materials and products, process area, fuel storage area, ETP area, admin building, laboratories etc. The system comprises Fire pump house, Fixed firefighting system, Portable fire extinguisher, Foam dumping system, Sprinkler system, Fire Alarm System, Fire Alarm System

#### **11.2.14 Greenbelt**

The proposed expansion will be done with in the existing plot area. The existing total area of the plot is 129.27 Acres out of which approx. 42.65 acres i.e. 1,82,666.44 m<sup>2</sup> area is already developed as green belt, which cover approx. >33% of total plot area. No Additional green belt area is proposed for the proposed expansion

#### **11.2.15 Rainwater Harvesting System**

The site has existing rain water harvesting facility in the form of run-off collection in 02 nos. of artificial pond for storm water and roof-top water. The site is utilizing rain water for various activities such as gardening, domestic, etc.

#### **11.2.16 Concept of Waste-Minimization, Recycle/Reuse/Recover Techniques, Energy Conservation & Natural Resource Conservation**

The following hierarchy is being followed for waste management with an ultimate aim of "Zero Waste":

- Resource conservation
- Elimination of waste streams
- Minimizing waste
- Reuse of wastes
- Recycle of wastes
- Treatment and disposal for making wastes harmless.

The followings are the measure to conserve the freshwater usage:

- The manufacturing facility will be zero liquid discharge plant.
- The treated effluent from the ETP will be recycled and reused in process within plant premises.

#### **11.2.17 Action Plan for Odour Control**

Following measures will be followed to control odour:

- Raw material and finished goods will be transferred and processed/stored into closed system, there will be no expose of the raw materials and finished good into the atmosphere air.
- Scrubber system will be provided to evacuate and adsorption of the odour/vapours/fumes of the chemical generates during the reaction process, handling and storage of raw material and finished goods.

- Green belt development inside the periphery of the plant, open area and also along the road area. It helps to reduce the concentration of pollutant in the ambient air and source emissions.
- Covering the water supply, pipelines, roads storm water drainage, sewerage, temporary waste storage facility, treated wastewater disposal (land/sewer/surface water bodies), common facility etc.
- Gas detector in storage & process area to detect the leakage of gases.
- Adequate stack height to disperse the release odour into the atmosphere.

#### 11.2.18 Assessment of New & untested technology

Latest and updated technology will be used for proposed expansion.

### 11.3 Description of Environment

The baseline environmental quality was assessed through field studies within the impact zone as well as collection of secondary data for various components of the environment viz. land, air, noise, water, ecological environment and socio-economic environment with specific reference to environmental aspects, which may have a bearing on the impacts of the proposed project. The methodology for conducting the baseline environmental survey obtained from the guidelines given in the EIA Manual of the MoEFCC.

Baseline information with respect to air, noise, soil and water quality in the study area was collected by conducting Study area survey, secondary data collection, primary data collection which includes sampling/field studies.

Field monitoring for meteorological conditions, ambient air quality, water quality, noise quality, soil quality etc. has been carried out, which constitutes major portion of the baseline environmental studies. In addition to these important parameters, certain aspects like land use, socio-economic studies, ecological & biodiversity studies etc. are covered during the study period. This information is based on secondary information sources and constitutes remaining part of the baseline environmental studies. The entire data has been collected through actual physical surveys and observations, literature surveys, interaction with locals, government agencies and departments.

#### 11.3.1 Study Area & Study Period

The study area is considered to be area within 10 km radius of the project site. The baseline environmental quality was assessed by Kadam Environmental Consultants from 2<sup>nd</sup> February 2023 to 10<sup>th</sup> May 2023.

#### 11.3.2 Land Use and Land Cover

##### Residential / Commercial

The built-up area covers ~12% of the total study area. Rohtak is the major city located in the study area. The urbanization is observed in the form of various plotting schemes, apartments, etc. The study area also covers major roads such as NA-10, NH-71, NH-71A and SH-18 (State Highway).

Baliana, Karauntha, Kiloi Dopana, Kheri Sadh, Pakasma, etc. are major villages located within the study area.

##### Industrial Area

The level of class covers 0.67% of the total study area.

Nearby situated industries are; M/s. Tata Steel Recycling, M/s. Aarti Greentech Limited, M/s. Maruti Suzuki India Limited R&D Plant, M/s. OM Enterprises, M/s. Enrich Agro Food Products, M/s. Mohindra Fasteners Limited, etc. as listed under **Table 2-3**.

The details of industries located in the study area can also be referred from:

- Brief Industrial Profile of District Rohtak and Jhajjar, Government of India:  
(a) [https://dcmsme.gov.in/old/dips/har\\_rohtak.pdf](https://dcmsme.gov.in/old/dips/har_rohtak.pdf)

- (b) <https://dcmsme.gov.in/old/dips/jhajjar.pdf>
- Haryana State Industrial & Infrastructure Development Corporation Limited:
  - (a) <https://hsiidc.org.in/activities-and-services/infrastructure-development-industrial-estates>

## **Agricultural Land**

### **Crop Land / Fallow Land**

The crops cultivated particularly in this area are wheat, gram, rice, bajra, rapeseed mustard, sugarcane, etc. The irrigation is essentially through canal and tube-well.

This class is dominating the study area by 71.89% (i.e. 24707 hectare) of the total study area.

### **Plantation**

The level of class covers 0.094% and mostly observed plantation of eucalyptus, mango, etc.

## **Water Bodies**

### **Reservoir / Lakes / Ponds / Tanks**

The level of class covers 1.538% of the study area. During ground truth survey in the month of April, nearby water bodies were observed fill with water. The major water bodies are Deswal Lake, Dhokar Pond, Tilyar Lake, etc. Besides various water bodies are located in the study area. It is observed that most of the water bodies are connected with the village domestic effluent.

### **River / Stream / Drain**

The level of this class covers 0.001% of total study area. Major drains such as Pakasma drain, Gandhra drain; minor drains such as Rurki, Asan are located in the study area. All the drains in the study area are elongated.

### **Canal**

The level of class covers 0.357% of the study area. It covers Jawaharlal Nehru Canal (Rohtak to Sonipat), W.Y.C. (Bhalot Sub-Branch) and their distributaries.

## **Vegetation Cover**

The level of class covers the study area by 10.46% of vegetation cover.

Mostly the species of Neem (*Azadirachta indica*), Banyan (*Ficus benghalensis*), Pipal, Baval (*Prosopis juliflora*), etc. were observed in the study area. The sub-class of scrub covers 7.181%, whereas sub-class of open vegetation covers 3.171% and sub-class of dense vegetation covers 0.111% of land.

## **Waste Land**

### **Land without Scrub**

The class land without scrub has 2.996% of the study area.

### **Others**

Aquatic Culture near Village of Kehrawar, Makrouli Minor and Rohtak. The level of this class covers 0.088% of the study area.

### 11.3.3 Meteorology/Climatology

Site Specific Meteorological data shows that:

- Average Temperature recorded as 23.3°C with maximum temperature recorded as 41.0°C and Minimum of 5.5°C.
- Average relative humidity was 39.96% with maximum Humidity as 95.6 and Minimum of 9.2%
- Wind blows predominantly from East followed by NW direction and West direction.
- Average wind speed was recorded 2.71m/s, Maximum wind speed of 9.7 m/s and minimum of 0.0 m/s

Parameter	Unit	1st January, 2023 to 31st May, 2023		
		Maximum	Minimum	Average
Temperature	°C	41.0	5.5	23.3
Humidity	%	95.6	9.2	39.96
Wind Speed	m/s	9.7	0.0	2.71
Cloud Cover	Tenth	1.8	0.8	1.2
Rainfall	mm	5.3	0	0.01
Predominant	-	1st	2nd	3rd
Wind Direction	Blowing From	NW	W	E

### 11.3.4 Ambient Air Quality

Ambient air monitoring was carried out at 9 locations in the study area. Details of AAQ monitoring locations are presented as follows:

S. No.	Code No.	AAQM Station	Latitude	Longitude	Justification
1	AA 01	At site	28°52'6.63"N	76°40'31.12"E	Base Station
2	AA 02	Bohar village	28°53'23.04"N	76°38'52.83"E	1st Upwind
3	AA 03	Gandhra village	28°49'47.18"N	76°43'25.75"E	2nd Downwind
4	AA 04	Sector-28, Rohtak	28°52'13.04"N	76°37'47.31"E	3rd upwind
5	AA 05	Paksma village	28°52'11.09"N	76°44'14.71"E	1st Downwind
6	AA 06	Garhi Bohar village	28°51'46.93"N	76°39'53.38"E	Crosswind
7	AA 07	Baliana village	28°52'35.07"N	76°41'5.82"E	Crosswind
8	AA 08	Ladhaut Bhaiyanpur	28°56'18.28"N	76°40'12.14"E	1st Upwind
9	AA 09	Chuliana village	28°53'56.81"N	76°42'31.20"E	2nd Downwind

The comparison of the results with the value range indicators NAAQ standards 2009 provided by CPCB for Industrial, Residential, Rural & Other Area indicates:

The comparison of the results with the value range indicators NAAQ standards 2009 provided by CPCB for Industrial, Residential, Rural & Other Area indicates:

- At various locations, average concentration of PM<sub>10</sub> was observed varying from 72 to 92 µg/m<sup>3</sup>. Average concentration of PM<sub>10</sub> levels are within the permissible limits at all locations.
- Average concentration of PM<sub>2.5</sub> levels was observed in range of 21 to 30 µg/m<sup>3</sup>, which is less than the permissible limits for all locations.
- Average concentration of SO<sub>2</sub> levels was observed in the range of 7.8 to 9.3 µg/m<sup>3</sup>, which is within the specified limit of CPCB.
- NO<sub>x</sub> levels were observed in the range of 11.4 to 16.9 µg/m<sup>3</sup>, which is within the specified limit of CPCB.
- Concentration of VOC level was observed to be below detectable level i.e. < 1.0 µg/m<sup>3</sup>.
- Average concentration of HC was found in the range of 955 to 1033 µg/m<sup>3</sup>.
- Average concentration of CO level was noted in the range of 1.01 – 1.12 mg/m<sup>3</sup>

### 11.3.5 Noise Quality

Noise levels were recorded at eight (8) different locations at and in the vicinity of the proposed site. The details of ambient noise monitoring along with the results are presented in the following table.

Loc. Code	Location	Date	Category	CPCB Limits in dB (A)		Avg. Noise levels in dB (A)	
				Day Time	Night Time	Day Time	Night Time
NL01	At Site	02/02/2023	Industrial	75.0	70.0	59.8	56.7
NL02	At Site	03/02/2023	Industrial	75.0	70.0	64.1	57.8
NL03	At Site	03/02/2023	Industrial	75.0	70.0	65.2	55.2
NL04	At Site	03/02/2023	Industrial	75.0	70.0	56.7	48.9
NL05	At Site	12/06/2023	Industrial	75.0	70.0	65.5	59.7
NL06	At Site	03/06/2023	Industrial	55.0	45.0	54.1	44.2
NL07	Baliana	02/02/2023	Residential	55.0	45.0	53.7	43.1
NL08	Kheri Sadh	17/03/2023	Residential	55.0	45.0	54.1	44.3

Noise level during daytime & nighttime, in Industrial area and Residential area was observed within CPCB standards i.e. Industrial area (75 dBA (d) & 70 dBA (n)) and Residential area (55 dBA (d) & 45 dBA (n)).

### 11.3.6 Surface Water Quality

Total 08 no's of Surface water sampling locations were selected to assess the surface water quality. The details of surface water sampling locations are presented in below table.

Sampling Code	Location	Source	Latitude	Longitude
SW01	Bauwara Vill	Pond	28° 53' 03.24" N	76° 41' 09.18" E
SW02	Kheri Sadh Village	Pond	28° 51' 43.00" N	76° 40' 14.18" E
SW03	Tilyar lake	Lake	28° 52' 46.25" N	76° 38' 10.51" E
SW04	Kharawar Village	Pond	28° 50' 09.29" N	76° 41' 01.99" E
SW05	Bhluat Village	Pond	28° 54' 09.10" N	76° 41' 58.03" E
SW06	Sector 33 Rohtak	Pond	28° 53' 45.54" N	76° 39' 37.58" E
SW07	Omaxe city	canal	28° 52' 06.52" N	76° 37' 34.27" E
SW08	Pakasma Village	Pond	28° 52' 29.61" N	76° 44' 6.38" E

### Observations of Surface Water Quality Analysis

The baseline quality of surface water based on the results of the surface water quality monitoring within the study area, it is observed that;

As per Inland surface water classification, the quality of surface water of locations SW01, SW02, SW04 SW05, SW06 and SW08 falls in Class E, as they have very low DO values, high TDS, Electrical Conductivity, Chlorides and Ammonical Nitrogen content. So, it can be used for irrigation and industrial cooling purposes. The quality of surface water of locations SW03, falls in Class E, as they have slightly higher BOD and Ammonical Nitrogen content. So, it can be for irrigation and industrial cooling purposes. The quality of surface water of locations SW07 is classified as canal and falls in Class B, as it has slightly higher coliform content than Class A. Because of which, it can be used in outdoor bathing purposes.

### 11.3.7 Geology and Hydrogeology

#### Physiography

The effects of desertification and presence of stabilised and semi-stabilised dunes is also observed in SW part of study area. There exists local depressions, paleochannels, lakes/ponds, etc. Overall it represents a flat terrain.



## Drainage

As per *Basin Atlas of India*<sup>30</sup>, the study area falls in Yamuna Upper Sub-Basin which is a part of Ganga Basin.

The study area falls in command area of Jawahar Lal Nehru Canal, Western Yamuna Canal (W.Y.C.) Bhalaut Sub-Branch and other distributary canals.

## Topography

Based on Google Earth Engine (GEE), the study area elevation levels vary between ~237 to ~253m above mean sea level. The northern part of the study area is elevated as compared to the southern part. The elevation profile anticipated towards ESE/SE/SSE from NW/NNW/North.

## Geology

As per Geological Survey of India (GSI), the entire district is covered by Quaternary sediments. These sediments are classified into Older Alluvium and Aeolian sediments. The study area is occupied by Indo-Gangetic alluvial plain of Quaternary Age of older alluvium and aeolian sediments. The alluvium formations is comprises of clay, silt, sand, kankar, *31murrans*, gravels, etc.

## Hydrogeology

As per studies carried out by Central Ground Water Board (CGWB), it reveals that clay group of formations dominate over the sand group in the area. Borehole drilled in the district were abandoned either due to bad quality of water or poor discharge. As per well-inventory study, manual drilling and rotary-rig machine techniques are utilized in borehole drilling activity since the area is underlain by thick alluvium deposits. Deep tube-wells are not planned out due to increase in salinity with depth. Water logging is one of the main reason for deterioration of ground water quality.

## Ground Water Environment

On the basis of standard ToR, the suggested nos. of sampling are 09 within 10 km radial distance from the project site and sampling details are given in below table.

Sample ID	Location	Source	Date of Sampling	Co-ordinates	Total Depth (m bgs)	Water-Level (m bgs)	Considered from Gate No. 1, APL, Rohtak		Sampling Rational
							Distance (Km)	Direction	
GW 1	Baliana	Hand-pump	08-05-2023	28°52'30.91"N 76°41'35.41"E	9-10	7	1.70	NE	To check ground water quality within study area
GW 2	Baliana	Hand-pump	08-05-2023	28°52'43.04"N 76°41'25.51"E	7	5-6	1.69	NE	
GW 3	Kheri Sadh	Hand-pump	08-05-2023	28°51'34.51"N 76°40'00.22"E	8	6	1.45	SSW	
GW 4	Bhalot	Tube-well	08-05-2023	28°54'09.32"N 76°42'14.71"E	12	6-7	4.57	NNE	
GW 5	Nunond	Tube-well	08-05-2023	28°50'55.03"N 76°42'54.99"E	7	5-6	4.32	SE	
GW 6	Kehrawar	Tube-well	08-05-2023	28°50'07.79"N 76°41'12.94"E	9-10	7	3.80	SSE	
GW 7	Bohar	Tube-well	08-05-2023	28°53'39.08"N 76°39'16.43"E	6	4-4.5	3.59	NW	

<sup>30</sup> Source: <https://india.wris.gov.in/wris/#/Basin>

<sup>31</sup> Murram is a calcareous material

Sample ID	Location	Source	Date of Sampling	Co-ordinates	Total Depth (m bgs)	Water-Level (m bgs)	Considered from Gate No. 1, APL, Rohtak		Sampling Rational
							Distance (Km)	Direction	
GW 8	Pahrawar	Tube-well	08-05-2023	28°50'49.88"N 76°37'54.23"E	12	8-8.5	5.05	SW	
GW 9	Asthal Bohar	Hand-pump	04-04-2024	28°52'25.99"N 76°38'43.84"E	NA	NA	3.16	WNW	

### Key Findings:

The water samples were collected and analysed for different parameters observation and key findings for some important parameters are as follows:

- The TDS content in groundwater is varying from 456 mg/ltr (At Bohar – 5488 mg/ltr (At Paharwar) TDS found well within the prescribed limit at all the location except GW8 (At Paharwar).
- Total hardness found above the permissible limit at all the sampling location except GW3 and GW7 (At Kherisadh and Bohar) and found in the range of 220 mg/ltr (At Kherisadh) to 4100 mg/ltr (At Paharwar).
- Chlorides ranges from 102 mg/ltr (At Kherisadh) – 1374 mg/ltr (At Paharwar), chloride was found well within the permissible limit at all the location except GW8 (At Paharwar).
- Magnesium ranges from 170 mg/ltr (At Kherisadh) – 3480 mg/ltr (At Paharwar).
- The presence of Nitrogen found in ground water samples and at places are above the desirable limit and this could be due to by-product of organic compounds, septic system and animal manure, agriculture waste.
- Fecal coliforms and total coliforms both are not detected in all the samples collected.
- All the heavy metals found within the prescribed limit.

### 11.3.8 Soil Quality

On the basis of standard ToR, the suggested nos. of sampling are 08 within 10 km radial distance from the project site. Details of sampling locations are given in below table.

Code	Sampling location name	Latitude (N)	Longitude (E)
ST01	Nr. project site	28°52'30.10"N	76°41'08.64"E
ST02	Baliana	28°52'43.15"N	76°41'24.21"E
ST03	Kherisad Village	28°51'43.63"N	76°40'11.37"E
ST04	Bhaluat Village	28°54'17.92"N	76°41'58.57"E
ST05	Nonand Village	28°50'54.62"N	76°42'54.42"E
ST06	Kharawar Village	28°50'14.26"N	76°41'03.00"E
ST07	Bohar Village	28°53'45.78"N	76°39'30.31"E
ST08	Pahrawar Village	28°50'50.87"N	76°37'54.99"E

### Observations on Soil Quality

The analysis of physicochemical properties of soil samples collected from surrounding area indicated that porosity ranged from 48 – 61 % and WHC varied from 42.07 – 52.60 %, while permeability ranged from 12.17 – 23.90 mm/hr. The highest porosity and WHC and the moderately low permeability was on account of sandy loam to clay loam texture of soils. The EC (0.567 – 4.420 dS/m) was low (<0.80 dS/m) to high (>4.420 ds/m) and ESP (<0.01) was well within the safe limits of 15. Soil pH (6.40 – 7.67) was near neutral (pH 6.65 - 7.8). Among water soluble cations predominance of Mg (6.24 – 10.04 meq/100 g) was seen followed by Ca (8.74 – 11.30 meq/100 g), Na (0.84 – 1.53 meq/100 g) and K (0.06 - 0.23 meq/100 g). Soil fertility data indicate that soils were low (<0.50 % OC) in organic carbon (0.42 – 0.48 %), which indicate that soils are low in nitrogen status.

### Soil Quality Interpretation:

Soils in the surrounding areas are having sandy loam to clay loam texture having moderately low permeability and non-saline to highly saline, but not-sodic. However, at site salinity is moderate. Soil should be monitored for EC, pH and ESP post monsoon in a greenbelt area.

### 11.3.9 Ecology and Biodiversity

A field study for biodiversity survey was carried out to understand biodiversity status during the month of March & July 2024. Standard methodologies were followed to assess biodiversity of project area. Status of trees, herbs, shrubs, grasses, climbers, herpetofauna, avifauna and mammals were assessed in the project study area.

Core zone of the proposed expansion project of 5,23,198 m<sup>2</sup> (i.e. 129.28 Acres i.e. or 52.31 Hectare) is situated at Plot No. 1, Sector-30B, HSIIDC, IMT Rohtak Haryana. A total number of 133 plant species are present at the project site comprising 64 tree, 13 shrubs, 51 herbs and 05 climbers. While in buffer zone, overall 187 species were reported from buffer zone of the proposed site, out of which maximum species of trees (85) followed by herbs (55), shrubs (24), grasses (12) and climbers (11).

The main agriculture crop in the study area is Wheat, Paddy, Jawar, Bajra, Mustard and Sugarcane.

Among reported floral species some of the plants are used for medicinal purposes includes *Aegle marmelos*, *Datura metal*, *Mangifera indica*, *Moringa oleifera*, *Pongamia pinnata*, and *Ricinus communis* etc.

Among faunal species, no mammals were observed from the project site during the study. A total of 42 species were reported from the project site which includes i.e. 1 species of reptiles, 26 species of birds, 1 species of amphibian, 8 species of butterflies and 6 species of insects.

In buffer zone, a total of 101 species were reported based on field observations and consultation with local people including 12 species of mammals, 8 species of reptiles, 3 species of amphibians, 62 species of birds, 10 species of butterflies and, 6 species of other insect during the site visit.

Some Schedule-I species are present in 10 km study area. In core zone / project site, no any threatened species was reported during survey. However, two species i.e. Shikra (*Accipiter badius*) and Indian Peafowl (*Pavo cristatus*) were reported under Schedule I of Wildlife (Protection) Amendment Act, 2022 (as mentioned in Rapid Biodiversity Assessment Report for Asian Paints, Rohtak).

From the buffer zone, total 2 species were reported under threatened category of IUCN Redlist including Red Sand Boa (*Eryx johnii*) and Black-headed Ibis (*Threskiornis melanocephalus*). 11 species were classified under schedule I of Indian Wildlife (Protection) Amendment Act, 2022 such as Golden Jackal (*Canis aureus*), Indian Grey Wolf (*Canis lupus pallipes*), Indian Grey Mongoose (*Herpestes edwardsii*), Indian Fox (*Vulpes bengalensis*), Red Sand Boa (*Eryx johnii*), Indian Cobra (*Naja naja*), Oriental Rat Snake (*Ptyas mucosa*), Chequered Keelback (*Fowlea piscator*), Shikra (*Accipiter badius*), Indian Peafowl (*Pavo cristatus*) and Black-Headed Ibis (*Threskiornis melanocephalus*).

Conservation plan for these Schedule I species is being prepared and will be submitted separately. Among floral species, no threatened species was reported during site visit. No mangrove species is report within the study area.

### 11.3.10 Socio-Economic Environment

The statistics regarding the human population and the number of dwelling units of villages in the study area indicates that there are 32 villages, Census town 01 and 01 Municipal Corporation in the study area.

There are total 1,05,443 households are covering 5,29,546 persons in the Study area with male population of 2,82,329 and female population of 2,47,217 indicating a sex ratio of 876 and household size of average 05 members. The national sex ratio in India is 940 as per latest reports of Census 2011, this indicates less Sex equality, than nationwide averages.

According to Census of India 2011 it is revealed that 17.11% of the study area population belongs to Schedule Caste communities and rest other communities. There is no population belongs to Scheduled Tribe as per census 2011 data.

The literacy rate in the study area, as per the Census of India 2011 is about 74.08% which is less as compared to the State literacy rate i.e. 75.6%. Wherein male literacy rate is 79.02 % and 68.45% women are literate in the study area.

Primary health centre and sub centre is available in surveyed villages. Most of the households in the study area have sufficient sanitation facilities.

In Study area water is supplied through bore well and canal.

The people from the villages in the study area earn their livelihood by farming and working in nearby industries.

## 11.4 Anticipated Environmental Impacts & Mitigation Measures

### 11.4.1 Land Use and Land Cover

11.4.1 Land Use and Land Cover

Code	Impacting Activity	Identified Impact	Impact Scoring			Mitigation Measures
			Severity (S)	Likelihood (L)	Final Score (S×L)	
C1	C2	C3	C4			C5
3	Project Construction (For Expansion)					
3.2	Excavation and paving of site (cutting, filling & Site Levelling)	Change in effective area topography of land	-2	1	-2	Minor / Negligible: restoration of top soil & green belt development
6	Final Decommissioning					
6.1	Final site clean-up	Change in land cover from industrial to barren	-8	1	-8	Moderately Significant: On completion of dismantling works, all wastes will be completely removed 1-2m below the ground surface

### Mitigation Measures

The proposed activity will be carried out on the existing ~130 acres of land parcel allotted to M/s. Asian Paints Limited as given in

- Annexure 3
- Necessary efforts will be made to minimize disruption of current land use to the extent possible.
- Existing roads will be used wherever possible for movement of personnel as well as materials and machineries; all transportation of hazardous materials will be done as per applicable laws and using drivers qualified to transfer such materials safely and with suitable permits and training including spill control training.
- Optimization of land requirement through proper site layout design will be basic criteria at the design phase.

#### **11.4.2 Air Environment**

Impact on ambient air during operation phase of proposed expansion would be due to:

- Emission of pollutants SO<sub>2</sub>, NO<sub>x</sub>, from operation of additional three GG set which will use PNG as fuel after expansion;
- Pollutants HC, CO, NO<sub>x</sub>, PM<sub>10</sub>, PM<sub>2.5</sub> emissions from vehicular movement.
- Maximum ground level concentration (GLC) due to flue gas stacks, process vents and vehicular movement due to proposed project is given below:

**Table 11-1: Point source GLC**

S. No.	Parameters	Number of sources	Maximum GLC Concentration	Distance (from site)	Direction (from site)
1	PM <sub>10</sub>	58	1.1157	500	W
2	SO <sub>2</sub>	3	0.06	250	NW
3	NO <sub>x</sub>	3	2.43	250	NW
4	VOC	3	15.53	500	W

**Table 11-2: Line Source GLC**

S. No.	Parameters	Number of sources	Maximum GLC Concentration	Distance (from site)	Direction (from site)
1	PM <sub>10</sub>	3	0.31	1000	W
2	NO <sub>x</sub>	3	12.41	1000	W
3	CO	3	50.26	1000	W
4	HC	3	4.06	1000	W

A comparison of the incremental Ground Level Concentrations of pollutants with the permissible limits prescribed in NAAQS by CPCB dated 18th November'2009 for Industrial, residential, rural & other area indicates that, the predicted impact level due to the proposed project activities for all the parameters is within specified at all locations.

### Mitigation Measures

Mitigation Measures to minimized impacts on air quality during operational phase:

- Dust and air emission can be controlled by greenbelt/green cover development. Greenbelt shall be maintained properly.
- Periodic air quality monitoring shall be carried out at project site and other location within study area.
- GG / DG sets shall be operated during power failure only.
- Ensure well working of APCMs & other equipment/machineries used in manufacturing process.
- Regular preventive check & maintenance of machineries shall be done.
- Use of PPEs (nose mask, safety goggles, safety shoes, hand gloves, breathing apparatus etc.) by all workers and employees.
- Odour levels control by applying various engineering controls.
- Closed feed system shall be maintained to reduce the chances of odour nuisance.
- Vehicles used shall be PUC-certified from time to time.

### 11.4.3 Incremental Traffic

The final Scenario of Incremental Traffic due to the Proposed Expansion Project and the Capacity of the Road is given below:

Name of the Road	Existing PCU/Hr.	Proposed PCU/Hr.	Total PCU/Hr.	Carrying Capacity PCU as per IRC: 106-1990
IMT Road	393	505.5	898.5	2400

### Impact due to Road Transportation

- An increase in transportation will lead to an increase in road traffic;
- Generation of dust;
- Emission of pollutants like HC, SO<sub>2</sub>, CO, CO<sub>2</sub>;
- Noise generation from vehicular movement;
- Spillage or leak of raw materials/products during transportation may lead to soil/water contamination.

## Mitigation Measures

- Vehicles shall be PUC certified.
- Traffic will be regulated through proper signage, instruction & parking spaces.
- Internal roads with 6 m width for movement of vehicles / people.
- Parking spaces will be provided.
- Speed limit within the premises will be minimal to reduce traffic congestion.
- Signpost will be/are provided for smooth traffic flow and also inculcate residents to follow traffic rules.

### 11.4.4 Noise Environment

The sound pressure levels were predicted at different sources as mentioned above. The observations are as below;

The predicted noise level along with the conflict are as given in below table.

## Mitigation Measures

Following noise control measures are being adopted and will be further improved:

- Acoustic enclosures on all major stationary equipment in the plant, wherever feasible, for noise attenuation.
- Provision of suitable personal protective equipment (PPEs) such as earmuffs and earplugs to all workers exposed to high noise generating areas/operations.
- Job rotation of workers in the high noise area.
- High noise generating areas would be identified and tags marked.
- Existing green belt will be further improved through additional plantation to reduce noise.
- Acoustic mufflers/enclosures to be provided in large engines/machinery.
- Equipment to be maintained in good working order.
- Implement good working practices (equipment selection) to minimize noise and reduce its impacts on human health (earmuffs, safe distances, and enclosures).
- Replacement of high noise generating old equipment with new silent type equipment, wherever feasible.
- Timely replacement of old/worn out parts of machines.
- Tightening of loose parts of machines, shades, etc.
- Ambient Noise Level to be monitored regularly within the plant premises and in nearby habitations.
- All equipment operated within specified design parameters.
- Periodic work zone and ambient noise level monitoring to ensure noise levels remain within permissible limits.
- Periodic audiometric tests for all employees of the company to detect impacts on hearing capacity, if any, due to exposure to high noise levels.

### 11.4.5 Vibrations

Vibrations are generated in the machines due to moving/rotating parts.

Hand arm vibration (HAV) is a potential hazard for employees who work with hand held tools, hand guided machinery or feed work by hand to a machine where this exposes their hands and arms to high levels of vibration. Prolonged and regular exposure to excessive levels of HAV can affect the operator's health in particular causing Hand Arm Vibration Syndrome (HAVS), of which the best-known condition is Vibration White Finger (VWF). The other impacts of HAV are decreased grip strength, decreased hand sensation and dexterity and Carpal tunnel syndrome.

Whole body vibration (WBV) is mainly concerned with large shocks or jolts when there is a risk of injury to the back and usually applies to workers in the sitting or standing position when travelling in mobile machinery over rough surfaces for extended periods. The major health problem associated with WBV is back pain.

Prolonged exposure to excessive levels of vibration can cause incurable conditions and severely affect the sufferer's ability to continue work and the quality of their life. The amount of injury is related to the magnitude of vibration



generated by the work equipment, the duration of the exposure and other factors such as the method of work, workplace temperature and damp or windy conditions.

### **Proposed Vibration Control Measures**

The following control measures are being adopted and will be further improved in expansion project to minimize the impacts due to vibrations:

- Procurement of less vibration generating machines/equipment.
- Periodic preventive maintenance of all the machines/equipment.
- Provision of suitable hand gloves & safety shoes to operators.
- Use vibration dampeners for all the equipment.
- Provision of vibration absorbing seats in transportation and other heavy vehicles.
- Periodic training to operators on how to prevent health problems caused by vibration.

### **11.4.6 Geology and Hydrogeology – Ground water Quality**

#### **Impact on Ground Water Quality**

- From resources utilization point of view on groundwater there will not be any likely direct impact.
- This is a paint industry, therefore storage, handling, disposal of solid and hazardous wastes will be the probable source area that may likely to have adverse impact, in eventuality of any leakages/spillage.

#### **Mitigation Measures**

- Handling & storage of raw materials and products will be performed on impermeable/impervious surface to reduce the possibility/probability of any likely leakage of pollutant into underground environment.
- The run off generated in the plant premises from green belt, roof top and paved area will be stored and reuse internally for various purpose at plant.
- Take all precautionary measures for controlling/eradicating any leakage from vehicles.
- Proper care need to be taken at the time of construction of road to reduce all possibilities/probability of any likely leakage into underground environment.
- The storage area as well as surrounding area should be provided proper impervious flooring. At bottom of this flooring impervious layer using bentonite clay/leak proof chemical should be provided to reduce/eradicated any likely leakage of any chemical, oil, petroleum product through development of any cracks, if emerged.

### **11.4.7 Surface Water Quality**

Surface water Quality get affected by activities like vehicle movements, storage and handling of Raw materials and products, manufacturing process, Equipment cleaning, wastewater treatment & disposal - operations of ETP, Water consumption & Operation of Utilities.

#### **Mitigation Measures**

Following mitigation measures will be implemented to reduce surface water related impacts:

- Fresh water demand will be reduced by recycling and reuse of treated water and avoiding the leakage of raw water at various source.
- Explore the possibility of condensate recovery from the boiler which will reduce the overall water demand.
- For greenbelt development, treated sewage will be used to reduce the fresh water requirement.
- Use of spill control measures, mechanical handling, PPE's shall be mandatory while handling the chemicals as well as handling and treatment of liquid and solid waste.
- Separate drainage for storm water and effluent will be provided to avoid any contamination of surface water sources.

- All chemical and fuel storage, handling areas will be provided with proper bunds to avoid runoff contamination during rainy season.

#### **11.4.8 Solid & Hazardous Waste Management**

Generation of Solid and hazardous waste from various project activities can affect the land and water quality

##### **Mitigation Measures for Solid and Hazardous Waste Management**

- Hazardous wastes will be properly handled in containers and properly stored in hazardous waste storage areas provided with impervious flooring.
- Bunding will be provided around the hazardous waste storage area to avoid overflow of spillage water which can contaminate the surroundings.
- All solid and hazardous waste will be disposed as per the conditions /rules given by the HSPCB/ CPCB Necessary membership will take from approved vendors for disposal of hazardous waste.
- Recyclable waste will be handed over to authorized recyclers.
- The other solid wastes will be handed over to authorized reprocessors

#### **11.4.9 Soil Environment**

Soil quality may get affected by spillage of raw materials during transportation, Handling & storage of Raw materials and products, Cleaning of machinery and equipment, Storage, handling, disposal of solid and hazardous wastes.

##### **Mitigation Measures**

- Spillage of oil, diesel etc. should be minimized to avoid soil contamination.
- Proper checks for leaks and spills to ensure no seepage from chemical storage tanks shall be carried out regularly.

#### **11.4.10 Biological Environment – Ecology & Biodiversity**

##### **Impact Identification**

Overall 7 likely impacts were identified out of which 03 were moderately severe, 1 very severe and 2 less severe, affecting which requires proper management. However, 1 impact is moderate benefit in nature. Further, Impact assessment shows that there will be no impact on the flora-fauna of the study area except some likely impact on close areas in the vicinity of project land.

##### **Mitigation Measures**

Mitigation measures are suggested to minimize intensity of impacts. Plantation in three layers around the periphery has suggested for mitigation of negative impacts due to PM10, PM2.5, SO2, NOx emissions and improving biodiversity and ecological status of the project area. Peripheral plantation with appropriate dust capturing / Gas tolerant / absorbing species is suggested before start any construction activity.

#### **11.4.11 Socio-Economic Environment**

There will be Positive impact due to creation of jobs permanent and temporary. Employment will get generated in the local market by sales and service for providing products to the industry.

- Approach roads will be upgraded to facilitate heavy vehicular movement.
- Project proponent may provide educational aid to local villages based on need and request from the village Panchayat and school.
- The roads connecting to the villages will be repaired at regular interval by the project proponent.
- The project proponent will provide employment opportunities to the local people of the villages.

### 11.5 Analysis of Alternatives (Technology & Site)

APL is proposing this project for capacity expansion in existing integrated paint manufacturing facilities by Increasing the production capacity and adding Putty. The existing facility is already in operation and expansion will be done within the existing area and no additional land is acquired for the proposed expansion.

Since this project is for expansion of only existing products hence risk of technological failure is not applicable. World-wide tested technology for manufacturing of above products being used are proven and tested well.

### 11.6 Environmental Monitoring Program

The regular monitoring of environmental parameters is of immense importance to assess the status of environment during project operation. With the knowledge of baseline conditions, the monitoring program will serve as an indicator for any deterioration in environmental conditions due to operation of the project, to enable taking up suitable mitigation measures in time to safeguard the environment. Monitoring is as important as that of control of pollution since the efficiency of control measures can only be determined by monitoring. The study has also examined the extent to which the adverse impacts identified can be controlled through the adoption of mitigation measures.

### 11.7 Additional Studies

#### 11.7.1 Public Consultation

Public consultation is not required for the proposed expansion project as the project site falls in Notified Industrial Area of HSIIDC IMT Rohtak which is completely fortified and protected on all four sides by boundary walls.

Total area of the project is 5, 23,198.00 m<sup>2</sup> which is allotted by HSIIDC to APL for development of integrated paint manufacturing facility. The existing facility is already in operation and expansion will be within the existing area. No additional land is acquired for the proposed expansion.

#### 11.7.2 Hazard Identification & Risk Analysis

On the basis of the study of the chemical properties like flash point, phase of chemical, operating conditions and total inventory etc. Chemicals such as Iso-octane, Methyl Methacrylate, Styrene, Butyl Acrylate, Ethyl Acrylate etc. have been selected to carry out consequence analysis.

Major failures selected for the analysis are 75mm & 250mm leak as maximum credible scenario and catastrophic rupture as worst case as per IOGP, Risk Assessment Data Directory, Report 434-03, August 2022.

The maximum damage distance of 81 m is observed for 4 kW/m<sup>2</sup> heat radiation due to Pool fire of Methylm Methacrylate which is well within the site premises. The major flammable consequence is pool fire. In case of catastrophic failure of tanks, the released liquid will be contained inside the dyke and pool is formed.

The risk to the member of the public from the raw material storage System at APL Rohtak site is within 1.0E- 05 per year which is in 'Acceptable' region.

Sufficient safety measures such as leak detectors, pressure safety valves, dyke valves, fire hydrants, flame arrestors, level indicator, sufficient ventilation, safety showers will be provided as safety measures.

### 11.8 Project Benefits

- The plant is located at Notified Industrial Area & the proposed expansion activity being executed within the existing premises, no human displacement or habitat loss is envisaged. It will help in improving the infrastructural facilities.

- This project will be positively impacting the lives of people living in nearby villages which leads to improvement in locale specific socio-economic aspects.
- According to the CER office memorandum dated 25<sup>th</sup> February, 2021 CER budget will be included with EMP cost. Hence, the CER budget for 5 years comes to INR 0.95 crores i.e. 0.75% of project cost INR 125 crores
- During operation phase existing permanent workers/Direct Employment are 420 Nos and project will generate more employment after expansion which is around 10 persons thus total employment will be 430 persons after expansion.
- There are 735 existing temporary/ indirect workers and for proposed expansion is 50 persons will get employment, total after expansion will be 785 persons.
- It is the endeavour of the company to utilize local manpower meeting the qualifications, to the extent possible.
- The project will also contribute in increase in revenue in form of various taxes which will be paid to government time to time.

### 11.9 Environmental Cost Benefit Analysis

In view of number of environmental / health and safety benefits as compared to nominal environmental costs, the proposed brownfield project of Integrated Paint manufacturing of paints will have no adverse effect on environment and ecology at large.

### 11.10 Environment Management Plan (EMP)

The EMP is prepared with a view to facilitate effective environmental management of the project in general and implementation of the mitigation measures in particular. The EMP describes a delivery mechanism for implementing the suggested mitigation measures aimed at addressing the potential adverse impacts and to introduce standards of good practice to be adopted for all project works. For each stage of the program, the EMP lists all the requirements to ensure effective implementation of the mitigation measures of every potential biophysical and socio-economic impact identified in the EIA. For each impact or operation, which could otherwise give rise to impact, the following information is presented:

- Role of proponent and its contractors;
- A comprehensive listing of the mitigation measures (actions) that APL shall implement;
- The timing for implementation of the action to ensure that the objectives of mitigation are fully met;
- The parameters that shall be monitored to ensure effective implementation of the action.

The EMP for operation phase is prepared incorporating various environmental management aspects and requirements relevant to the plant operating processes and its impact on the environment. This EMP would also be revised in accordance with the requirement of additional impact mitigation measures due to change in site conditions, natural calamities, unforeseen eventuality, etc.

The EMP for the proposed project has been designed for the various environmental attributes viz. air, water, land, noise, ecology, socio-economic etc.

#### 11.10.1 Conservation Plan for Schedule – I species

#### 11.10.2 Social Management Plan

The social management plan proposes to improve the quality of life of inhabitants of potentially affected villages directly.

The goal is “a pollution free area with improved quality of life and empowered community” and the three key pillars on which this would be developed are – social, health, infrastructure improvements with efforts on minimal disruptions present life style and any ensuing negative impacts.

**Social** – Awareness on project benefits, Sex empowerment, increases livelihood opportunities during implementation of technical and social remediation plans and generating community participation.

**Health** - Awareness on health, hygiene, environmental sanitation and generic issues related to improving quality of life with specific emphasis on potable drinking water, HIV/AIDS/STI mitigation)

**Infrastructure** - Developing prioritized infrastructure facilities which are related to the continuum of project benefits to the local communities and area.

### **Corporate Environment Responsibility**

According to the CER office memorandum dated 1<sup>st</sup> May, 2018 of MoEF&CC the CER budget for 2 year comes to INR 95 lakh i.e. 0.75 % of project cost INR 125 Crore.

#### **11.10.3 Environment Management Cell**

APL has a team consisting of officers from various departments to co-ordinate the activities concerned with management and implementation of the environmental control measures. This team undertakes the activity of monitoring the stack emissions, ambient air quality, noise level etc. either departmentally or by appointing external agencies wherever necessary. Regular monitoring of environmental parameters has been carried out to find out any deterioration in environmental quality and also to take corrective steps, if required, through respective internal departments.

The works Manager is responsible for environmental issues at plant, Environmental policy and directions. EHS Manager is responsible for environmental management and decision making for all environmental issues. EHS officer is Overall in-charge of operation of environmental management facilities. Ensure environmental monitoring as per appropriate procedures. Ensure correct records of generation, handling, storage, transportation and disposal of solid hazardous wastes. Ensuring legal compliance by properly undertaking activities as laid down by various regulatory agencies from time to time and interacting with the same and arranging awareness program among the workers.

#### **11.10.4 Expenditure on Environmental Matter**

The expenditure to be incurred by APL on environmental matters as total approximate capital cost per annum is 5239.28 Lakh and total approximate recurring cost per annum is 334.98 lakh.

#### **11.10.5 Occupational Health Management Plan & Fund Allocation**

As per policy and norms all of the workmen are put to medical examination and testing periodically and at set interval and based on the medical report actions are taken, if at all anything is necessary and required. Even based on the medical examination report/feedback, workmen are counselled and put in different area /job rotation kind of activities.

A full-fledged Occupational Health Center (OHC) is provided in accordance with Haryana Factories rules with the required services and facilities as per laid down scale.

- The OHC is equipped with First Aid boxes, examination table, stretcher, Oxygen cylinder, resuscitator, B P apparatus bag, decontamination facility of syringes, needle burner, emergency tray, anti-snake bite medicine etc.
- The OHC is under the control of a qualified Medical Practitioner (FMO), who is assisted by qualified paramedical staff, to provide service on working days. The FMO visits Factory on daily and his service is readily available during the medical emergencies.
- First aid boxes are available at designated place in each section to attend first aid injury. The First aider team trained in First aid from recognized institute is available at the site in each shift to attend medical emergency.
- Ambulance is kept in readiness, with a standby driver available round the clock, in the event of an emergency.

- Medical Facilities provided inside the factory is sufficient in case of First Aid cases. Company takes services from outside medical facilities. An ambulance and other transport modes are available for transfer the victim fast.

**Fund Allocation**

The capital investment of INR 51.82 Lakh for Periodic Medical check-up of regular employees, pre-employment check-up of new joiners. However, operational and maintenance cost for Occupational Health Centre (OHC) and for ambulance are estimated approx. INR 81.03 Lakh.

**11.11 Conclusion**

The project aims for an expansion in production capacity in an existing integrated paint industry at Plot No. 1 Sector 30-B, HSIIDC, IMT Rohtak Haryana with due respect to environmental sensitivity as well as techno economic feasibility.

The site is in the notified industrial area. The existing facility is already in operation and expansion will be within the existing area. No additional land is acquired for the proposed expansion. The current land use is Industrial.

Appropriate air pollution control measures, adequate treatment facility for waste water generation and proper hazardous waste management leads to very negligible environmental impact which can be mitigated by taking preventive measures.

Based on the baseline studies as per ToR, Study area encompasses industrial areas, urban areas, agriculture land, water bodies including pond and river. There are no Biosphere Reserve, Tiger/Elephant Reserve, Wildlife Sanctuaries, National Parks, Migratory Corridors, protected and reserve forest falls within 15 radius of the project site. In core zone/project site no any threatened species were reported during survey. However, from buffer zone, 10 species fall under the Schedule –I category of Indian Wildlife (Protection) Amendment Act (2022) were reported. Conservation plan for Schedule–I and threatened species has been prepared and submitted.

Any abnormal and emergency situations can be handled by well experienced staff of APL with well-equipped safety equipment and fire hydrant network.

Employment potential includes skilled, semi-skilled and unskilled labourers.

The EIA study has concluded that the project would be environmentally acceptable, in compliance with environmental legislation and standards. Hence, the proposed project may be considered for grant of Environmental Clearance.

## 12 DISCLOSURE OF CONSULTANTS

### 12.1 Brief Resume and Nature of Consultancy Rendered by Kadam Environmental Consultants

Kadam Environmental Consultants (KEC) was established in 1981 and has four decades of varied experience in the field of environment. The mission of the company is to provide sustainable solutions in the field of Environmental Consultancy and allied fields with the firm belief on "Environment *for* Development".

Headquartered at Vadodara, India, Kadam group of companies (including Kadam Pollution Control Pvt. Ltd. and Kadam Enviro Projects LLP in addition to Kadam Environmental Consultants), have a total office and site staff strength of ~350 persons covering the entire gamut of specializations in the Environment, Health and Safety spheres.

KEC has been servicing its clients, including several multinationals, government institutions, public and private sector Indian enterprises across several sectors for four decades, now.

KEC is certified to ISO 9001:2015 and OHSAS 18001:2007 by BSI. KEC has been recognized as Environmental Auditors with Gujarat Pollution Control Board (GPCB) since inception of the Environmental Audit Scheme. KEC is also empanelled with Gujarat Industrial Development Corporation (GIDC), Ministry of Housing and Urban Affairs (MHUF) and Gujarat Infrastructure Development Board (GIDB) as Consultants.

Customer services provided by KEC are mainly categorized into:

- *Consultancy Services:* Environmental Impact assessment, Environmental Site Assessment and Due Diligence, Enviro-Legal Services, Statutory Environmental Audits/ Environmental Statements/Compliance, Risk assessments and HAZOP, Energy Audit, Environmental, Health and Safety Management Systems, Deep Sea Pipeline Projects and Waste Management Systems.
- *Engineering Services:* Collection and Conveyance of liquid and solid wastes, designing and executing effluent and sewage treatment plants, municipal solid waste studies and solid waste management systems, bio gas plants, rain water harvesting systems and deep sea marine disposal systems.
- *Laboratory Services:* Chemical and waste testing, microbiology, soil testing and field sampling. The company has a well-equipped laboratory with modern instruments and experienced staff catering to the need of statutory and advisory environmental testing of water, wastewater and hazardous solid waste. KEC's widely-acclaimed laboratory is accredited by National Accreditation Board for Testing and Calibration Laboratories (NABL), a Constituent Board of Quality Council of India. The laboratory is capable of monitoring of ambient air and air emissions, water, including surface water (marine as well as sweet water including ecological parameters), groundwater, soil, solid and hazardous wastes. The laboratory is staffed by more than 25 full time scientists supported by an equal number of field staff engaged in sampling and collection of environmental samples.

KEC has a team comprising of environmental planners and engineers, chemical, civil, structural and electrical engineers, geologists and hydrogeologists, enviro-legal experts, socio-economic experts, microbiologists, zoologists, botanists, industrial hygienists and industrial / analytical chemists.

For Environmental Impact Assessment Studies, the company's strength lies in project management, performing risk assessment, HAZOP/HAZID studies, formulating environmental disaster plans, use of satellite imagery in impact



assessment, use of mathematical models for air / surface water / ground water / marine studies / solid waste / hazardous waste and soil assessment, and expertise in public consultation.

KEC is an accredited EIA Consultant Organization (ACO) by NABET, Quality Council of India under EIA accreditation scheme as per mandatory requirement of the MOEF&CC, Govt. of India for carrying out Environmental Impact Assessment studies. It has accredited EIA coordinators and Functional Area Experts for undertaking Environmental Impact Assessment and related studies in all approved functional areas.

## 12.2 EIA Team Members

Work presented in this report was carried out by KEC with active co-operation from M/s. Asian Paints Ltd. The names of the EIA co-ordinator and FAEs deployed for the project are mention at the start of the report (in Quality Control Section). KEC team members (along with their role in the project) include:

Functional Areas	Name of the Team Member	Involvement /Task
Project Co-ordinator	Sidat Azaz	Site Visit, assist in identification of impact of the project & suggesting mitigation measures, preparation of EMP & environment budget, key issue identification in the project
Air Pollution Monitoring & Control (AP)	Vaibhavi Kadu	Finalization of monitoring locations, checking air quality data, evaluation of results of Ambient Air Quality Monitoring (AAQM) and contribution to EIA documentation
Air Quality Modeling and Prediction (AQ)		Finalization of monitoring locations, checking air quality data, evaluation of results of Ambient Air Quality Monitoring (AAQM)
Noise and Vibration (NV)	Anup Ojha	Site visit, Supervision of noise sampling programme, analysis of data and contribution to EIA documentation
Risk and Hazards (RH)	Pratik Panchal	contribution to the EIA documentation, identification of impacts, finalization of DMP, contribution to RA / DMP Documentation
Solid and Hazardous Waste Management (SHW)	Khushbu Gohel	Identification of waste generated from the industry, studying adequacy of mitigation measures for management of hazardous waste
Hydrogeology and Water Conservation (HG)	Kushal Chavare	Understanding and representing groundwater conditions, contaminants, finalization of survey findings
Geology (GEO)	Kushal Chavare	Geology and geomorphologic analysis based on secondary data and in co-operation with FAE, HG
Soil Conservation (SC)	Sidat Azaz	Site visit, Supervision of soil sampling programme, analysis of data and contribution to EIA documentation
Laboratory	Bhavisha Patel	Sample analysis of water, soil and air collected from the study area as per MoEF&CC requirements.
Draftsman	Jitesh Mali	Preparation of landuse maps of study area using GIS / related tools
Independent Review	K. K. Antani	Independent Review of EIA report against pre-set criteria

## **ANNEXURES**

**Annexure 1: ToR Letter from SEAC Haryana**

**File No.:**  
**Government of India**  
**Ministry of Environment, Forest and Climate Change**  
**(Issued by the State Level Expert Appraisal Committee(SEAC),**  
**HARYANA)**

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Dated 31/05/2024



To,

M/s ASIAN PAINTS LIMITED  
Asian Paint House, 6A, Shanti Nagar, Santacruz (E), MUMBAI, MAHARASHTRA, 400055  
compliance.rohtak@asianpaints.com

**Subject:** Standard Terms of Reference (ToR) to the proposed Expansion in Existing Integrated Paint Manufacturing Facility.

**Sir/Madam,**

This is in reference to your application submitted to SEAC vide proposal number SIA/HR/IND3/462739/2024 dated 06/05/2024 for grant of Terms of Reference (ToR) to the project under the provision of the EIA Notification 2006-and as amended thereof.

2. The particulars of the proposal are as below :

(i) ToR Identification No.	TO24B2601HR5419231N
(ii) File No.	
(iii) Clearance Type	Fresh ToR
(iv) Category	B1
(v) Project/Activity Included Schedule No.	5(h) Integrated paint industry
(vii) Name of Project	Proposed Expansion in Existing Integrated Paint Manufacturing Facility by M/s. Asian Paints Ltd. at Rohtak, Haryana
(viii) Name of Company/Organization	ASIAN PAINTS LIMITED
(ix) Location of Project (District, State)	ROHTAK, HARYANA
(x) Issuing Authority	SEAC
(xii) Applicability of General Conditions	YES

3. The SEAC has examined the proposal in accordance with the Environment Impact Assessment (EIA) Notification, 2006 & further amendments thereto and after detailed examination hereby decided to grant Standard Terms of Reference to the instant proposal of M/s. ASIAN PAINTS LIMITED under the provisions of the aforementioned Notification.

SIA/HR/IND3/462739/2024

Page 1 of 9

4. The brief about products and by products as submitted by the Project proponent in Form-1 (Part A, B) and Standard Terms of Reference are annexed to this letter as Annexure (1).
5. The Ministry reserves the right to stipulate additional TORs, if found necessary.
6. The Standard Terms of Reference (ToR) to the aforementioned project is under provisions of EIA Notification, 2006 and as amended thereof. It does not tantamount to approvals/consent/permissions etc required to be obtained under any other Act/Rule/regulation. The Project Proponent is under obligation to obtain approvals /clearances under any other Acts/ Regulations or Statutes, as applicable, to the project.
7. The granted letter, all the documents submitted as a part of application viz. Form-1 Part A and Part B are available on PARIVESH portal which can be accessed by scanning the QR Code above.

**Copy To**

compliance.rohtak@asianpaints.com

scy.seachr@gmail.com

**Annexure 1****Standard Terms of Reference for conducting Environment Impact Assessment Study for Integrated paint industry and information to be included in EIA/EMP report****1. Executive Summary**

Sr. No.	Terms of Reference
1.1	Executive Summary

**2. Introduction**

Sr. No.	Terms of Reference
2.1	Details of the EIA Consultant including NABET accreditation
2.2	Information about the project proponent
2.3	Importance and benefits of the project

**3. Project Description**

Sr. No.	Terms of Reference
3.1	Cost of project and time of completion.
3.2	Products with capacities for the proposed project.
3.3	If expansion project, details of existing products with capacities and whether adequate land is available for expansion, reference of earlier EC if any.

Sr. No.	Terms of Reference
3.4	Details of existing products and production, if any, along with present product/production details in tabular format, to verify the compliance of the EIA Notifications.
3.5	List of raw materials required and their source along with mode of transportation.
3.6	Other chemicals and materials required with quantities and storage capacities
3.7	Details of Emission, effluents, hazardous waste generation and their management.
3.8	Requirement of water, power, with source of supply, status of approval, water balance diagram, man-power requirement (regular and contract)
3.9	Details of boiler/gensets (including stacks/exhausts) and fuels to be used
3.10	Process description along with major equipment's and machineries, process flow sheet (quantitative) from raw materials to products to be provided
3.11	Hazard identification and details of proposed safety systems.
3.12	<p>Expansion/modernization proposals:</p> <p>a. Copy of all the Environmental Clearance(s) including Amendments thereto obtained for the project from MOEF/SEIAA shall be attached as an Annexure. A certified copy of the latest Monitoring Report of the Integrated Regional Office of the Ministry of Environment, Forest and Climate Change as per circular dated 30th May, 2012 on the status of compliance of conditions stipulated in all the existing environmental clearances including Amendments shall be provided. In addition, copy of the latest CTO and status of compliance of Consent to Operate for the ongoing/existing operation of the project from SPCB shall be attached with the EIA-EMP report.</p> <p>b. In case the existing project has not obtained environmental clearance, reasons for not taking EC under the provisions of the EIA Notification 1994 and/or EIA Notification 2006 shall be provided. Copies of Consent to Establish/No Objection Certificate and Consent to Operate (in case of units operating prior to EIA Notification 2006, CTE and CTO of FY 2005-2006) obtained from the SPCB shall be submitted. Further, compliance report to the conditions of consents from the SPCB shall be submitted.</p>

**4. Site Details**

Sr. No.	Terms of Reference
4.1	Location of the project site covering village, Taluka/Tehsil, District and State, Justification for selecting the site, whether other sites were considered.
4.2	A topo-sheet of the study area of radius of 10km and site location on 1:50,000/1:25,000 scale on an A3/A2 sheet. (including all eco-sensitive areas and environmentally sensitive places)
4.3	Details w.r.t. option analysis for selection of site
4.4	Co-ordinates (lat-long) of all four corners of the site.



Sr. No.	Terms of Reference
4.5	Google map-Earth download of the project site.
4.6	Layout maps indicating existing unit as well as proposed unit indicating storage area, plant area, greenbelt area, utilities etc. If located within an Industrial area/Estate/Complex, layout of Industrial Area indicating location of unit within the Industrial area/Estate.
4.7	Photographs of the proposed and existing (if applicable) plant site. If existing, show photographs of plantation/greenbelt, in particular.
4.8	Land-use break-up of total land of the project site (identified and acquired), government/private - agricultural, forest, wasteland, water bodies, settlements, etc shall be included. (not required for industrial area)
4.9	A list of major industries with name and type within study area (10km radius) shall be incorporated. Land use details of the study area
4.10	Geological features and Geo-hydrological status of the study area shall be included.
4.11	Details of Drainage of the project upto 5km radius of study area. If the site is within 1 km radius of any major river, peak and lean season river discharge as well as flood occurrence frequency based on peak rainfall data of the past 30 years. Details of Flood Level of the project site and maximum Flood Level of the river shall also be provided. (mega green field projects)
4.12	Status of acquisition of land. If acquisition is not complete, stage of the acquisition process and expected time of complete possession of the land. Documents related to conversion of land for Industrial purpose.
4.13	R&R details in respect of land in line with state Government policy.

**5. Forest, wildlife and CRZ related issues (if applicable):**

Sr. No.	Terms of Reference
5.1	Permission and approval for the use of forest land (forestry clearance), if any, and recommendations of the State Forest Department. (if applicable)
5.2	Land-use map based on High resolution satellite imagery of the proposed site delineating the forestland (in case of projects involving forest land more than 40 ha)
5.3	Status of Application submitted for obtaining the stage I forestry clearance along with latest status shall be submitted.
5.4	The projects to be located within 10 km of the National Parks, Sanctuaries, Biosphere Reserves, Migratory Corridors of Wild Animals, the project proponent shall submit the map duly authenticated by Chief Wildlife Warden showing these features vis-à-vis the project location and the recommendations or comments of the Chief Wildlife Wardenthereon
5.5	Wildlife Conservation Plan duly authenticated by the Chief Wildlife Warden of the State Government for conservation of Schedule I fauna, if any exists in the study area

Sr. No.	Terms of Reference
5.6	Copy of application submitted for clearance under the Wildlife (Protection) Act, 1972, to the Standing Committee of the National Board for Wildlife
5.7	Recommendations and NOC from the concerned State/UT Coastal Zone Management Authority on CRZ angle

**6. Environmental Status**

Sr. No.	Terms of Reference
6.1	Determination of atmospheric inversion level at the project site and site-specific micrometeorological data using temperature, relative humidity, hourly wind speed and direction and rainfall.P • AAQ data (except monsoon) at 8 locations for PM10, PM2.5, SO2, NOX, CO and other parameters relevant to the project shall be collected. The monitoring stations shall be based CPCB guidelines and take into account the pre-dominant wind direction, population zone and sensitive receptors including reserved forests. Study should indicate minimum, maximum value of different parameters for the period (3 months) collected. Collected data should be supported by the reference data of either CPCB or SPCB. AAQ data & GLC of pollutants from stack emissions should suggest technology/ measures- Best Practiced Technology (BPT) indicating best achieved results.
6.2	Raw data of all AAQ measurement for 12 weeks of all stations as per frequency given in the NAQPM Notification of Nov. 2009 along with – min., max., average and 98% values for each of the AAQ parameters from data of all AAQ stations should be provided as an annexure to the EIA Report.
6.3	Surface water quality of nearby River (100m upstream and downstream of discharge point) and other surface drains at eight locations as per CPCB/MoEF&CC guidelines.
6.4	Whether the site falls near to polluted stretch of river identified by the CPCB/MoEF&CC, if yes give details.
6.5	Ground water monitoring at minimum at 8 locations shall be included.
6.6	Noise levels monitoring at 8 locations within the study area.
6.7	Soil Characteristic as per CPCB guidelines.
6.8	Traffic study of the area, type of vehicles, frequency of vehicles for transportation of materials, additional traffic due to proposed project, parking arrangement etc.
6.9	Detailed description of flora and fauna (terrestrial and aquatic) existing in the study area shall be given with special reference to rare, endemic and endangered species. If Schedule-I fauna are found within the study area, a Wildlife Conservation Plan shall be prepared and furnished.
6.10	Socio-economic status of the study area.

**7. Environment Impact and Environment Management Plan**

Sr. No.	Terms of Reference
7.1	Assessment of ground level concentration of pollutants from the stack emission based on site-specific meteorological features. In case the project is located on a hilly terrain, the AQIP Modelling shall be done using inputs of the specific terrain characteristics for determining the potential impacts of the project on the AAQ. Cumulative impact of all sources of emissions (including transportation) on the AAQ of the area shall be assessed. Details of the model used and the input data used for modelling shall also be provided. The air quality contours shall be plotted on a location map showing the location of project site, habitation nearby, sensitive receptors, if any.
7.2	Water Quality Modelling – in case of discharge in water body
7.3	Impact of the transport of the raw materials and end products on the surrounding environment shall be assessed and provided. In this regard, options for transport of raw materials and finished products and wastes (large quantities) by rail or rail-cum road transport or conveyor-cum-rail transport shall be examined.
7.4	A note on treatment of wastewater from different plant operations, extent recycled and reused for different purposes shall be included. Complete scheme of effluent treatment. Characteristics of untreated and treated effluent to meet the prescribed standards of discharge under E(P) Rules 1986.
7.5	Details of stack emission and action plan for control of emissions to meet standards
7.6	Measures for fugitive emission control
7.7	Details of hazardous waste generation and their storage, utilization and management. Copies of MOU regarding utilization of solid and hazardous waste in cement plant shall also be included. EMP shall include the concept of waste-minimization, recycle/reuse/recover techniques, Energy conservation, and natural resource conservation.
7.8	Proper utilization of fly ash shall be ensured as per Fly Ash Notification, 2009. A detailed plan of action shall be provided.
7.9	Action plan for the green belt development plan in 33 % area i.e. land with not less than 2,500 trees per ha. Giving details of species, width of plantation, planning schedule etc. shall be included. The green belt shall be around the project boundary and a scheme for greening of the roads used for the project shall also be incorporated.
7.10	Action plan for rainwater harvesting measures at plant site shall be submitted to harvest rainwater from the roof tops and storm water drains to recharge the ground water and also to use for the various activities at the project site to conserve fresh water and reduce the water requirement from other sources.
7.11	Total capital cost and recurring cost/annum for environmental pollution control measures shall be included.
7.12	Action plan for post-project environmental monitoring shall be submitted.
7.13	Onsite and Offsite Disaster (natural and Man-made) Preparedness and Emergency Management Plan including Risk Assessment and damage control. Disaster management plan should be linked with District Disaster Management Plan.

**8. Occupational health**

SIA/HR/IND3/462739/2024

Page 6 of 9



Sr. No.	Terms of Reference
8.1	Plan and fund allocation to ensure the occupational health & safety of all contract and casual workers
8.2	Details of exposure specific health status evaluation of worker. If the workers' health is being evaluated by pre designed format, chest x rays, Audiometry, Spirometry, Vision testing (Far & Near vision, colour vision and any other ocular defect) ECG, during preplacement and periodical examinations give the details of the same. Details regarding last month analyzed data of above mentioned parameters as per age, sex, duration of exposure and department wise.
8.3	Details of existing Occupational & Safety Hazards. What are the exposure levels of hazards and whether they are within Permissible Exposure level (PEL). If these are not within PEL, what measures the company has adopted to keep them within PEL so that health of the workers can be preserved,
8.4	Annual report of health status of workers with special reference to Occupational Health and Safety.

**9. Corporate Environment Policy**

Sr. No.	Terms of Reference
9.1	Does the company have a well laid down Environment Policy approved by its Board of Directors? If so, it may be detailed in the EIA report.
9.2	Does the Environment Policy prescribe for standard operating process / procedures to bring into focus any infringement / deviation / violation of the environmental or forest norms / conditions? If so, it may be detailed in the EIA.
9.3	What is the hierarchical system or Administrative order of the company to deal with the environmental issues and for ensuring compliance with the environmental clearance conditions? Details of this system may be given.
9.4	Does the company have system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the company and / or shareholders or stakeholders at large? This reporting mechanism shall be detailed in the EIA report
9.5	Details regarding infrastructure facilities such as sanitation, fuel, restroom etc. to be provided to the labour force during construction as well as to the casual workers including truck drivers during operation phase.

**10. Corporate Environmental Responsibility (CER)**

Sr. No.	Terms of Reference
10.1	Adequate funds, as per the Ministry's OM/Guidelines, shall be earmarked towards the Corporate Environmental Responsibility based on Public Hearing issues/socioeconomic issues and item-wise details along with time bound action plan shall be included (CER activities shall be related to environment). Socio-economic development activities need to be elaborated upon. For the projects where public hearing is not conducted, CER plan shall be provided based on socio-economic study of the area.

**11. Additional studies/Measures to be considered**

Sr. No.	Terms of Reference
11.1	Provide latest and ecofriendly technology for product manufacturing.
11.2	Emphasize on Green chemistry/Clean Manufacturing
11.3	Provide CAS No. of products along with product list.
11.4	Provide details of amount of carbon sequestered in their unit through greenbelt/other modes, in case of expansion project.
11.5	Life structure and sustainability for carbon and water foot print.
11.6	Detailed pollution Load estimation.
11.7	Transportation of Hazardous substance, effluents etc shall be carried out through authorized and GPS enable vehicles/Trucks only.
11.8	Category of Hazardous Wastes shall be mentioned in the EIA/EMP report and in presentation.
11.9	Details of greenhouse gases and emissions shall be provided.
11.10	Greenbelt shall be developed in the first year of the project and wind breaks shall be erected.
11.11	Study area map shall be overlapped with all the associated features.
11.12	Emphasize on green fuels.
11.13	The project from NCR shall not use Coal as fuel. Further, PP shall avoid use of Coal in the CPAs and elsewhere also if alternatives are available.
11.14	Provide the Cost-Benefit analysis with respect to the environment due to the project.
11.15	Details of carbon foot prints and carbon sequestration study w.r.t. proposed project needs to be spelled out. Proposed mitigation measures also need to be analyzed and submitted for further appraisal of the EAC
11.16	Any litigation pending against the project and/or any direction/order passed by any Court of Law against the project, if so, details thereof shall also be included. Has the unit received any notice under the Section 5 of Environment (Protection) Act, 1986 or relevant Sections of Air and Water Acts? If so, details thereof and compliance/ATR to the notice(s) and present status of the case.
11.17	A tabular chart with index for point wise compliance of above TORs and its details needs to be submitted in the EIA/EMP Report.

**12. Specific Conditions**

Sr. No.	Terms of Reference
12.1	Details on requirement of raw materials (binders, solvents, pigments, additives, resin, driers etc.), their source and storage at the plant.

Sr. No.	Terms of Reference
12.2	Whether any of the material content lead if so details thereof.
12.3	Details on solvent management including loss accounting.
12.4	Details on composition, generation and utilization of waste from the plant-left out raw materials, paint sludge, filter cartridges, off-specification paint, etc
12.5	Existing ambient air quality for expected emissions (VOCs, pigment dust, etc.) from paint industry
12.6	Detailed effluent treatment scheme including segregation for units adopting 'Zero' liquid discharge.
12.7	Authorization/Membership for the disposal of liquid effluent in CETP and solid/hazardous waste in TSDF, if any.
12.8	Details of carbon foot prints and carbon sequestration study w.r.t. proposed project needs to spelled out. Proposed mitigation measures also needs to be analysed and submitted for further appraisal of the EAC.

**Additional Terms of Reference**

N/A

**Annexure 2****Details of Products & By-products**

Name of the product /By-product	Product / By-product	Existing	Proposed	Total	Unit	Mode of Transport / Transmission	Remarks (eg. CAS number)
Water based & Solvent based Paint	Product	400000	125000	525000	KL per annum	Rail & Road	NA
Intermediates	Product	160000	102500	262500	KL per annum	Pipelines, Road, Rail	Intermediates will be mostly used inside plant through pipelines in closed loop. May be transferred to other Asian Paints facilities through road & rail, on need-basis.
Putty	Product	160000	65000	225000	Tons per Annum (TPA)	Road & Rail	Non - EC product. Existing quantity as per valid Consent to Operate issued by Haryana State Pollution Control Board.

Signature Not Verified

Digitally Signed by: Sh. Bhupender Singh  
Rinwa  
Member Secretary, SEAC

Date: 31/05/2024



**Annexure 2: Certificate of Incorporation of the Company**

No. 11- 4598

**FRESH CERTIFICATE OF INCORPORATION  
CONSEQUENT ON CHANGE OF NAME  
IN THE OFFICE OF THE REGISTRAR OF COMPANIES,  
MAHARASHTRA, MUMBAI**

In the matter of

**ASIAN PAINTS (INDIA) LIMITED**

I hereby approve and signify in writing under Section 21 of the Companies Act, 1956 (Act of 1956) read with the Government of India, Department of Company Affairs, Notification No. G.S.R. 507E dated the 24<sup>th</sup> June 1985 the change of name of the Company :

from **ASIAN PAINTS (INDIA) LIMITED.**to **ASIAN PAINTS LIMITED**

and I hereby certify that

**ASIAN PAINTS (INDIA) LIMITED**

which was originally incorporated on TWENTY FOURTH day of OCTOBER 1945 under the Indian Companies Act, VII of 1913 and under the name **ASIAN OIL & PAINT CO. (India) LIMITED**

having duly passed necessary resolution in terms of section 21 of the Companies Act, 1956 the name of the said Company is this day changed to **ASIAN PAINTS LIMITED**

and this certificate is issued pursuant to Section 23(1) of the said Act.

Given under my hand at Mumbai this TWELFTH day of JULY

TWO THOUSAND FIVE.



  
(M. V. CHAKRANARAYAN)  
Dy. Registrar of Companies,  
Maharashtra, Mumbai.

**Annexure 3: Land Allotment Letter**

**HARYANA STATE INDUSTRIAL AND INFRASTRUCTURE  
DEVELOPMENT CORPORATION LTD.**

Regd. Office : C-13 & 14, Sector-6, Panchkula (Haryana)  
Telephone: 0172-2590481-83, Fax : 0172-2590474

**REGULAR LETTER OF ALLOTMENT WITH OFFER OF POSSESSION  
(EMP 2005)**

Registered

To

M/s Asian Paints Ltd.,  
6-A, Shanti Nagar, Vakoila,  
Santacruz (East),  
MUMBAI-400055

Ref. No.: HSIIDC/IMT/ROHTAK/2007 9965

Dated: 24.8.07

Subject:- Regular Letter of Allotment (RLA) of Plot/Shed No. 1  
Sector/Phase/Block \_\_\_\_\_ Industrial  
Estate I.M.T., Rohtak

Dear Sir,

IMT, Rohtak has been considered by the Allotment

1. WHEREAS your application for allotment of an industrial plot/shed in Industrial Estate, Committee, pursuant to State Govt's Industrial Policy-2005 and Estate Management Procedure-2005 (EMP) of the HSIIDC.

AND WHEREAS it has been decided to allot you plot/shed bearing No. 1 in  
Sector/Block/Phase \_\_\_\_\_

Industrial Estate Industrial Model Township, Rohtak  
for setting up an industrial project of Integrated Paint Mfg. Plant with final capacity of 10000 Kt of  
alongwith offer of physical possession of the aforesaid plot/shed, subject to the terms & conditions  
contained hereinafter as well as in the format of the Agreement annexed hereto as appendix-A, which  
shall be read as part & parcel of this RLA. The tentative area and price of the Plot/Shed are specified  
hereunder:-



Supt. Wr.  
R

**Annexure 4: Copy of Court Orders against pending litigation**

Neutral Citation No:=2024:PHHC:111353-DB  
2024:PHHC:111353-DB

CWP-11372-2021 -1-

IN THE HIGH COURT OF PUNJAB AND HARYANA  
AT CHANDIGARH

**CWP-11372-2021 (O&M)**  
**Date of decision: 29.08.2024**

Asian Paints Ltd. ....Petitioner

Versus

State of Haryana and others ....Respondents

**CORAM: HON'BLE MR. JUSTICE ARUN PALLI  
HON'BLE MR. JUSTICE VIKRAM AGGARWAL**

Present: Mr. Gurminder Singh, Senior Advocate, with  
Ms. Bindiya Raichura, Advocate,  
Mr. Amandeep Singh, Advocate,  
Mr. Nitish Bansal, Advocate,  
Mr. Karmanbir Singh, Advocate,  
for the petitioner.

Mr. Ankur Mittal, Additional Advocate General, Haryana,  
Mr. Karan Jindal, Assistant Advocate General, Haryana.

Mr. Ankur Mittal, Advocate,  
Ms. Kushaldeep Kaur, Advocate,  
Ms. Saanvi Singla, Advocate,  
Ms. Naina Jindal, Advocate,  
for the respondent-HSIIDC.

Mr. Sachin Sharma, Advocate, for  
Mr. Aman Bahri, Advocate,  
for respondent No.3.

\*\*\*\*

**ARUN PALLI, J.** (Oral)

Learned counsel for the parties are *ad idem* that under the Vivadon Ka Samadhan Scheme-One Time Settlement Scheme, dated 15.03.2024, the petitioner could avail the benefits as regards demand(s) for additional price, owing to enhancement in the cost of acquisition. It is submitted that initially, the last date to seek any such benefit was 30.06.2024, and to pay the requisite amount, that was to be worked out under the Scheme, was 30.09.2024. However, pursuant to the decision of the Board of Directors, the last date to apply for the benefits under the Scheme has since been extended to 31.08.2024, and accordingly, the date

1 of 2

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Neutral Citation No:=2024:PHHC:111353-DB

2024 PHHC 111353-DB

**CWP-11372-2021**

-2-

to pay the amount is also extended till 30.11.2024. Further, it is submitted that the amount the petitioner is required to pay, after factoring in the benefits that flows from the Scheme, was Rs.6,39,59,295/-. But, on a re-analysis, the said amount has further been reduced to Rs. 5,58,57,675/-.

Learned counsel for the respondent-HSIIDC fairly submits that if the petitioner intends to avail the benefit under the Scheme, it shall have to apply by 31.08.2024. He asserts that, in the event, any such application is moved, the same shall be taken cognizance of by the competent authority, forthwith. And the required formalities would be carried out, in accordance with law, as expeditiously as possible.

To this, learned Senior counsel for the petitioner submits that the petitioner, if so advised, shall move the application within the stipulated date to avail the benefits, as indicated above. Accordingly, he submits that nothing substantive survives in the petition, as also in the application(s), and the same be disposed of, as having been rendered infructuous.

In the wake of the position sketched out above and in terms of the statements made by learned counsel for the parties, the petition is accordingly disposed of.

**(ARUN PALLI)**  
**JUDGE**

**(VIKRAM AGGARWAL)**  
**JUDGE**

**29.08.2024**

Ak Sharma

Whether speaking/reasoned	Yes/No
Whether reportable	Yes/No

2 of 2

Downloaded on - 30-08-2024 17:04:02

**Annexure 5: Copy of the Previous Environmental Clearances**

भारत सरकार  
पर्यावरण एवं वन मंत्रालय  
**Government of India**  
**Ministry of Environment & Forests**  
(IA Division)

By Speed Post

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

E-mail: [hsmalviya@gmail.com](mailto:hsmalviya@gmail.com)

Telephone: 011: 2436 7076

F. No. J-11011/1158/2007-IA-II(I)

Dated : April 9, 2008

To

M/S Asian Paints Ltd  
Asian Paint House  
6A, Shanti nagar, Santacruz (East)  
Mumbai-400055

[Sameer.salvi@asianpaints.com](mailto:Sameer.salvi@asianpaints.com), [Rajeev.batra@asianpaints.com](mailto:Rajeev.batra@asianpaints.com)

Sub: Integrated Paint manufacturing plant (4.0 Lakhs KL/Annum) at IMT Rohtak, Haryana by M/S Asian Paints LTD – Environmental Clearance reg.

Sir,

This has reference to your letter no. Nil dated 23<sup>rd</sup> October, 2007 alongwith Form-I and Pre-feasibility report seeking environmental clearance under the Environment Impact Assessment Notification, 2006 and subsequent correspondence vide your letter dated 10<sup>th</sup> March, 2008.

2. The Ministry of Environment and Forests has examined the application. It is noted that proposal is for environmental clearance for setting up of Integrated Paint manufacturing plant (4.0 Lakhs KL/Annum) at IMT Rohtak, Haryana by M/S Asian Paints LTD. The total land allotted to the plant by HSIIDC, Haryana is 130 acre. No eco-sensitive areas are located within 15 km periphery of the plant. The total cost of the project will be Rs. 810 Crores. The following products and intermediates will be manufactured in the Plant:

1. Water Based & Solvent Based Paint - 4,00,000 KL/annum
2. Intermediates Capacity- Resins and Polymers - 1,60,000 KL/ annum

3. For control of air pollution from boilers, thermic fluid heaters, incinerator, DG sets and process equipment vents stack height as per CPCB norms, scrubber and bag filters will be installed. Total water 1312 KL/day (fresh water requirement considering re-use and rain water harvesting) will be sourced from IMT authority. Total effluent 178 KLD (including domestic sewage) will be treated through own Effluent treatment Plant comprising of primary treatment tanks, primary settling tanks, equalizing tank, bio-

Page 1 of 6



reactors, Activated carbon & multi-grade filters. RO will be used to polish treated effluent before reuse. ETP Sludge will be centrifuged, dried and dewatered before disposal to TSDF facility

4. The integrated paint manufacturing units are listed at para 5 (h) of schedule of EIA Notification, 2006 under 'B' Category and should be appraised at SEIAA level but in absence of the same in State of Haryana, the proposal was considered and appraised at central level. The public hearing is not required as per para 7(i) III Stage (3) of EIA Notification, 2006 as the plant is located within the notified IMT Rohtak.

5. Based on the information submitted by you, the Ministry of Environment and Forests hereby accords environmental clearance to above project under the provisions of EIA Notification dated 14<sup>th</sup> September 2006 subject to the compliance of the following Specific and General conditions:

**A SPECIFIC CONDITIONS :**

- i) The project authorities shall ensure periodical monitoring of the solvents like Xylene and Toluene. No Benzene shall be used in the process.
- ii) The project authorities shall provide vents with condensers to control solvent emissions and recover the same. The recovery of the solvents shall not be less than 98%.
- iii) The gaseous emissions (SO<sub>2</sub>, NO<sub>x</sub>, HCl, Toluene, xylene, butane) and particulate matters from various process units shall conform to the standards prescribed by the concerned authorities from time to time and monitoring report shall be submitted to the Ministry's Regional Office, CPCB and Haryana PCB. At no time, the emission levels shall go beyond the stipulated standards. In the event of failure of pollution control system(s) adopted by the unit, the respective unit shall not be restarted until the control measures are rectified to achieve the desired efficiency.
- iv) Fugitive emissions in the work zone environment, product, raw materials storage area etc. shall be regularly monitored. The emissions shall conform to the limits imposed by Haryana PCB. For control of fugitive emission and VOCs following steps shall be followed :
  - A. Closed handling system shall be provided for chemicals.
  - B. Reflux condenser shall be provided over reducer.
  - C. Chemical handling pump shall be provided with mechanical seals to prevent leakages
  - D. System of leak detection and repair of pump/pipeline based on preventive maintenance.
  - E. Chemicals shall be taken to reactors through closed pipeline. Storage tanks shall be vented through trap receiver and condenser operated on chilled water.

- v) During transfer of materials, spillages shall be avoided and garland drains be constructed to avoid mixing of accidental spillages with domestic waste and storm drains.
- vi) The project authorities shall install acoustic enclosures to the DG Sets for noise control and the stack heights of DG Sets and thermic fluid heaters shall be as per the guideline of CPCB.
- vii) Total water requirement shall not exceed 1312 m<sup>3</sup>/d. A full fledged treatment plant shall be installed for treatment of the wastewater to achieve the standards prescribed by the State Pollution Control Board. The treated wastewater shall be reused and zero discharge condition shall be maintained.
- viii) Hazardous waste (996 MT/annum) and Non-hazardous waste (2130 MT/annum) shall be generated from the proposed project. Incinerable hazardous waste will be incinerated and incineration ash and other hazardous waste shall be disposed in TSDF. Non hazardous solid waste shall be sold and recycled/incinerated. Used/spent oil from power generator sets shall be separately collected and sold to authorized oil recycler.
- ix) The project authorities shall store ETP sludge in leachate proof storage facility at site and shall be disposed of to TSDF. The company shall obtain membership of TSDF and copy of the same shall be submitted to the Ministry.
- x) The project authorities shall obtain necessary commitment from IMT and HSIIDC authorities for supply of requisite water within three month. The copy of the same shall be submitted to Ministry's Regional Office at Chandigarh.
- xi) The company shall develop 33% of the total area as green belt as per the CPCB guidelines to mitigate the effect of fugitive emissions.
- xii) The project authorities shall earmark adequate funds to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so provided shall not be diverted for any other purpose.
- xiii) Occupational health surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.

**B. GENERAL CONDITIONS :**

- (i) The project authorities shall strictly adhere to the stipulations made by the state government, State Pollution Control Board and any other statutory body.

- (ii) No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment and Forests. In case of deviations or alterations in the project proposal from those submitted to this Ministry for clearance, a fresh reference shall be made to the Ministry to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any.
- (iii) At no time, the emissions shall exceed the prescribed limits. In the event of failure of any pollution control system adopted by the unit, the unit shall be immediately put out of operation and shall not be restarted until the desired efficiency has been achieved.
- (iv) Levels of HC and VOC at various probable locations in the ambient air will be monitored. Regular monitoring of HC and VOC may be carried out in the ambient air in and around the plant.
- (v) The locations of ambient air quality monitoring stations shall be reviewed in consultation with the State Pollution Control Board (SPCB) and additional stations shall be installed, if required, in the downwind direction as well as where maximum ground level concentrations are anticipated.
- (vi) Dedicated scrubbers and stacks of appropriate height as per the Central Pollution Control Board guidelines shall be provided to control the emissions from various vents. The scrubbed water shall be sent to ETP for further treatment.
- (vii) All the storage tanks shall be under negative pressure to avoid any leakages. Breather valves, N<sub>2</sub> blanketing and secondary condensers with brine chilling system shall be provided for all the storage tanks to minimize vapour losses. All liquid raw material shall be stored in storage Tanks and Drums.
- (viii) The company shall undertake following Waste Minimization measures.
  - Metering and control of quantities of active ingredients to minimize waste.
  - Reuse of by-products from the process as raw materials or as raw material substitutes in other processes.
  - Use of automated filling to minimize spillage.
  - Use of "Closed Feed" system into batch reactors.
  - Venting equipment through vapour recovery system.
  - Use of high pressure hoses for equipment cleaning to reduce wastewater generation.
- (ix) The project authorities shall strictly comply with the rules and guidelines under Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 as amended in October, 1994 and January, 2000 and Hazardous Waste (Management and Handling) Rules, 1989, as amended from time to time.

Authorization from the SPCB shall be obtained for collection, treatment, storage, and disposal of hazardous wastes.


- (x) The overall noise levels in and around the plant area shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels shall conform to the standards prescribed under Environment (Protection) Act, 1986 Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time).
- (xi) The company shall develop rain water harvesting structures to harvest the run off water for recharge of ground water.
- (xii) The company shall undertake eco-developmental measures including community welfare measures in the project area for the overall improvement of the environment. The eco-development plan should be submitted to the SPCB within three months of receipt of this letter for approval.
- (xiii) The project proponent shall also comply with all the environmental protection measures and safeguards proposed in the EIA/EMP report.
- (xiv) A separate Environmental Management Cell equipped with full fledged laboratory facilities shall be set up to carry out the Environmental Management and Monitoring functions.
- (xv) The implementation of the project vis-à-vis environmental action plans shall be monitored by the concerned Regional Office of the Ministry/SPCB / CPCB. A six monthly compliance status report shall be submitted to monitoring agencies and shall be posted on the website of the Company.
- (xvi) The project proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB and may also be seen at Website of the Ministry at <http://envfor.nic.in>. This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the concerned Regional Office of the Ministry.
- (xvii) The project authorities shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of start of the project.

6. The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.

7. The Ministry reserves the right to stipulate additional conditions, if found necessary. The company in a time bound manner will implement these conditions.


8. Any appeal against this environmental clearance shall lie with the National Environment Appellate Authority, if preferred within a period of 30 days as prescribed under Section 11 of the National Environment Appellate Authority Act, 1997.

9. The above conditions will be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986 Hazardous Wastes (Management and Handling) Rules, 2003 and the Public Liability Insurance Act, 1991 along with their amendments and rules.

  
(H.S. Malviya)  
Joint Director

Copy to :

1. The Secretary, Department of Environment, Govt. of Haryana, SCO No. 1-3, Sector 17-D, Chandigarh.
2. The Chairman, Central Pollution Control Board, Parivesh Bhawan, CBD-cum-Office Complex, East Arjun Nagar, New Delhi - 110 032.
3. The Chairman, Haryana Pollution Control Board, C -11, Sector 6, Panchkula, Haryana.
4. The Conservator of Forests (Central), Ministry of Environment & Forests, Regional Office (Northern Zone), Bays No. 24-25, Sector 31-A, Dakshin Marg, Chandigarh - 160 047.
5. Adviser IA(II), Ministry of Environment and Forests, Paryavaran Bhavan, CGO Complex, New Delhi
6. Monitoring Cell, Ministry of Environment and Forests, Paryavaran Bhavan, CGO Complex, New Delhi.
7. Guard File.
8. Record File.

  
(H.S. Malviya)  
Joint Director



**Annexure 6: Certified EC Compliance Report (CCR) from MOEF&CC, RO, Chandigarh**

भारत सरकार  
GOVERNMENT OF INDIA  
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय  
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE  
क्षेत्रीय कार्यालय, चंडीगढ़ / Regional Office, Chandigarh



F. No.:4-492/2008/ENV/PART-II/eFile



Dated: 07/10/2024

सेवा में,

निदेशक ,

Compliance and Monitoring Division-IA Division,  
पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय  
जोर बाग रोड, नई दिल्ली -110 003  
Email: [moefcc-monitoring@gov.in](mailto:moefcc-monitoring@gov.in)

विषय: Environmental Clearance for Proposed expansion in Integrated Paints Manufacturing Plant located at HSIIDC, IMT Rohtak, Haryana by M/s. Asian Paints Limited- Certification reg.

सन्दर्भ: ई.सी. पत्र संख्या/11011/1158/2007-IA(II)-I dated 09.04.2008.

महोदय,

उपरोक्तवर्णित पत्र के संदर्भ में आपके संज्ञान में लाया जाता है की उपरोक्त परियोजना का निरीक्षण इस कार्यालय द्वारा दिनांक 25.07.2024 को किया गया था। उक्त परियोजना की विस्तृत मॉनिटरिंग रिपोर्ट निम्नलिखित गैर-अनुपालन (non-compliance) बिंदुओं सहित अग्रिम कार्यवाही हेतु संलग्न हैं :

- 1) The approved eco-development plan receipt from HSPCB was not provided to IRO.
- 2) During site visit, it was observed that waste material or scraps are not properly kept on designated place it may cause accident/harm to the workers.

भवदीय,

संलग्नक: उपरोक्तानुसार।

(डॉ. धर्मेन्द्र कुमार गुप्ता)

निदेशक /वैज्ञानिक 'एफ'

प्रति :

1. उप वन महानिरीक्षक (ROHQ), पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय, जोर बाग रोड, नई दिल्ली Email: [digf-rohq.mefcc@gov.in](mailto:digf-rohq.mefcc@gov.in)
2. सदस्य सचिव, SEIAA, हरियाणा, बेज़न. 55-58, प्रयत्न भवन, सेक्टर-2 पंचकुला, हरियाणा Email: [seiaa-21.env@hry.gov.in](mailto:seiaa-21.env@hry.gov.in)
3. सदस्य सचिव, हरियाणा राज्य प्रदूषण नियंत्रण बोर्ड, C-11, सेक्टर- 6, पंचकुला, हरियाणा- 134109
4. अधिकृत हस्ताक्षरकर्ता, M/s Asian Paints Limited, Integrated Paints Manufacturing Plant located at HSIIDC, IMT Rohtak, Haryana. Email: [Compliance.Rohtak@asianpaints.com](mailto:Compliance.Rohtak@asianpaints.com)

Ministry of Environment, Forests and Climate Change  
Regional Office, Chandigarh  
Monitoring the Implementation of Environmental Safeguards  
MONITORING REPORT  
PART - I  
DATA SHEET

[illegible]

⑤ अनुप्रास

		3) Green belt is well developed in premises as well as periphery area of the plant.																																													
7.	Break-up of Project area a) Submergence forest area and non-forest area b) Others	None																																													
8.	Break-up of the project affected population with enumeration of those losing houses/dwelling units only agricultural land only both dwelling units & agricultural land & landless laborers/artisans: a) SC, ST/Adivasi b) Others	N/A																																													
9.	Financial Details: a) Project Cost as originally planned and subsequent revised estimates and the year of price reference  b) Allocation made for EMP with item wise and year wise break-up  c) BC ratio/IRR and the year of assessment  d) Whether includes the cost of EMP as shown above  e) Actual expenditure incurred on project so far          f) Actual expenditure incurred on EMP so far	<p>Planned Project cost (planned in 2006-2007) – 810 Crores.</p> <p><b>Actual Expenditure:</b> Project construction and commissioning was done in 3 phases: Phase I (2008-09)– Rs. 497.53 Crores Phase II (2010-11) – Rs. 147.59 Crores Phase III (2013-14) – Rs. 553.80 Crores.</p> <p>Year wise actual capital expenditure post commissioning:</p> <table><tr><th>FY</th><th>Capital Expenditure</th></tr><tr><td>2010-11</td><td>₹ 2,58,30,204.0</td></tr><tr><td>2011-12</td><td>₹ 3,92,08,344.0</td></tr><tr><td>2012-13</td><td>₹ 1,14,64,118.0</td></tr><tr><td>2013-14</td><td>₹ 3,70,36,298.0</td></tr><tr><td>2014-15</td><td>₹ 13,17,96,029.0</td></tr><tr><td>2015-16</td><td>₹ 5,32,25,219.0</td></tr><tr><td>2016-17</td><td>₹ 10,02,43,551.0</td></tr><tr><td>2017-18</td><td>₹ 21,08,92,768.0</td></tr><tr><td>2018-19</td><td>₹ 19,15,34,410.0</td></tr><tr><td>2019-20</td><td>₹ 11,13,60,369.0</td></tr><tr><td>2020-21</td><td>₹ 17,58,11,496.0</td></tr><tr><td>2021-22</td><td>₹ 35,95,30,215.0</td></tr><tr><td>2022-23</td><td>₹ 30,80,43,606.0</td></tr><tr><td>2023-24</td><td>₹ 24,53,39,807.0</td></tr></table> <p><b>Actual expenditure on Environment Management: EMP capital expenditure:</b></p> <table><tr><th>Items in Environment Management</th><th>Cost incurred (in ₹)</th><th>Year of expenditure</th></tr><tr><td>Equipment - ETP</td><td>21,37,08,947.00</td><td>2008-09</td></tr><tr><td>Effluent treatment plant construction</td><td>9,01,81,295.00</td><td>2008-09</td></tr><tr><td>equipment - EHS Lab</td><td>8,85,65,399.00</td><td>2008-09</td></tr><tr><td>Fire detection and hydrant</td><td>6,40,81,234.00</td><td>2010-11</td></tr></table>	FY	Capital Expenditure	2010-11	₹ 2,58,30,204.0	2011-12	₹ 3,92,08,344.0	2012-13	₹ 1,14,64,118.0	2013-14	₹ 3,70,36,298.0	2014-15	₹ 13,17,96,029.0	2015-16	₹ 5,32,25,219.0	2016-17	₹ 10,02,43,551.0	2017-18	₹ 21,08,92,768.0	2018-19	₹ 19,15,34,410.0	2019-20	₹ 11,13,60,369.0	2020-21	₹ 17,58,11,496.0	2021-22	₹ 35,95,30,215.0	2022-23	₹ 30,80,43,606.0	2023-24	₹ 24,53,39,807.0	Items in Environment Management	Cost incurred (in ₹)	Year of expenditure	Equipment - ETP	21,37,08,947.00	2008-09	Effluent treatment plant construction	9,01,81,295.00	2008-09	equipment - EHS Lab	8,85,65,399.00	2008-09	Fire detection and hydrant	6,40,81,234.00	2010-11
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	setup		
	Sprinklers	5,87,07,212.00	2008-09
	RO	2,09,01,205.00	2008-09
	Incinerator	1,71,70,726.00	2008-09
	Weigh bridges for Environment monitoring	1,08,40,331.00	2013-14
	MEE	53,99,861.00	2008-09
	Storm Water Drain and tank construction	49,51,862.00	2018 -19
	Flow meters to monitor raw water consumption	26,81,439.00	2017 -18
	Reactor wash water reuse scheme	20,11,624.00	2018 -19
	Wash water Reuse scheme	18,68,595.00	2021 -22
	Zero Spillage and Leakage projects	17,45,934.00	2018 -19
	Wash Water Re - Use scheme	14,32,467.00	2020 -21
	Centrifuge system for sludge drying	14,09,237.00	2021 -22
	Compliance with CPCB guidelines on BCY	13,64,622.00	2022 -23
	Rain water harvesting	12,22,265.00	2022 -23
	Domestic Water Tanks	11,15,712.00	2018 -19
	Water Coolers and UV	10,41,581.00	2022 -23
	Shade wash water Reuse scheme	10,01,476.00	2018 -19
	RO equipment	7,59,513.00	2017 -18
	Sludge drying bed system	7,33,251.00	2021 -22
	Silo roof drainage system	6,94,252.00	2019 -20
	Address Sewage Pit overflow	6,37,228.00	2021 -22
	ETP lab and monitoring equipment	5,90,009.00	2017 -18
	Effluent and Sewage pits	5,70,674.00	2021 -22


		Flow meters for Water monitoring	5,12,883.00	2023 -24
		Concreting of ETP area	4,52,369.00	2018-19
		Flow Meter for Water consumption	3,28,066.00	2021-22
		ETP lab equipment	3,20,008.00	2021-22
		Effluent flow meters	2,64,963.00	2017-18
		ETP Lab equipment	1,80,000.00	2019-20
		Hazardous Waste Reduction initiatives	1,66,324.00	2020-21
		Barrel cleaning yard	99,744.00	2017-18
		Revenue expenditure: Approximately --2% of total revenue expenditure is incurred in Environment management in plant, every year.		
10.	Forest land Requirement	N/A		
	a) The status of approval for diversion of forest land for non-forestry use			
	b) The status of clearing felling			
	c) The status of CA, if any			
	d) Comments on the viability and sustainability of CA program in the light of actual field experience so far			
11.	The status of clear felling in the non-forest areas	N/A		
12.	Status of Construction (Actual and/or Planned)			
	a) Date of commencement	May, 2008		
	b) Date of completion	April, 2010		
13.	Reason for delay if the project is yet to start	N/A		
14.	Dates of site visits			
	a) Date of previous site visit:			
	b) Date of present site visit:	25.07.2024		



**PART – II & III DESCRIPTIVE REPORT ON STATUS OF COMPLIANCE TO CONDITIONS OF  
ENVIRONMENTAL CLEARANCE AND ENVIRONMENTAL MANAGEMENT  
EC No.: J-11011/1158/2007-IA (II)-I dated 09.04.2008**

S. No.	Conditions	Compliance Status
<b>PART A - SPECIFIC CONDITIONS:</b>		
<b>Construction Phase:</b>		
1	The Project authorities shall ensure periodical monitoring of the solvents like Xylene and Toluene. No Benzene shall be used in the products.	<b>Complied.</b> Asian Paints Ltd. (APL) is water-based paint manufacturing unit, which does not require benzene, toluene, and xylene in the process. Third party test reports submitted by the PP along with the compliance report have confirmed the same. Periodic solvent monitoring is carried out on a regular basis.
2	The Project authorities shall vents with condensers to control solvent emissions and recover the same. The recovery of the solvents shall not be less than 98%.	<b>Complied and also noted by the PP.</b> As per PP, the unit currently produces water based paints exclusively. Condensers and vents are provided by the unit to recover solvents and regulate emissions. And also, unit shall strictly follow the condition and adhere to recover solvents more than 98%.
3	The gaseous emissions (SO <sub>2</sub> , NO <sub>x</sub> , HCl, Toluene, Butane) and particulate matters from various process units should conform to the standard prescribed by the concerned authorities from time to time and monitoring report shall be submitted to the Ministry's Regional Office, CPCB and HSPCB. At no time, the emissions should go beyond the prescribed standards. In the event of failure of any pollution control system adopted by the units, the respective unit should be out of operation immediately and should not be restarted until the control systems are rectified to achieve the desired efficiency.	<b>Complied.</b> The Gaseous Emissions from the various processes are monitored at regular intervals. Industry also provides adequate pollution control systems to process vessels for controlling gaseous emissions. Ambient Air Monitoring is carried out by third-party monitoring by M/s. Haryana Test House & Consultancy service. During site visit Test report showed by the PP and all the findings within the conformity with the standards prescribed by the various authorities for the purpose.
4	Fugitive emission in the work zone environment, product, raw material storage area etc. shall be regularly monitored. The emission shall conform to the limits imposed by Haryana PCB. For control of fugitive emission and VOCs following steps shall be followed: A. Closed handling system shall be provided for chemicals. B. Reflux condenser shall be provided over reducer. C. Chemical handling pump shall be provided with mechanical seals to prevent leakage. D. System of leak detection and repair of pump/pipeline based on preventive maintenance. E. Chemical shall be taken to reactor through closed pipeline. Storage tanks shall be vented through trap receiver and condenser operated on chilled water.	<b>Complied.</b> Fugitive emissions in the work zone environment, product, raw materials storage area etc. have been monitored regularly. Accordingly, following steps are being followed on regular basis to control fugitive emission and VOC. A. Closed handling system is provided for chemicals. B. Reflux condenser is provided over reducer. C. All the rotating equipment like pumps is installed with Mechanical Seals to arrest any sort of emissions. D. Condensers are provided for the storage tanks of highly volatile chemicals. Venting through trap receiver and condenser operated on chilled water cannot be practical provided for all storage tanks. APL is an automated paint manufacturing plant handling all Raw material and products in closed-loop system minimizing the fugitive emission scope all together. During the site visit, these systems and equipment were found operational.



5	During transfer of material, spillage shall be avoided and garland drains be constructed to avoid mixing of accidental spillage with domestic waste and storm drain.	<b>Complied.</b> Garland drains were observed around all tankers unloading area, which were also connected to trade effluent pits. It is also reported in Half-yearly compliances report.
6	The Project authorities shall install acoustic enclosures to the DG Sets for noise control and the stack heights of DG Sets and thermal fluid heaters shall be as per guidelines of CPCB.	<b>Complied.</b> For DG sets, the stack height 30m conforms to the extant regulations and the CPCB guidelines. Acoustic enclosure is provided to DG set for controlling the noise pollution (Please see photo-1). The unit also uses GG (gas generator) primarily post power failure, and 2 of the highest capacity DGs retrofitted with ECDs (emission control devices) are used in case of failure of GGs (Please photo-2).
7	The water requirement shall not exceed 1312 M <sup>3</sup> /day. A fully fledged treatment plant shall be installed for treatment of the waste water to achieve the standards prescribed by SPCB. The treated waste water shall be reuse and zero discharge condition shall be maintained.	<b>Complied.</b> As per PP, unit has adequate ETP for treatment of effluent generated from plant premises. Unit is Zero liquid discharge unit and proposed ETP having Primary, Secondary & Tertiary treatment units followed by RO for reuse in gardening and industrial purposes after achieving the standards prescribed by the State Pollution Control Board. It was also observed during the site visit. 
8	Hazardous waste (996 MT/annum) and Non-Hazardous waste (2130 MT/annum) shall be generated from proposed project. Incinerable hazardous waste will be incinerated and incineration ash and other hazardous waste shall be disposed in TSDF. Non hazardous solid waste shall be sold and recycled/incinerated. Used/spent oil from power generator sets shall be separately collected and sold to authorized oil recycler.	<b>Complied.</b> Unit has agreement for membership of active TSDF site with Gujarat Enviro Protection & Infrastructure (Haryana) Pvt. Ltd. (GEPIL), Faridabad for dispose of hazardous waste. Non-hazardous waste is sold to scrap vendors and authorized recyclers. Used/Spent oil is collected separately and sell to authorized oil recyclers. During the time of inspection, PP showed email copies, awarding Non-Hazardous waste purchase to M/s Sri Krishna, M/s Nitya Plastics and M/s Advance waste solution (scrap vendors).
9	The Project authorities shall store ETP Sludge in leachate proof storage facility at site and shall be disposed off to TSDF. The Company shall obtain membership to the TSDF and submitted to the Ministry.	<b>Complied.</b> Leachate proof storage facility is provided for store of ETP sludge (Please see photo-3). The unit has agreement for membership of active TSDF site with Gujarat Enviro Protection & Infrastructure (Haryana) Pvt. Ltd. (GEPIL), Faridabad.
10	The Project authorities shall obtain necessary commitment from IMT and HSIIDC authorities for supply of requisite water within three month. The copy of the same shall be submitted to Ministry's Regional office.	<b>Complied.</b> Unit has obtained permission letter from IMT and HSIIDC authorities for supply of requisite water, agreement shown during visit.
11	The company shall develop 33% of the total area as green belt as per CPCB guidelines to mitigates the effect of fugitive emission.	<b>Complied.</b> Industry has well developed greenbelt with 35% of total plot area. In the whole periphery of the unit

*(Signature)*

		<p>green belt has been developed (Please see photo-4). 35% of the total plot area is under green cover, the number of plants and area covered (in acres) may be seen in below table.</p> <table border="1"> <tr> <td>Total plot area</td><td>~130acres</td><td>100%</td></tr> <tr> <td>Green area</td><td>~43 acres</td><td>35%</td></tr> <tr> <td>Total No. of Trees</td><td>12,099 Nos.</td><td>-</td></tr> <tr> <td>Total No. of Shrubs</td><td>12,126 Nos.</td><td>-</td></tr> </table> <p>PP also showed a recently developed Biodiversity Park with a dense and variety-based forest development, planting ~800 trees. It has also tied up with the regional Forest authorities to plant another 4000+ trees within the plant premises to increase its tree cover.</p>	Total plot area	~130acres	100%	Green area	~43 acres	35%	Total No. of Trees	12,099 Nos.	-	Total No. of Shrubs	12,126 Nos.	-
Total plot area	~130acres	100%												
Green area	~43 acres	35%												
Total No. of Trees	12,099 Nos.	-												
Total No. of Shrubs	12,126 Nos.	-												
12	The PA shall earmarked adequate fund to implement the conditions stipulated by the Ministry as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so provided shall not be diverted for any other purpose.	<p><b>Complied.</b> Adequate fund has been allotted as expenditure on Environmental matters. The budget allocation and expenditure on Environmental Matters details are included in duly filled monitoring data sheet (submitted to RO vide letter no. Nil dated 22.05.2024).</p>												
13	Occupational Health Surveillance of the workers shall be done on regular basis and records maintained as per the Factory act.	<p><b>Complied.</b> As per PP, the medical surveillance for all the workers is being carried out every six month &amp; records are being maintained. Record of Occupational Health Surveillance records were shown by the PP during the visit. Records were not shared due to privacy concerns of individual employees. Instead, a copy of acknowledgement from Hospital which conducted last two medical examinations was provided over email on 01.08.2024.</p>												
<b>GENERAL CONDITIONS :</b>														
1	The Project authorities shall strictly adhere to the stipulations of the SPCB/State government or any statutory body.	<p><b>Noted and Complied.</b> As per PP, unit is strictly adhering to requirements laid down by the state government and Haryana State Pollution Control Board from time to time.</p>												
2	No further expansion or modifications in the plant shall be carried out without prior approval of the MoEF. In case of deviations or alterations in the project proposal from those submitted to MoEF, New Delhi for clearance, a fresh reference shall be made to the MoEF to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any.	<p><b>Noted by the PP.</b></p>												
3	At no time, the emissions shall exceed the prescribed limits. In the event of failure of any pollution control system adopted by the unit, the unit shall be immediately put out of operation and shall not be restarted until desired efficiency has been achieved.	<p><b>Noted and Complied.</b> As per PP, the unit has not faced any Emergency condition due to the failure of Pollution Control Devices during the period October, 2023 to March, 2024. All emission control devices were inspected and were found to be operational during the time of inspection.</p>												
4	Levels of HC and VOC at various probable locations in the ambient air will be monitored. Regular monitoring of HC and VOC may be carried out the ambient air in and around the plant.	<p><b>Noted and Complied.</b> During site visit PP showed the test report for HC and VOC. Level of HC and VOC is monitored at 04 Ambient Air locations (twice a month) and 29 other probable workplace locations (twice a year)</p>												





		using the services of an accredited third party. Equipment used for the same are RDS, handy samplers, CT, GC, UV etc. Reports were inspected and were within limit. Based on the above, it can be concluded that HC & VOC levels are within acceptable range.
5	The locations of Ambient air quality monitoring stations shall be reviewed in consultation with the HSPCB and additional stations shall be installed, if required, in the downwind direction as well as where maximum ground level concentration are anticipated.	<b>Complied.</b> There are four areas throughout the plant where ambient air quality is being monitored, and this is done on a regular basis, during site visit PP showed the report as well. Ambient Air Monitoring is also carried out by third-party monitoring agency i.e. M/s. Haryana Test House & Consulting Services.
6	Dedicated Scrubbers and stacks of appropriate height as per the Central Pollution Control Board Guidelines shall be provided to control the emissions from various vents. The scrubbed water shall be sent to ETP for further treatment.	<b>Complied.</b> PP has installed adequate scrubbers, dust collectors, Gas generators, DG retrofitted with Emission control devices with stacks of appropriate height. It is also reported in Half-yearly compliances report.
7	All the storage tanks will be under negative pressure to avoid any leakages, breather valves, N <sub>2</sub> blanketing and secondary condensers with brine chilling system shall be provided for all the storage tanks to minimize vapour losses. All liquid raw materials shall be stored in storage tanks and drums.	<b>Complied.</b> During site visit it was observed that liquid raw materials are stored in storage tanks and barrels. Storage tanks are under negative pressure, Breather valves, N <sub>2</sub> blanketing and condensers.
8	The company shall undertake following Waste Minimization measures:- <ul style="list-style-type: none"> <li>• Metering of quantities of active ingredients to minimize waste.</li> <li>• Reuse of by-products from the process as raw materials or as raw material substitutes in other processes.</li> <li>• Maximizing recoveries.</li> <li>• Use of automated material transfer system to minimize spillage.</li> <li>• Use of Closed Feed system into batch reactors.</li> <li>• Venting equipment through vapour recovery system.</li> <li>• Use of high pressure hoses for equipment cleaning to reduce waste water generation.</li> </ul>	<b>Complied.</b> As per PP, <ol style="list-style-type: none"> <li>1. Raw ingredients are being added in closed loop manner and are metered for controlled addition in the equipment.</li> <li>2. Reactors'/Mixers' washing are being collected &amp; reused back in products.</li> <li>3. Automated filling system is provided.</li> <li>4. All liquid raw materials are charged from storage tank to process vessels in a closed system.</li> <li>5. Vapour recovery system is provided for required processing equipment.</li> <li>6. High pressure hoses of pressure 100 bar &amp; more are being used for equipment cleaning.</li> </ol> During the site visit some of the measures were observed like raw ingredient mixing loop, automated filling system, vapor recovery system and high pressure hose.
9	The Project authorities shall strictly comply with the rules and guidelines under the Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 as amended in October 1994 and January 2000 and Hazardous Waste (Management and Handling) Rules 1989, as amended from time to time. Authorization from the SPCB shall be obtained for collection, treatment, storage and disposal of hazardous wastes.	<b>Complied.</b> As per PP, unit is complying all the rules and guidelines under Manufacture, Storage, and Import of Hazardous Chemicals Rules, 1989 as amended in October, 1994 and January, 2000 and Hazardous Waste (Management and Handling) Rules, 1989, as amended from time to time. Unit is regularly getting hazardous waste management authorization. The latest authorization received from SPCB vides no. HWM/ROH/2023/5743639 dated 26/02/2023 is valid till 30/09/2027.



10	The overall noise levels in and around the plant area shall be kept well within the standards (85 dBA) by providing noise control measure including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels shall conform to the standards prescribed under Environment (Protection) Act, 1986 Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time).	<b>Complied.</b> PP has developed thick green belt around the boundary working as acoustic measures and water bodies. It was verified from the Google maps as well. PP also showed a recently developed Biodiversity Park with a dense and variety-based forest development plan. It has also tied up with the regional Forest authorities to plant another 4000+ trees within the plant premises to increase its tree cover. During site visit undersigned also planted a plant sapling in the Biodiversity park.
11	The company shall develop rainwater harvesting structures to harvest the runoff water for recharge of ground water.	<b>Complied.</b> Rain water harvesting system is developed with a harvesting capacity of 8120 KL.
12	The company shall undertake eco-developmental measures including community welfare measures in the project area for the overall improvement of the environment. The eco-development plan should be submitted to the SPCB within 3 month of receipt of this letter for approval.	<b>Not Complied.</b> As per PP, 1. Environment-related CSR activities have been undertaken. 2. Rainwater harvesting project has been implemented and being maintained at BD Sharma University of health science, Foot ware Design Institute (FDDI) Rohtak. 3. Lake desilting project done at Bohar and Gandhra village, Rohtak, 4. Health & Hygiene activity are being carried out in nearby villages. 5. Continuous potable water is being supplied in Kherisadh Govt. School and Village after implementation of pipeline project at Baliyana village, Rohtak. 6. 3100 M long Canal channel lining project has been done in Kharawar Village, Rohtak. 7. 1500 M long Canal channel lining project has been done in Nonand Village, Rohtak. 8. Water body Rejuvenation work at Gandhara. 9. 4550 M long canal lining take up in Nonand & Chuliana village. The approved eco-development plan receipt from HSPCB was not provided to RO during site visit.
13	The project proponent shall also comply with all the environmental protection measures and safeguards proposed in the EIA/EMP report.	<b>Partially Complied.</b> During site visit, it was observed that waste material or scraps are not properly kept on designated place it may cause accident/harm to the workers (Please see Photo-5 & 6).
14	A separate Environmental Management Cell equipped with full fledged laboratory facilities shall be set up to carry out the environmental management and monitoring functions.	<b>Complied.</b> Environment Management Cell and ETP was visited along with the PP. Laboratory was in good working condition and some tests and analysis was going on during visit. Registers /log books were up to date. It was noted that SOP was being followed while performing the tests.
15	The implementation of the project vis-à-vis environmental action plans shall be monitored by Ministry's Regional Office, Chandigarh/SPCB. A six monthly compliance status report shall be submitted to monitoring agencies and shall be posted on the website of the Company.	<b>Complied.</b> Six Monthly compliance reports are being submitted to MoEF&CC and are also uploaded on company's website regularly.





16	The project proponent shall inform the public that the project has been accorded environmental clearance by the MoEF and copies of the clearance letter are available with the SPCB and may also be seen at Website of the Ministry At <a href="http://envfor.nic.in">http://envfor.nic.in</a> . This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the Ministry's Regional Office.	<b>Complied.</b> The copy of advertisement in "The Times of India" dated 16 <sup>th</sup> April 2008 was provided by PP over email on 04.09.2024.
17	The Project authorities shall inform the Regional Office, the date of financial closure and final approval of the project by the concerned authorities and the date of start of the project.	<b>Noted by the PP.</b>
6	The Ministry may revoke or suspend the clearance if implementation of any of the above conditions is not satisfactory.	<b>Noted by the PP.</b>
7	The ministry reserve the right to stipulate additional conditions, if found necessary. The Company in a time bound manner will implement these conditions.	<b>Noted by the PP.</b>
8	Any appeal against this environmental clearance shall lie with the National Environment Appellate Authority, if preferred within a period of 30 days as prescribed under Section 11 of the National Environment Appellate Authority Act, 1997.	<b>Noted by the PP.</b>
9	The above conditions will be enforced, inter-alia under the provision of the Water (Prevention & Control Act., 1974), Air (Prevention & Control of Pollution Act., 1981), the environment (Protection) Act, 1986. HWM Rules, 2003 and the Public liability Insurance Act, 1991 along with their amendments and rules.	<b>Noted and Complied.</b>

**Concluding Remarks:****Implementation of conditions:**

It is evident from the above that during site visit on 25<sup>th</sup> July, 2024, PP showed requisite documents and also provided the copies of the same to RO-Chandigarh.

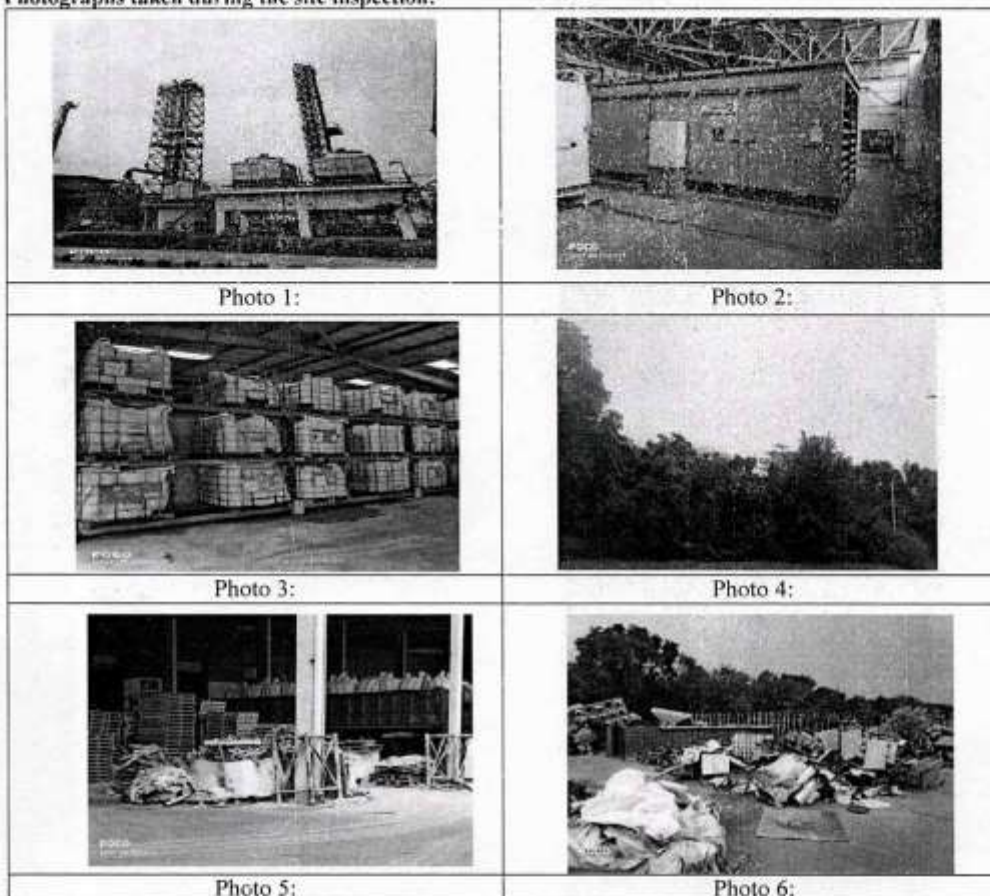
**The major observations are as follow:**

- 1) The approved eco-development plan receipt from HSPCB is not provided to RO.
- 2) During site visit, it was observed that waste material or scraps are not properly kept on designated place it may cause accident/harm to the workers.



(Dr. Dharmendra Kumar Gupta)  
Director/Scientist 'F'

**Photographs taken during the site inspection:**



*Signature*

**Annexure 7: Action Taken Report**

**Asian Paints Limited**  
Plot No. 1, Sector - 30B  
I.M.T, HSIIDC, Rohtak  
Haryana - 124021.  
T : (01262) 20 4610  
www.asianpaints.com

26<sup>th</sup> Dec 2024

To,  
The Director/Scientist 'F'  
Regional Office,  
Ministry of Environment, Forest and Climate Change,  
Regional Office (NEZ), Bays No. 24-25,  
Sector 31-A, Dakshim Marg,  
Chandigarh – 160 022

Sub.: Submission of Action Taken Report for Non-Compliance and Partially Complied Points of EC letter no. J-11011/1158/2007-IA (II), dated 09<sup>th</sup> April 2008, for Integrated Paint Manufacturing plant at Plot No. 01, HSIIDC, IMT Rohtak, Haryana by M/s. Asian Paint Limited  
Ref: RO, Chandigarh, MoEFCC visited the project site dtd 25<sup>th</sup> July 2024 and Certified Compliance report received on 07<sup>th</sup> October, 2024.

Dear Sir,

With reference to the subject matter, we are submitting Action taken Report of non-compliance and partial compliance points of EC Letter No. J-11011/1158/2007-IA (II), dated 09<sup>th</sup> April 2008, against MoEF&CC Certified EC Compliance Report Letter dated 07<sup>th</sup> October, 2024. **(Annexure1)**

Herewith, the unit is submitting the point wise action taken report for the non-compliance and partial compliance points as below.

EC Sr. No.	EC Condition	Remarks of RO Chandigarh, MoEFCC, based on the compliance status furnished by the project proponent & The On-Field Observation of the Site Visit	Action Taken
<b>GENERAL CONDITIONS:</b>			
11.	The company shall undertake eco-development measures including community welfare measures in the project area for the overall improvement of the Environment. The eco-development plan should be submitted to the SPCB within 3 month of receipt of this letter for approval.	<b>Not complied.</b> As per PP, 1. Environment-related CSR activities have been undertaken 2. Rainwater harvesting project has been implemented and being maintained at BD Sharma University of health science, Foot ware Design Institute (FDDI) Rohtak. 3. Lake desilting project done at Bohar and Gandhra village, Rohtak. 4. Health & Hygiene activity are being carried out in nearby villages. 5. Continuous potable water is being supplied in Kherisadh Govt. School and Village after implementation of pipeline project at Baliyan; village, Rohtak.	The Eco-development plan report as per the activities undertaken and presented during site visit is submitted to SPCB. The proof of submission to SPCB is attached as <b>Annexure 3</b> . The copy of submitted report for approval is attached as <b>Annexure 4</b> .

Registered Office : Asian Paints Limited, 6A & 6B, Shantinagar Santacruz (East) Mumbai - 400 055. tel : (022) 6218 1000 fax : (022) 6218 1111

Corporate Identification Number : L24220MH1945PLC004598  
For shares related queries, email to investorrelations@asianpaints.com  
For consumer queries email to customercare@asianpaints.com

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**Asian Paints Limited**  
Plot No. 1, Sector - 30B  
I.M.T, HSIIDC, Rohtak  
Haryana - 124021  
T : (01262) 20 4610  
www.asianpaints.com

EC Sr. No.	EC Condition	Remarks of RO Chandigarh, MoEFCC, based on the compliance status furnished by the project proponent & The On-Field Observation of the Site Visit	Action Taken
<b>GENERAL CONDITIONS:</b>			
		6. 3100 M long Canal channel lining project has been done in Kharawar Village, Rohtak. 7. 1500 M long Canal channel lining project has been done in Nonand Village, Rohtak. 8. Water body Rejuvenation work at Gandhara. 9. 4550 M long canal lining take up in Nonand & in Chuliana village. The approved eco-development plan receipt from SPCB was not provided to RO during site visit.	
12.	The project proponent shall also comply with all the Environmental protection measures and safeguards proposed in the EIA/EMP report.	<b>Partially Complied</b> During site visit, it was observed that waste material or scraps are not properly kept on designated place. It may cause accident/harm to the workers (Please see Photo-5 & 6 provided in <b>Annexure 2</b> )	Keeping the worker's safety into consideration, the waste materials and scraps generated from the plant are kept in designated storage areas and is disposed at a regular interval to avoid over-stacking. The area identified in CCR has been cleaned and all scrap has been removed. The photographs for which is provided as Image 1 & 2 in <b>Annexure 2</b> .

We hope, you would find the same in order and we abide with both of the stipulated EC condition which is mentioned as non-compliance in MoEF&CC Certified EC compliance.

Thanking you,

Yours faithfully,  
For Asian Paints Limited

Authorized Signatory

Registered Office : Asian Paints Limited, 6A & 6B, Shantinagar Santacruz (East) Mumbai - 400 055. tel : (022) 6238 1000 fax : (022) 6238 1111

Corporate Identification Number : L34220MH1949PLC004596  
For share related queries, email to investorrelations@asianpaints.com  
For consumer queries email to customercare@asianpaints.com

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**Annexure 1: MoEF&CC letter dated 07<sup>th</sup> October 2024 for Non compliances observed with respect to the proposed expansion in Integrated Paints Manufacturing Plant located at HSIIDC, IMT Rohtak, Haryana by M/s. Asian Paints Limited.**



भारत सरकार  
GOVERNMENT OF INDIA  
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय  
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE  
क्षेत्रीय कार्यालय, चंडीगढ़ / Regional Office, Chandigarh



F. No.:4-492/2008/ENV/PART-II/eFile



Dated: 07/10/2024

सेवा में,

निदेशक,  
Compliance and Monitoring Division-IA Division,  
पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय  
जोर बाग रोड, नई दिल्ली -110 003  
Email: [moefcc-monitoring@gov.in](mailto:moefcc-monitoring@gov.in)

विषय: Environmental Clearance for Proposed expansion in Integrated Paints Manufacturing Plant located at HSIIDC, IMT Rohtak, Haryana by M/s. Asian Paints Limited- Certification reg.

सन्दर्भ: ई.सी. फ़ॉर संख्या-I-11011/1158/2007-IA(II)-I dated 09.04.2008.

महोदय,

उपरोक्त वर्णित फ़ॉर के संदर्भ में आपके संज्ञान में लाया जाता है की उपरोक्त परियोजना का निरीक्षण इस कार्यालय द्वारा दिनांक 25.07.2024 को किया गया था। उक्त परियोजना की विस्तृत मॉनिटरिंग रिपोर्ट निम्नलिखित गैर-अनुपालन (non-compliance) बिंदुओं सहित अग्रिम कार्यवाही हेतु संलग्न है :

- 1) The approved eco-development plan receipt from HSPCB was not provided to IRO.
- 2) During site visit, it was observed that waste material or scraps are not properly kept on designated place it may cause accident/harm to the workers.

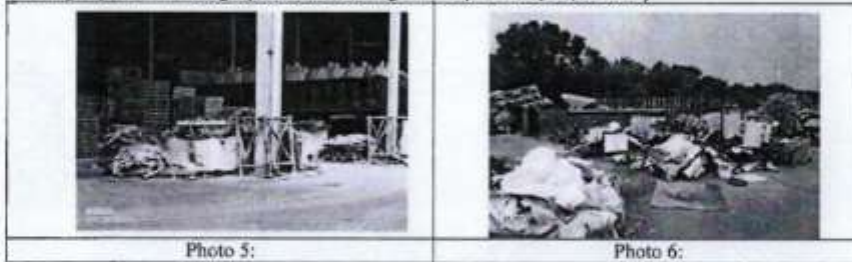
भवदीय,

संलग्नक: उपरोक्तानुसार।

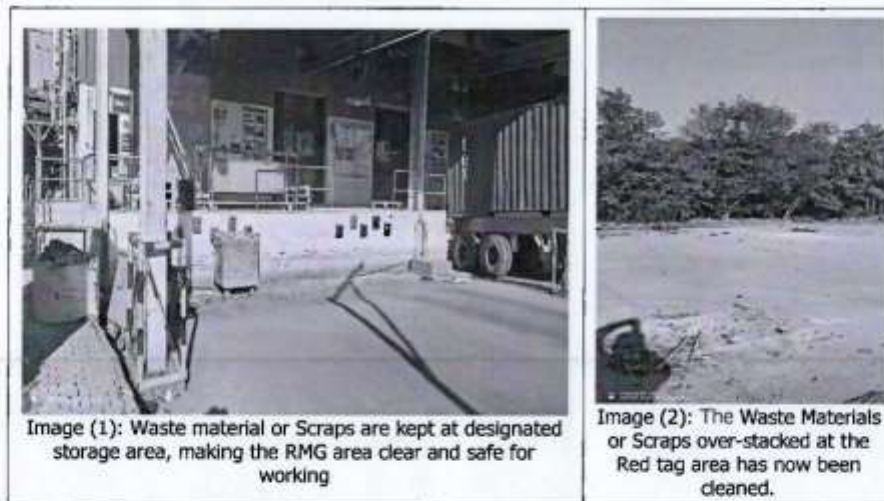
(डॉ. धर्मेन्द्र कुमार गुप्ता)  
निदेशक/वैज्ञानिक 'एफ'

प्रति :

1. उप वन महानिरीक्षक (ROHQ), पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय, जोर बाग रोड, नई दिल्ली Email: [dgf-rohq.mefcc@gov.in](mailto:dgf-rohq.mefcc@gov.in)
2. सदस्य सचिव, SEIAA, हरियाणा, बेलन- 55-58, प्रपल भवन, सेक्टर-2 पंचकुला, हरियाणा Email: [seiaa-21.ems@hry.gov.in](mailto:seiaa-21.ems@hry.gov.in)
3. सदस्य सचिव, हरियाणा राज्य प्रदूषण नियंत्रण बोर्ड, C-11, सेक्टर- 6, पंचकुला, हरियाणा- 134109
4. अधिकृत सहायक, M/s Asian Paints Limited, Integrated Paints Manufacturing Plant located at HSIIDC, IMT Rohtak, Haryana. Email: [Compliance.Rohtak@asianpaints.com](mailto:Compliance.Rohtak@asianpaints.com)

**Annexure 2:****Photographs 1:** Photographs taken during the inspection (As per CCR)

*(Handwritten signature)*

**Photographs 2:** Photos representing the areas highlighted in the CCR inspection report completely cleared of scrap ensuring safe working condition (recent date images)



**Annexure 3: Copy of covering letter as proof of Eco-development plan submitted to SPCB along with the Eco-development plan.**

**asianpaints**

Asian Paints Limited  
Plot No. 1, Sector - 10B  
HSIIDC, Rohtak  
Haryana - 124001  
E: 011-26140000  
www.asianpaints.com

11<sup>th</sup> December, 2024

To  
Regional Officer  
Haryana State Pollution Control Board  
SCO-A6 T-8, New Vishal Tower, Sector-76  
Rohtak, Haryana

**Subj:** Submission of Eco-development Plan against our Environmental Clearance letter no. J-11011/1158/2007-IA (II), dated 09<sup>th</sup> April 2008 (referred hereafter as 'EC') for Integrated Paint Manufacturing plant at Plot No. 01, HSIIDC, IMT Rohtak, Haryana by M/s. Asian Paint Limited (referred hereafter as 'Unit')

**Ref/Annexure:**

- EC for Unit received as letter no. J-11011/1158/2007-IA (II), dated 09<sup>th</sup> April 2008
- Director - MoEFCC, Chandigarh, visit to the project site on dtd 25<sup>th</sup> July, 2024 and Certified Compliance report received on 07<sup>th</sup> October, 2024 against referred EC.
- Eco-development report and Plan of Asian Paints Rohtak Unit.

Dear Sir,

With reference to the subject matter, we are submitting a fresh Eco-development Plan against the general condition (Sr. No. 12) mentioned in our Environmental Clearance for Approval.

As per the General condition (Sr. No. 12) mentioned in the Environment Clearance it states that:  
"The company shall undertake eco-developmental measures including community welfare measures in the project area for the overall improvement of the environment. The eco-development plan should be submitted to the SPCB within 3 months of receipt of this letter for approval".

As we are unable to trace back the Eco-development plan documents in our archives, We are hereby submitting a fresh Eco-development plan that has been undertaken and planned by the Unit for your kind reference, record, and approval.

The non-availability of eco-development plan record has been identified as a non-compliance in the general condition (Sr. No. 12) mentioned in EC, Concluded compliance check conducted by the Director, MoEFCC, Chandigarh during his visit to the plant dtd 25th July 2024.

We would like to bring to your kind notice that we have been undertaking adequate eco-development measures right from the time of the plant commissioning i.e. from FY 2010-11 onwards till date and plan to continue this as part of our commitment to the community.

Herby kindly requesting to approve the eco-development plan.

Thanking you,

Yours faithfully,  
For Asian Paints Limited  
Authorized Signatory

**RECEIVED**  
Asst. Clerk  
Haryana State Pollution Control Board  
ROHTAK  
20/12/24

Registered Office: Asian Paints Limited, 6A-9-68, Sherlingar Sertacua (East) Mumbai - 400 055. Tel: (022) 6216 1000 Fax: (022) 6216 1111

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Asian Paints Limited  
Plot No. 1, Sector - 30B  
I.M.T, HSIIDC, Rohtak  
Haryana - 124021  
T : (01262) 20 4610  
www.asianpaints.com

11<sup>th</sup> December, 2024

To  
Regional Officer  
Haryana State Pollution Control Board  
SCO -A6,7 8, Near Vishal Hotel, Suncity, Sector-36  
Rohtak, Haryana

**Sub.:** Submission of Eco-development Plan against our Environmental Clearance letter no. J-11011/1158/2007-IA (II), dated 09<sup>th</sup> April 2008 (referred hereafter as 'EC') for Integrated Paint Manufacturing plant at Plot No. 01, HSIIDC, IMT Rohtak, Haryana by M/s. Asian Paint Limited (referred hereafter as 'Unit')

Ref/Annexure:

- i. EC for Unit received as letter no. J-11011/1158/2007-IA (II), dated 09<sup>th</sup> April 2008
- ii. Director – MoEFCC, Chandigarh, visit to the project site on dtd 25<sup>th</sup> July, 2024 and Certified Compliance report received on 07<sup>th</sup> October, 2024 against referred EC
- iii. Eco-development report and Plan of Asian Paints Rohtak unit.

Dear Sir,

With reference to the subject matter, we are submitting a fresh Eco-development Plan against the general condition (Sr. NO. 12) mentioned in our Environmental Clearance for Approval.

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We would like to bring to your kind notice that we have been undertaking adequate eco-development measures right from the time of the plant commissioning i.e. from FY 2010-11 onwards till-date and plan to continue this as part of our commitment to the community.

Hereby kindly requesting to approve the eco-development plan.

Thanking you,

Yours faithfully,  
For Asian Paints Limited  
Authorized Signatory

RECEIVED  
Asst./Clerk  
20/12/24  
Haryana State Pollution Control Board  
ROHTAK

Registered Office : Asian Paints Limited, 6A & 6B, Shantinagar Santacruz (East) Mumbai - 400 055. tel : (022) 6218 1000 fax : (022) 6218 1111

Corporate Identification Number : U24220MH1943PLG004568  
For shares related queries, email to investor.relations@asianpaints.com  
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## Eco-development plan & Report at Asian Paints Limited, Rohtak

Asian paints, being a responsible corporate citizen, is committed towards creating self-sustained, empowered, and equitable communities and has kept pace with the overall vision and mission delivering 'Joy' to people's life through its CSR interventions.

As an organization, we have formed partnerships with local NGOs and relevant stakeholders in assessing the requirements of local communities, to design program & its implementation, monitoring & evaluation. The **thematic focus areas** of Asian Paints Limited CSR programme are as follows:

- a) **Health & Hygiene:** Community health and hygiene is one of the key focus areas of our CSR activities. We aspire to deliver primary health care support through diagnosis and treatments to our communities. Our interventions are aimed at promoting preventive healthcare, building awareness about hygiene, sanitation, maternal and child health care. These interventions are carried out in the vicinity of manufacturing units of APL.
- b) **Water Security:** We acknowledge the significant problem of water scarcity in India, affecting millions of people. As a socially responsible company, we have placed a high priority on leaving a *Watermark* through holistic approach around water. We have been making efforts to address the challenges of water by not only reducing our consumption but also replenishing more than what we consume in our production processes. These interventions are carried out in the vicinity of manufacturing units of APL.
- c) **Skilling:** Asian Paints *Colour Academy* empowers communities with specialised skills by providing vocational training in the paint application trade. We have expanded our horizons in this segment to also include carpentry, plumbing and masonry trainings for the further benefit of our local communities to ensure enhanced livelihood. This is a Pan India intervention by Asian Paints with presence in 24 states with a total of 47 Mobile colour academies and 24 fixed colour academies.

During the year 2021-2024, APL has spent a total of **Rs.12.12 Cr** across various themes, all around the Haryana as a part of CSR activity. Asian Paints Limited is a listed company and a responsible corporate citizen and it will keep fulfilling its CSR requirements in the coming years as well.

The Set of Activities carried under various themes are as follows:

### 1. CSR interventions by APL in the vicinity of its manufacturing plant in Rohtak:

At the Asian Paints Rohtak Plant, CSR interventions have been carried out since 2010 around multiple thematic areas. In the previous financial year, Rohtak Plant has spent a total of Rs. 4.23 Crores across Water Security and Health & Hygiene thematic areas. Additionally, a total of Rs. 0.77 Cr was spent in Colour Academy in the state of Haryana.

The major projects carried out in the nearby locations of Rohtak Plant are:

#### **Health & Hygiene:**

- a) **Mobile Medical Unit:** This intervention is focused on providing primary/basic health care facilities to nearby villages ensuring quality health care services accessible to the marginalized community including disadvantaged older patients at no cost. In FY 2023-24, more than 20,000 beneficiaries were benefitted from this project by APL Rohtak.
- b) **Truckers Well-being Programme:** Through our *SAFAR* project, we focus on the wellbeing of trucker community by providing Consultation, Treatment, Medicines, Diagnosis, Referral; Physiotherapy, Nutrition and lifestyle counselling, Yoga and Nutrition sessions, Hygiene kit distribution; Awareness and facilitation for Scheme linkages etc. This intervention by APL Rohtak has helped more than 8500 Truckers in FY 2023-24.

- c) Nutrition Centric Interventions: Through this intervention, we focus to improve the health status, reduction in anaemia & malnutrition among adolescent girls, pregnant & lactating women (Women Reproductive Age Group: 15-49 Years) & Children with the support of AAAs (Anganwadi Workers, Accredited Social Health Activist & Auxiliary Nurse Midwife) in the nearby villages of APL Rohtak through counselling on food groups & diet diversity and Behaviour Change Communication (BCC). The target beneficiaries of this intervention in 2023-24 were more than 2000 women, children and adolescent girls.
- d) The total CSR spend after Health and hygiene during 2021-2024 are as follows:

Year	Thrust Area	Name of the project	Amount Released FY 2021-24
2021-2022	Health	Mobile Health Van Donation for Safar Project	19,33,195
2021-2022	Health	Improvement in Health & Nutrition of Females	4,64,625
2021-2022	Health	Infrastructure Development at Primary Health Centre (PHC) Kharawar	14,76,847
2021-2022	Health	Safar - Risk Profiling of Truckers	16,26,000
2021-2022	Health	Safar Project for Truck Drivers	32,18,115
2021-2022	Health	Mobile Medical Unit Project	26,41,726
2021-2022	Health	Govt. Scheme Linkages	2,34,590
2022-2023	Health	Tarangini - (Maternal, Infant, Young Children, Female Adolescent Nutrition) Nutrition Project	43,39,386.00
2022-2023	Health	Risk Profiling Project for Truck Drivers	13,66,441.00
2022-2023	Health	Safar Programme for Truck Drivers	49,81,266.00
2022-2023	Health	Mobile Health Care Unit	31,87,738.00
2022-2023	Health	Eye Care Program	20,00,000.00
2022-2023	Health	Govt. Scheme Linkages - Health	4,80,000
2023-2024	Health	SAFAR - MMU for Truck Drivers	47,13,382.00
2023-2024	Health	SAFAR - Risk Profiling	18,91,600.00
2023-2024	Health	Tarangini - (Maternal, Infant, Young Children, Female Adolescent Nutrition) Nutrition Project	43,24,588.00
2023-2024	Health	Mobile Medical Unit Project	31,81,798.00
<b>Total</b>			<b>84122594.00</b>

## 2. CSR WORK UNDER WATER CONSERVATION AND RESOURCE DEVELOPMENT

Asian paints is doing water conservation and resource development program to address the water scarcity issue and promote water conservation nearby area under Corporate Social Responsibility.

Key Work done by Asian paints in area of water conservation and resource development program:

- a. Asian paints have done water conservation projects that benefited the communities around the factory area. These RHW project have helped in improvement of water quality along with conservation of good quality water. In some of institute where water logging was one of the major issue, significant reduction has happened after the implementation of urban roof top water harvesting projects. Below are the details of rain water harvesting project done in the surrounding area for the time period of 2021-2024.

### RAIN WATER HARVESTING STRUCTURE

CSR Project Name- Rain water harvesting structure	Project Year	Implemented by (NGO/Vendor)	No of structure constructed	Rain water recharge potential)
Maintenance of existing Rainwater Harvesting structures in FDDI, MDU and B. D. Sharma Institute (209 structures)	2021-22	D&D Ecotech, Mumbai (RWH Expert)	209	1896
RWH Maintenance - Rohtak 111 Nos (FDDI and PGIMS)	2022-23	FORCE NGO	111	7594
<b>Total</b>			<b>310</b>	<b>135892</b>

*b. Water Pipe line connection to Kherisadh School:*

The School is located near the plant and having strength of 420 children and 25 teachers. There was no direct water supply and school was fulfilling water requirement by procuring tanker water. Asian paints approached the HSIIDC for water connection and laid down the pipe line along with other infra for water by fulfilling all the HSIIDC requirement for water connection. Now school is getting good quality potable water supply throughout the year.

*c. Water Pipe line connection to Kherisadh Village:*

Kherisadh village with population of 5200 was facing the crisis of drinking water. Village main water supply pipeline had been blocked/damaged due to national highway work. There was no direct supply of water in village. Villages were forced to procure tanker water from private supplier at cost of 700 Rs per Tanker. In order to provide sustainable water solution to Kherisadh village, based on detail assessment of all possible intervention, the new pipe line of 2.4 km along the side of national highway laid down and connected with new borewell. By this project, about 3200 people from 650 households benefiting.

**I. Rainwater Harvesting Projects by APL at Footwear Development & Design Institute, Rohtak:**

Asian Paints has identified Water Conservation as a priority Corporate Social Responsibility area. For the Asian Paints unit in Rohtak, Haryana, it has been decided to identify Water Conservation projects that benefit communities around the unit location.

In this context, FORCE had conducted a Pre-Project Feasibility study to assess the options for Asian Paints. Based on the recommendations of the report, in year 2014-15, it was decided to focus on Rooftop Rainwater Harvesting in Institutions.

Based on the potential and feasibility keeping in mind budgetary and time considerations, 1 Govt institution had been identified and recommended for Rainwater Harvesting under 2014-15 of the Asian Paints CSR Program.

The detailed report on Rainwater Harvesting Project at Footwear Development & Design Institute, Rohtak, Haryana is provided as Report.



## II. Rainwater Harvesting Projects by APL at School, Rohtak:

Project RWH Potential & Estimate

To	Mr. Sandeep Rao Iddya	Date	28th Feb'14
	Manager, EHS	Est. No	322/3
Client :	Asian Paints, Rohtak		
Project :	Rainwater Harvesting for school in Rohtak		

RWH Potential

## Rooftop &amp; Open Ground RWH via groundwater recharging

Sr. No	Description	Building	Open ground	Total
1	Area	2,000	11,000	13,000
2	Rohtak Avg. Rainfall ( as per CGWB report, Copy attached)	515	515	
3	RWH Collection Co-Efficient	85%	20%	
	<b>Total RWH Potential</b>	<b>8,75,500</b>	<b>11,33,000</b>	<b>20,08,500</b>
	Average daily rainfall harvesting potential based on 25 days average	35,020	45,320	80,340
5	Rainfall expected at peak intensity i.e. 10 mm in 15 mins	17,000	22,000	39,000
6	Ideal holding capacity required for 70% of the rainfall expected at peak intensity in 15	11,900	15,400	27,300

Technical Notes :

Since the school faces water logging problems due to its ground being in a low lying area, we suggest the following

Roof Area

1. Channelling the rainwater collected on the roof via 4" PVC piping towards the Jal Rakshak recharge systems. This will help recharge the groundwater levels. Additionally it will help prevent flooding from the rooftop rainwater on the ground areas adjacent to the school building.
2. Creation of a trench in the low lying area to collect the rainwater falling on the ground.
3. Water from the trench will be diverted to the Jal Rakshak recharge systems for recharging the groundwater levels.
4. Rainwater from the left side of the school naturally flows into the right side of the school, where we are proposing trench. As such we do not need to create separate channelling for the same.
5. We have suggested 6 Jal rakshak systems as per the calculations detailed above, keeping in mind the site conditions and need to remove water from the ground asap.



D&amp;D Ecotech Services

35, 1st Floor, Raghuleela Mall, Powai, Kandivli (W), Mumbai - 400 067 Tel. : 91-22-6725 3728 Email : info@andecotech.com Web : www.andecotech.com

**d. Cleaning and Desilting work at Bohar Village Pond**

The identified pond in Bohar village which was serving the purpose of cattle rearing and domestic utilities has become completely abandoned due to the spread of Water Hyacinth, an invasive species of water weed. The water weed when not controlled, cover the ponds entirely; this dramatically affects water flow and blocks sunlight from reaching native aquatic plants which often die. The decay processes deplete dissolved oxygen in the water. The plants also create a prime habitat for mosquitos.

The pond cleaning and desilting work was done. It would enable conservation of 9480 KL rainwater. It established a clean and healthy environment in community.

**LAKE DESILTING PROJECT AT BOHAR VILLAGE, ROHTAK (JULY, 2020)**

**e. Irrigation Canal lining Brick Work:**

Most of the channels existing in the region to carry irrigation water are unlined, and hence, a large part of irrigation water is lost in percolation and absorption as seepage loss. It accounts to be 25-50% of water lost due to seepage. It is a very serious loss and proportionately reduces the irrigation potential of the supplied water. Hence, there is need to reduce the seepage loss of the costly irrigation water. The seepage losses can be avoided or minimized by lining of irrigation channels.

The irrigation canal lining work completed in Kharawar Village to reduce conveyance loss of irrigation water by doing brick work on the irrigation channel. In 1st phase, total 680 meter brick work completed on irrigation channel.

**Work done area of water resource development program in 2020-21:**

In 2<sup>nd</sup> phase of canal lining work in Kharawar Village, total 587 meter long brick lining completed in Kharawar. Total 1267 meter canal line brick work completed in two phases.



**Water Security:** Under this *Watermark* theme, APL Rohtak carries out multiple interventions in the nearby villages for example Construction/Renovation of Canal Lining for efficient water usage in agricultural areas, Pond rejuvenation, Tree plantation, Sewage treatment through innovative solutions. Out of these interventions around Water conservation, Canal Lining is one of the flagship interventions of APL Rohtak Plant. Details of which are provided below:

**The Canal Lining project under Watermark theme:** Haryana is an agriculture intensive state and so is the district of Rohtak. Out of the total village population in and around Rohtak, 82-85% of population depends only on Agriculture. The irrigation water is supplied once in 40 days to these villages



through a network of unlined channels. The released water for the village does not reach on time because of losses in these unlined canals. The groundwater available in this area is brackish and is also expensive to draw.

Therefore, to address this issue, APL Rohtak plant has taken up an extensive intervention of Canal Lining, where the kuccha canals in the fields of local farmers are made pucca by providing proper lined channels for irrigation.

The objective of this intervention is as follows:

- Reducing the water loss due to percolation and absorption as a seepage loss.
- Reducing the maintenance cost of (desilting and removal of weeds) for farmers.
- Reduction in the annual utilization of ground water.
- Saving of fuel consumption in pumps for tube well due to reduced usage, saving money for farmers.
- Increase in yield (kg/acre) of crops using good quality river water than saline ground water, thus increasing the income of farmers to support their livelihood.



In the past few years, we have lined >9km length of irrigation canals and have planned another 6 km in the year 2024-25. Water savings from these lined canals over the years are shown below:

Year	Length of Canal lined (in meters)	Cultivable area to be irrigated through lined canals (in hectares)	Water conservation potential created (in KL)
<b>2019-20</b>	680	10.9	36515
<b>2020-21</b>	587	8.5	28475
<b>2021-22</b>	1,833	24.3	81405
<b>2022-23</b>	1,500	25.8	86430
<b>2023-24</b>	4,550	76.3	319590
<b>Total</b>	9,150	146	5,52,415

#### f. Trainings:

Total 12 no's of training program were arranged for the local farmer. The topic covered in training were vermicomposting, Technology-based cultivation, Soil health management, Preparation of organic formulation & improved irrigation methods

### III. CSR Plan for upcoming 5 Years (2024-25 to 2028-29)

In the next 5 years, the company intends to continue to invest in community building CSR initiatives in similar trajectory and focus areas:

#### 1. **Health & Hygiene:**

- Mobile Medical Unit
- Nutrition Centric Interventions
- Truckers Well-being Programme

#### 2. **Water Security:**

- Construction/Renovation of Canal Lining for efficient water usage in agricultural areas
- Promotion of Water Use Efficiency
- Safe Drinking Water availability
- Grey water management
- Sewage treatment

#### 3. **Skill Development:** Mobile Colour Academy

The Budget Allocation Projections for Next 5 Years:

Amount in crores.

Proposed tentative CSR Budget for APL Rohtak Plant						
Vertical	2023-24 (Actuals)	2024-25	2025-26	2026-27	2027-28	2028-29
Health & Hygiene**	1.42	1.16	1.20	1.20	1.20	1.20
Watermark**	2.81	3.95	4.00	4.25	4.50	4.75
Total*	4.23	5.11	5.20	5.45	5.70	5.95

Budget projections is subject to change basis overall CSR mandate and location Specific allocation.

\*\*CSR Operations under Health & Hygiene and Water Security will be carried out in 20 km periphery of Rohtak manufacturing facility.

Apart from this, we will continue with our Pan India Skilling initiatives via Mobile Colour Academy across the state of Haryana with a budget of ~1 crore planned in the state.

**Annexure 8: Consent to Operate from Haryana State Pollution Control Board (HSPCB)**
**HARYANA STATE POLLUTION CONTROL BOARD**

SCF No. 42 & 43, Shopping Centre, Sector-6, Huda,  
Bahadurgarh Ph. 01276-243077 (O) Email:-  
hspcbrobdh@gmail.com  
E-mail: hspcb@hry.nic.in



No. HSPCB/Consent/ : 313096423ROHCTO5463972

Dated:22/02/2023

To.

M/s :ASIAN PAINTS LIMITED

Asian Paints Limited, Plot No.1, Sector 30-B, HSIIDC, IMT Rohtak, 124021

Subject: Grant of consent to operate to M/s ASIAN PAINTS LIMITED.

Please refer to your application no. 5463972 received on dated 2023-01-16 in regional office Bahadurgarh. With reference to your above application for consent to operate, M/s ASIAN PAINTS LIMITED is here by granted consent as per following specification/Terms and conditions.

<b>Consent Under</b>	BOTH
<b>Period of consent</b>	09/02/2023 - 30/09/2027
<b>Industry Type</b>	Manufacturing of paints varnishes, pigments and intermediate (excluding blending/mixing)
<b>Category</b>	RED
<b>Investment(In Lakh)</b>	111185.48
<b>Total Land Area(Sq. meter)</b>	526091.8
<b>Total Builtup Area(Sq. meter)</b>	139363.6
<b>Quantity of effluent</b>	
1. Trade	105.0 KL/Day
2. Domestic	35.0 KL/Day
<b>Number of outlets</b>	1.0
<b>Mode of discharge</b>	
1. Domestic	to ETP aeration tank
2. Trade	gardening/reuse
<b>Domestic Effluent Parameters</b>	
1. BOD	30 mg/l
<b>Trade Effluent Parameters</b>	
1. BOD	30 mg/l
2. COD	250 mg/l
3. TSS	100 mg/l
4. OG	10 mg/l
5. Total chrome	2 mg/l
6. Hex chrome	0.1 mg/l
7. sulphide	2 mg/l

8. Fe	3 mgl
9. Zinc	5 mgl
10. Nikel	2 mgl
11. Total phosphours	5 mgl
Number of stacks	9
<b>Height of stack</b>	
1. Boiler 502 ( 2 TPH)	30 mtr
2. Boiler 503 ( 4 TPH)	30 mtr
3. DG R502	30 mtr
4. DG R503	30 mtr
5. DG R505	30 mtr
6. DG R506	30 mtr
7. Boiler 501(2 TPH)	30 mtr
8. GG R 504	30 mtr
9. GG R 501	30 mtr
<b>Emission parameters</b>	
1. SPM	80 mg/m3
<b>Product Details</b>	
1. Putty	640 Metric Tonnes/day
2. Paint	2000 Kilo liters/Day
3. Sanitizer and Disinfectant	100 Kilo liters/Day
<b>Capacity of boiler</b>	
1. Boiler 501	2 Ton/hr
2. Boiler 502	2 Ton/hr
3. Boiler 503	4 Ton/hr
<b>Type of Furnace</b>	
1. na	0 0
<b>Type of Fuel</b>	
1. HSD	22 KLD
2. Natural gas/LPG	22 MTD
3. PNG	20.5 MTD
<b>Raw Material Details</b>	
Pigments	191 Metric Tonnes/Day
Extenders	1376 Metric Tonnes/Day
Monomers	239 Metric Tonnes/Day
Additives	340 Metric Tonnes/Day
Emulsion	492 Metric Tonnes/Day
Solvent and Misc.	104 Metric Tonnes/Day

*Regional Officer, Bahadurgarh  
Haryana State Pollution Control Board.*



### **Terms and conditions**

1. The applicants shall maintain good house keeping both within factory and in the premises. All hose pipelines valves, storage tanks etc. shall be leak proof. In plant allowable pollutants levels, if specified by State Board should be met strictly.
2. The applicant/company shall comply with and carry out directive/orders issued by the Board in this consent order at all subsequent times without negligence of his /its part. The applicant/company shall be liable for such legal action against him as per provision of the law/act in case of violation of any order/directives. Issued at any time and or non compliance of the terms and conditions of his consent order.
3. The applicant shall make an application for grant of consent at least 90 days before the date of expiry of this consent.
4. Necessary fee as prescribed for obtaining renewal consent shall be paid by the applicant alongwith the consent application.
5. If due to any technological improvement or otherwise this Board is of opinion that all or any of the conditions referred to above required variation (including the change of any control equipment either in whole or in part) this Board shall after giving the applicant an opportunity of being heard vary all or such condition and there upon the applicant shall be bound to comply with the conditions so varied.
6. The industry shall provide adequate arrangement for fighting the accidental leakages, discharge of any pollutants gas/liquids from the vessels, mechanical equipment etc. which are likely to cause environment pollution.
7. The industry shall comply noise pollution (Regulation and control) Rules, 2000.
8. The industry shall comply all the direction/Rules/Instructions as may be issued by the MOEF/CPCB/HSPCB from time to time.
9. The industry shall ensure that various characteristics of the effluents remain within the tolerance limits as specified in EPA Standard and as amended from time to time and at no time the concentration of any characteristics should exceed these limits for discharge.
10. The industry would immediately submit the revised application to the Board in the event of any change in the raw material in process, mode of treatment/discharge of effluent. In case of change of process at any stage during the consent period, the industry shall submit fresh consent application alongwith the consent to operate fee, if found due, which may be on any account and that shall be paid by the industry and the industry would immediately submit the consent application to the Board in the event of any change during the year in the raw material, quantity, quality of the effluent, mode of discharge, treatment facilities etc.
11. The officer/official of the Board shall reserve the right to access for the inspection of the industry in connection with the various process and the treatment facilities. The consent to operate is subject to review by the Board at any time.
12. Permissible limits for any pollutants mentioned in the consent to operate order should not exceed the concentration permitted in the effluent by the Board.
13. The industry shall pay the balance fee, in case it is found due from the industry at any time later on.
14. If the industry fails to adhere to any of the conditions of this consent to operate order, the consent to operate so granted shall automatically lapse.
15. If the industry is closed temporarily at its own, they shall inform the Board and obtain permission before restart of the unit.


16. The industry shall comply all the Directions/ Rules/Instructions issued from time to time by the Board.

**Specific Conditions :**

1. Unit will comply the conditions mentioned in the letter dated 25-10-2019 of CPCB regarding mechanism for Environmental management in compliance of Hon'ble NGT order dated 23-08-2019 in the matter of O.A. No. 1038/2018.
2. The unit will comply with the Directions dated 27-11-2020 issued by CPCB regarding to allow only those new industrial units in NCR-Delhi, which are using cleaner fuels, namely, natural gas (PNG/CNG), liquefied petroleum gas, bio-gas, propane, butane etc.
3. The unit will comply CAQM Directions.
4. The unit will obtain EC as per policy, as and when applicable.
5. The unit will use treated effluent only in reuse or horticulture.
6. The unit will obtain CTE expansion if unit will increase effluent quantity.
7. Unit will submit analysis report of air emissions within 03 months, as applicable as per policy of the Board.
8. Unit will comply the conditions mentioned in the letter dated 25-10-2019 of CPCB regarding mechanism for Environmental management in compliance of Hon'ble NGT order dated 23-08- 2019 in the matter of O.A. No. 1038/2018.
9. The unit will comply with the Directions dated 27-11-2020 issued by CPCB regarding to allow only those new industrial units in NCR-Delhi, which are using cleaner fuels, namely, natural gas (PNG/CNG), liquefied petroleum gas, bio-gas, propane, butane etc.
10. The unit will install & connect online monitoring devices for effluent, air emission for consent parameters and connect the same with HSPCB and CPCB servers
11. The unit will also provide online monitoring devices for Gas leakage monitoring and compliance- VOC, Ammonia or other gases which are present in their production area along with ambient air monitoring parameters - PM10/2.5 , SO2, NOx , CO and provide the details on main gate area on the display panel.
12. The unit will comply the emission standards directions issued from CAQM / CPCB/ HSPCB time to time.

**Regional Officer, Bahadurgarh  
Haryana State Pollution Control Board.**

**Annexure 9: Status of CTO Compliance****STATUS OF CTO COMPLIANCE****Descriptive Report on status of CTO compliance of Asian paints  
Rohtak(Haryana)****Project** : ASIAN PAINTS LTD.**Project Activity** : Integrated Paint Manufacturing**Location** : Plot No. 1, Sector 30-B, HSIIDC Industrial Estate, IMT Rohtak,  
State-Haryana.**CTO** : HSPCB/Consent/ 313096423ROHCTO5463972**Dated:** 22/02/2023**Period** : 9th Feb, 2023 to 30<sup>th</sup> Sep, 2027

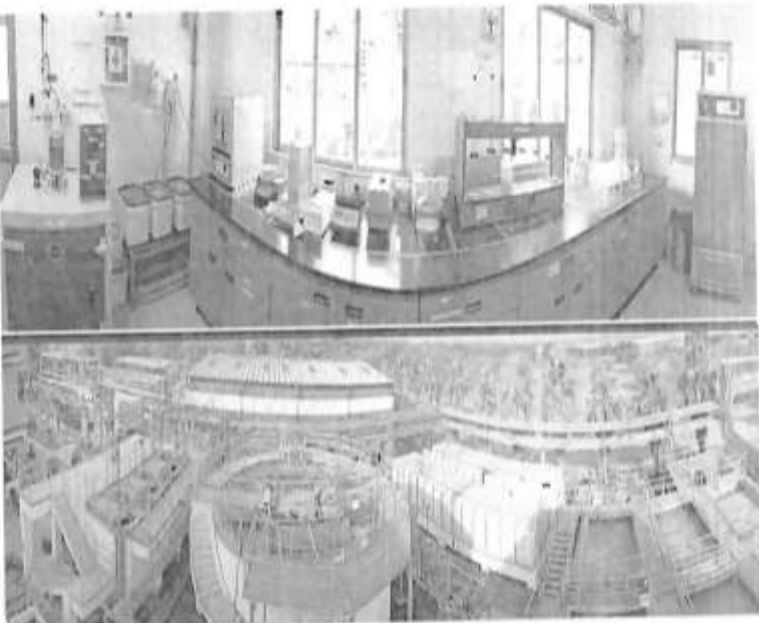
S. No.	CTO Terms and conditions	Compliance Status
<b>(A) GENERAL CONDITIONS</b>		
i)	The applicants shall maintain good house keeping both within factory and in the premises. All hose pipelines valves, storage tanks etc. shall be leak proof. In plant allowable pollutants levels, if specified by State Board should be met strictly.	<p>Complied.</p> <p>Good Housekeeping is being maintained on shop floor as well in the plant premises. Regular inspection for housekeeping is being carried out for continues monitoring and in house maintenance.</p> <p>All hose pipelines, valves and storage tank are leak-proof and monitored regularly. In plant, all pollutants parameters are within limit and testing is done by NABL accredited third party lab in recommended frequency.</p> 

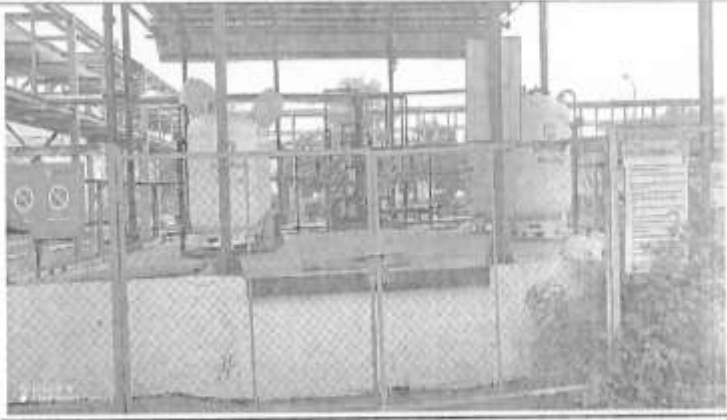
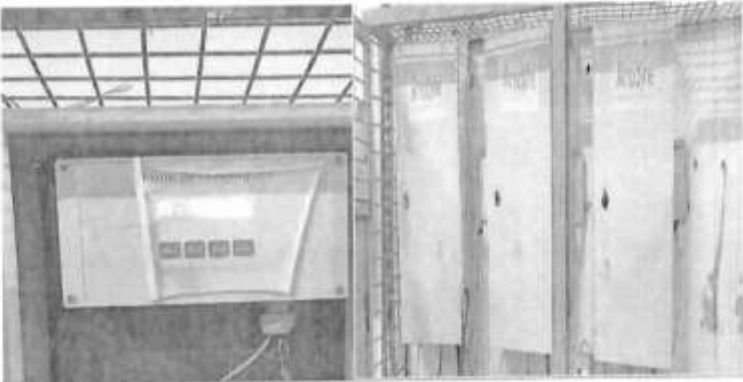

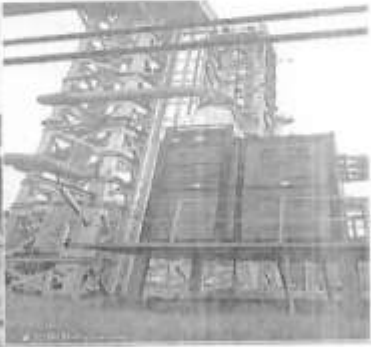




S. No.	CTO Terms and conditions	Compliance Status
ii)	The applicant/company shall comply with and carry out directive/orders issued by the Board in this consent order at all subsequent times without negligence of his /its part. The applicant/company shall be liable for such legal action against him as per provision of the law/act in case of violation of any order/directives. Issued at any time and or non compliance of the terms and conditions of his consent order	Noted and Complied.  The company is complying with the directives issued time to time without negligence.
iii)	The applicant shall make an application for grant of consent at least 90 days before the date of expiry of this consent.	Noted and shall be complied.
iv)	Necessary fee as prescribed for obtaining renewal consent shall be paid by the applicant along with the consent application.	Noted and shall be complied.
v)	If due to any technological improvement or otherwise this Board is of opinion that all or any of the conditions referred to above required variation (including the change of any control equipment either in whole or in part) this Board shall after giving the applicant an opportunity of being heard vary all or such condition and there upon the applicant shall be bound to comply with the conditions so varied.	Noted
vi)	The industry shall provide adequate arrangement for fighting the accidental leakages, discharge of	Complied.


S. No.	CTO Terms and conditions	Compliance Status
	any pollutants gas/liquids from the vessels, mechanical equipment etc. which are likely to cause environment pollution.	The company has a full-fledged reporting system for any such incident. Additionally, adequate system is available to avoid such incidents (like Level transmitter, pressure switches are available on tanks)  Also, spill kit is provided in each block for spillage material collection, ERP team also form for in plant for handle such type of incidents, if occurred.
vii)	The industry shall comply noise pollution (Regulation and control) Rules, 2000.	Complied Noise monitoring is regularly carried out at several sites in the facility that have been recognized as high noise regions.  Additionally, a third party conducts six monthly noise monitoring in plant.
viii)	The industry shall comply noise pollution (Regulation and control) Rules, 2000.	Complied Noise monitoring is regularly carried out at several sites in the facility that have been recognized as high noise regions.  Additionally, a third party conducts six monthly noise monitoring in plant.
ix)	The industry shall ensure that various characteristics of the effluents remain within the tolerance limits as specified in EPA Standard and as amended from time to time and at no time the concentration of any characteristics should exceed these limits for discharge.	Complied  Testing for ETP output water characteristics is done on a monthly basis in compliance with EPA 1986 regulations, and the results are below limitations.
x)	The industry would immediately submit the revised application to the Board in the event of any change in the raw material in process, mode of treatment/discharge of effluent. In case of change of process at any stage during the consent period, the industry shall submit fresh consent application alongwith the consent to operate fee, if found due, which may be on any account and that shall be paid by the industry and the industry would immediately submit the consent	Note & shall be complied.

S. No.	CTO Terms and conditions	Compliance Status
	application to the Board in the event of any change during the year in the raw material, quantity, quality of the effluent, mode of discharge, treatment facilities etc.	
xi)	The officer/official of the Board shall reserve the right to access for the inspection of the industry in connection with the various process and the treatment facilities. The consent to operate is subject to review by the Board at any time.	Noted
xii)	Permissible limits for any pollutants mentioned in the consent to operate order should not exceed the concentration permitted in the effluent by the Board.	Complied  Testing for ETP output water characteristics is done on a monthly basis in compliance with EPA 1986 regulations, and the results are within limits.
xiii)	The industry shall pay the balance fee, in case it is found due from the Industry at any time later on.	Noted.
xiv)	If the industry fails to adhere to any of the conditions of this consent to operate order, the consent to operate so granted shall automatically lapse.	Noted.
xv)	If the industry is closed temporarily at its own, they shall inform the Board and obtain permission before restart of the unit.	Noted.
xvi)	The industry shall comply all the Directions/ Rules/Instructions issued from time to time by the Board.	Noted.

S. No.	CTO Terms and conditions	Compliance Status
<b>(B) SPECIFIC CONDITIONS :</b>		
(i)	Unit will comply the conditions mentioned in the letter dated 25-10-2019 of CPCB regarding mechanism for Environmental management in compliance of Hon'ble NGT order dated 23-08-2019 in the matter of O.A. No. 1038/2018	<p>Complied.</p> <p>ETP is installed with Lab in plant for water treatment inside the plant and No polluted matter is discharged into a stream or well or on land.</p> 
(ii)	The unit will comply with the Directions dated 27-11-2020 issued by CPCB regarding to allow only those new industrial units in NCR-Delhi, which are using cleaner fuels, namely, natural gas (PNG/CNG), liquefied petroleum gas, bio-gas, propane, butane etc.	<p>The unit is strictly complying the direction dated 27.11.2020 issued by CPCB.</p> <ol style="list-style-type: none"> <li>1. The primary source of power for the industry is through the grid.</li> <li>2. For secondary power supply source in case of grid failure, the unit has installed 2 Gas Generators, which is run by PNG.</li> <li>3. The unit has also converted its Boilers into dual-fuel system.</li> </ol> <p>Hence, PNG &amp; LPG has primarily been used as a fuel for Generators &amp; Boilers. Diesel is used only in the case of breakdown in PNG driven equipment.</p> <p>Also, OCEMS has been installed for monitoring regular emissions from Stacks of DG, GG and boilers.</p>

S. No.	CTO Terms and conditions	Compliance Status
		 
(iii)	The unit will comply CAQM Directions.	<p>Complied.</p> <p>The unit keeps a track of CAQM directions applicable to the plant, as and when issued and complies to them strictly.</p> <p>Unit has installed two 2875 KVA Gas generators to be operated in case of emergency, especially during GRAP period. Unit has also retrofitted ECD with its two main DGs. Unit has also installed anti-smog gun in the plant premises to abate the fugitive emissions. Water tankers are used to suppress dust on roads, if required.</p>  

S. No.	CTO Terms and conditions	Compliance Status
(iv)	The unit will obtain EC as per policy, as and when applicable.	Complied.  EC was taken on 09 April 2008 following is the EC reference- <u>Letter no. J-11011/1158/2007-IA-II (I) dated 9<sup>th</sup> April 2008</u>
(v)	The unit will use treated effluent only in reuse or horticulture.	Complied.  ETP treated water is re-used for Gardening purposes.
(vi)	The unit will obtain CTE expansion if unit will increase effluent quantity.	Complied. Unit has not increased the effluent qty post obtaining last CTE. Following is the latest CTE no:- <u>HSPCB/Consent/ : 313096420ROHCTE8308984</u>
(vii)	Unit will submit analysis report of air emissions within 03 months, as applicable as per policy of the Board.	Complied.
(viii)	Unit will comply the conditions mentioned in the letter dated 25-10-2019 of CPCB regarding mechanism for Environmental management in compliance of Hon'ble NGT order dated 23-08-2019 in the matter of O.A. No. 1038/2018	Complied.  ETP is installed with Lab in plant for water treatment inside the plant and No polluted matter is discharged into a stream or well or on land.    

S. No.	CTO Terms and conditions	Compliance Status
(ix)	The unit will comply with the Directions dated 27-11-2020 issued by CPCB regarding to allow only those new industrial units in NCR-Delhi, which are using cleaner fuels, namely, natural gas (PNG/CNG), liquefied petroleum gas, bio-gas, propane, butane etc.	<p>The unit is strictly complying the direction dated 27.11.2020 issued by CPCB.</p> <ol style="list-style-type: none"> <li>1. The primary source of power for the industry is through the grid.</li> <li>2. For secondary power supply source in case of grid failure, the unit has installed 2 Gas Generators, which is run by PNG.</li> <li>3. The unit has also converted its Boilers into dual-fuel system.</li> </ol> <p>Hence, PNG &amp; LPG has primarily been used as a fuel for Generators &amp; Boilers. Diesel is used only in the case of breakdown in PNG driven equipment.</p> <p>Also, OCEMS has been installed for monitoring regular emissions from Stacks of DG, GG and boilers.</p> 
(x)	The unit will install & connect online monitoring devices for effluent, air emission for consent parameters and connect the same with HSPCB and CPCB servers	<p>The unit has installed online monitoring device for effluent &amp; air emission and connection request has been provided to both CPCB &amp; HSPCB.</p> <p>The OCEMS has been connected with CPCB server, but it is yet to be connected with HSPCB server.</p> <p>All the required documentation for connection with HSPCB server has been submitted over email to HSPCB office and follow ups for the same has been done.</p>
(xi)	The unit will also provide online monitoring devices for Gas leakage monitoring and compliance- VOC, Ammonia or other gases which are present in their production area along with ambient air monitoring parameters -	<p>The PO (Purchase Order) for supply and installation of AAQM system has been provided to the L1 vendor, as per process, in the month of Oct 2023.</p> <p>The delivery and installation are getting delayed from vendor due to high lead time of the equipment.</p> <p>A communication regarding the delay has been made to the HSPCB (attached as annexure).</p> <p>Also, Alternates are being explored for the same.</p>



S. No.	CTO Terms and conditions	Compliance Status
	PM10/2.5 , SO2, NOx , CO and provide the details on main gate area on the display panel.	
(xii)	The unit will comply the emission standards directions issued from CAQM / CPCB/ HSPCB time to time.	Complied.



Asian Paints Limited  
Asian Paints House  
6A, Shantinagar  
Santacruz (E)  
Mumbai 400 055  
T : (022) 6216 1000  
F : (022) 6216 1111  
www.asianpaints.com

18<sup>th</sup> July 2024

To  
Regional Officer  
Haryana State Pollution Control Board  
SCO -A6,7 8, Near Vishal Hotel, Suncity, Sector-36  
Rohtak, Haryana

Subject: : Intimation Regarding Delay in Installation of AAQM Device at Asian Paints Ltd., Rohtak.

Dear Sir,

This is to inform you regarding the concern we are facing w.r.t. installation of Ambient Air Quality Monitoring (AAQM) devices at our facility in Rohtak, your good office has asked us install an AAQM device in our premises. We have accordingly raised an order to M/s Anodyne after multiple assessments as no vendor has agreed for providing the right model.

We issued a purchase order to M/s Anodyne for the installation of an AAQM device in our plant on October 23, but the vendor has expressed multiple and continues difficulties in the procurement and installation of the same. We are continuing to follow up with the vendor on the installation of the AAQM devices.

Please accommodate the delay while we resolve this issue with the vendor (M/s Anodyne).

We respectfully request your assistance and suggestions on the matter.

Thanking you,

Yours truly,

  
For Asian Paints Limited

**Annexure 10: Water Supply Permission from HSIIDC, IMT Rohtak**

Date of purchase of stamp paper 6/5/2007  
 Total cost of plot - Rs. 80,15,67,000.00  
 Stamp duty @ 5% - Rs. 4,00,78,350.00

**CONVEYANCE DEED**

This deed of conveyance made and executed on the 31<sup>st</sup> day of December in the year 2008 between the Haryana State Industrial & Infrastructure Development Corporation Limited, Registered Office C-13 & 14, Sector-6, Panchkula, hereinafter called the transferor of the one part, which expression shall include its successor, assignees, administrators, executors through its authorized signatory; Mr. Gulshan Kumar, Dy. General Manager (E) Bahadurgarh, HSIIDC, IMT Rohtak, hereinafter called the transferee of the other part of the conveyance deed, which expression shall include his/her/its heirs, successors, assignees, administrators, nominees, executive etc. through its authorized signatory Mr. Jayesh Merchant S/o Mr. Tulsidas Merchant, resident of 4 Sai Manzil, 18 Almond Road, Mumbai - 400026.

Whereas the plot hereinafter described and intended to be hereby conveyed is owned by the transferor with full proprietary rights.

Whereas Industrial Plot No. 1, in IMT, Rohtak ( Industrial Model Township ) measuring 129.285 Acres, was allotted to the transferee, in pursuance to its application for allotment of the plot for the purpose of setting up of integrated paint manufacturing plant with final capacity of 400000 Kilo Liter per Annum as per the terms and conditions, contained in the Regular Letter of Allotment (RLA), dated 24<sup>th</sup> August 2008 and Agreement dated 6<sup>th</sup> November 2007 which shall continue to remain part and parcel of this deed.

FOR ASIAN PAINTS LIMITED

JAYESH MERCHANT

Ey. Gen. Manager  
 HSIIDC  
 B. O. Bahadurgarh

Whereas the transferee has made the full payment amounting to Rs.80,15,67,000/- (Rs. Eighty Crores Fifteen Lacs and Sixty Seven Thousands only) as on date, towards the full price of the said plot to the transferor.

NOW THEREFORE, this deed witness that for the purpose of carrying into effect the Regular Letter of Allotment (RLA) and the Agreement and further in consideration of the said sum of Rs. 80,15,67,000/- (Rs. Eighty Crores Fifteen Lacs and Sixty Seven Thousands only) paid by the transferee, the transferor hereby grants and conveys to the transferee all that part and parcel of plot No. 1, in I M T - Rohtak, measuring 129.285 Acres on the following terms and conditions :-

1. That any additional price of the aforesaid plot, as a consequence of enhancement in compensation that may be awarded by the Court (s) in the matters/cases arising out of the acquisition proceedings or any incidental or connected matter thereto, shall be payable by the transferee, in lump-sum, within 30 days from the date of issuance of demand notice, alongwith interest @15% p. a. or in the installments as per the Policy of the Corporation approved from time to time. In case if the amount will be deposited in installments, interest @ 15% p.a. will be charged. In case of default, penal interest @ 2% higher than the above rate on the defaulted amount for the defaulted period will also be charged.
2. That the aforesaid plot has been allotted on the "as is where is basis" and that the transferor will not be responsible for leveling uneven site, and that the transferee shall be liable to pay additional sum/money for any structure/super structure, trees & plants, boundary/compound wall or any other fixture that may be standing/existing thereon at the time of allotment, for which compensation, as assessed, had been paid by the transferor.

FOR ASIAN PAINTS LIMITED

JAYESH MERCHANT  
CHIEF FINANCIAL OFFICER &  
COMPANY SECRETARY

Dy. Gen. Manager  
HSIIDC  
O. Bahadurgarh

3. That the transferee shall be required to implement the project, for which the aforesaid plot has been allotted, within a period of three years from the date of offer of possession; and that implementation of the project shall mean the commencement of commercial production, after coverage of construction in accordance with the norms specified in the Estate Management Procedure - 2005, as amended from time to time (hereinafter called EMP) and installation of the plant and machinery.
4. That notwithstanding the period of three years stipulated for implementation of the project on the plot, the allottee shall comply with the following norms:-
  - a) The allottee shall be required to take possession of plot, submit building plan and start construction at site within Six months of allotment.
  - b) The allottee shall raise construction at least to the extent of plinth level within one Year of allotment.
  - c) The allottee shall complete the minimum required construction for completion of project and finalize tie-up for procurement of plant and machinery within two years.
  - d) The allottee shall implement the project after constructing at least 25% of the permissible covered area and raising investment in fixed capital assets (minimum of Rs.100 crores) in the project as per project report within three years of allotment and submit documents in this regard to the corporation.

Upon failure on the part of allottee to adhere to the schedule/time available for implementation of the project and investment of minimum Rs.100 crores

FOR ASIAN PAINTS LIMITED

  
JAYESH MERCHANT  
CHIEF FINANCIAL OFFICER &  
COMPANY SECRETARY

  
Dy. Gen. Manager  
HSIIDC

P. O. Bahadurgarh

In fixed capital assets in the project, HSIIDC shall be competent to resume the aforesaid plot.

5. Keeping in view that the aforesaid plot has been allotted under the ongoing scheme as per the provisions of EMP-2005, cost of the project being more than Rs.780 crores, the allottee hereby agrees and undertakes to implement the project within the stipulated period with an investment of Rs.500 crores as provided in the project report, failing which, the afore said plot shall be liable to be resumed. However, extension for implementation of project/raising investment in fixed capital assets as per project report can be considered under exceptional circumstances, subject to payment of extension fee at double the rates as stipulated in the EMP-2005, which may be revised from time to time.
  6. That the transferee shall be deemed to have completed the project if he, within the period available for implementation of the project, achieves construction coverage as per the norms specified in EMP and starts commercial production of the project after installation of plant & machinery. The transferee shall, within one month of completion of project, inform the concerned field office of the transferor, in writing, that the project has been completed, along with documentary proofs in this regard.
  7. That the transferee shall use and utilize the aforesaid plot for the purposes for which it has been allotted and shall not change the nature of the project or related activities in any manner whatsoever, except with the prior permission, which may be granted by the transferor only after considering the ground (s) and such other factors, as contemplated in the EMP, provided that the transferee has paid requisite fee along with written request in this behalf.
- Violation, if any, shall entail resumption of the plot.

FOR ASIAN PAINTS LIMITED

JAYESH MERCHANT  
CHIEF FINANCIAL OFFICER &  
MANAGING DIRECTOR

Dy. Genl. B. O. Bahadurgarh  
HSIIDC

8. That the transferee shall construct the building on the aforesaid plot after getting the building plans approved from the competent authority and the said building plans shall be approved in conformity with the building bye-laws, as applicable from time to time. However, before start of construction, the transferee shall submit a copy of the approved building plans to the transferor.
9. That the transferee shall apply for an occupation certificate in the concerned field office of transferor. Further, the procedure to grant occupation certificate shall be governed by the rules and regulations of Department of Town and Country Planning, Haryana, as amended from time to time.
10. That the use of the land and the building erected on the above said plot shall be governed by the zoning plan of the Estate. The permissible covered area shall be governed as per rules and regulations of the Department of Town and Country Planning, Haryana, as amended from time to time. Zoning violations and the deviation from the approved building plans at any stage shall cause a notice to rectify the breach by the transferee. In the event of non-compliance by the transferee, the aforesaid plot shall be liable to be resumed and the transferee shall be required to remove the plant and machinery within a period of two months from the order of the resumption at the cost and peril of the transferee.
11. That the transferee shall not bifurcate the aforesaid plot except with the prior permission of the transferor. Bifurcation of the plot shall, however, be governed and regulated in the manner as provided in the EMP. Bifurcation of shed shall not be allowed.

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COMPANY SECRETARYDy. Gen. Manager,  
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R. O. Behadurgarh



12. That the transferee shall have no right to transfer the land and building standing thereon by way of sale of gift, mortgage, lease or any other way without specific written approval from the transferor.

13. That further alienation of the above said plot may be allowed by the transferor only after the expiry of one year from the date of commencement of commercial production, after coverage of construction in accordance with the norms specified in EMP and installation of the plant and machinery, subject to further condition that the person, who steps into the shoes of the transferee, shall not be allowed to further transfer the plot for atleast one year from the date of transfer of the aforesaid plot in his/her/its name. Such transfer shall, however, be subject to the compliance of provisions and payment of transfer fee as prescribed in the EMP, as revised from time to time.

No transfer fee would be leviable after the project of the transferee has been in commercial production for more than five years and is free from all encumbrances. However, prior permission of transferor shall be necessary for such transfer of the plot. The fee at the rates, prescribed from time to time in the EMP, shall however, be payable by the transferee.

14. That the transfer of the aforesaid plot, due to inheritance, succession upon the death of the transferee/majority share holders or the project has been taken over by a financial Institution may be allowed without charging transfer fee, but on the payment of processing fee at the rates as prescribed in the EMP, from time to time. The change of management by transfer of majority shareholding shall also be treated as transfer.

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COMPANY SECRETARY

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HSIIDC - Rohtak  
Bhadurgarh

15. That for seeking permission for further transfer of the aforesaid plot, the transferee shall apply to the transferor along with following documents :-

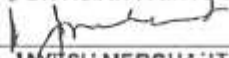
- a) Original letter of allotment.
- b) Proposed agreement to sell.
- c) Project report of the proposed transferee, in case of any change of project.
- d) Statement of means of financing of the proposed transferee.


The transferee shall, however, be required to submit his request for the proposed transfer within a period of 30 days from the date of proposed Agreement to Sell, failing which a penalty equivalent to the transfer fee shall be imposed upon the transferee, while allowing such transfer. In case the transfer is allowed, the person who steps into the shoes of the transferee, shall be required to enter into a fresh Agreement with the transferor in respect of the industrial plot.

16. That the change in shareholding may be allowed only if the original allottee/transferee or his family members (spouse, son, daughter, wife, parents, brother, sister) retain a minimum of 51% share in the project/company/firm. In case the original allottee / transferee and his family fail to retain the prescribed share holding of 51%, it shall be deemed to be transfer, for which the transfer fee at the rates prescribed in EMP, from time to time shall be payable by the transferor.

17. That the transferee, being a private limited company, if becomes a public limited company and is listed with recognized stock exchange, the change in constitution may be allowed subject to the condition that the transferee or his associates (family members), retain the largest share holding and having management control, otherwise it shall be treated as a case of transfer and the

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HSIIDC  
D. Bahadurgarh

transfer fee at the rates prescribed in EMP, from time to time, shall be payable by the transferee.

18. That in order to ensure optimum utilization of the industrial areas/industrial estates, leasing/renting of the premises of the building may be allowed if the transferee has made construction as per the standard norms and has remained in production for one year. Such permission may be granted by the transferor on payment of leasing fee, as prescribed in the EMP, from time to time. However, prior approval of the transferor for leasing shall be mandatory.
19. That the number of leases on the aforesaid plot shall be permitted as per the provisions contained in EMP. The permission for leasing shall be valid for the period specified in the permission letter and after having obtained permission for leasing, the transferee shall be at liberty to change the tenants within the period so specified subject to the transferee keeping transferor informed about any change made in the tenancy and getting the project of the lessee/ tenant approved from transferor and payment of lessing fee as prescribed in the EMP, from time to time.
20. That the transferee shall have to take water for the unit set up and other area of the said plot from the water supply system of the transferor on payment in accordance with the rates fixed from time to time. The transferee shall not dig or install any tube well/bore-well within his plot/shed for meeting his water requirements.
21. That the transferor shall continue to be the owner of all mines and minerals, whatsoever including sub-soil water in or underneath the surface of the plot with all such rights and powers as may be necessary or expedient for the purpose of searching, working, obtaining, removing and enjoying the same at

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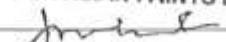
all such times and in such manner as transferor may deem fit, with power to carry out any survey of all or any part of the said plot and to sink pits, erect building, construct lines and generally appropriate and use surface of the said plot for the purpose of doing the full enjoyment of the exceptions and reservations herein contained.


Provided that the transferee shall be entitled to receive from transferor such payment for the occupation by transferor of the surface and for the damage done to the surface or building on the said land by such works or workings or letting down as may be agreed upon between the transferor and the transferee or failing such agreement, the same shall be ascertained by reference to arbitration.

22. That the Government may in the near future acquire possession and proprietary rights over the land surrounding the industrial estates and the Government or any other authority on behalf of the Govt. may thereafter, in its discretion, decide to convert this area or a part thereof into a green belt or to use it for any other common purpose and in the event of such happening, the cost of the acquisition and development of the part of land so utilized payable by transferor to the Government or any authority on its behalf will be recoverable by transferor from its transferees proportionately. An amount demanded by transferor on account of such external development charges will be payable by the transferee to transferor in lump-sum or in installments, as may be decided by transferor.

23. That the transferee shall pay to the transferor such proportionate external development charges spent by the transferor or as may be payable to the Government or any other agency by the transferor for external water supply, electricity installation, Roads, Storm Water, drainage, sewerage, CETP, STP,

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HSIIDC  
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pumping charges etc. in addition to already stated in Clause 22 above, within 30 days from the date of the letter of demand failing which the transferee shall be liable to pay the sum along with interest @ 14% p.a. In the event of failure of the transferee to make payment of the amount demanded within three months from the date of issue of the said letter of demand, the plot shall be liable to be resumed.

24. That the transferor may, but its officers and servants, at all reasonable times and in reasonable manner after giving 24 hours notice in writing, enter in and upon any part of the plot and building erected thereon for the purpose of ascertaining that the transferee has duly performed and observed the conditions to be observed under the provisions of the RLA/Agreement and this deed.
25. That the transferor shall have full right, power and authority at all times, to do through its officers or servants, all acts and things which may be necessary or expedient for the purpose of enforcing compliance of all or any of the terms, conditions and reservations imposed and to recover from transferee, as first charge upon the said land, the cost of doing all or any such acts and things and all costs incurred in connection therewith or in any way relating thereto.
26. That the transferee shall comply with all the Estate Management regulations dealing with malba, cleanliness, quantum and the quality of effluent discharge, solid waste disposal, green cover obligations, vehicle parking regulations etc. among other things for proper maintenance of the industrial estate and its surrounding. Transferor shall be within its rights to ensure compliance of measures considered necessary for its maintenance and levy

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COMPANY SECRETARY

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HSIIDC

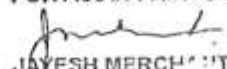
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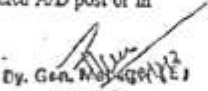
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charges, fines and penalties, if necessary, towards achievement of its objectives.

27. That the transferee shall have to pay local and general taxes, rates or cesses etc., as imposed on the said plot by the competent authority from time to time.
28. That the transferee shall pay the proportionate maintenance and service charges fixed from time to time and as communicated by the transferor. The maintenance and service charges will be payable on per square meter basis.
29. That the transferee agrees and undertakes that he/she/it shall, as far as possible, employ 75% of un-skilled workforce and shall give preference for other categories to candidates from among the Haryana domiciles in the unit set up/to be set up on plot.
30. That the transferor transfers this plot for setting up and running an industry and thereby contributing to the overall economic activity in the State. In case the transferee does not continue to remain in production and the production gets held up, transferor shall issue a notice to resume production within a period of three months. In case the transferee fails to resume production activity within the given time, the plot shall be liable to be resumed.
31. That if the transferee appoints ANY ATTORNEY, he/she/they shall submit the certified copy of the Registered Power of Attorney along with photograph and signatures of the transferee duly attested by the Magistrate First Class within a week from the registration of the deed by Registered A/D post or in person.

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JAYESH MERCHANT  
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COMPANY SECRETARY

  
Dy. Gen. Manager  
HSIIDC  
B. O. Bahadurgarh

32. That so long as the transferee fully performs and complies with and continues to so perform and comply with each and all the terms and conditions herein made and provided, but not otherwise, the transferor will ensure to the transferee full and peaceful enjoyment of the rights and privileges herein and hereby conveyed in this deed.

33. That the transferor will be competent to resume plots in its Industrial Estates in case an transferee defaults in complying with the terms and conditions of allotment/transfer/leasing etc. The resumption of plot would be done by the transferor after giving show cause notice. Upon resumption, the principal amount deposited by the transferee will be refunded and deducting 10% of the price of the plot without any interest. The amount of interest and penalty, if any, paid on the installment (s), if any, shall also stand forfeited. The transferee will be free to remove the structure/debris, if any, within a period of two months of resumption order at his own cost, failing which it shall be removed by the transferor at the transferee's cost. The transferee shall not be entitled to any payment/compensation for building constructed by it on the resumed plot.

34. That the plot once resumed shall not be restored by transferor. However, an appeal shall lie to a committee, comprising of the Financial Commissioner Industries, Haryana, Director of Industries, Haryana and Managing Director, Haryana Financial Corporation against the order of the Transferor ordering resumption. The decision of the aforesaid committee shall be final and binding.

35. That all the acts and expenses of or incidental to the execution of this deed including the cost of stamp duty, registration etc. shall be borne by the transferee.

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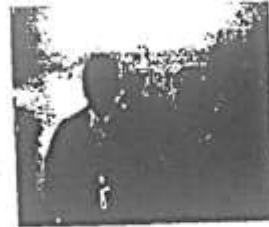
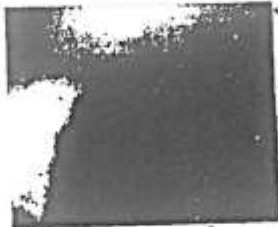
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Reg. No. 1574 Reg. Year 2008-2009 Book No. 1



विशेष  
विशेष विवरण

प्रेम  
एशियन पेंट्स लिमिटेड द्वारा कार्यवाही

पत्र 1- विवरण विवरण पत्र 2- विवरण विवरण

प्रमाण-पत्र

संयुक्त सब रजिस्ट्रार  
सांपला

प्रमाणित किया जाता है कि यह प्रवेश कर्मीक 1,574 मजदूर दिनांक 31/12/2008 को बही नं. 1 जिल्द नं. 2 के  
पृष्ठ नं. 195 पर दर्ज किया गया था इसको एक प्रति अतिरिक्त बही सख्या 1 जिल्द नं. 41 के  
पृष्ठ सख्या 83 से 95 पर विभाजित करके। यह भी प्रमाणित किया जाता है कि इस इलाके में प्रत्येक वर्ष  
गणना के अपने इलाके/निवास अंगुल से सापने किये हैं।

दिनांक 31/12/2008

संयुक्त सब रजिस्ट्रार  
सांपला

Revenue Department Haryana

HARIS-EX

NIC-HSU



**Annexure 11: Membership Certificate of CSHW TDSF**

Renewal

**Certificate**

**To whomsoever it may concern**  
This is to certify that

**ASIAN PAINTS LTD**

**PLOT NO - 01, SECTOR-30B,  
IMT, VILLAGE - KHERISADH,  
ROHTAK  
Haryana**

is a valid member of

**Gujarat Enviro-Protection And Infrastructure (Haryana) Pvt Limited**

for Integrated Common Hazardous Waste Management Facility.

This membership is valid for a period of  
**5 Years**

Date of issue : 15.03.2021  
Date of expiration : 14.03.2026  
Place of issue : SURAT

For, Gujarat Enviro-Protection And Infrastructure (Haryana)  
Pvt Limited

Director/Authorised signatory

Waste Information					
SrNo	Type Of Waste	Sign Qty(TPA)	SrNo	Type Of Waste	Sign Qty(TPA)
1	CHEMICAL RESIDUE FROM DECONTAMINATION	10.000	2	CHEMICAL SLUDGE.	225.000
3	DISCARDED LINER CONTAINERS.	25.000	4	FILTER CONTAMINATED WITH OIL.	10.000
5	OIL & GREASE SKIMMING RESIDU.	5.000	6	OIL CONTAMINATED WITH WW SLUDGE	10.000
7	PROCESS WASTE.	125.000	8	SPENT CARBON.	5.000
9	WASTE RESIDUE.	80.000	10	WASTE SOLVENT.	30.000
Total Sign Qty (TPA)					525.000

**SUBJECT TO FARIDABAD JURISDICTION**

**Annexure 12: Membership Certificate for Bio-Medical Waste Safe disposal****S.D. BIO-MEDICAL WASTE MANAGEMENT CO.**

Rohtak Road, V. &amp; P.O. - Baland, Distt. - Rohtak

Mobile : 9254251184, 9818586688

E-mail : sdrtk43@yahoo.com

(Regd. No. ....872-149....)**SERVICE AGREEMENT**The Agreement is entered into on this 20th Day of May 2024 at Haryana.**BY AND BETWEEN**

M/s S D Bio Medical Waste Management Co. having its treatment facility at VPO Baland, Rohtak Road, District Rohtak, Haryana (hereinafter referred to as "First Party" which expression shall, unless contrary to and/or repugnant to the context mean and include its successors, representatives and permitted assigns) through Mr. Sumit Nandal to enter into and sign this agreement for and on behalf of the **First Party**.

**AND**

M/s. Asian Paints Limited  
(Hereinafter referred to as "Second Party" which expression shall, unless contrary to and / or repugnant to the context mean and include its successors, representatives and permitted assigns) through its authorized representative Mr/Mrs. Mr Rachit Jain {Manager - HR} of the **Second Party**.

**WHEREAS**

The First Party is authorized by the Haryana State Pollution Control Board (H.S.P.C.B) for operating a facility for the collection, reception, transportation, treatment and disposal of Bio-Medical Waste in Haryana as per the Bio-Medical Waste Rules, 2016 (amended 2018).

The Second Party in compliance of the Bio-Medical Waste (Management & Handling) Rules, 2016 (amended 2018) should have service agreement with the First Party for disposal of their Bio-Medical Waste (except liquid bio-medical waste) for which the First Party is authorized facility of HSPCB.



Cont.....2

(1)

**Annexure 13: Authorization Letter from HSPCB for BMW Waste****Authorization letter from Haryana State Pollution Control Board**

**HARYANA STATE POLLUTION CONTROL BOARD**  
 SCF No. 42 & 43, Shopping Centre, Sector-6, Huda, Bahadurgarh Ph. 01276-  
 243077 (O) Email:- hspcbrobdh@gmail.com

 No. HSPCB/BMW/2022-2023 Dated 18/04/2022  
 Authorization No. BMW22ROH23070645 Application No.  
 23070645  
 Date of Submission 12/04/2022

**Sub: Renewal of Authorization under Bio Medical Waste Management Rules, 2016.**

1. M/s : ASIAN PAINTS LIMITED an occupier or operator of the facility located at Asian Paints Limited, Plot No.1, Sector 30-B, HSIIDC, IMT Rohtak, 124027, is hereby granted an authorisation for; Generation, segregation, Collection, Storage, Packaging

2. M/s : ASIAN PAINTS LIMITED is hereby authorized for handling of Biomedical Waste as per the capacity given below;

- (i) Number healthcare facilities covered by CBMWTF: 0
- (ii) Installed treatment and disposal capacity: 0 Kg/Day
- (iii) Area or distance covered by CBMWTF: 0
- (iv) Quantity of Biomedical waste handled, treated or disposed:

Category	Type of Waste	Quantity Generated or collected in Kg/day
Yellow	a) Human Anatomical Waste	0
	b) Animal Anatomical Waste	0
	c) Soiled Waste	0
	d) Expired or Discarded Medicines	0
	e) Chemical Solid Waste	0.9
	f) Chemical Liquid Waste	0
	g) Discarded linen, mattresses, beddings contaminated with blood or body fluid	0
	h) Microbiology, Biotechnology and other clinical laboratory waste	0
Red	Contaminated waste (Recyclable)	0.3
White (Translucent)	Waste sharps including Metals	0.05
Blue	Glassware	0.1
	Metallic Body Implants	

3. This authorisation shall be in force till the Clinic is operational.

4. This authorisation is subject to the condition stated below and to such other condition as may be specified in the rules for the time being in force under the Environment (Protection) Act, 1986.



**TERMS & CONDITIONS OF AUTHORISATION:-**

1. The applicants shall comply with the provisions of Bio-Medical Waste Management Rules 2016 notified vide No.S.O. 630(E) dated 20th July,2016
2. Bio-Medical Waste shall be treated & disposed off in Compliance with the standards prescribed in Schedule I.
3. Every occupier where required shall setup in accordance with the time schedule-IV, requisite treatment Bio-Medical Waste treatment facilities like incinerator,autoclave,microwave system for the treatment of the waste at a common waste treatment facility or any other waste treatment facility.
4. Bio-Medical Waste shall not be mixed with any other waste.
5. Bio-Medical Waste shall be segregated into containers/bags at appoint of generation with Shedule-II prior to its storage, transportation,treatment & disposal.The containers shall be labeled according to Schedule-II
6. If a container is transported from the premises where Bio-Medical Waste is generated to any waste treatment facility outside the premises where Bio-Medical Waste is generated to any waste treatment facility outside the premises, the container shall apart from the label prescribed in schedule III, also carry information according to Schedule IV.
7. Notwithstanding anything contains in Motors Vehicle Act, 1995 or rules there under, untreated the Bio-medical Waste shall be transported only in such vehicle as may be authorised for the purpose by the competent authority as specified by the Govt.
8. No untreated Bio-Medical Waste Shall be kept stored beyond a period of 48 hours.
9. Every authorised person shall maintain records related to the generation, collection, reception, storage, transportation, treatment disposal of Bio-Medical Waste in accordance with those rules & any guideline issued.
10. All records shall be subject to inspection & verifications by the prescribed authority at any time.
11. Suitably designed pollution control devices should be installed/retrofitted with the incinerator to acheive the above emission limits, if necessary.
12. Waste to be incinerated shall not be chemically treated with any chlorinated disinfectants.
13. Chlorinated plastics shall not be incinerated.Toxic metals in incineration ash shall be limited with the regulatory quantities as defined under the Hazardous Waste Management Rules, 2016.
14. Only low sulphur fuel like L.D.O/L.S.H.S/Deisel shall be used as fuel in the incinarator.
15. Occupier will comply all direction for generation, collection, reception, storage, transportation, treatment, disposal as per Bio-Medical Waste Management Rules 2016 & will ensure that there is no adverse effect to human & Environment.
16. The occupier will segregate the Bio-Medical Waste at the point of generation in accordance with the special-II of Bio-Medical Waste Management Rules, 2016.
17. The authorization would be subject/having proper disposal system for Bio-Medical Waste.
18. The unit shall maintained a log Book for suggestion/collection of Bio-Medical Waste at the source (i.e.wards) and also for each category of waste i.e.incienaration, autoclaving or landfill etc.
19. The yellow Bags should be non chlorinated bags.

20. The every occupier will also submit the copy of agreement every year before 30th April from any authorised services provider.

**Specific Conditions****General Deficiencies**

1. 1. The unit will adhere the BMW Rules, 2. The unit will segregate the biomedical waste properly and dispose safely to CBMWTF. 3. The unit will submit annual report every year as per BMW Rules. 4. The unit will renew agreement with CBMWTF for disposal of BMW and submit in the office in hard copy every year.





**Annexure 14: Properties of Raw Materials and Products.**

Sr. No.	Chemical / Material name	CAS No.	Formula	State at Ambient Condition	Odour	Mol. Wt.	Flash Point	Melting Point	Boiling Point	IDLH	Stability	Hazard	Color	Sp. Gr	LE L	UEL	Vapor density	Safety measures
						(g/mole)	(°C)	(°C)	(°C)	(ppm)				(g/cc)	%	%		
1	TiO2 BLR 698	13463-67-7	TiO2	Solid	Odourless	79.866	~	1560-1850	2500-3000	~	Stable	Exposure can irritate the eyes, nose and throat. since it has been shown to cause lung cancer in animals. a carcinogen.	White	3.5 - 4.2	~	~	~	Wear breathing apparatus if exposed to vapours/dust/spray/gases. Keep away from drains, surface and ground water. Retain contaminated washing water and dispose of it.
2	DAA (Diacetone alcohol)	123-42-2	C6H12O2	Liquid	~	116.16	58	-44	166	~	Chemically stable under ambient condition.	Flammable	Light yellow	~	1.8	6.9	4.01	Personal protective equipment. Do not let product enter drains.
3	IPA	67-63-0	C3H8O	Liquid	alcohol-like	60.1	12	-89.5	82	~	Chemically stable under ambient condition.	Highly Flammable	colorless	~	2	13.4	0.785	Personal protective equipment. Do not let product enter drains.
4	XYLENE	1330-20-7	C8H10	Liquid	~	106.17	25	-35	136-140	~	Chemically stable under ambient condition.	Flammable, Toxic	colorless	~	1.1	7	0.865	Personal protective equipment. Do not let product enter drains.
5	ISOBUTYL ALCOHOL	78-83-1	C4H10O	Liquid	alcohol-like	74.12	28	-108	108	~	Chemically stable under ambient condition.	Flammable	colorless	~	1.7	10.6	2.55	Personal protective equipment.
6	PMA	16561-29-8	C36H56O8	Powder	~	616.83	~	50-70	698.1	~	Chemically stable under ambient condition.	Fatal if swallowed, in contact with skin or if inhaled.	colorless	~	~	~	~	Nitrile rubber gloves, respiratory protection system
7	BUTYL ACETATE	123-86-4	C6H12O2	Liquid	sweet	116.16	27	-90	126	~	Chemically stable under ambient condition.	Flammable	colorless	~	~	~	~	explosion-proof electrical/ventilating/lighting equipment Ensure adequate ventilation
8	MEK	78-93-3	C4H8O	Liquid	~	72.11	-3	-87	80	~	Chemically stable under ambient condition.	Highly Flammable	colorless	~	1.8	10.1	2.49	butyl-rubber gloves Flame retardant antistatic protective clothing.
9	DISTILLED SOYA FATTY ACID	68308-53-2	C18h37n	liquid	fatty acid odour	282	186	25	285	N/A	Stable	N/A	Yellow-brown liquid	0.88	-	-	-	use of PPE
10	REFINED GLYCERINE	56-81-5	C3h8o3	liquid	odourless	92.09	-	19	290	N/A	Stable	N/A	colourless	1.26			3.17	use of PPE
11	PHTHALIC ANHYDRIDE (LOCAL)	85-44-9	C8H4O3	crystalline	~	148.12	152	131-134	284	~	Stable under recommended storage conditions.	Acute toxicity, Oral Specific target organ toxicity	colorless	~	1.7	10.4	~	Nitrile rubber gloves Face shield and safety glasses
12	MALEIC ANHYDRIDE	108-31-6	C4H2O3	Solid	~	98.06	103	52-54	200	~	Chemically stable under ambient condition.	Acute toxicity, Oral Specific target organ toxicity	White		1.4	7.1	~	Nitrile rubber gloves Tightly fitting safety goggles
13	MIX XYLENE SOLVENT GRADE (MXS)	1330-20-7	C8H10	Liquid	Aromatic	106	23-27	> -48	136-145	~	Stable under normal conditions of use. Reacts violently with strong oxidising agents.	Highly flammable. Toxic to aquatic organisms.	colorless	~	~	~	~	air-filtering respirators are suitable Chemical splash goggles
14	ETHYL CARBITOL ACETATE (HM)	112-15-2	C8H16O4	Liquid	aromatic	176.21	98	-17.4	218-219	~	Chemically stable under ambient condition.	very bioaccumulative (vPvB) at levels of 0.1% or higher	~	~	~	~	~	butyl-rubber gloves Recommended Filter type Filter A for Respiratory protection
15	VINYL ACETATE MONOMER	108-05-4	C4H6O2	Liquid	Pleasant fruity odour	86.09	-7.7	-100	73	~	Stable under normal conditions.	Highly flammable liquid and vapour	colorless		2.6	13.4	3	chemical resistant gloves/safety goggles and protective clothing. Wash thoroughly after handling.

Sr. No.	Chemical / Material name	CAS No.	Formula	State at Ambient Condition	Odour	Mol. Wt.	Flash Point	Melting Point	Boiling Point	IDLH	Stability	Hazard	Color	Sp. Gr	LE L	UEL	Vapor density	Safety measures
						(g/mole)	(°C)	(°C)	(°C)	(ppm)				(g/cc)	%	%		
16	PROPYLENE GLYCOL	57-55-6	C3H8O2	Liquid	~	76.09	104	-60	187	~	Chemically stable under ambient condition.	very bioaccumulative (vPvB) at levels of 0.1% or higher.	colorless	~	2.6	12.5	~	Filter A-(P2) for Respiratory protection Nitrile rubber gloves
17	SODIUM BICARBONATE (COMM/LR)	144-55-8	CHNaO3	powder	odorless	84.01	~	270	~	~	Chemically stable under ambient condition.	very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher	white	2.159	~	~	~	Nitrile rubber gloves, Safety glasses
18	TERTIARY BUTYL HYDROPEROXIDE	75-91-2	C4H10O2	Liquid	~	90.12	42	-3	96.2	~	Chemically stable under ambient condition.	Flammable liquid and vapor. Toxic in contact with skin.	colorless	~	5.75	10.15	~	Filter type ABEK Respiratory protection. Handle with gloves.
19	SODIUM FORMALDEHYD SULPHOXALATE	149-44-0	CH3NaO3S	~	Mild	154.12	~	123-140	~	~	Stable under recommended storage conditions	Suspected of causing genetic defects.	Off-white particles	1.57	~	~	~	Eye wash stations and emergency showers should be available. NIOSH approved respirator or dust mask
20	SODIUM META BISULPHITE	7681-57-4	Na2S2O5	powder	~	190.107	~	>120	~	~	Chemically stable under ambient condition.	Corrosive	Light yellow	~	~	~	~	Nitrile rubber gloves, Tightly sealed goggles
21	2-OCTANOL	123-96-6	C8H18O	Liquid	unpleasant	130.23	71	~	174-181	~	Chemically stable under ambient condition.	Causes serious eye damage.	colorless	~	~	~	~	Tightly fitting safety goggles, Nitrile rubber gloves
22	AMMONIUM PERSULFATE	7727-54-0	(NH4)2S2O8	powder	~	228.2	~	Decomposes before melting.	~	~	Chemically stable under ambient condition.	May intensify fire; oxidizer.	White	~	~	~	~	Nitrile rubber gloves, Do not let product enter drains.
23	BUTYL CARBITOL ACETATE 98%	124-17-4	C10H20O4	liquid	odourless	204.27	116.1	-32	247		stable	flammable	colourless	0.98	~	~	7	closed loop handling, equipment earthing, use of PPE
24	UREA TECHNICAL	57-13-6	CH4N2O	solid	~	60.06	~	132-135	101.04	~	Stable under recommended storage conditions.	Urea decomposes upon heating and can form products including ammonia, oxides of nitrogen, cyanuric acid, cyanic acid, biuret, carbon dioxide.	White	~	~	~	~	Use of PPE Do not eat, drink, or smoke during work.
25	VINYL NEODECANOATE	51000-52-3	C12H22O2	Liquid	Ester like	198.3	83	<-73.49	60-216	~	Stable under recommended handling and storage conditions.	Isolate from fire, if possible, without unnecessary risk.	colourless	~	~	~	~	Use of PPE Do not eat, drink, or smoke during work.
26	Xanthan Gum	11138-66-2	C35H49O29	Solid	~	933.74	~	~	~	~	Stable under recommended storage conditions.	Not a hazardous substance or mixture according to Regulation (EC) No 1272/2008.	~	~	~	~	~	General industrial hygiene practice.
27	Carbendazime	10605-21-7	C9H9N3O2	Crystalline	Odorless	191.1	~	302-307	~	~	Chemically stable	May cause genetic defects. May damage fertility or the unborn child.	~	~	~	~	~	butyl rubber gloves, Tightly sealed goggles
28	Diuron	330-54-1	C9H10Cl2N2O	Powder	amine-like	233.1	~	156	355-357	~	chemically stable under standard ambient conditions	Suspected of causing cancer, Very toxic to aquatic life with long lasting effects.	White	~	~	~	~	Nitrile rubber gloves, Do not let product enter drains.
29	SODIUM GLUCONATE	527-07-1	C6H11NaO7	Solid	~	218.14	~	205-209	613	~	Chemically stable under ambient condition.	Not a hazardous substance or mixture according to Regulation (EC) No 1272/2008.	Beige	~	~	~	~	Respiratory protection required when dusts are generated, Nitrile rubber gloves

Sr. No.	Chemical / Material name	CAS No.	Formula	State at Ambient Condition	Odour	Mol. Wt.	Flash Point	Melting Point	Boiling Point	IDLH	Stability	Hazard	Color	Sp. Gr	LE L	UEL	Vapor density	Safety measures
						(g/mole)	(°C)	(°C)	(°C)	(ppm)				(g/cc)	%	%		
30	Nipacide BIT	107-21-1	C <sub>2</sub> H <sub>6</sub> O <sub>2</sub>	liquid	~	62.07	115	-13	197.6	~		Harmful if swallowed. May cause damage to organs through prolonged or repeated exposure if swallowed.	~	~	3.2	15.3	~	General Industrial safety practice.
31	Sodium Hydroxide (48%)	1310-73-2	NaOH	pellets	odorless	40	~	318	1.39	~	Chemically stable under ambient condition.	May be corrosive to metals. Causes severe skin burns and eye damage.	White	~	~	~	1.38	Tightly fitting safety goggles. Do not let product enter drains.
32	Invert Sugar	8013-17-0	C <sub>12</sub> H <sub>24</sub> O <sub>12</sub>	Syrup	Sweet	360.3	301.5	~	551.7	~	Stable product at normal temperatures	Not classified as hazardous	Water white to light straw-colored liquid	~	~	~	~	~
33	Tributyl Phosphate	126-73-8	C <sub>12</sub> H <sub>27</sub> O <sub>4</sub> P	Liquid	odorless	266.3	146	-79	289	~	Stable under normal conditions.	Suspected of causing cancer	colourless	~	~	~	~	Do not eat, drink or smoke when using this product Wear eye/face protection
34	Potassium Sodium Tartrate	6381-59-5	C <sub>4</sub> H <sub>4</sub> KNaO <sub>6</sub> · 4H <sub>2</sub> O	Crystalline	odorless	282.22	~	75	220	~	chemically stable under standard ambient conditions	Not classified as hazardous	colourless	~	~	~	~	Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation. Use with adequate ventilation. Storage: Store in a cool, dry place
35	Diethylene Glycol	111-46-6	C <sub>4</sub> H <sub>10</sub> O <sub>3</sub>	Liquid	odorless	106.12	138	-10	245	~	chemically stable under standard ambient conditions	May cause eye and skin irritation. May be harmful if swallowed. May cause central nervous system depression. May cause kidney damage.	colourless	~	1.7	37	3.66	Wash thoroughly after handling. Use with adequate ventilation. Avoid breathing vapors from heated material. Avoid contact with eyes, skin, and clothing.
36	TEA (Triethylamine)	121-44-8	C <sub>6</sub> H <sub>15</sub> N	liquid	disagreeable	101.2	-11	-115	89	~	stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.	Acute exposure can irritate the skin and mucous membranes in humans.	Light yellow	0.73	1.2	8	3.49	Wear self-contained breathing apparatus. Wear full chemical protective clothing. Use personal protective equipment as required. Avoid contact with skin, eyes and clothes.
37	Sodium Nitrate	7631-99-4	NNaO <sub>3</sub>	Solid	odorless	84.99	~	308	380	~	chemically stable under standard ambient conditions	Hazardous in case of ingestion. Slightly hazardous in case of skin contact. Prolonged exposure may result in skin burns and ulcerations.	~	~	~	~	~	Avoid dust formation. Store in a dry place. Measures to prevent fire as well as aerosol and dust generation.
38	Tartaric Acid	87-69-4	HOOC(CHOH) <sub>2</sub> COOH	Solid	odorless	150.09	210	168 - 172	~	~	The Product is stable.	corrosive to the eyes, skin and respiratory tract. Inhalation of the aerosol may cause lung oedema.	White	1.76	~	~	5.18	Remove affected clothing and wash all exposed skin area with mild soap and water, followed by warm water rinse.
39	Citric Acid Monohydrate	5949-29-1	C <sub>6</sub> H <sub>8</sub> O <sub>7</sub> · H <sub>2</sub> O	Solid	odorless	210.14	173.9	135-172	~	~	chemically stable under standard ambient conditions	May cause gastrointestinal irritation with nausea, vomiting and diarrhoea.	~	~	~	~	~	Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.
40	Carmel color DS 400 (Dye)	8028-89-5	~	Liquid	Burnt Sugar	~	~	~	101.67-110	~	Stable under recommended storage conditions.	caramel colors are not genotoxic or carcinogenic,	Dark brown	1.30-1.325			~	General Industrial safety practice.
41	SODIUM GLUCONATE	527-07-1	C <sub>6</sub> H <sub>11</sub> NaO <sub>7</sub>	Solid	~	218.14	~	205-209	613.1	~	chemically stable under standard	May cause respiratory irritation in susceptible	Beige	1.79	~	~	~	Avoid contact with water and humidity. May cause irritation

Sr. No.	Chemical / Material name	CAS No.	Formula	State at Ambient Condition	Odour	Mol. Wt.	Flash Point	Melting Point	Boiling Point	IDLH	Stability	Hazard	Color	Sp. Gr	LE L	UEL	Vapor density	Safety measures
						(g/mole)	(°C)	(°C)	(°C)	(ppm)				(g/cc)	%	%		
											ambient conditions	individuals. May cause shortness of breath, sneezing and coughing.						and redness for susceptible individuals in skin connect.
42	Sodium Hydroxide (48%)	1310-73-2	NaOH	Pellets	odorless	40	~	318	1.390	~	chemically stable under standard ambient conditions	Causes severe skin burns and eye damage. Harmful to aquatic life.	White	2.13	~	~	~	Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.
43	Glycol	107-21-1	C2H6O2	Liquid	odorless	62.07	115	-13	196-198	~	chemically stable under standard ambient conditions	It can harm the eyes, skin, kidneys, and respiratory system. Can cause death if swallowed.	colorless	~	3.2	15.3	~	enclosing chemical processes for severely irritating and corrosive chemicals. general ventilation to control exposures to skin and eye irritants.
44	Isopropyl Alcohol	67-63-0	C3H8O	Liquid	alcohol-like	60.10	12	-89.5	82	~	Reacts with air to form peroxides. Chemically stable under standard ambient conditions. Stable under recommended storage conditions	excessive alcohol use can lead to the development of chronic diseases and other serious problems.	colorless	~	2	13.4	~	The higher your BAC, the more at risk you are of injury or overdose. The faster you drink, the higher your BAC, as your body can only process one standard drink per hour.
45	Diglycol	112-34-5	C8H18O3	Liquid	faintly perceptible	162.2	99	-68	231	~	Stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.	Diglycol is flammable and Reactive and Dangerous fire and Explosion Hazard.	colourless	0.955	0.7	5.9	5.6	It can harm the eyes, skin, kidneys, and respiratory system. Ethylene glycol can cause death if swallowed.
46	Water	7732-18-5	H2O	Liquid	odorless	18.02	~	0	100	~	Stable at room temperatures in closed containers under normal and recommended storage and use conditions.	~	colorless	~	~	~	0.46	Do not dive or jump into water that is not at least 12 feet deep. Enter the water feet-first and never dive head-first into a river, lake, or pond.
47	FormulaShell Motor Oil	25103-54-2	~	Liquid	Slight hydrocarbon	~	400	~	> 280	~	Stable	risk of fire and explosion due to ignition of flammable vapors or gases.	~	7.43	1	10	> 1	Spills should be cleaned immediately. Spills should be cleaned immediately.
48	Organic Acid	77-02-09	C2H6O6	Liquid	Acidic	126.07	93.33	101-102	~	~	Stable under normal conditions	Causes eye irritation. May cause respiratory irritation. May form combustible dust concentrations in air.	Slightly yellow to green	~	~	~	~	Take off immediately all contaminated clothing and wash it before reuse. Rinse skin with water/shower
49	Polypropylene polyethylene glycol (Polyol)	53637-25-5	(CH2CHOH)n	Liquid	Slight	~	> 200	< 20	~	~	Stable under normal conditions	combustion of polyol resin blends will produce carbon monoxide and carbon dioxide.	colorless	~	~	~	~	Avoid eye and skin contact. prohibiting eating and smoking in chemical handling areas.
50	Butyl Isocyanate	111-36-4	C5H9NO	liquid	~	99.13	11	~	115	~	Stable under recommended storage conditions	May cause an asthma-like allergy. Isocyanate is a Flammable and Reactive chemical and	Clear Light yellow	~	~	~	3.42	Good personal hygiene should be practiced and separate storage areas to prevent the contamination of work clothing to regular clothing.

Sr. No.	Chemical / Material name	CAS No.	Formula	State at Ambient Condition	Odour	Mol. Wt.	Flash Point	Melting Point	Boiling Point	IDLH	Stability	Hazard	Color	Sp. Gr	LE L	UEL	Vapor density	Safety measures
						(g/mole)	(°C)	(°C)	(°C)	(ppm)				(g/cc)	%	%		
												a Fire and Explosion Hazard.						Hands should always be washed before eating, drinking, smoking and before leaving work.
51	ACTICIDE SPX	55965-84-9	~	Liquid	Mild	~	~	~	~	~	Before handling, the product should not be diluted or mixed with other chemicals, in order to avoid any negative influences on the ingredients.	corrosive to mild steel. Do not store or transport in unlined metal containers.	colorless to slightly yellowish	~	~	~	~	Personal protective equipment.
52	ASE 60	37325-11-4	~	Liquid	acrylic like	~	Non combustible	0	100	~	Stable	~	White milky	~	~	~	< 1	~
53	NATROSOL 250 HHBR	~	~	Solid	odorless	~	~	~	~	~	Stable under normal conditions.	May form combustible dust concentrations in air	off-white	1.38	~	~	~	No hazards which require special first aid measures.
54	MICRONISED SILICA 10	7631-86-9	~	Solid	odorless	~	~	1710	2230	~	Stable under recommended storage conditions.	This chemical is not considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)	white	2.1-2.2	~	~	~	General industrial hygiene practice.
55	MICRONISED BARYTES	7727-43-7	BaSO4	solid	odorless	233.39	~	~	~	~	Stable under normal conditions.	insoluble, inert and non-toxic. No recognized unusual toxicity to plants or animals.	~	~	~	~	~	May cause skin irritation. May cause eye irritation. May cause mechanical irritation to eyes.
56	CHINA CLAY 10 MICRON	1332-58-7	Al2Si2O5(OH)	solid	odorless	258.16	~	~	~	~	Stable under normal temperature conditions and recommended use.	Prolonged and massive inhalation of respirable crystalline silica dust may cause lung fibrosis, commonly referred to as silicosis.	off-white	~	~	~	~	: No harmful effects expected in amounts likely to be ingested by accident. Prolonged contact may cause dryness of the skin.Particles in the eyes may cause irritation and smarting.
57	SYNTHETIC YELLOW OXIDE	51274-00-1	Fe(OH)3	Solid	odorless	106.867	~	> 1000	~	~	No particular stability concerns. Temperature of approximately 180 C and above, result in dehydration to Fe2o3.	Dust may be irritating to the lungs and cause sneezing. Contact with skin may cause irritation.	Yellow	~	~	~	~	Special protective equipment for firefighters Wear self-contained breathing apparatus as combustion may produce hazardous fumes. Avoid generation and spreading of dust.
58	PHIL BLACK A	1333-86-4	~	Powder or pellet	odorless	~	~	~	~	~	Stable under normal ambient conditions.		Black	1.7-1.9	~	~	~	General industrial hygiene practice.
59	SYN R OXIDE IS 473	75-56-9	C3H6O	Liquid	Sweet	58.08	-38	-112	34		chemically stable under standard ambient conditions	may cause a skin allergy. Exposure can cause headache, dizziness, lightheadedness, and passing out.	colorless		1.9	36-45	2.01	Wear safety goggles or eye protection in combination with breathing protection. Do not eat, drink, or smoke during work.
60	TITANIUM DIOXIDE RUT	13463-67-7	TiO2	Nano particles	odorless	79.87	~	1.850	2.972	~	chemically stable under standard ambient conditions	Exposure can irritate the eyes, nose and throat. since it has been shown to cause	white	~	~	~	~	Remove persons to safety. Wear breathing apparatus if exposed to vapours/dust/spray/gases.

Sr. No.	Chemical / Material name	CAS No.	Formula	State at Ambient Condition	Odour	Mol. Wt.	Flash Point	Melting Point	Boiling Point	IDLH	Stability	Hazard	Color	Sp. Gr	LE L	UEL	Vapor density	Safety measures
						(g/mole)	(°C)	(°C)	(°C)	(ppm)				(g/cc)	%	%		
												lung cancer in animals. a carcinogen.						Keep away from drains, surface and ground water. Retain contaminated washing water and dispose of it.
61	SHORT OIL LINSEED ALKYD	8001-26-1	~	Liquid	~	~	222	-19	>340	~	Unstable in the presence of incompatible materials. Product is considered stable. Hazardous polymerisation will not occur.	May cause an allergic skin reaction. void breathing mist, vapors or spray	~	~	~	~	~	General industrial hygiene practice.
62	MIXED XYLENE	1330-20-7	C8H10	Liquid	~	106.17	25	0	136-140		chemically stable under standard ambient conditions	Dizziness, Vomiting, Irritation To Eyes & Skin. If Contact With Eye & Skin Flush With Plenty Of Water immediately.	colorless	0.865	1.1	7	~	Wear chemical safety goggles. A face shield (with safety goggles) may also be necessary. Skin Protection: Wear chemical protective clothing.
63	BUTYL ACETATE	123-86-4	C6H12O2	Liquid	fruity odor	116.16	~	-77	126	~	Stable under ordinary conditions of use and storage.	Use water spray to keep fire-exposed containers cool and to dilute and disperse vapors.	colorless	0.8822	1.7	7.6	4	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. Use only non-sparking tools.
64	REFINED SOLVENT CIX	64742-95-6	~	Liquid	Aromatic	121	> 42	~	161-171	~	Stable under normal conditions.	High airborne concentrations of some solvents can cause unconsciousness and death.	colorless	~	0.9	6.2	4.2	keep lids on containers and use sealed containers for solvent -contaminated waste. Do not leave solvent-contaminated rags lying around. do not use solvents to remove paint, grease etc from your skin.
65	ISOBUTANOL	78-83-1	C4H10O	Liquid	alcohol-like	74.12	28	-108	108	~	chemically stable under standard ambient conditions	can irritate the eyes and skin causing a rash or burning feeling on contact.	colorless	0.803	1.7	10.6	~	Avoid contact with skin and eyes. Avoid inhalation of vapour or mist. Keep away from sources of ignition - No smoking.
66	GLYCERINE	56-81-5	C3H8O3	Liquid	odorless	92.09	199	18.17	290	~	stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.	May Increase risk of fire/explosion.	colorless	1.261	2.7	19	3.17	Avoid contact with skin and eyes. Avoid inhalation of vapour or mist. Keep container tightly closed in a dry and well-ventilated place.
67	PTHALICANHYDRIDE	85-44-9	C8H4O3	Crystalline	~	148.12	152	131-134	284	~	Stable under recommended storage conditions.	Exposure to phthalic anhydride may occur during its use as a chemical intermediate in the industry.	colorless	1.53	1.7	10.4	~	Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. Avoid contact with skin
68	MTO	8006-64-2	~	Liquid	Kerosene like odour	~	35	~	145-205	~	Chemically Stable	A complex mixture of airborne solids, liquids and gases will be evolved when combustion or thermal or oxidative degradation.	Water White	0.79			4.8	All cars will now have to be equipped with driver-side airbags as a minimum requirement.

**Annexure 15: Long-term Climatological Table Published by IMD for Rohtak****जलवायवी सारणी १९९१-२०२०****CLIMATOLOGICAL TABLE 1991-2020**स्टेशन : रोहतक  
STATION : ROHTAKराज्य : हरियाणा  
STATE : HARYANAसूचकांक : 42176  
INDEX NO. :

	मौसम परिघटना						पवन												मेघ										दृश्यता						
	के साथ दिनों की संख्या						पवन की गति (कि.मी.प्र.घं.) का माह में दिनों की संख्या				पवन की दिशा के दिनों की संख्या का प्रतिशत								मेघ मात्रा (सभी मेघ) सहित दिनों की संख्या – अष्टमांश					निम्न स्तरी मेघ मात्रा सहित दिनों की संख्या – अष्टमांश					दृश्यता सहित दिनों की संख्या						
माह	वर्षण 0.3 मि.मी.या अधिक	ओले	गर्जन	कुहरा	धूल भरी आंधी	चंड वात	62 या अधिक	20-61	1-19	0	उ	उपू	पू	दपू	द	दप	घ	उप	शांत	0	1-2	3-5	6-7	8	0	1-2	3-5	6-7	8	कुहरा 8	1 कि.मी. तक	1-4 कि.मी.	4-10 कि.मी.	10-20 कि.मी.	20 कि.मी. से अधिक
	WEATHER PHENOMENA						WIND												CLOUD										VISIBILITY						
	No. OF DAYS WITH						NO. OF DAYS WITH WIND SPEED (Kmph)				PERCENTAGE NO. OF DAYS WIND FROM								NO. OF DAYS WITH CLOUD AMOUNT (ALL CLOUDS) OKTAS					NO. OF DAYS WITH LOW CLOUD AMOUNT OKTAS					NO. OF DAYS WITH VISIBILITY						
MONTH	PPT 0.3 mm OR MORE	HAIL	THUNDER	FOG	DUST STORM	SQUALL	62 OR MORE	20-61	1-19	0	N	NE	E	SE	S	SW	W	NW	CALM	0	1-2	3-5	6-7	8	0	1-2	3-5	6-7	8	FOG 8	UPTO 1 Km.	1-4 Kms.	4-10 Kms.	10-21 Kms.	OVER 21 Kms.
जनवरी JAN	I II	2.2 0	0 0	0.3 0	11.4 0	0 0	0 0	0 0	20 22	11 9	2 4	6 4	6 9	3 2	3 1	16 3	14 19	13 28	37 30	17 15	2 5	3 5	3 3	6 3	22 23	2 4	3 2	3 1	1 1	0 0	19.6 2.8	8.9 22.3	2.5 4.9	0 0.9	0 0
फरवरी FEB	I II	2.4 0	0 0	0.2 0	6.3 0	0 0	0 0	0 0	20 21	8 7	1 4	5 5	8 10	5 3	1 1	15 5	25 18	10 30	30 24	18 15	2 4	3 4	3 3	2 2	24 22	2 4	1 1	1 1	0 0	0 0	13.8 0.1	10.9 16.8	3.3 9.5	0 1.5	0 0.1
मार्च MAR	I II	2.2 0	0.1 0	0.8 0	3.7 0	0.1 0	0 0	0 0	20 22	11 9	1 3	3 7	7 6	4 2	1 1	18 7	16 22	12 24	38 28	18 17	3 4	4 4	3 3	3 3	26 26	3 2	1 2	1 1	0 0	0 0	5.5 0.4	19.8 8.7	5.7 17	0 5	0 0
अप्रैल APR	I II	2.1 0	0 0	1 0	0.1 0	0.2 0	0 0	0 0	19 23	11 7	3 1	4 6	8 7	4 1	1 0	15 7	14 22	13 31	38 25	21 18	2 3	3 4	3 3	1 2	27 24	2 3	1 2	0 1	0 0	0 0	0.8 0	21.2 4.9	7.6 17.4	0.4 7.6	0 0
मई MAY	I II	4.2 0	0.1 0	1.9 0	0.1 0	0.9 0	0 0	0 0	24 26	7 5	2 2	7 5	18 16	8 3	1 1	11 9	23 29	8 19	22 16	21 18	2 3	3 4	3 3	2 3	27 23	2 4	1 3	1 1	0 0	0 0	0.1 0	19.8 4.8	11 17.4	0.1 8.8	0 0
जून JUN	I II	5.2 0	0 0	1.6 0	0 0	0.8 0	0 0	0 0	25 26	5 4	2 2	10 8	18 19	8 6	1 0	15 8	21 25	8 18	17 14	17 12	2 5	3 5	3 4	5 4	21 19	3 6	3 3	2 2	1 0	0 0	0.6 0	19.7 5.5	9.5 17.5	0.1 6.9	0 0
जुलाई JUL	I II	9.5 0	0 0	0.8 0	0 0	0.1 0	0 0	0 0	23 22	8 9	2 1	7 12	27 25	10 6	0 0	13 7	13 10	2 11	26 28	6 4	3 3	5 8	5 9	12 7	15 10	6 12	6 6	4 3	0 0	0 0	0 0	18.8 3.3	12.1 20.8	0 6.8	0 0.1
अगस्त AUG	I II	9.9 0	0 0	1.2 0	0 0	0 0	0 0	0 0	22 21	9 10	0 1	6 9	21 18	6 5	1 1	17 6	16 16	3 12	30 32	6 3	3 4	7 9	6 8	9 7	13 8	7 12	7 9	3 2	1 0	0 0	0 0	18.5 4	12.4 19.3	0.1 7.4	0 0.3
सितम्बर SEP	I II	5.6 0	0 0	1 0	0 0	0 0	0 0	0 0	20 20	10 10	2 3	9 7	10 13	6 2	1 0	17 7	13 14	6 19	36 35	15 10	3 5	4 6	3 5	5 4	19 18	4 5	5 5	2 2	0 0	0 0	0.1 0	18.1 2.2	10.5 19.6	1.4 8.1	0 0
अक्टूबर OCT	I II	1 0	0 0	0.3 0	0.6 0	0 0	0 0	0 0	14 15	17 16	1 3	4 4	7 4	3 0	1 1	13 4	11 14	5 19	55 51	27 25	1 2	1 2	1 1	1 1	28 29	1 1	1 0	1 1	0 0	0 0	1.8 0	22.4 9.4	6.8 15.4	0 6.2	0.1 0
नवम्बर NOV	I II	0.7 0	0 0	0.1 0	5 0	0 0	0 0	0 0	13 14	17 16	1 2	4 5	4 4	5 2	2 0	16 6	9 14	5 15	54 52	25 24	1 2	2 2	1 1	1 1	28 28	1 1	1 1	0 0	0 0	0 0	8.8 0.2	18 21.2	3.2 6.2	0 2.2	0 0
दिसम्बर DEC	I II	1 0	0 0	0.2 0	9.3 0	0 0	0 0	0 0	18 18	13 13	1 1	3 5	7 5	3 1	1 0	18 5	17 16	6 26	44 41	22 21	2 3	2 3	2 2	3 2	26 27	1 2	2 1	1 1	0 0	0 0	18.9 3.2	10.6 24.1	1.5 3.2	0 0.6	0 0
वार्षिक योग या माध्य ANNUAL TOTAL OR MEAN	I II	46.3 0	0.2 0	9.3 0	36.5 0	2.1 0	0 0	0 0	240 252	125 113	1 2	6 6	12 11	5 3	1 0	15 6	16 18	8 21	36 33	216 184	26 44	40 56	37 43	46 38	275 263	32 50	33 35	20 14	5 3	0 0	67 6.8	209.5 123.8	86.1 171.8	2.3 62	0.1 0.6

भारत मौसम विज्ञान विभाग

331

INDIA METEOROLOGICAL DEPARTMENT



## जलवायवी सारणी १९९१-२०२०

## CLIMATOLOGICAL TABLE 1991-2020

स्टेशन : रोहतक  
STATION : ROHTAK

अक्षांश  
LAT.

28° 50'

देशांतर  
LONG.

76° 35'

माध्य समुद्र तल से ऊँचाई  
HEIGHT ABOVE M.S.L.

219.46

मीटर  
METRES

प्रेक्षणों पर आधारित  
BASED ON OBSERVATIONS

1991-2020

माह	स्टेशन का सतह दाब	वायु तापमान										आद्रता		मघ की मात्रा		मासिक योग	वर्षा के दिनों की संख्या	वर्षा सहित सबसे नम महीने का योग	सबसे शुष्क महीने का योग	24 घंटे की सबसे भारी वर्षा	दिनांक और वर्ष	माध्य पवन गति	
		माध्य						चरम															
		शुष्क बल्ब	नम बल्ब	दैनिक अधिकतम	दैनिक न्यूनतम	माह में उच्चतम	माह में निम्नतम	उच्चतम	दिनांक और वर्ष	निम्नतम	दिनांक और वर्ष	सापेक्ष आर्द्रता	वाष्प दाब	रामस्त मेघ	निम्न मेघ								
MONTH	STATION LEVEL PRESSURE	AIR TEMPERATURE										HUMIDITY		CLOUD AMOUNTS		RAINFALL						MEAN WIND SPEED	
		MEAN						EXTREMES								MONTHLY TOTAL	NO. OF DAYS	TOTAL IN WETTEST MONTH WITH YEAR	TOTAL IN DRIEST MONTH WITH YEAR	HEAVIEST FALL IN 24 HOURS	DATE AND YEAR		
		DRY BULB	WET BULB	DAILY MAX	DAILY MIN	HIGHEST IN THE MONTH	LOWEST IN THE MONTH	HIGHEST	DATE AND YEAR	LOWEST	DATE AND YEAR	RELATIVE HUMIDITY	VAPOUR PRESSURE	ALL CLOUDS	LOW CLOUDS								
	एच.पी.ए hPa	डि. सें. °C	डि. सें. °C	डि. सें. °C	डि. सें. °C	डि. सें. °C	डि. सें. °C	डि. सें. °C		डि. सें. °C		प्रतिशत %	एच.पी.ए. hPa	आकाश के अठ्ठांश Oktas of sky	मि.मी. mm		मि.मी. mm	मि.मी. mm	मि.मी. mm			कि.मी.प्र.घ. Kmph	
जनवरी JAN	I	992.3	9.5	8.4	20.1	6.9	26.1	2.7	31.6	4	-0.5	8	86	10.3	2.8	1.4	10.9	1.2	89.0	0.0	64.0	28	4.7
	II	990.1	17.4	13.4						1999		2006	62	12.3	2.3	0.7			1983			1983	
फरवरी FEB	I	989.8	12.9	11.1	24.0	9.8	29.4	5.1	33.6	17	0.2	8	79	11.9	1.8	0.7	18.0	1.6	95.2	0.0	91.6	20	5.3
	II	987.9	21.3	15.4						1993		1978	51	13.0	2.1	0.6			1968			1968	
मार्च MAR	I	987.1	18.8	15.4	29.4	14.6	36.0	9.9	40.0	29	2.0	3	68	14.9	2.0	0.7	11.1	1.2	173.1	0.0	111.5	12	5.8
	II	984.6	27.0	18.6						1973		1987	42	15.1	2.1	0.7			1982			1987	
अप्रैल APR	I	983.5	26.0	18.7	37.1	20.1	42.2	14.8	45.0	28	10.4	2	48	15.9	1.5	0.4	14.5	1.2	76.2	0.0	61.2	2	5.1
	II	980.1	34.6	21.4						1979		1968	28	15.1	1.9	0.6			1997			1997	
मई MAY	I	979.1	30.2	21.9	40.4	24.7	44.7	19.0	46.8	23	10.5	20	47	19.8	1.4	0.5	35.8	2.3	145.7	0.0	99.1	18	6.0
	II	975.6	37.8	23.8						2010		2008	29	18.5	2.1	0.8			2008			1992	
जून JUN	I	975.6	31.4	24.8	39.5	26.6	44.6	21.6	47.2	8	17.6	10	59	26.1	2.6	1.1	62.1	3.8	341.0	0.0	297.9	30	5.6
	II	972.1	36.8	26.0						1995		2011	43	25.0	2.9	1.1			1981			1981	
जुलाई JUL	I	974.7	29.8	26.5	36.0	26.8	41.0	23.7	46.9	5	19.4	23	77	31.9	4.3	2.0	143.8	7.2	501.5	0.0	193.6	11	5.2
	II	972.0	33.3	27.5						1976		1968	64	32.1	4.8	2.1			1983			2003	
अगस्त AUG	I	977.1	28.6	26.2	34.4	26.0	37.7	23.4	41.3	4	21.1	30	82	32.2	4.5	2.2	193.0	7.2	928.0	0.0	202.7	31	4.5
	II	974.4	31.9	27.4						1972		2009	70	32.9	4.8	2.3			1995			1975	
सितम्बर SEP	I	981.5	27.3	24.5	34.1	24.1	37.2	20.4	40.5	25	16.8	26	79	28.7	2.8	1.3	99.3	4.7	300.9	0.0	158.9	11	3.9
	II	978.6	31.7	26.0						1987		1972	63	29.0	3.1	1.2			2009			2009	
अक्तूबर OCT	I	987.5	22.8	19.4	33.2	18.1	36.2	13.6	39.4	2	8.3	26	72	20.2	0.8	0.3	16.0	0.7	87.5	0.0	46.3	5	3.0
	II	984.4	29.5	22.1						1968		2009	50	20.8	0.8	0.3			2004			1996	
नवम्बर NOV	I	991.0	16.8	14.1	28.7	12.0	32.8	7.3	37.9	1	2.9	21	74	14.2	0.7	0.2	4.7	0.3	72.9	0.0	38.4	27	2.6
	II	988.0	24.3	18.3						1976		2009	53	16.3	0.8	0.1			1981			1972	
दिसम्बर DEC	I	992.7	10.7	9.3	23.0	7.3	27.6	3.1	30.3	2	-0.8	24	82	10.7	1.5	0.6	4.5	0.4	102.3	0.0	55.0	24	3.6
	II	990.3	19.3	14.6						1982		2011	58	12.9	1.3	0.4			1967			1967	
वार्षिक योग या माध्य ANNUAL TOTAL OR MEAN	I	984.1	22.3	18.5	31.7	18.2	45.5	1.9	47.2	8	-0.8	24	71	19.9	2.2	0.9	613.5	31.8	1247.4	44.8	297.9	30	4.6
	II	981.3	29	21.3					6	1995	12	2011	51	20.4	2.4	0.9			1983	1987	6	1981	

**Annexure 16: Detailed Result of Ambient Air Quality**

S. No	Sampling Date	Sampling Location	Area /Category	Average Pollutant Concentration µg/m³, except CO (in mg/m³)						
				PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	HC	CO	VOC
				(24hr.)	(24hr.)	(24hr.)	(24hr)	Grab	(1 hr)	(24hr)
National Ambient Air Quality Standards by Central Pollution Control Board dtd. 16 <sup>th</sup> November'2009				100	60	80	80	NS	4	NS
Ecologically Sensitive Area (Notified by Central Govt.)				100	60	80	80	NS	4	NS
(AA01) At Site										
1	31.01.2023	At Site	Industrial	90	34	11.0	15.6	1012	1.10	<1
2	01.02.2023	At Site	Industrial	103	17	8.1	17.7	-	-	-
3	04.02.2023	At Site	Industrial	106	11	9.5	12.9	-	-	-
4	05.02.2023	At Site	Industrial	118	12	9.5	16.1	-	-	-
5	10.02.2023	At Site	Industrial	97	38	9.8	16.3	958	1.18	<1
6	11.02.2023	At Site	Industrial	112	40	8.7	15.2	-	-	-
7	16.02.2023	At Site	Industrial	115	29	3.8	6.0	-	-	-
8	17.02.2023	At Site	Industrial	104	12	7.6	9.3	-	-	-
9	26.02.2023	At Site	Industrial	98	35	9.5	10.5	966	0.99	<1
10	27.02.2023	At Site	Industrial	92	30	6.8	9.8	-	-	-
11	14.03.2023	At Site	Industrial	84	25	7.6	12.0	-	-	-
12	15.03.2023	At Site	Industrial	76	22	9.5	6.0	-	-	-
13	18.03.2023	At Site	Industrial	91	31	8.6	16.4	927	1.10	<1
14	19.03.2023	At Site	Industrial	58	15	10.5	14.2	-	-	-
15	30.03.2023	At Site	Industrial	73	20	8.5	11.6	-	-	-
16	31.03.2023	At Site	Industrial	94	35	6.7	12.6	-	-	-
17	07.04.2023	At Site	Industrial	65	26	9.5	10.8	-	-	-
18	08.04.2023	At Site	Industrial	84	27	7.6	9.6	911	0.84	<1
		Minimum		118	40	11.0	17.7	1012	1.18	<1
		Maximum		58	11	3.8	6.0	911	0.84	<1
		Average		92	25	8.5	12.4	955	1.04	<1
		98 <sup>th</sup> Percentile		117	39	10.8	17.3	1008	1.18	<1
(AA02) Bohar Village										
1	31.01.2023	Bohar Village	Rural	87	18	5.3	10.5	-	-	-
2	01.02.2023	Bohar Village	Rural	49	9	6.9	6.0	-	-	-
3	04.02.2023	Bohar Village	Rural	72	16	8.7	6.0	938	1.13	<1
4	05.02.2023	Bohar Village	Rural	57	14	6.9	6.0	-	-	-
5	10.02.2023	Bohar Village	Rural	38	11	7.5	6.0	-	-	-
6	11.02.2023	Bohar Village	Rural	37	15	9.6	6.0	-	-	-
7	16.02.2023	Bohar Village	Rural	102	13	8.7	6.0	1004	1.25	<1

S. No	Sampling Date	Sampling Location	Area /Category	Average Pollutant Concentration µg/m³, except CO (in mg/m³)						
				PM <sub>10</sub> (24hr.)	PM <sub>2.5</sub> (24hr.)	SO <sub>2</sub> (24hr.)	NO <sub>x</sub> (24hr)	HC Grab	CO (1 hr)	VOC (24hr)
National Ambient Air Quality Standards by Central Pollution Control Board dtd. 16 <sup>th</sup> November'2009				100	60	80	80	NS	4	NS
Ecologically Sensitive Area (Notified by Central Govt.)				100	60	80	80	NS	4	NS
8	17.02.2023	Bohar Village	Rural	113	18	9.4	14.6	-	-	-
9	26.02.2023	Bohar Village	Rural	69	26	6.8	18.6	-	-	-
10	27.02.2023	Bohar Village	Rural	87	27	8.9	17.5	-	-	-
11	14.03.2023	Bohar Village	Rural	95	39	7.5	12.9	1038	0.87	<1
12	15.03.2023	Bohar Village	Rural	67	24	9.5	11.8	-	-	-
13	18.03.2023	Bohar Village	Rural	84	29	8.9	12.6	-	-	-
14	19.03.2023	Bohar Village	Rural	91	37	9.7	17.5	-	-	-
15	30.03.2023	Bohar Village	Rural	82	36	8.9	13.8	938	0.90	<1
16	31.03.2023	Bohar Village	Rural	79	30	7.6	14.0	-	-	-
17	07.04.2023	Bohar Village	Rural	94	37	8.6	9.0	-	-	-
18	08.04.2023	Bohar Village	Rural	76	30	3.8	16.7	1004	0.88	<1
		Minimum		113	39	9.7	18.6	1038	1.25	<1
		Maximum		37	9	3.8	6.0	938	0.87	<1
		Average		77	24	8.0	11.4	984	1.01	<1
		98 <sup>th</sup> Percentile		109	38	9.7	18.2	1035	1.24	<1
(AA03) GANDHRA VILLAGE										
1	06.02.2023	Gandhra Village	Rural	71	26	7.3	17.4	-	-	-
2	07.02.2023	Gandhra Village	Rural	95	22	9.3	15.3	973	0.99	<1
3	18.02.2023	Gandhra Village	Rural	83	17	3.8	16.7	-	-	-
4	19.02.2023	Gandhra Village	Rural	85	28	4.4	18.9	-	-	-
5	24.02.2023	Gandhra Village	Rural	92	41	8.9	17.2	-	-	-
6	25.02.2023	Gandhra Village	Rural	63	23	6.7	16.4	1054	1.18	<1
7	02.03.2023	Gandhra Village	Rural	76	29	9.5	18.0	-	-	-
8	03.03.2023	Gandhra Village	Rural	82	27	7.9	17.8	-	-	-
9	08.03.2023	Gandhra Village	Rural	84	29	8.5	16.4	-	-	-
10	09.03.2023	Gandhra Village	Rural	91	38	10.1	13.8	1087	1.10	<1
11	12.03.2023	Gandhra Village	Rural	96	41	9.2	14.0	-	-	-
12	13.03.2023	Gandhra Village	Rural	85	26	7.5	15.3	-	-	-
13	22.03.2023	Gandhra Village	Rural	74	27	9.1	17.6	-	-	-
14	23.03.2023	Gandhra Village	Rural	61	23	8.0	13.5	1021	1.01	<1
15	01.04.2023	Gandhra Village	Rural	84	29	6.9	13.7	-	-	-
16	02.04.2023	Gandhra Village	Rural	73	24	9.7	19.0	-	-	-

S. No	Sampling Date	Sampling Location	Area /Category	Average Pollutant Concentration $\mu\text{g}/\text{m}^3$ , except CO (in $\text{mg}/\text{m}^3$ )						
				PM <sub>10</sub> (24hr.)	PM <sub>2.5</sub> (24hr.)	SO <sub>2</sub> (24hr.)	NO <sub>x</sub> (24hr)	HC Grab	CO (1 hr)	VOC (24hr)
National Ambient Air Quality Standards by Central Pollution Control Board dtd. 16 <sup>th</sup> November'2009				100	60	80	80	NS	4	NS
Ecologically Sensitive Area (Notified by Central Govt.)				100	60	80	80	NS	4	NS
17	09.04.2023	Gandhra Village	Rural	82	28	6.8	21.0	-	-	-
18	10.04.2023	Gandhra Village	Rural	57	15	8.4	13.8	1004	1.29	<1
		Minimum		96	41	10.1	21.0	1087	1.29	<1
		Maximum		57	15	3.8	13.5	973	0.99	<1
		Average		80	27	7.9	16.4	1028	1.11	<1
		98 <sup>th</sup> Percentile		96	41	10.0	20.3	1085	1.28	<1
(AA04) Sector-28, Rohtak										
1	06.02.2023	Sector-28, Rohtak	Residential	41	7	9.1	17.5	-	-	-
2	07.02.2023	Sector-28, Rohtak	Residential	78	17	7.5	16.8	-	-	-
3	18.02.2023	Sector-28, Rohtak	Residential	32	35	9.1	12.6	973	1.01	<1
4	19.02.2023	Sector-28, Rohtak	Residential	41	8	8.3	14.0	-	-	-
5	24.02.2023	Sector-28, Rohtak	Residential	97	39	7.6	12.0	-	-	-
6	25.02.2023	Sector-28, Rohtak	Residential	93	32	9.3	28.0	1054	1.16	<1
7	02.03.2023	Sector-28, Rohtak	Residential	85	25	8.5	16.2	-	-	-
8	03.03.2023	Sector-28, Rohtak	Residential	54	15	6.9	14.0	-	-	-
9	08.03.2023	Sector-28, Rohtak	Residential	76	24	7.9	13.0	-	-	-
10	09.03.2023	Sector-28, Rohtak	Residential	61	20	9.2	19.0	1087	1.10	<1
11	12.03.2023	Sector-28, Rohtak	Residential	82	28	8.3	21.0	-	-	-
12	13.03.2023	Sector-28, Rohtak	Residential	92	37	7.5	14.0	-	-	-
13	22.03.2023	Sector-28, Rohtak	Residential	94	35	9.2	18.0	-	-	-
14	23.03.2023	Sector-28, Rohtak	Residential	81	28	6.8	13.6	-	-	-
15	01.04.2023	Sector-28, Rohtak	Residential	67	26	7.6	14.8	1046	1.03	<1
16	02.04.2023	Sector-28, Rohtak	Residential	73	27	8.9	16.0	-	-	-
17	09.04.2023	Sector-28, Rohtak	Residential	81	29	9.7	17.3	-	-	-
18	10.04.2023	Sector-28, Rohtak	Residential	76	28	6.4	13.5	1004	1.14	<1
		Minimum		97	39	9.7	28.0	1087	1.16	<1
		Maximum		32	7	6.4	12.0	973	1.01	<1
		Average		72	26	8.2	16.2	1033	1.09	<1
		98 <sup>th</sup> Percentile		96	38	9.6	25.6	1085	1.16	<1
(AA05) PAKASMA VILLAGE										
1	08.02.2023	Pakasma Village	Rural	97	34	6.3	14.5	-	-	-
2	09.02.2023	Pakasma Village	Rural	106	19	7.7	16.9	-	-	-

S. No	Sampling Date	Sampling Location	Area /Category	Average Pollutant Concentration µg/m³, except CO (in mg/m³)						
				PM <sub>10</sub> (24hr.)	PM <sub>2.5</sub> (24hr.)	SO <sub>2</sub> (24hr.)	NO <sub>x</sub> (24hr)	HC Grab	CO (1 hr)	VOC (24hr)
National Ambient Air Quality Standards by Central Pollution Control Board dtd. 16 <sup>th</sup> November'2009				100	60	80	80	NS	4	NS
Ecologically Sensitive Area (Notified by Central Govt.)				100	60	80	80	NS	4	NS
3	12.02.2023	Pakasma Village	Rural	110	35	7.3	12.5	966	-	-
4	13.02.2023	Pakasma Village	Rural	81	21	8.2	14.6	-	1.12	<1
5	20.02.2023	Pakasma Village	Rural	110	19	8.6	13.5	-	-	-
6	21.02.2023	Pakasma Village	Rural	97	13	9.0	14.3	-	-	-
7	06.03.2023	Pakasma Village	Rural	109	15	8.3	13.6	955	1.07	<1
8	07.03.2023	Pakasma Village	Rural	104	9	9.3	12.0	-	-	-
9	16.03.2023	Pakasma Village	Rural	116	21	7.4	17.0	-	-	-
10	17.03.2023	Pakasma Village	Rural	95	56	8.2	15.2	-	-	-
11	24.03.2023	Pakasma Village	Rural	85	26	9.4	13.5	996	1.18	<1
12	25.03.2023	Pakasma Village	Rural	76	28	6.8	14.2	-	-	-
13	28.03.2023	Pakasma Village	Rural	92	39	9.3	13.6	-	-	-
14	29.03.2023	Pakasma Village	Rural	81	26	7.9	19.0	-	-	-
15	05.04.2023	Pakasma Village	Rural	74	21	8.2	20.0	1038	0.99	<1
16	06.04.2023	Pakasma Village	Rural	63	20	6.7	21.5	-	-	-
17	11.04.2023	Pakasma Village	Rural	85	29	10.2	18.0	-	-	-
18	12.04.2023	Pakasma Village	Rural	73	25	9.3	13.0	985	0.85	<1
		Minimum		116	56	10.2	21.5	1038	1.18	<1
		Maximum		63	9	6.3	12.0	955	0.85	<1
		Average		92	25	8.2	15.4	988	1.04	<1
		98th Percentile		114	50	9.9	21.0	1034	1.18	<1
(AA06) GARHI BOHAR VILL.										
1	08.02.2023	Garhi Bohar	Rural	106	26	9.2	16.3	1004	1.14	<1
2	09.02.2023	Garhi Bohar	Rural	98	34	7.3	14.7	-	-	-
3	12.02.2023	Garhi Bohar	Rural	109	12	8.6	16.1	-	-	-
4	13.02.2023	Garhi Bohar	Rural	98	18	8.1	14.0	911	1.01	<1
5	20.02.2023	Garhi Bohar	Rural	36	7	8.9	16.4	-	-	-
6	21.02.2023	Garhi Bohar	Rural	55	13	9.4	14.5	-	-	-

S. No	Sampling Date	Sampling Location	Area /Category	Average Pollutant Concentration $\mu\text{g}/\text{m}^3$ , except CO (in $\text{mg}/\text{m}^3$ )						
				PM <sub>10</sub> (24hr.)	PM <sub>2.5</sub> (24hr.)	SO <sub>2</sub> (24hr.)	NO <sub>x</sub> (24hr)	HC Grab	CO (1 hr)	VOC (24hr)
National Ambient Air Quality Standards by Central Pollution Control Board dtd. 16 <sup>th</sup> November'2009				100	60	80	80	NS	4	NS
Ecologically Sensitive Area (Notified by Central Govt.)				100	60	80	80	NS	4	NS
7	06.03.2023	Garhi Bohar	Rural	108	23	8.1	13.8	-	-	-
8	07.03.2023	Garhi Bohar	Rural	90	19	8.8	13.5	938	1.13	<1
9	16.03.2023	Garhi Bohar	Rural	95	36	7.9	13.5	-	-	-
10	17.03.2023	Garhi Bohar	Rural	84	28	8.6	16.7	-	-	-
11	24.03.2023	Garhi Bohar	Rural	73	24	9.1	13.5	-	-	-
12	25.03.2023	Garhi Bohar	Rural	62	21	8.4	14.5	1004	1.25	<1
13	28.03.2023	Garhi Bohar	Rural	85	28	6.8	13.8	-	-	-
14	29.03.2023	Garhi Bohar	Rural	94	27	9.4	16.5	-	-	-
15	05.04.2023	Garhi Bohar	Rural	76	26	7.6	14.3	-	-	-
16	06.04.2023	Garhi Bohar	Rural	61	21	9.1	19.4	919	0.87	<1
17	11.04.2023	Garhi Bohar	Rural	82	27	8.2	13.8	-	-	-
18	12.04.2023	Garhi Bohar	Rural	73	26	6.9	12.7	-	-	-
		Minimum		109	36	9.4	19.4	1004	1.25	<1
		Maximum		36	7	6.8	12.7	911	0.87	<1
		Average		83	26	8.4	14.9	956	1.08	<1
		98 <sup>th</sup> Percentile		108	35	9.4	18.5	1004	1.24	<1
(AA07) Baliana Village										
1	02.02.2023	Baliana Village	Rural	104	21	9.7	13.4	935	1.10	<1
2	03.02.2023	Baliana Village	Rural	91	7	4.6	6.4	-	-	-
3	14.02.2023	Baliana Village	Rural	46	18	9.4	12.5	-	-	-
4	15.02.2023	Baliana Village	Rural	110	13	9.0	13.4	-	-	-
5	22.02.2023	Baliana Village	Rural	109	58	9.5	14.5	-	-	-
6	23.02.2023	Baliana Village	Rural	109	28	6.9	13.5	958	1.16	<1
7	28.02.2023	Baliana Village	Rural	85	26	9.8	12.0	-	-	-
8	01.03.2023	Baliana Village	Rural	92	39	7.9	10.0	-	-	-
9	04.03.2023	Baliana Village	Rural	73	23	6.1	20.0	-	-	-
10	05.03.2023	Baliana Village	Rural	81	28	5.8	14.5	955	1.03	<1
11	10.03.2023	Baliana Village	Rural	94	39	9.3	19.0	-	-	-
12	11.03.2023	Baliana Village	Rural	96	41	6.7	13.5	-	-	-
13	20.03.2023	Baliana Village	Rural	61	21	8.5	17.3	-	-	-

S. No	Sampling Date	Sampling Location	Area /Category	Average Pollutant Concentration µg/m³, except CO (in mg/m³)						
				PM <sub>10</sub> (24hr.)	PM <sub>2.5</sub> (24hr.)	SO <sub>2</sub> (24hr.)	NO <sub>x</sub> (24hr)	HC Grab	CO (1 hr)	VOC (24hr)
National Ambient Air Quality Standards by Central Pollution Control Board dtd. 16 <sup>th</sup> November'2009				100	60	80	80	NS	4	NS
Ecologically Sensitive Area (Notified by Central Govt.)				100	60	80	80	NS	4	NS
14	21.03.2023	Baliana Village	Rural	52	15	8.1	13.8	1004	1.09	<1
15	26.03.2023	Baliana Village	Rural	73	21	7.0	17.2	-	-	-
16	27.03.2023	Baliana Village	Rural	92	30	7.6	13.5	-	-	-
17	03.04.2023	Baliana Village	Rural	84	28	8.6	16.4	-	-	-
18	04.04.2023	Baliana Village	Rural	78	21	6.9	18.2	980	1.22	<1
		Minimum		110	58	11.3	23.0	1004	1.22	<1
		Maximum		46	7	7.4	13.5	935	1.03	<1
		Average		85	26	9.3	16.9	966	1.12	<1
		98 <sup>th</sup> Percentile		110	52	11.0	22.5	1002	1.22	<1
(AA08) Ladhaut Bhaiyanpur										
1	02.02.2023	Ladhaut Bhaiyanpur	Rural	95	32	7.4	16.0	1062	1.12	<1
2	03.02.2023	Ladhaut Bhaiyanpur	Rural	105	35	8.8	18.4	-	-	-
3	14.02.2023	Ladhaut Bhaiyanpur	Rural	108	36	8.4	14.0	-	-	-
4	15.02.2023	Ladhaut Bhaiyanpur	Rural	79	26	9.3	16.1	-	-	-
5	22.02.2023	Ladhaut Bhaiyanpur	Rural	108	36	9.7	15.0	1008	1.20	<1
6	23.02.2023	Ladhaut Bhaiyanpur	Rural	96	32	10.1	15.8	-	-	-
7	28.02.2023	Ladhaut Bhaiyanpur	Rural	108	36	9.4	15.1	-	-	-
8	01.03.2023	Ladhaut Bhaiyanpur	Rural	102	34	10.4	13.5	-	-	-
9	04.03.2023	Ladhaut Bhaiyanpur	Rural	115	38	8.5	18.5	1016	1.01	<1
10	05.03.2023	Ladhaut Bhaiyanpur	Rural	93	31	9.3	16.7	-	-	-
11	10.03.2023	Ladhaut Bhaiyanpur	Rural	84	28	10.5	15.0	-	-	-
12	11.03.2023	Ladhaut Bhaiyanpur	Rural	75	25	7.9	15.7	-	-	-
13	20.03.2023	Ladhaut Bhaiyanpur	Rural	91	30	10.4	15.1	977	1.12	<1
14	21.03.2023	Ladhaut Bhaiyanpur	Rural	80	26	9.0	20.5	-	-	-
15	26.03.2023	Ladhaut Bhaiyanpur	Rural	73	24	9.3	21.5	-	-	-
16	27.03.2023	Ladhaut Bhaiyanpur	Rural	61	21	7.8	23.0	-	-	-
17	03.04.2023	Ladhaut Bhaiyanpur	Rural	84	28	11.3	19.5	-	-	-
18	04.04.2023	Ladhaut Bhaiyanpur	Rural	71	24	10.4	14.5	961	0.86	<1
		Minimum		115	38	11.3	23.0	1062	1.20	<1
		Maximum		61	21	7.4	13.5	961	0.86	<1
		Average		90	30	9.3	16.9	1005	1.06	<1



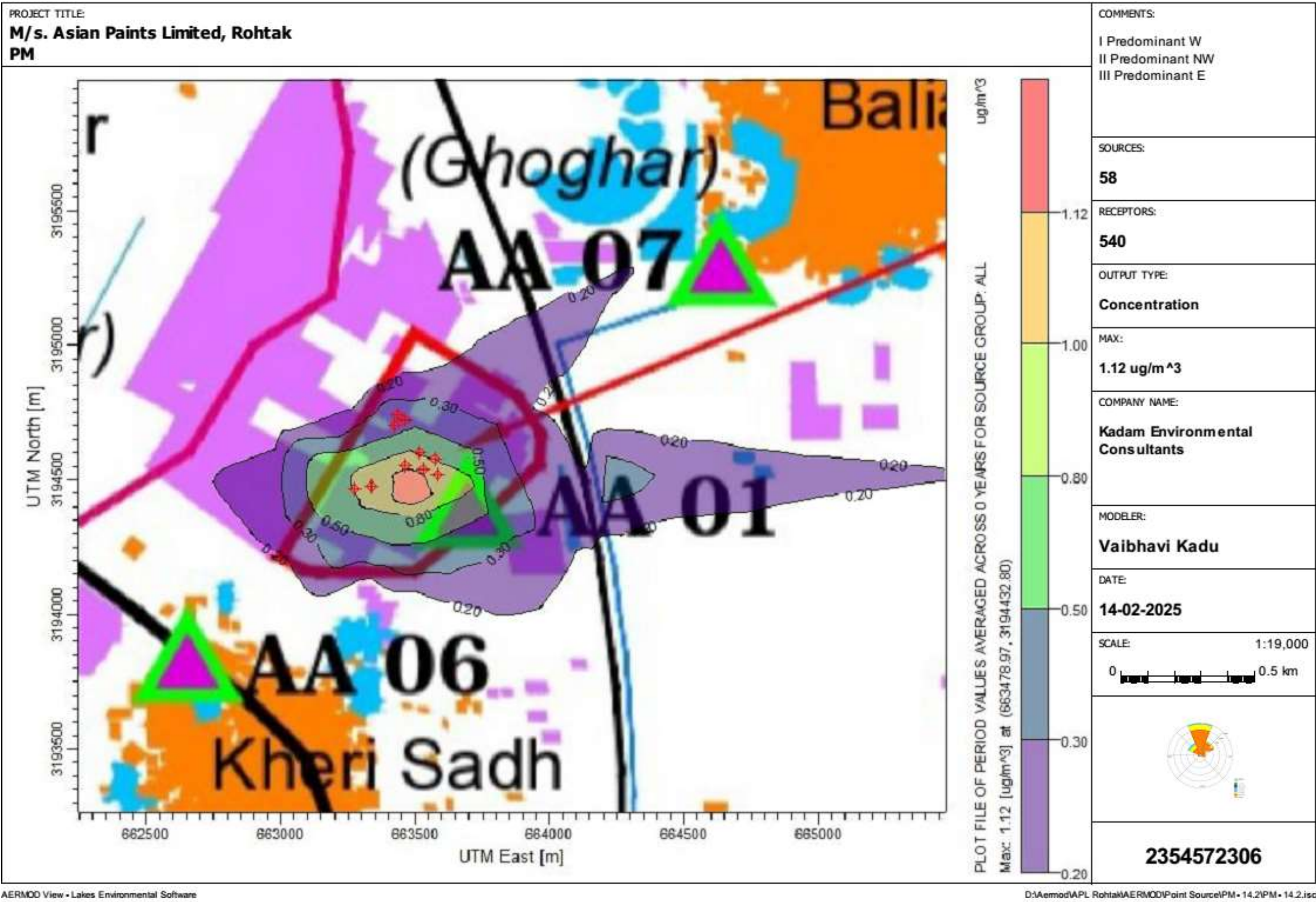
S. No	Sampling Date	Sampling Location	Area /Category	Average Pollutant Concentration $\mu\text{g}/\text{m}^3$ , except CO (in $\text{mg}/\text{m}^3$ )						
				PM <sub>10</sub> (24hr.)	PM <sub>2.5</sub> (24hr.)	SO <sub>2</sub> (24hr.)	NO <sub>x</sub> (24hr)	HC Grab	CO (1 hr)	VOC (24hr)
				100	60	80	80	NS	4	NS
National Ambient Air Quality Standards by Central Pollution Control Board dtd. 16 <sup>th</sup> November'2009				100	60	80	80	NS	4	NS
Ecologically Sensitive Area (Notified by Central Govt.)				100	60	80	80	NS	4	NS
		98 <sup>th</sup> Percentile		113	38	11.0	22.5	1058	1.20	<1
(AA09) Chuliana Village										
1	02.02.2023	Chuliana Village	Rural	56	11	5.6	13.5	-	-	-
2	03.02.2023	Chuliana Village	Rural	79	14	7.5	14.7	-	-	-
3	04.02.2023	Chuliana Village	Rural	74	15	9.2	13.6	1038	1.23	<1
4	05.02.2023	Chuliana Village	Rural	48	12	8.3	12.8	-	-	-
5	14.02.2023	Chuliana Village	Rural	97	12	7.6	17.4	-	-	-
6	15.02.2023	Chuliana Village	Rural	39	14	9.5	15.8	-	-	-
7	22.02.2023	Chuliana Village	Rural	89	23	10.0	16.2	973	1.09	<1
8	23.02.2023	Chuliana Village	Rural	97	33	6.9	12.4	-	-	-
9	28.02.2023	Chuliana Village	Rural	86	28	7.5	13.8	-	-	-
10	01.03.2023	Chuliana Village	Rural	64	21	5.9	13.4	955	1.07	<1
11	04.03.2023	Chuliana Village	Rural	52	15	7.8	13.4	-	-	-
12	05.03.2023	Chuliana Village	Rural	73	20	9.1	17.0	-	-	-
13	10.03.2023	Chuliana Village	Rural	81	27	6.7	16.0	-	-	-
14	11.03.2023	Chuliana Village	Rural	94	39	8.2	11.0	996	1.18	<1
15	20.03.2023	Chuliana Village	Rural	52	16	9.2	13.5	-	-	-
16	21.03.2023	Chuliana Village	Rural	81	18	6.7	14.2	-	-	-
17	26.03.2023	Chuliana Village	Rural	83	19	8.5	13.8	-	-	-
18	27.03.2023	Chuliana Village	Rural	92	34	9.1	17.0	1004	0.99	<1
19	03.04.2023	Chuliana Village	Rural	73	26	10.7	23.0	-	-	-
20	04.04.2023	Chuliana Village	Rural	68	20	9.1	21.0	-	-	-
		Minimum		97	39	10.7	23.0	1038	1.23	<1
		Maximum		39	11	5.6	11.0	955	0.99	<1
		Average		74	21	8.2	15.2	993	1.11	<1
		98th Percentile		97	37	10.4	22.2	1035	1.23	<1

Annexure 17: Air Quality Dispersion Modelling Results

Point Source

1. Particulate Matter (PM<sub>10</sub>)

Figure 12-1: Isopleth for Concentration of PM<sub>10</sub>



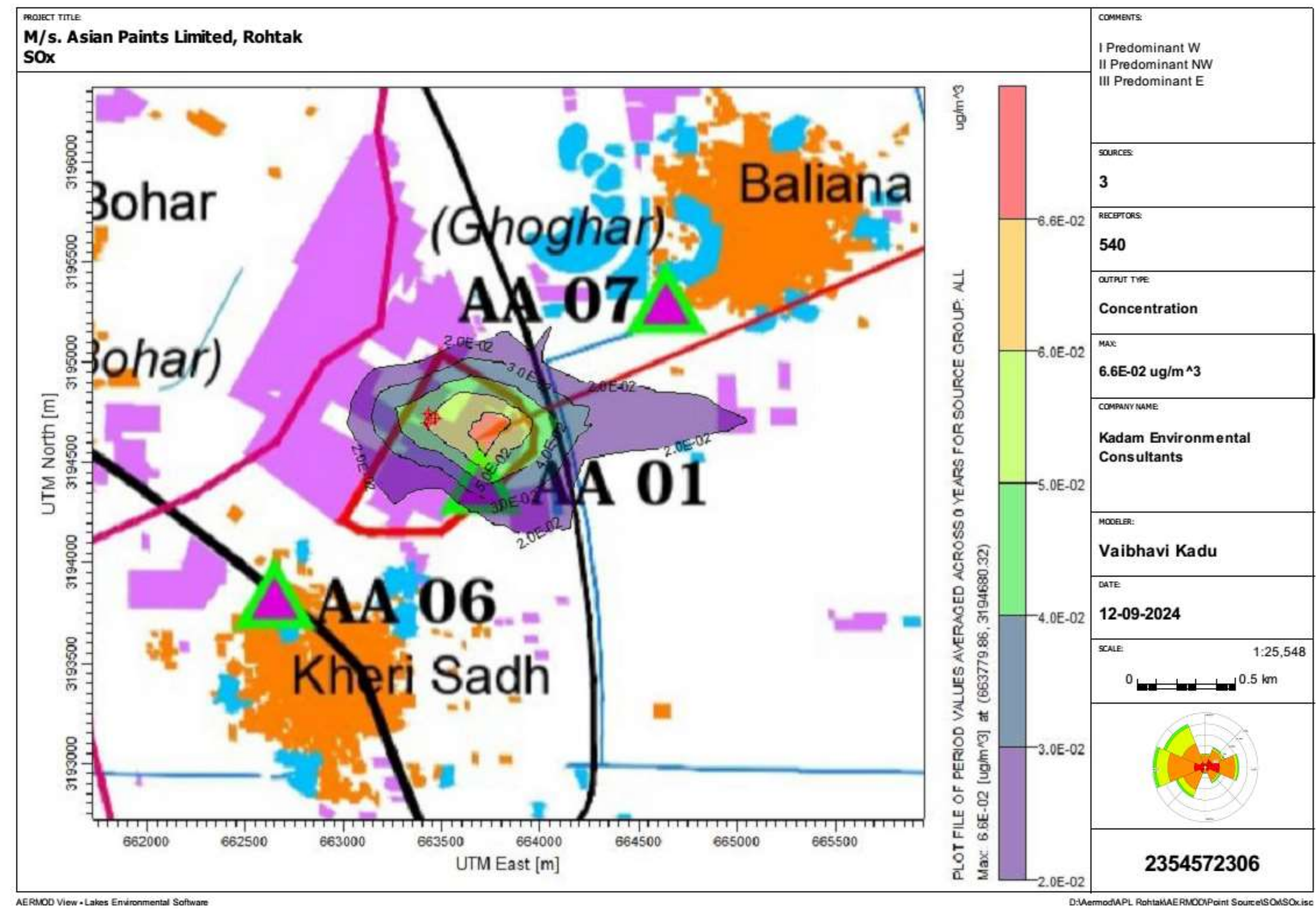
**Table 12-1: Incremental GLC ( $\mu\text{g}/\text{m}^3$ ) of Particulate Matter ( $\text{PM}_{10}$ )**

DIRECTION (DEGREE)	DISTANCE (METER)														
	250	500	750	1000	1500	2000	2500	3000	4000	5000	6000	7000	8000	9000	10000
10	0.15358	0.2523	0.17628	0.07686	0.03109	0.0249	0.02413	0.02314	0.01908	0.01552	0.01325	0.01165	0.01055	0.00976	0.00912
20	0.14147	0.19049	0.21413	0.14707	0.05128	0.02813	0.02111	0.01789	0.01459	0.01283	0.01149	0.01025	0.00922	0.00838	0.0077
30	0.14344	0.12235	0.16931	0.18132	0.12359	0.06763	0.03985	0.02715	0.01679	0.01249	0.01016	0.00867	0.00766	0.00696	0.00643
40	0.16064	0.08279	0.09132	0.11121	0.13702	0.13025	0.10941	0.08876	0.05751	0.0387	0.02732	0.02014	0.01556	0.01254	0.01047
50	0.19241	0.081	0.05431	0.05007	0.05325	0.05869	0.06185	0.06323	0.06112	0.05629	0.05057	0.04502	0.04017	0.036	0.03243
60	0.23528	0.11313	0.06427	0.04334	0.02908	0.02578	0.02382	0.02215	0.01858	0.0155	0.01295	0.01098	0.0095	0.00838	0.00752
70	0.28212	0.17039	0.11299	0.08224	0.05133	0.03658	0.02839	0.02354	0.01804	0.01489	0.01254	0.01071	0.0094	0.00843	0.00766
80	0.32227	0.23692	0.18618	0.15423	0.11417	0.08904	0.07151	0.05977	0.04525	0.03684	0.03088	0.02629	0.02286	0.02024	0.01812
90	0.34405	0.27881	0.2453	0.22816	0.20746	0.18944	0.16931	0.15212	0.12388	0.10342	0.08757	0.07505	0.06527	0.05748	0.05111
100	0.34074	0.25772	0.20618	0.17237	0.12761	0.09818	0.07582	0.06042	0.04056	0.02921	0.02205	0.01723	0.01394	0.01163	0.00997
110	0.31629	0.19581	0.12454	0.08387	0.04648	0.03271	0.02634	0.02285	0.01837	0.01533	0.01308	0.01137	0.01007	0.00908	0.00832
120	0.28251	0.1432	0.08537	0.06281	0.05054	0.05019	0.05051	0.05012	0.04633	0.04154	0.03703	0.03325	0.03021	0.02779	0.02586
130	0.25101	0.12167	0.08895	0.0834	0.08964	0.08803	0.0799	0.0716	0.05825	0.04933	0.04294	0.03819	0.03469	0.03207	0.03007
140	0.22882	0.12608	0.11376	0.11396	0.10293	0.09041	0.07881	0.06851	0.05148	0.03974	0.03174	0.02621	0.02239	0.01971	0.01778
150	0.21813	0.14496	0.13547	0.12007	0.09115	0.06569	0.04983	0.04013	0.02895	0.02242	0.018	0.01492	0.01277	0.01127	0.0102
160	0.21817	0.16637	0.14053	0.11033	0.06445	0.04384	0.03138	0.02372	0.01692	0.01383	0.01166	0.00997	0.00871	0.00777	0.00709
170	0.22687	0.18325	0.13631	0.08955	0.04501	0.02638	0.01831	0.01404	0.0113	0.01065	0.01005	0.0094	0.00878	0.00822	0.00775
180	0.24214	0.19792	0.12214	0.07099	0.02923	0.01503	0.01128	0.01063	0.01119	0.0113	0.01086	0.01026	0.00966	0.00911	0.00866
190	0.26269	0.21176	0.10705	0.05647	0.01969	0.01339	0.01184	0.0116	0.01175	0.01124	0.01032	0.00938	0.0086	0.00799	0.00754
200	0.28891	0.22425	0.0996	0.04483	0.02325	0.0205	0.01912	0.01744	0.01427	0.01194	0.0102	0.00893	0.008	0.00732	0.00682
210	0.32326	0.24175	0.09716	0.04693	0.04045	0.03676	0.03268	0.02948	0.02383	0.01928	0.01585	0.0133	0.01139	0.00995	0.00886
220	0.37198	0.27947	0.1022	0.07121	0.07307	0.06417	0.05002	0.0383	0.02442	0.01767	0.01416	0.01214	0.01081	0.00985	0.0091
230	0.4466	0.35789	0.13089	0.12111	0.10057	0.06204	0.04114	0.0304	0.0201	0.01518	0.01237	0.01056	0.00922	0.00824	0.0075
240	0.56027	0.50982	0.20643	0.17681	0.08139	0.05815	0.05752	0.05674	0.04966	0.04181	0.03569	0.03094	0.02702	0.02395	0.02151
250	0.70039	0.76067	0.39486	0.19645	0.09817	0.07675	0.07105	0.06574	0.05218	0.04182	0.03477	0.02959	0.0253	0.02199	0.0194
260	0.79391	<b>1.1157</b>	0.70024	0.22442	0.11581	0.08723	0.07771	0.06897	0.05382	0.04318	0.03587	0.03047	0.02587	0.02236	0.01963
270	0.77345	1.07097	0.78244	0.24166	0.15771	0.14337	0.15031	0.14259	0.11673	0.09584	0.08094	0.06963	0.06013	0.05274	0.04687
280	0.64346	0.81121	0.32093	0.16483	0.08053	0.06054	0.05591	0.05382	0.04738	0.0406	0.03517	0.03061	0.02661	0.02343	0.02086
290	0.49307	0.51186	0.18565	0.14628	0.0603	0.03421	0.02719	0.02528	0.02279	0.01983	0.01733	0.01529	0.01348	0.01202	0.01086
300	0.38205	0.33265	0.13876	0.09824	0.08842	0.04977	0.02902	0.02045	0.01445	0.01157	0.00965	0.00824	0.00716	0.00635	0.00575
310	0.32523	0.25364	0.10208	0.07508	0.07588	0.07729	0.07105	0.06007	0.03621	0.0226	0.01563	0.01169	0.00923	0.00765	0.00659
320	0.29359	0.22258	0.08289	0.06083	0.03866	0.04445	0.05342	0.05693	0.04997	0.04135	0.03476	0.0296	0.02557	0.02247	0.02002
330	0.26656	0.22129	0.07363	0.0556	0.02914	0.01924	0.01825	0.01953	0.02222	0.02302	0.02295	0.0221	0.02081	0.01945	0.01812
340	0.23783	0.23895	0.06804	0.05135	0.03695	0.02202	0.01445	0.0113	0.00892	0.00787	0.00718	0.00661	0.00613	0.00574	0.00543
350	0.20675	0.263	0.07668	0.04508	0.03682	0.03131	0.02525	0.01877	0.0115	0.00856	0.00699	0.00596	0.00524	0.00474	0.00438
360	0.1769	0.2752	0.11301	0.04775	0.03282	0.03066	0.02641	0.0241	0.02266	0.02028	0.01687	0.01347	0.01086	0.00896	0.00758



2. Sulphur Dioxide (SO<sub>2</sub>)

Figure 12-2: Isopleth for Concentration of Sulphur Dioxide (SO<sub>2</sub>)



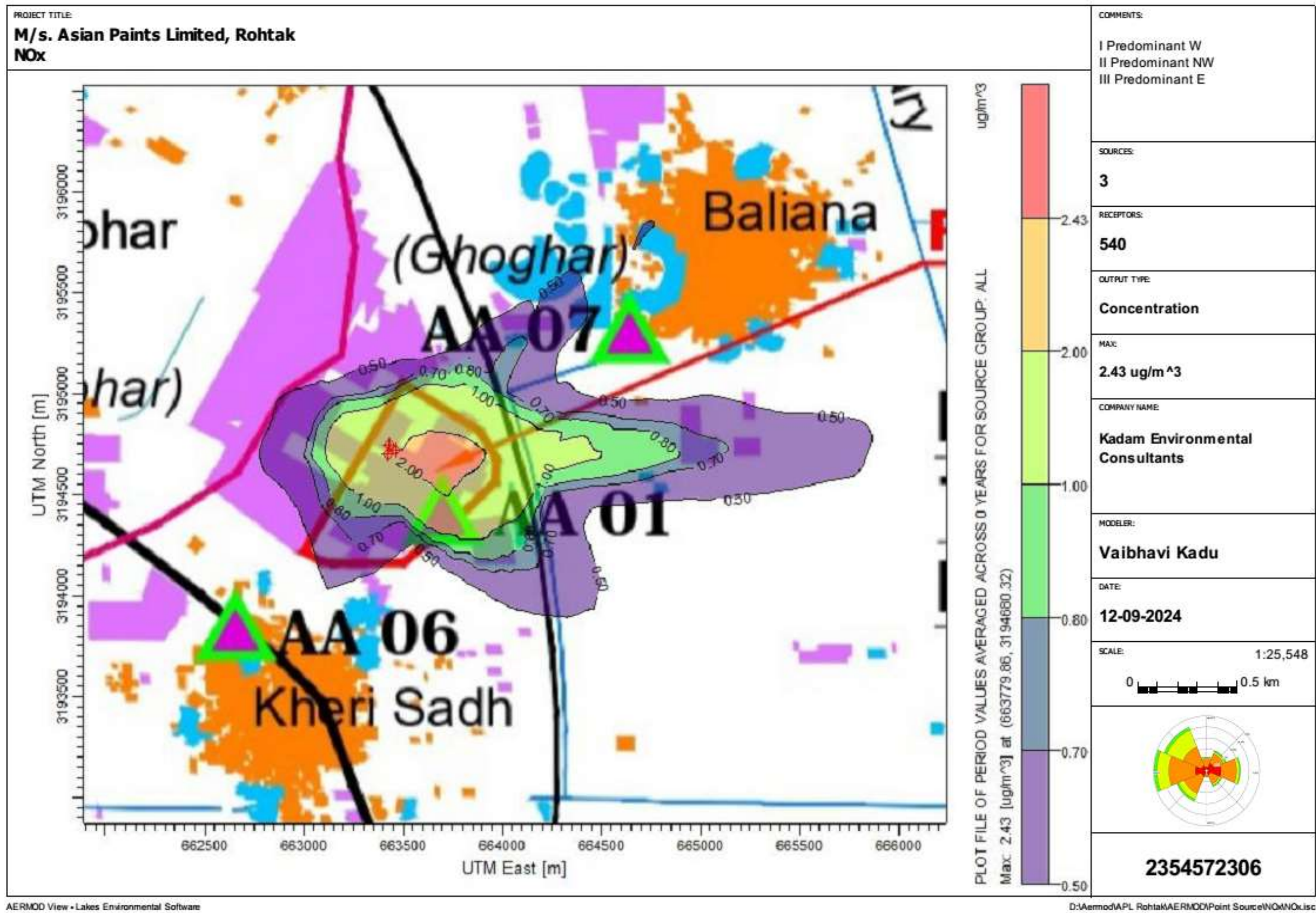
**Table 12-2: Incremental GLC ( $\mu\text{g}/\text{m}^3$ ) of Sulphur Dioxide ( $\text{SO}_2$ )**

DIRECTION	DISTANCE (METER)														
(DEGREE)	250	500	750	1000	1500	2000	2500	3000	4000	5000	6000	7000	8000	9000	10000
10	0.04081	0.01672	0.01985	0.01232	0.00385	0.00249	0.002	0.00172	0.00131	0.00106	0.00089	0.00078	0.0007	0.00064	0.00059
20	0.03955	0.01482	0.01545	0.01713	0.008	0.0035	0.0022	0.00172	0.00126	0.00101	0.00085	0.00075	0.00069	0.00064	0.00061
30	0.03857	0.01558	0.01008	0.0128	0.01388	0.00964	0.00603	0.00385	0.00187	0.00118	0.00089	0.00075	0.00066	0.00061	0.00057
40	0.03714	0.01899	0.00865	0.00703	0.0091	0.01047	0.01046	0.00953	0.00693	0.00497	0.00365	0.00276	0.00215	0.00171	0.0014
50	0.03475	0.02412	0.01144	0.00636	0.00398	0.00392	0.00422	0.00447	0.00446	0.00419	0.00389	0.00361	0.00336	0.00313	0.00292
60	0.03125	0.02831	0.01788	0.01062	0.00447	0.0026	0.00186	0.00148	0.00111	0.00091	0.00077	0.00067	0.00059	0.00053	0.00048
70	0.0271	0.02819	0.02391	0.01819	0.00997	0.00597	0.00394	0.00278	0.00165	0.00117	0.00093	0.00079	0.00069	0.00062	0.00055
80	0.02312	0.02331	0.02293	0.02112	0.01672	0.0132	0.01054	0.00845	0.00574	0.00418	0.00322	0.00259	0.00215	0.00183	0.00159
90	0.02012	0.01715	0.01603	0.01507	0.01338	0.01208	0.0109	0.00972	0.00782	0.00652	0.00564	0.00503	0.00458	0.00424	0.00396
100	0.01851	0.01335	0.01057	0.00872	0.0064	0.00507	0.00418	0.00351	0.00258	0.002	0.00161	0.00133	0.00112	0.00097	0.00084
110	0.01823	0.01273	0.00968	0.00767	0.00531	0.00401	0.00317	0.00259	0.00186	0.00143	0.00115	0.00096	0.00082	0.00072	0.00064
120	0.01887	0.01397	0.01124	0.00936	0.007	0.00559	0.00463	0.00392	0.003	0.00249	0.00218	0.00198	0.00184	0.00172	0.00162
130	0.01998	0.01556	0.01284	0.01085	0.00833	0.00679	0.00571	0.00487	0.00376	0.00308	0.00264	0.00233	0.0021	0.00191	0.00175
140	0.02123	0.01676	0.01363	0.0113	0.00817	0.00615	0.00483	0.0039	0.00277	0.00215	0.00178	0.00154	0.00137	0.00122	0.00111
150	0.02242	0.01723	0.01309	0.0101	0.00652	0.00467	0.00362	0.00295	0.00216	0.0017	0.0014	0.00118	0.00102	0.00089	0.00079
160	0.0235	0.01681	0.0116	0.00844	0.00531	0.00386	0.00293	0.00231	0.00156	0.00113	0.00087	0.0007	0.00058	0.00049	0.00043
170	0.02445	0.01583	0.01001	0.00687	0.00379	0.00237	0.00161	0.00119	0.00079	0.00059	0.00048	0.0004	0.00035	0.00031	0.00028
180	0.02533	0.01466	0.00826	0.00502	0.0024	0.00157	0.00119	0.00096	0.0007	0.00055	0.00046	0.00039	0.00034	0.00031	0.00028
190	0.02629	0.01342	0.0064	0.0037	0.00218	0.00173	0.00149	0.00133	0.0011	0.00096	0.00084	0.00075	0.00067	0.0006	0.00055
200	0.02748	0.01214	0.00522	0.00361	0.00312	0.00294	0.00267	0.00238	0.00186	0.00148	0.00121	0.00101	0.00087	0.00076	0.00068
210	0.02914	0.01112	0.00528	0.005	0.00537	0.00477	0.00397	0.0033	0.00241	0.00191	0.00159	0.00134	0.00116	0.00102	0.00092
220	0.03153	0.01081	0.00687	0.00803	0.00782	0.00581	0.00425	0.00324	0.00208	0.00148	0.00113	0.00091	0.00077	0.00067	0.0006
230	0.03489	0.01162	0.01032	0.01158	0.0083	0.00508	0.00346	0.00257	0.00167	0.00123	0.00097	0.00081	0.00071	0.00063	0.00058
240	0.03953	0.01389	0.01514	0.01325	0.00714	0.00454	0.00337	0.00277	0.00221	0.0019	0.0017	0.00155	0.00144	0.00135	0.00126
250	0.04553	0.01806	0.01951	0.01268	0.00701	0.00505	0.00403	0.00338	0.00249	0.0019	0.00156	0.00136	0.00122	0.00113	0.00105
260	0.05246	0.02433	0.02176	0.01301	0.00691	0.00469	0.00371	0.00331	0.00284	0.00237	0.00202	0.00176	0.00156	0.00141	0.00129
270	0.05886	0.03402	0.02589	0.01443	0.00695	0.00538	0.00491	0.00487	0.00451	0.0038	0.00331	0.00301	0.00283	0.00271	0.00262
280	0.06258	0.048	0.03582	0.01763	0.00827	0.00585	0.00472	0.00417	0.00337	0.00263	0.00214	0.00181	0.00158	0.00141	0.00128
290	0.06343	0.05644	0.04015	0.01776	0.0068	0.00417	0.00311	0.00261	0.00199	0.00154	0.00125	0.00105	0.0009	0.00079	0.00071
300	0.06445	0.05487	0.02993	0.01431	0.00612	0.00409	0.003	0.00236	0.00164	0.00122	0.00096	0.00079	0.00066	0.00057	0.0005
310	0.0657	0.05165	0.0203	0.01084	0.00618	0.0043	0.00333	0.0028	0.00211	0.00159	0.00126	0.00103	0.00086	0.00074	0.00064
320	0.06355	0.04389	0.0157	0.00768	0.00457	0.00425	0.00412	0.00395	0.00328	0.00254	0.00206	0.00176	0.00158	0.00146	0.00137
330	0.05801	0.0366	0.01338	0.00704	0.00335	0.0024	0.00209	0.002	0.00192	0.00176	0.00161	0.00147	0.00135	0.00125	0.00116
340	0.05177	0.03102	0.01227	0.00672	0.0037	0.00236	0.0017	0.00134	0.001	0.00082	0.0007	0.00061	0.00055	0.0005	0.00046
350	0.0466	0.02587	0.01354	0.00644	0.00376	0.00287	0.00226	0.00184	0.00131	0.00097	0.00075	0.00061	0.0005	0.00043	0.00037
360	0.04302	0.02076	0.01774	0.00735	0.00345	0.00253	0.00217	0.00195	0.00163	0.00137	0.00117	0.001	0.00087	0.00076	0.00066



3. Oxides of Nitrogen (NO<sub>x</sub>)

Figure 12-3: Isopleth for Concentration of Oxides of Nitrogen (NO<sub>x</sub>)



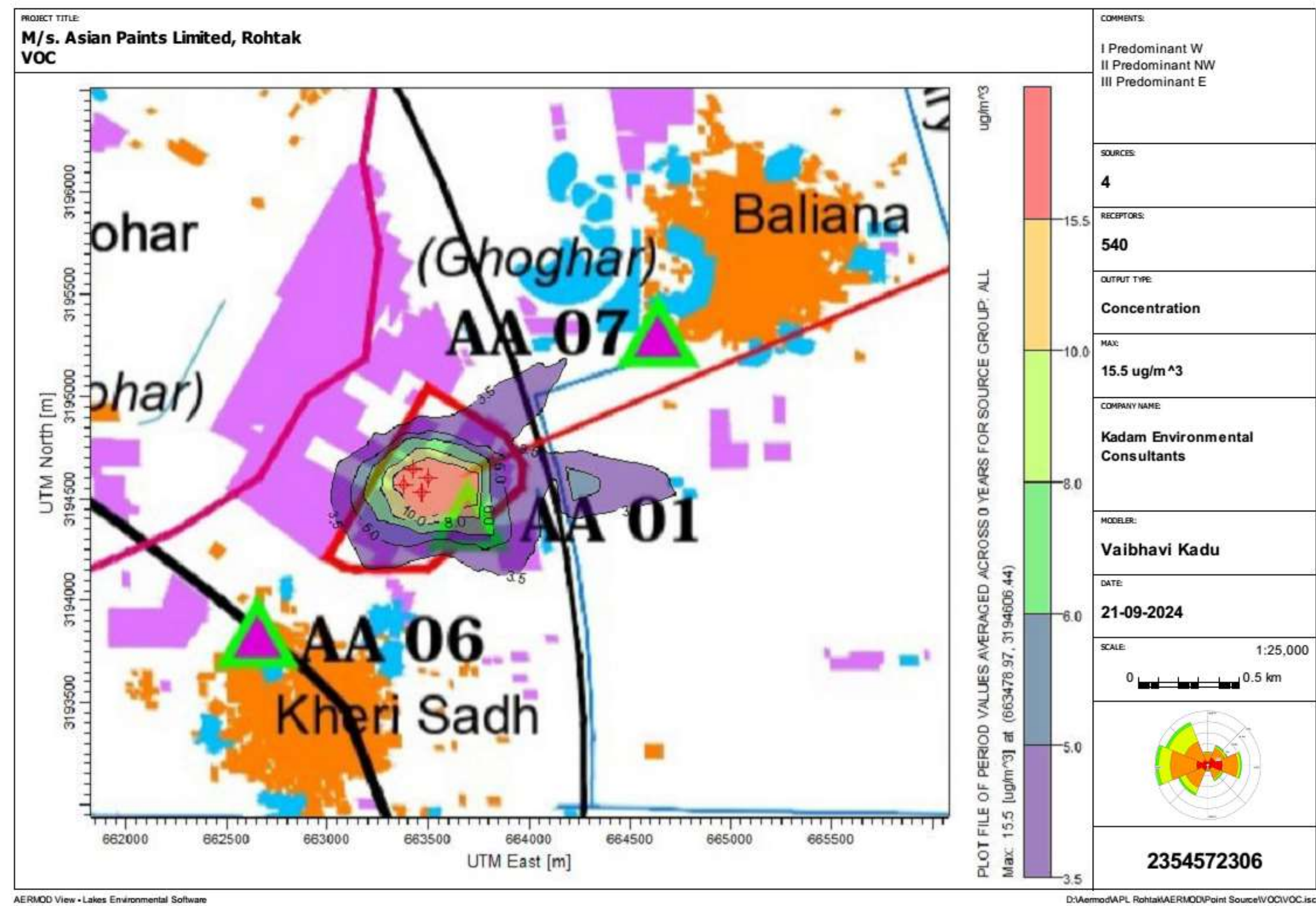
**Table 12-3: Incremental GLC ( $\mu\text{g}/\text{m}^3$ ) of Oxides of Nitrogen ( $\text{NO}_x$ )**

DIRECTION	DISTANCE (METER)														
(DEGREE)	250	500	750	1000	1500	2000	2500	3000	4000	5000	6000	7000	8000	9000	10000
10	1.50993	0.61847	0.7343	0.45579	0.14255	0.09229	0.07417	0.06353	0.04853	0.03912	0.03294	0.02875	0.02582	0.02368	0.02185
20	1.46332	0.54832	0.57166	0.63384	0.29613	0.12932	0.08124	0.06356	0.04663	0.03732	0.03152	0.02786	0.02546	0.02378	0.02242
30	1.42704	0.57663	0.37304	0.47342	0.5135	0.35685	0.22299	0.14246	0.06902	0.04375	0.03304	0.02765	0.02458	0.02261	0.02121
40	1.37429	0.70246	0.32015	0.26029	0.33667	0.38721	0.38695	0.35249	0.25638	0.18389	0.13506	0.10214	0.07947	0.06338	0.05165
50	1.2856	0.89235	0.42334	0.23532	0.14729	0.14497	0.1563	0.16534	0.16487	0.15515	0.14392	0.13349	0.12421	0.11585	0.10814
60	1.15629	1.04731	0.66148	0.3929	0.16553	0.09618	0.06868	0.05483	0.04096	0.03349	0.0285	0.02482	0.02199	0.01974	0.01791
70	1.00254	1.04311	0.88467	0.67297	0.36876	0.22072	0.14561	0.10278	0.0612	0.04344	0.03448	0.02921	0.02566	0.02276	0.02042
80	0.8553	0.86264	0.84851	0.78144	0.61874	0.48851	0.38996	0.3128	0.2122	0.15478	0.11906	0.09566	0.07956	0.06783	0.05896
90	0.7444	0.63473	0.59302	0.55755	0.49514	0.44705	0.40321	0.3595	0.28921	0.24133	0.20872	0.18598	0.16947	0.15674	0.1464
100	0.68501	0.49409	0.39111	0.32247	0.23676	0.18759	0.15474	0.12976	0.09563	0.07408	0.0595	0.04914	0.04151	0.03572	0.03122
110	0.67442	0.47103	0.35798	0.28384	0.1965	0.14823	0.11728	0.09577	0.06879	0.05292	0.04267	0.03561	0.03052	0.02664	0.02363
120	0.69817	0.51699	0.41601	0.34615	0.25888	0.2068	0.17132	0.14488	0.11115	0.0921	0.08069	0.07332	0.06812	0.06373	0.05995
130	0.73933	0.57567	0.47509	0.40145	0.30832	0.25133	0.21141	0.18033	0.13902	0.11392	0.09758	0.08622	0.07768	0.07059	0.06472
140	0.78533	0.61994	0.50414	0.41806	0.30212	0.22771	0.17878	0.14439	0.10264	0.07972	0.06594	0.05695	0.05053	0.0452	0.04107
150	0.82958	0.63733	0.48418	0.37354	0.24127	0.17296	0.13386	0.10912	0.07979	0.06289	0.05177	0.04373	0.03765	0.03293	0.02909
160	0.86939	0.62204	0.42933	0.31227	0.19654	0.14264	0.10844	0.08556	0.05754	0.04188	0.03224	0.02587	0.02144	0.01824	0.01588
170	0.90447	0.58572	0.37029	0.25433	0.14038	0.08752	0.05941	0.04411	0.02907	0.02188	0.01766	0.01489	0.01296	0.01156	0.01052
180	0.93715	0.54255	0.30567	0.1859	0.08887	0.0581	0.04395	0.03557	0.02585	0.02041	0.01691	0.0145	0.01276	0.01146	0.01048
190	0.97256	0.49655	0.23691	0.13696	0.08084	0.06408	0.05531	0.04913	0.04076	0.03545	0.03125	0.02767	0.02471	0.02225	0.0202
200	1.01684	0.44921	0.19326	0.13353	0.1156	0.10863	0.0989	0.08809	0.06867	0.05465	0.04477	0.03749	0.03218	0.02818	0.0251
210	1.07821	0.41147	0.1952	0.18496	0.19881	0.17645	0.14707	0.12226	0.08922	0.0707	0.05865	0.04944	0.0428	0.03776	0.03388
220	1.1666	0.40007	0.25422	0.29707	0.28949	0.21481	0.15736	0.11976	0.07691	0.05472	0.04198	0.03382	0.02854	0.02478	0.02211
230	1.29104	0.43008	0.38173	0.42846	0.30694	0.18806	0.12804	0.09524	0.0619	0.04549	0.03601	0.03005	0.02616	0.02343	0.02138
240	1.46254	0.51385	0.56033	0.49025	0.26403	0.16801	0.12457	0.10234	0.08171	0.07012	0.06274	0.05741	0.05324	0.04981	0.04652
250	1.68456	0.66813	0.72195	0.46902	0.25941	0.1867	0.14902	0.12511	0.09216	0.07043	0.05784	0.05017	0.04518	0.04166	0.03886
260	1.94109	0.90005	0.80496	0.48121	0.2556	0.17342	0.13729	0.12243	0.10514	0.08754	0.07463	0.06503	0.05776	0.05213	0.04765
270	2.17774	1.25886	0.9579	0.53399	0.25722	0.19895	0.18175	0.18023	0.16702	0.14063	0.12253	0.11131	0.10454	0.10021	0.0971
280	2.31532	1.77584	1.3254	0.65233	0.30616	0.21633	0.17467	0.15415	0.12457	0.09725	0.07925	0.06703	0.05845	0.05219	0.04749
290	2.34704	2.08843	1.48555	0.65701	0.25144	0.15425	0.11517	0.09651	0.07373	0.05707	0.04617	0.03867	0.03328	0.02927	0.02619
300	2.38461	2.03004	1.10758	0.5295	0.22655	0.15139	0.11091	0.08747	0.06079	0.0452	0.03557	0.02912	0.02457	0.02122	0.01867
310	<b>2.43104</b>	1.91101	0.75122	0.40104	0.22848	0.15907	0.12321	0.10366	0.07792	0.05886	0.04646	0.03793	0.0318	0.02725	0.02375
320	2.35135	1.62383	0.58096	0.28407	0.16927	0.15723	0.15227	0.14631	0.12135	0.09408	0.07634	0.06528	0.05838	0.05392	0.05071
330	2.14648	1.35416	0.4952	0.2606	0.124	0.08893	0.07736	0.07393	0.07122	0.06527	0.05963	0.05454	0.0501	0.04628	0.04274
340	1.91534	1.14768	0.45389	0.24865	0.13672	0.0873	0.06275	0.04956	0.03715	0.0304	0.02595	0.02272	0.0203	0.01847	0.01688
350	1.72421	0.95704	0.50094	0.23832	0.13926	0.10614	0.08354	0.06825	0.04862	0.03597	0.02789	0.02242	0.01856	0.01577	0.01369
360	1.59187	0.76816	0.6564	0.2719	0.12775	0.09353	0.08015	0.07216	0.06024	0.05063	0.04318	0.03708	0.03205	0.02795	0.02439



4. Volatile Organic Carbons (VOC)

Figure 12-4: Isopleth for Concentration of Volatile Organic Compounds (VOC)



**Table 12-4: Incremental GLC ( $\mu\text{g}/\text{m}^3$ ) of Volatile Organic Compound (VOC)**

DIRECTION	DISTANCE (METER)														
(DEGREE)	250	500	750	1000	1500	2000	2500	3000	4000	5000	6000	7000	8000	9000	10000
10	2.81	3.94	3.01	1.21	0.44	0.36	0.35	0.33	0.27	0.21	0.18	0.16	0.14	0.13	0.12
20	2.85	2.76	3.48	2.40	0.76	0.40	0.30	0.25	0.19	0.17	0.15	0.14	0.13	0.12	0.11
30	3.13	1.73	2.51	2.76	1.87	1.01	0.58	0.39	0.24	0.18	0.15	0.12	0.11	0.10	0.09
40	3.64	1.31	1.28	1.57	1.93	1.89	1.61	1.32	0.84	0.56	0.39	0.29	0.23	0.18	0.15
50	4.33	1.55	0.83	0.69	0.71	0.78	0.84	0.87	0.85	0.79	0.71	0.65	0.58	0.53	0.49
60	5.06	2.35	1.18	0.72	0.41	0.32	0.30	0.28	0.25	0.21	0.18	0.15	0.13	0.12	0.11
70	5.61	3.49	2.17	1.46	0.85	0.60	0.43	0.34	0.23	0.18	0.15	0.13	0.12	0.11	0.10
80	5.78	4.35	3.37	2.73	1.97	1.53	1.19	0.96	0.66	0.50	0.40	0.34	0.30	0.27	0.25
90	5.47	4.26	3.51	3.09	2.74	2.58	2.39	2.21	1.81	1.51	1.29	1.12	0.98	0.87	0.78
100	4.78	3.29	2.41	1.87	1.28	0.98	0.78	0.65	0.45	0.34	0.26	0.21	0.17	0.15	0.13
110	3.96	2.25	1.43	1.00	0.60	0.43	0.35	0.31	0.25	0.22	0.19	0.16	0.14	0.13	0.12
120	3.27	1.76	1.23	1.01	0.86	0.84	0.82	0.80	0.73	0.65	0.57	0.50	0.45	0.40	0.36
130	2.88	1.83	1.56	1.44	1.32	1.21	1.08	0.98	0.83	0.71	0.62	0.55	0.49	0.44	0.40
140	2.78	2.19	1.94	1.70	1.38	1.14	0.94	0.79	0.60	0.48	0.40	0.33	0.28	0.25	0.22
150	2.93	2.60	2.12	1.66	1.08	0.77	0.61	0.51	0.37	0.29	0.23	0.19	0.16	0.14	0.12
160	3.23	2.88	1.99	1.34	0.79	0.52	0.37	0.29	0.21	0.17	0.15	0.13	0.11	0.10	0.09
170	3.61	2.95	1.70	1.10	0.56	0.33	0.21	0.15	0.12	0.11	0.11	0.11	0.11	0.11	0.10
180	4.03	2.86	1.52	0.89	0.33	0.19	0.14	0.12	0.11	0.11	0.11	0.11	0.11	0.10	0.10
190	4.48	2.76	1.30	0.60	0.26	0.19	0.16	0.14	0.13	0.13	0.12	0.11	0.10	0.10	0.09
200	4.97	2.73	1.01	0.50	0.36	0.33	0.29	0.25	0.19	0.16	0.14	0.12	0.11	0.10	0.09
210	5.52	2.72	0.89	0.67	0.64	0.57	0.51	0.45	0.36	0.29	0.23	0.19	0.16	0.14	0.12
220	6.17	2.78	1.12	1.16	1.09	0.95	0.73	0.56	0.36	0.25	0.20	0.16	0.14	0.12	0.11
230	6.92	3.10	1.89	1.84	1.27	0.83	0.58	0.44	0.29	0.22	0.18	0.15	0.13	0.11	0.10
240	7.76	4.03	3.25	2.19	0.98	0.75	0.73	0.74	0.69	0.58	0.50	0.43	0.38	0.34	0.31
250	8.75	6.38	4.72	2.20	1.27	0.99	0.88	0.83	0.71	0.57	0.47	0.40	0.35	0.31	0.27
260	10.36	11.45	5.61	2.56	1.46	1.10	0.97	0.90	0.72	0.57	0.47	0.40	0.35	0.30	0.27
270	12.52	12.28	6.61	2.97	2.23	1.80	1.76	1.78	1.54	1.27	1.07	0.92	0.81	0.73	0.66
280	12.91	15.53	6.23	2.44	1.43	1.02	0.89	0.85	0.73	0.60	0.51	0.44	0.39	0.34	0.31
290	11.12	10.50	3.92	1.92	0.84	0.54	0.43	0.39	0.34	0.29	0.25	0.22	0.19	0.17	0.15
300	8.64	6.45	2.27	1.98	1.04	0.56	0.36	0.28	0.20	0.16	0.13	0.11	0.10	0.08	0.08
310	6.66	4.43	1.59	1.19	1.44	1.07	0.88	0.69	0.40	0.25	0.18	0.14	0.11	0.09	0.08
320	5.38	3.67	1.40	0.80	0.70	0.82	0.86	0.83	0.72	0.60	0.51	0.44	0.39	0.34	0.31
330	4.54	3.57	1.22	0.91	0.40	0.30	0.30	0.31	0.34	0.35	0.34	0.32	0.30	0.28	0.26
340	3.89	3.90	1.09	0.84	0.54	0.30	0.20	0.15	0.12	0.11	0.10	0.09	0.09	0.08	0.08
350	3.38	4.39	1.19	0.72	0.54	0.45	0.34	0.24	0.15	0.11	0.09	0.08	0.07	0.06	0.06
360	3.00	4.55	1.84	0.72	0.47	0.41	0.36	0.33	0.28	0.24	0.19	0.16	0.13	0.11	0.10



### Line Source

- ## 5. Particulate Matter (PM<sub>10</sub>)

**Figure 12-5: Isopleth for Concentration of  $PM_{10}$**

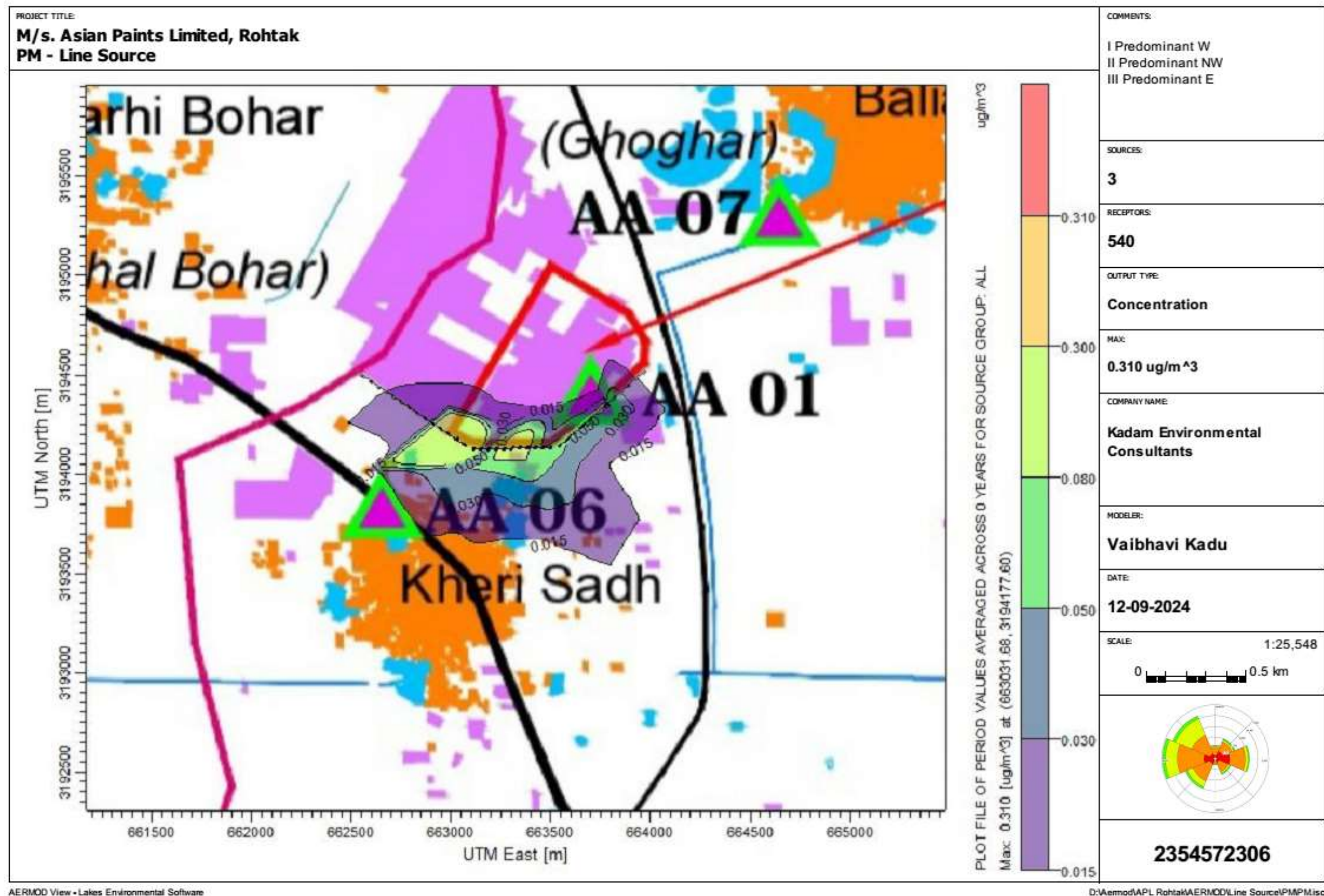


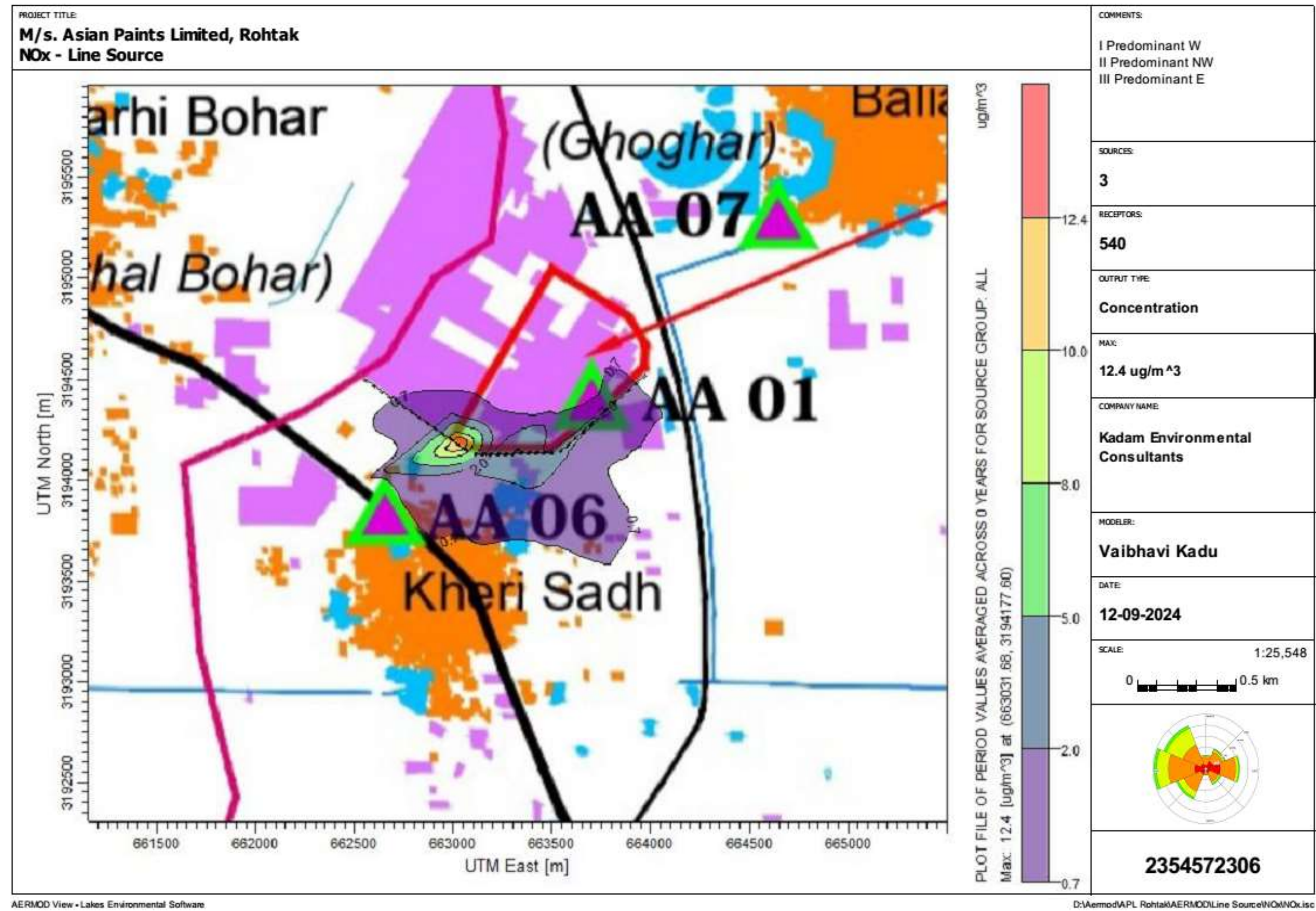
Table 12-5: Incremental GLC (µg/m³) of Particulate Matter (PM<sub>10</sub>)

DIRECTION	DISTANCE (METER)														
(DEGREE)	250	500	750	1000	1500	2000	2500	3000	4000	5000	6000	7000	8000	9000	10000
10	0.00234	0.00135	0.00102	0.00082	0.00035	0.00016	0.00012	0.0001	0.00008	0.00006	0.00005	0.00004	0.00003	0.00003	0.00002
20	0.00233	0.00133	0.00097	0.00078	0.00051	0.00023	0.00011	0.00007	0.00005	0.00004	0.00003	0.00003	0.00002	0.00002	0.00002
30	0.00249	0.00144	0.00102	0.00079	0.00058	0.00041	0.00026	0.00015	0.00005	0.00003	0.00002	0.00002	0.00001	0.00001	0.00001
40	0.00314	0.0018	0.00125	0.00096	0.00066	0.00051	0.00042	0.00035	0.00023	0.00015	0.0001	0.00006	0.00004	0.00003	0.00002
50	0.00405	0.00237	0.00164	0.00125	0.00084	0.00062	0.00049	0.0004	0.0003	0.00024	0.0002	0.00017	0.00014	0.00012	0.00011
60	0.00352	0.00177	0.00109	0.00074	0.00041	0.00026	0.00019	0.00014	0.00009	0.00007	0.00005	0.00004	0.00003	0.00002	0.00002
70	0.0029	0.00149	0.00102	0.00078	0.0005	0.00035	0.00025	0.00019	0.00012	0.00008	0.00006	0.00005	0.00004	0.00003	0.00003
80	0.00314	0.00189	0.00136	0.00105	0.00072	0.00054	0.00043	0.00035	0.00025	0.00019	0.00014	0.00011	0.00009	0.00008	0.00007
90	0.00412	0.00275	0.00219	0.00184	0.00132	0.00102	0.00085	0.00073	0.00056	0.00045	0.00036	0.0003	0.00025	0.00022	0.00019
100	0.00496	0.00361	0.00294	0.00248	0.00198	0.00149	0.00108	0.00079	0.00043	0.00024	0.00014	0.00009	0.00006	0.00004	0.00003
110	0.00543	0.00406	0.00335	0.0028	0.00131	0.00047	0.00018	0.00011	0.00008	0.00007	0.00007	0.00006	0.00005	0.00005	0.00004
120	0.00681	0.00503	0.00398	0.0022	0.00069	0.00058	0.00052	0.00045	0.00039	0.00039	0.00039	0.00037	0.00035	0.00032	0.00029
130	0.00919	0.00687	0.00398	0.00205	0.00166	0.00168	0.00187	0.00182	0.00141	0.00112	0.00093	0.00077	0.00064	0.00054	0.00046
140	0.01117	0.00805	0.00357	0.00292	0.00355	0.00361	0.00309	0.0026	0.00172	0.00114	0.0008	0.00059	0.00045	0.00035	0.00028
150	0.01302	0.00848	0.00435	0.00485	0.00594	0.00471	0.00318	0.00207	0.00101	0.00065	0.00055	0.00051	0.00045	0.00039	0.00032
160	0.01449	0.00826	0.00582	0.00835	0.00696	0.00359	0.00205	0.00157	0.00113	0.00065	0.00043	0.00029	0.00022	0.00017	0.00013
170	0.01589	0.00825	0.00886	0.0114	0.00576	0.00283	0.00214	0.00125	0.00054	0.00029	0.00023	0.00016	0.0001	0.00007	0.00005
180	0.01806	0.00934	0.01385	0.01339	0.00473	0.00282	0.00133	0.00082	0.00047	0.00037	0.00033	0.00029	0.00025	0.00021	0.00018
190	0.02087	0.01141	0.0192	0.0148	0.00525	0.00215	0.00135	0.00105	0.00087	0.00062	0.00046	0.00037	0.00031	0.00025	0.00019
200	0.02415	0.01441	0.02445	0.01414	0.00442	0.00209	0.00158	0.0012	0.00063	0.00026	0.00009	0.00003	0.00002	0.00001	0.00001
210	0.0296	0.02151	0.03173	0.01465	0.00377	0.00219	0.00133	0.00065	0.0001	0.00006	0.00005	0.00004	0.00003	0.00002	0.00002
220	0.04205	0.04184	0.04235	0.01784	0.00384	0.00188	0.0005	0.00021	0.00012	0.00008	0.00006	0.00005	0.00004	0.00003	0.00003
230	0.05668	0.05338	0.06281	0.02483	0.00418	0.00093	0.00035	0.00023	0.00012	0.00007	0.00005	0.00003	0.00002	0.00002	0.00002
240	0.0216	0.01989	0.12815	0.04825	0.00586	0.00151	0.00095	0.00067	0.00043	0.00032	0.00024	0.00019	0.00016	0.00013	0.00011
250	0.01427	0.01378	0.02007	0.31015	0.00774	0.00229	0.00138	0.00092	0.00044	0.00025	0.00017	0.00013	0.0001	0.00008	0.00006
260	0.01068	0.00982	0.01366	0.02531	0.01517	0.00598	0.00283	0.00162	0.00071	0.0004	0.00026	0.00018	0.00014	0.00011	0.00009
270	0.00774	0.00659	0.00777	0.01004	0.00773	0.00406	0.00265	0.002	0.00132	0.00093	0.00068	0.00051	0.0004	0.00032	0.00027
280	0.00548	0.00437	0.0041	0.00451	0.00385	0.00035	0.00033	0.00034	0.00025	0.00018	0.00013	0.0001	0.00008	0.00006	0.00005
290	0.00438	0.00335	0.00279	0.00255	0.00157	0.00125	0.00016	0.00009	0.00004	0.00003	0.00003	0.00003	0.00003	0.00002	0.00002
300	0.0038	0.00278	0.00224	0.00141	0.00093	0.0011	0.00078	0.0004	0.00006	0.00002	0.00002	0.00001	0.00001	0.00001	0.00001
310	0.00346	0.00243	0.00193	0.00103	0.00069	0.0005	0.00059	0.00059	0.0003	0.00018	0.00011	0.00007	0.00004	0.00003	0.00002
320	0.00312	0.00212	0.00168	0.00086	0.00056	0.00029	0.00025	0.00027	0.00029	0.00025	0.00019	0.00014	0.0001	0.00008	0.00006
330	0.00268	0.00177	0.00138	0.00072	0.00043	0.00028	0.00013	0.00009	0.00008	0.00008	0.00008	0.00007	0.00007	0.00007	0.00006
340	0.00237	0.00151	0.00115	0.00063	0.00031	0.00023	0.00016	0.00008	0.00002	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
350	0.00232	0.00143	0.00109	0.00069	0.00028	0.00022	0.00017	0.00014	0.00008	0.00003	0.00001	0.00001	0	0	0
360	0.00236	0.00141	0.00108	0.00081	0.00027	0.0002	0.00016	0.00014	0.0001	0.00008	0.00007	0.00005	0.00004	0.00003	0.00003



6. Oxides of Nitrogen (NO<sub>x</sub>)

Figure 12-6: Isopleth for Concentration of Oxides of Nitrogen (NO<sub>x</sub>)



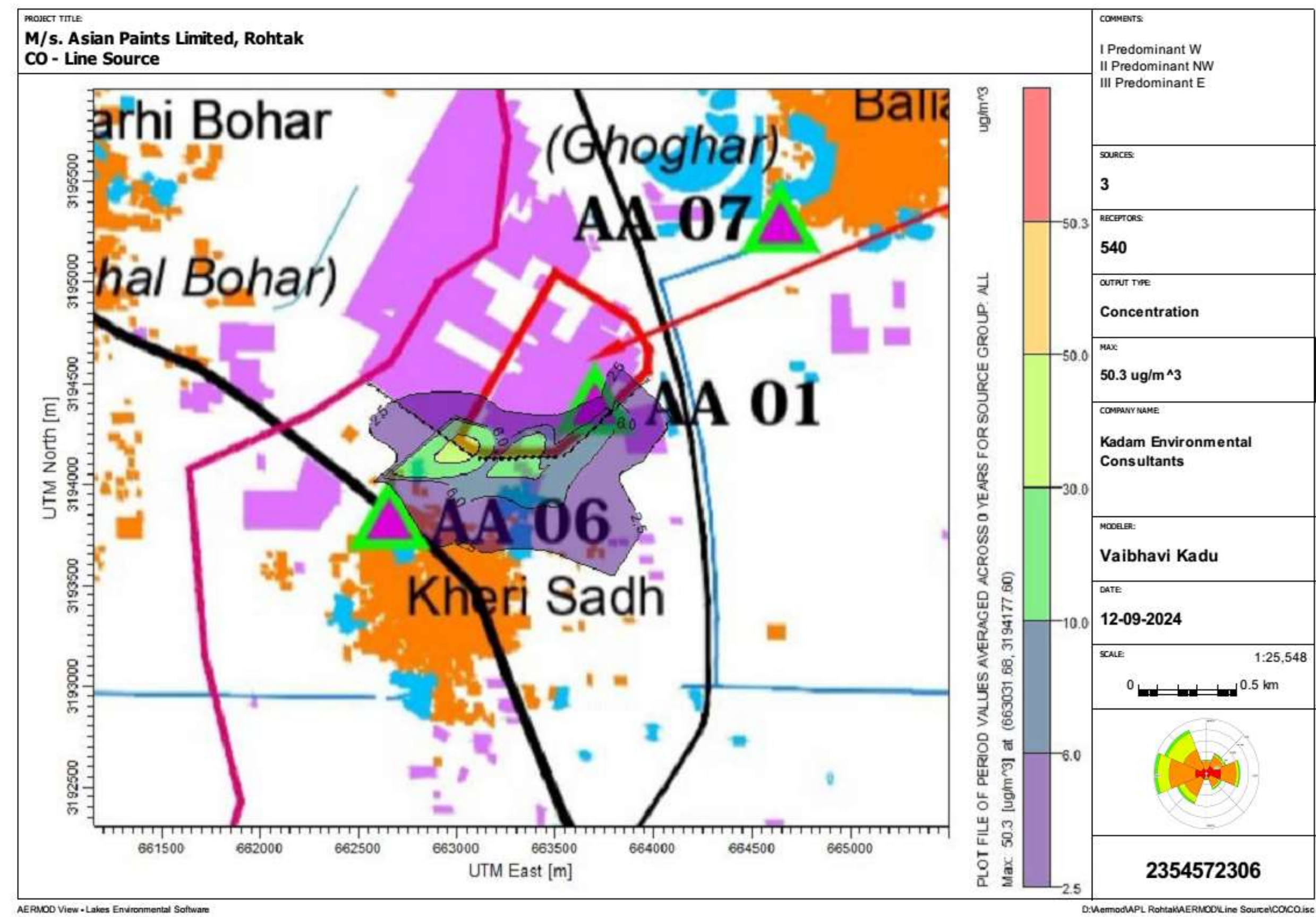
**Table 12-6: Incremental GLC ( $\mu\text{g}/\text{m}^3$ ) of Oxides of Nitrogen ( $\text{NO}_x$ )**

DIRECTION	DISTANCE (METER)														
(DEGREE)	250	500	750	1000	1500	2000	2500	3000	4000	5000	6000	7000	8000	9000	10000
10	0.09512	0.05445	0.04111	0.03314	0.01415	0.00662	0.00502	0.00419	0.00305	0.00232	0.00187	0.00154	0.00128	0.00108	0.00093
20	0.09466	0.05404	0.03917	0.03149	0.02029	0.0091	0.00437	0.00304	0.00203	0.00157	0.00125	0.00102	0.00085	0.00072	0.00061
30	0.10121	0.0586	0.04114	0.03195	0.0231	0.01663	0.01031	0.00591	0.00217	0.00125	0.00089	0.00068	0.00055	0.00045	0.00039
40	0.12792	0.0731	0.05068	0.03913	0.02659	0.02053	0.017	0.01401	0.00908	0.00586	0.00384	0.00256	0.00175	0.00124	0.00091
50	0.16526	0.09653	0.06695	0.0508	0.0342	0.02533	0.01977	0.01617	0.012	0.00964	0.00802	0.00679	0.00581	0.00503	0.00439
60	0.14349	0.07181	0.04445	0.03015	0.01644	0.01067	0.00768	0.00585	0.00376	0.00262	0.00192	0.00144	0.0011	0.00085	0.00068
70	0.1177	0.06038	0.04138	0.03148	0.02042	0.01418	0.01028	0.00774	0.00483	0.00335	0.0025	0.00197	0.00161	0.00135	0.00115
80	0.12742	0.0767	0.05494	0.04237	0.02898	0.02191	0.0174	0.01424	0.01007	0.00749	0.00579	0.00461	0.00376	0.00312	0.00264
90	0.16769	0.11162	0.0889	0.0746	0.05347	0.04122	0.03419	0.02944	0.0228	0.01817	0.01475	0.01219	0.01025	0.00873	0.00756
100	0.202	0.14648	0.11933	0.10058	0.08016	0.06019	0.04371	0.03182	0.01736	0.00988	0.00587	0.00364	0.00235	0.00158	0.0011
110	0.22091	0.1648	0.13584	0.11345	0.05309	0.01896	0.00747	0.00438	0.0032	0.00293	0.00269	0.00243	0.00215	0.00188	0.00164
120	0.2771	0.20425	0.16178	0.08969	0.02816	0.02345	0.02113	0.01845	0.01606	0.0159	0.01573	0.01511	0.01415	0.01301	0.01182
130	0.37491	0.28001	0.1623	0.08403	0.06762	0.06833	0.07597	0.07401	0.05725	0.04548	0.03748	0.03109	0.02592	0.02194	0.01874
140	0.45568	0.32849	0.14616	0.11926	0.14433	0.14638	0.12532	0.10537	0.06951	0.04615	0.03218	0.02372	0.01817	0.01423	0.01135
150	0.53169	0.34657	0.17793	0.19795	0.2409	0.19057	0.12839	0.08358	0.04076	0.02639	0.02234	0.02056	0.01836	0.01568	0.01307
160	0.59179	0.33794	0.23758	0.33912	0.28127	0.14497	0.08289	0.06341	0.04561	0.02607	0.01717	0.01173	0.00873	0.00686	0.00541
170	0.64922	0.33753	0.3608	0.46225	0.23279	0.11448	0.08608	0.05041	0.02191	0.01176	0.00912	0.00643	0.00402	0.00277	0.00223
180	0.73826	0.38229	0.56314	0.5417	0.19135	0.11351	0.05392	0.03332	0.01912	0.0149	0.01339	0.01181	0.0101	0.00858	0.00732
190	0.85345	0.46706	0.78008	0.59784	0.21154	0.08707	0.05494	0.04252	0.03526	0.02498	0.01859	0.0151	0.01247	0.01009	0.00774
200	0.98788	0.58951	0.99218	0.57128	0.17839	0.08478	0.06395	0.04836	0.02537	0.01027	0.00371	0.00137	0.00079	0.00058	0.00048
210	1.21148	0.87977	1.28701	0.59143	0.15219	0.08776	0.05323	0.02597	0.0041	0.00252	0.00195	0.00153	0.0012	0.00095	0.00077
220	1.72233	1.71097	1.71864	0.7189	0.15422	0.07543	0.02021	0.00831	0.00493	0.0032	0.00234	0.00184	0.0015	0.00125	0.00107
230	2.32299	2.18457	2.5554	0.99871	0.16754	0.03749	0.01394	0.00913	0.00492	0.00287	0.00182	0.0013	0.001	0.0008	0.00067
240	0.88268	0.81005	5.22427	1.93925	0.23609	0.06137	0.0385	0.02718	0.01732	0.01275	0.00985	0.00783	0.00641	0.00538	0.0046
250	0.58239	0.55957	0.81194	12.4166	0.3118	0.09219	0.05549	0.03718	0.01762	0.01017	0.00688	0.00504	0.00388	0.00309	0.00252
260	0.43549	0.3983	0.551	1.01554	0.60945	0.24129	0.11445	0.06561	0.02884	0.01607	0.01033	0.00729	0.00547	0.00429	0.00349
270	0.31529	0.26669	0.3132	0.40365	0.30999	0.16312	0.10664	0.08065	0.05333	0.03747	0.02733	0.02072	0.01622	0.01307	0.01077
280	0.22278	0.17672	0.16535	0.18166	0.15437	0.01413	0.01334	0.01382	0.01024	0.00738	0.0053	0.00395	0.00307	0.00249	0.00209
290	0.17773	0.13548	0.11249	0.10288	0.06341	0.05014	0.00656	0.00346	0.00173	0.00119	0.00116	0.00113	0.00105	0.00096	0.00086
300	0.15433	0.11238	0.09024	0.0568	0.03757	0.0441	0.03126	0.01593	0.00256	0.00083	0.00061	0.00054	0.0005	0.00045	0.0004
310	0.14043	0.09822	0.07789	0.04163	0.02778	0.02016	0.02392	0.02381	0.01197	0.00727	0.00461	0.0027	0.00169	0.00113	0.00078
320	0.12662	0.08575	0.06765	0.03504	0.02248	0.01186	0.01024	0.01083	0.01168	0.01016	0.00759	0.0056	0.00415	0.00311	0.0024
330	0.10885	0.07151	0.05567	0.02897	0.01725	0.01134	0.00528	0.00382	0.0033	0.0032	0.0031	0.00298	0.00284	0.00267	0.0025
340	0.09618	0.06093	0.04623	0.0255	0.01255	0.00916	0.00634	0.00319	0.00074	0.00043	0.00031	0.00026	0.00023	0.00022	0.0002
350	0.09412	0.05773	0.04398	0.02797	0.01133	0.00887	0.00683	0.00543	0.0032	0.00122	0.00045	0.00025	0.00018	0.00014	0.00011
360	0.09578	0.05677	0.04339	0.03258	0.01115	0.008	0.00665	0.0056	0.00414	0.00323	0.00264	0.00214	0.00171	0.00133	0.00101



7. Carbon Monoxide (CO)

Figure 12-7: Isopleth for Concentration of Carbon Monoxide (CO)



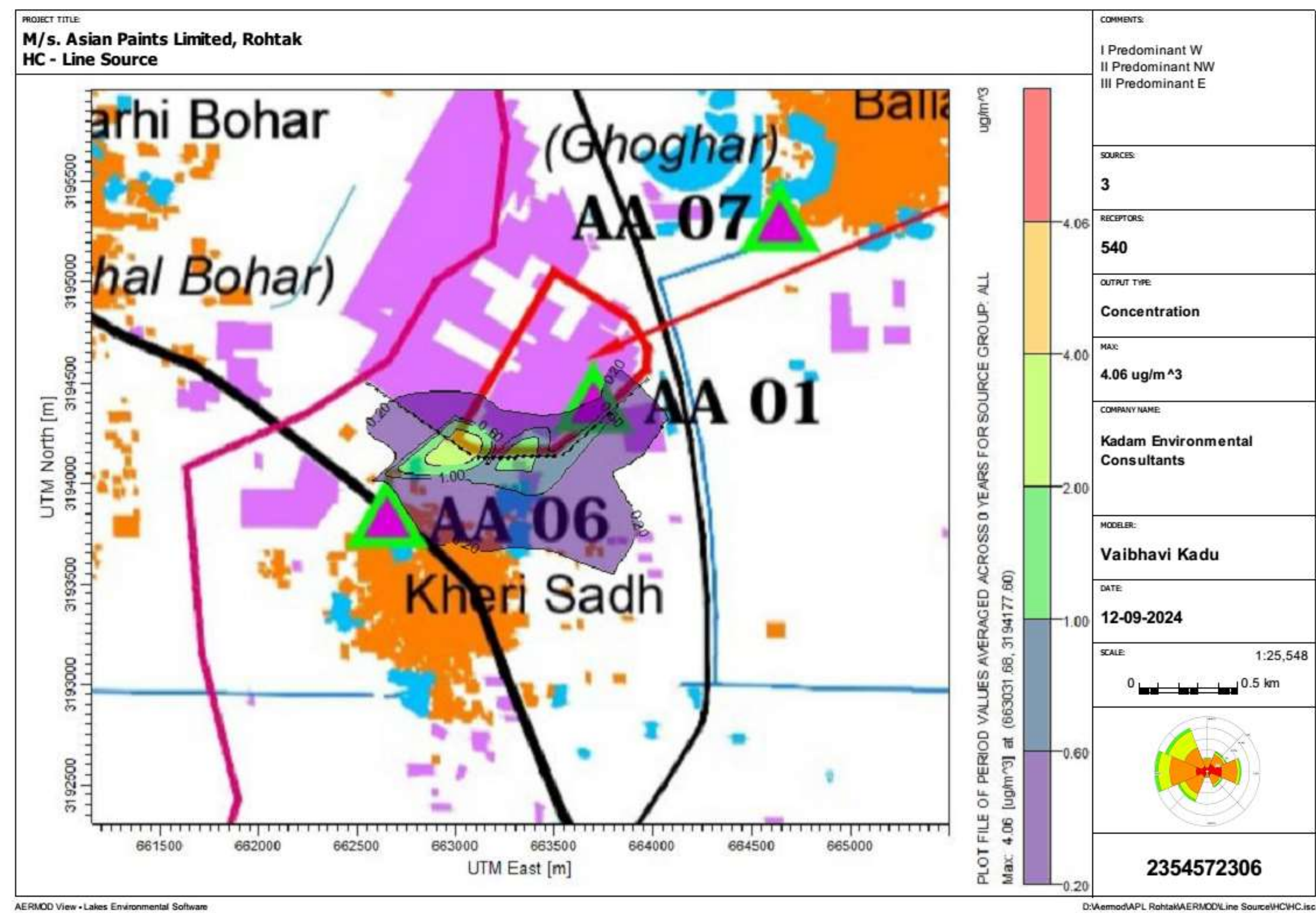


**Table 12-7: Incremental GLC ( $\mu\text{g}/\text{m}^3$ ) of Carbon Monoxide (CO)**

DIRECTION	DISTANCE (METER)														
(DEGREE)	250	500	750	1000	1500	2000	2500	3000	4000	5000	6000	7000	8000	9000	10000
10	0.39491	0.22513	0.16941	0.13627	0.05858	0.02768	0.021	0.01751	0.0127	0.00966	0.00777	0.00639	0.0053	0.00448	0.00386
20	0.39206	0.22237	0.16074	0.12898	0.08303	0.03742	0.01816	0.01263	0.00845	0.00651	0.0052	0.00424	0.00352	0.00297	0.00254
30	0.42134	0.24087	0.1684	0.13052	0.09411	0.06772	0.04201	0.02416	0.00892	0.00516	0.00369	0.00283	0.00226	0.00188	0.00161
40	0.54231	0.3049	0.20971	0.16107	0.10885	0.08378	0.06927	0.05703	0.03695	0.02385	0.01562	0.01042	0.00715	0.00507	0.00372
50	0.71205	0.41242	0.28484	0.21546	0.14433	0.10655	0.08302	0.06776	0.05011	0.04013	0.03329	0.02816	0.02406	0.02081	0.01815
60	0.61636	0.30488	0.18735	0.12653	0.06859	0.04435	0.03178	0.02414	0.01547	0.01078	0.00785	0.00588	0.0045	0.0035	0.00277
70	0.50085	0.25323	0.17255	0.13093	0.08468	0.05871	0.04254	0.03202	0.01998	0.01385	0.01033	0.00812	0.00663	0.00556	0.00477
80	0.54232	0.3226	0.22998	0.17685	0.12061	0.09107	0.07225	0.05909	0.04174	0.03102	0.02396	0.01907	0.01554	0.01292	0.01092
90	0.71913	0.47322	0.37448	0.31294	0.22339	0.17186	0.1423	0.12233	0.09456	0.07523	0.06105	0.0504	0.04239	0.03608	0.03121
100	0.86833	0.62067	0.50163	0.42069	0.33258	0.24861	0.18006	0.13084	0.07124	0.04051	0.02405	0.0149	0.00962	0.00647	0.00453
110	0.94781	0.69448	0.56652	0.46932	0.21826	0.07818	0.03114	0.01842	0.01343	0.01223	0.0112	0.01004	0.00887	0.00776	0.00675
120	1.19399	0.8642	0.67627	0.37591	0.12211	0.10131	0.09077	0.07914	0.06842	0.06704	0.06584	0.06293	0.05874	0.05387	0.04892
130	1.62673	1.19307	0.69344	0.36855	0.29457	0.2925	0.31969	0.30911	0.23809	0.18866	0.15511	0.12851	0.10708	0.0906	0.07736
140	1.98322	1.40342	0.64073	0.52202	0.60914	0.60814	0.51741	0.43344	0.2851	0.18912	0.13182	0.09716	0.0744	0.05829	0.04648
150	2.31876	1.49013	0.78233	0.84714	0.99706	0.78326	0.52767	0.34442	0.16906	0.10961	0.09238	0.08468	0.07544	0.06438	0.05363
160	2.58311	1.46507	1.02929	1.4128	1.15442	0.59596	0.34087	0.26014	0.18639	0.10666	0.07029	0.04811	0.03584	0.0282	0.02229
170	2.83566	1.47309	1.52406	1.90014	0.95211	0.46776	0.35107	0.2058	0.08965	0.04832	0.0375	0.0265	0.01666	0.01155	0.00933
180	3.23053	1.67406	2.33756	2.21896	0.78444	0.46602	0.2234	0.13889	0.07989	0.06198	0.05543	0.04874	0.04164	0.03536	0.03015
190	3.74404	2.04433	3.2144	2.4447	0.87026	0.3609	0.22803	0.17588	0.14452	0.10213	0.07583	0.06148	0.05072	0.04099	0.03143
200	4.34575	2.5694	4.06071	2.33496	0.72726	0.34441	0.25942	0.19607	0.10288	0.0417	0.01513	0.00565	0.00327	0.00243	0.00199
210	5.34897	3.79941	5.2485	2.40088	0.61782	0.35608	0.21597	0.1055	0.01683	0.01038	0.008	0.00627	0.00494	0.00392	0.00317
220	7.63957	7.32765	6.9725	2.91489	0.62612	0.30635	0.08255	0.03418	0.02028	0.01318	0.00964	0.00755	0.00615	0.00515	0.00439
230	10.32644	9.5493	10.38137	4.05182	0.68112	0.15335	0.0574	0.03762	0.02029	0.01188	0.00756	0.00539	0.00416	0.00334	0.00278
240	3.85949	3.43717	21.21927	7.86562	0.96298	0.25287	0.15883	0.11223	0.07147	0.05257	0.04056	0.03226	0.0264	0.02214	0.01892
250	2.5196	2.35413	3.33743	50.26297	1.26922	0.37673	0.22682	0.15199	0.07215	0.04169	0.02821	0.0207	0.01594	0.01268	0.01035
260	1.87214	1.67249	2.2642	4.13572	2.4818	0.98507	0.46815	0.26868	0.11829	0.06597	0.04242	0.02996	0.02251	0.01766	0.01434
270	1.34521	1.11599	1.2873	1.64778	1.2643	0.66754	0.43742	0.33111	0.21903	0.15393	0.11233	0.08517	0.0667	0.05376	0.04429
280	0.94163	0.73397	0.67909	0.73943	0.62713	0.05911	0.05544	0.05705	0.04219	0.03039	0.02184	0.01626	0.01267	0.01029	0.00863
290	0.74855	0.56153	0.46387	0.41999	0.25749	0.20343	0.02695	0.01434	0.00725	0.00501	0.00486	0.00469	0.00436	0.00396	0.00356
300	0.64999	0.46626	0.37334	0.23519	0.15364	0.17893	0.1267	0.06461	0.01044	0.00344	0.00253	0.00223	0.00204	0.00185	0.00165
310	0.59207	0.40856	0.32297	0.17463	0.11578	0.08333	0.09782	0.09699	0.04871	0.02953	0.01874	0.01098	0.00685	0.00458	0.00316
320	0.53325	0.35702	0.28031	0.1471	0.09482	0.0508	0.04344	0.04525	0.04811	0.04166	0.03111	0.02298	0.01703	0.0128	0.00989
330	0.45564	0.2964	0.22903	0.12006	0.07188	0.04756	0.02275	0.01666	0.01423	0.01361	0.01307	0.01248	0.01183	0.01111	0.01035
340	0.40007	0.25113	0.18918	0.10411	0.05117	0.03731	0.02584	0.01307	0.0031	0.00185	0.00132	0.00111	0.001	0.00093	0.00086
350	0.39129	0.23839	0.18071	0.11481	0.04635	0.03608	0.02775	0.02201	0.01297	0.00495	0.00183	0.001	0.00071	0.00055	0.00043
360	0.39857	0.23522	0.17907	0.13432	0.04661	0.03331	0.0275	0.02306	0.01696	0.01318	0.01074	0.0087	0.00694	0.00539	0.00409

8. Hydro Carbons (HC)

Figure 12-8: Isopleth for Concentration of Hydro Carbons (HC)



**Table 12-8: Incremental GLC ( $\mu\text{g}/\text{m}^3$ ) of Hydro Carbons (HC)**

DIRECTION	DISTANCE (METER)														
(DEGREE)	250	500	750	1000	1500	2000	2500	3000	4000	5000	6000	7000	8000	9000	10000
10	0.03117	0.01786	0.01349	0.01087	0.00464	0.00217	0.00165	0.00138	0.001	0.00076	0.00061	0.0005	0.00042	0.00035	0.0003
20	0.031	0.01769	0.01283	0.01032	0.00665	0.00298	0.00144	0.001	0.00067	0.00051	0.00041	0.00034	0.00028	0.00024	0.0002
30	0.03318	0.01916	0.01345	0.01045	0.00756	0.00545	0.00338	0.00194	0.00071	0.00041	0.00029	0.00022	0.00018	0.00015	0.00013
40	0.04211	0.02397	0.01659	0.0128	0.00869	0.00671	0.00556	0.00458	0.00297	0.00192	0.00126	0.00084	0.00057	0.00041	0.0003
50	0.0546	0.03183	0.02205	0.01672	0.01124	0.00832	0.00649	0.00531	0.00394	0.00316	0.00263	0.00223	0.0019	0.00165	0.00144
60	0.04739	0.02366	0.01462	0.00991	0.0054	0.0035	0.00252	0.00192	0.00123	0.00086	0.00063	0.00047	0.00036	0.00028	0.00022
70	0.03881	0.01985	0.01359	0.01033	0.0067	0.00465	0.00337	0.00254	0.00158	0.0011	0.00082	0.00064	0.00053	0.00044	0.00038
80	0.04202	0.02524	0.01806	0.01392	0.00951	0.00719	0.00571	0.00467	0.0033	0.00246	0.0019	0.00151	0.00123	0.00102	0.00087
90	0.05539	0.03679	0.02926	0.02453	0.01757	0.01354	0.01123	0.00966	0.00748	0.00596	0.00484	0.004	0.00336	0.00286	0.00248
100	0.06676	0.04827	0.03926	0.03305	0.02629	0.01972	0.01431	0.01041	0.00568	0.00323	0.00192	0.00119	0.00077	0.00052	0.00036
110	0.07298	0.05424	0.0446	0.03716	0.01736	0.0062	0.00245	0.00144	0.00105	0.00096	0.00088	0.0008	0.0007	0.00062	0.00054
120	0.09161	0.06726	0.05309	0.02944	0.00932	0.00775	0.00698	0.00609	0.00529	0.00523	0.00517	0.00496	0.00464	0.00426	0.00388
130	0.12411	0.09228	0.05349	0.02787	0.0224	0.02255	0.02498	0.0243	0.01878	0.01492	0.01228	0.01019	0.00849	0.00719	0.00614
140	0.15094	0.10828	0.04846	0.03954	0.04748	0.048	0.04105	0.03449	0.02275	0.0151	0.01053	0.00776	0.00595	0.00466	0.00371
150	0.17618	0.11438	0.05905	0.06529	0.07892	0.06237	0.04204	0.02739	0.01337	0.00865	0.00732	0.00673	0.00601	0.00513	0.00428
160	0.19612	0.11174	0.07857	0.11121	0.09204	0.04748	0.02713	0.02074	0.01492	0.00853	0.00562	0.00384	0.00286	0.00225	0.00177
170	0.21517	0.11179	0.11863	0.15118	0.07614	0.03741	0.02816	0.01649	0.00717	0.00385	0.00299	0.00211	0.00132	0.00091	0.00073
180	0.24477	0.12672	0.18443	0.17714	0.06258	0.03718	0.01769	0.01094	0.00627	0.00488	0.00439	0.00387	0.00331	0.00281	0.0024
190	0.28312	0.15479	0.25509	0.19548	0.06933	0.02855	0.018	0.01392	0.01153	0.00817	0.00607	0.00494	0.00408	0.0033	0.00253
200	0.32791	0.19517	0.324	0.1868	0.05831	0.02765	0.02088	0.01581	0.0083	0.00336	0.00121	0.00045	0.00026	0.00019	0.00016
210	0.40246	0.29059	0.41994	0.19308	0.04967	0.0287	0.01742	0.0085	0.00134	0.00083	0.00064	0.0005	0.00039	0.00031	0.00025
220	0.57272	0.56391	0.55996	0.23478	0.05045	0.02469	0.00662	0.00272	0.00161	0.00105	0.00077	0.0006	0.00049	0.00041	0.00035
230	0.77278	0.72375	0.83213	0.32642	0.05484	0.01228	0.00457	0.00299	0.00161	0.00094	0.0006	0.00043	0.00033	0.00026	0.00022
240	0.29259	0.2667	1.69988	0.634	0.07722	0.02007	0.0126	0.0089	0.00567	0.00418	0.00322	0.00257	0.0021	0.00176	0.00151
250	0.19262	0.18399	0.26571	4.063	0.10195	0.03016	0.01816	0.01217	0.00577	0.00333	0.00225	0.00165	0.00127	0.00101	0.00083
260	0.14384	0.13098	0.1805	0.33253	0.19949	0.07891	0.03742	0.02146	0.00944	0.00526	0.00338	0.00239	0.00179	0.00141	0.00114
270	0.10397	0.08769	0.10262	0.13215	0.10157	0.05346	0.03496	0.02643	0.01747	0.01227	0.00895	0.00679	0.00531	0.00428	0.00353
280	0.07332	0.05802	0.05418	0.05939	0.05054	0.00465	0.00438	0.00453	0.00336	0.00242	0.00174	0.00129	0.00101	0.00082	0.00069
290	0.05845	0.04446	0.0369	0.03366	0.02071	0.01641	0.00215	0.00114	0.00057	0.00039	0.00038	0.00037	0.00035	0.00031	0.00028
300	0.05076	0.03689	0.02962	0.01864	0.01227	0.01441	0.01022	0.00521	0.00084	0.00027	0.0002	0.00018	0.00016	0.00015	0.00013
310	0.0462	0.03226	0.02557	0.0137	0.00912	0.00659	0.00782	0.00779	0.00391	0.00238	0.00151	0.00088	0.00055	0.00037	0.00025
320	0.04165	0.02817	0.0222	0.01153	0.00741	0.00391	0.00337	0.00355	0.00382	0.00333	0.00248	0.00183	0.00136	0.00102	0.00079
330	0.03576	0.02348	0.01824	0.0095	0.00567	0.00373	0.00175	0.00127	0.00109	0.00105	0.00102	0.00098	0.00093	0.00088	0.00082
340	0.03155	0.01998	0.01514	0.00834	0.0041	0.003	0.00208	0.00105	0.00024	0.00014	0.0001	0.00009	0.00008	0.00007	0.00007
350	0.03086	0.01894	0.01442	0.00916	0.0037	0.0029	0.00223	0.00177	0.00105	0.0004	0.00015	0.00008	0.00006	0.00004	0.00003
360	0.03141	0.01864	0.01424	0.01069	0.00366	0.00262	0.00218	0.00183	0.00135	0.00106	0.00086	0.0007	0.00056	0.00043	0.00033

**Annexure 18: Workplace Monitoring Reports****HTH Laboratories Pvt. Ltd.**

(Formerly Known as Haryana Test House &amp; Consultancy Services)

Plot No. 50-C, Sector-25 Part-II, HUDA, PANIPAT-132 103 (HR.)

Contact : (Off.) 86077-70160, 0180-4067223, (Env.) 86077-70164, (BM) 86077-70166, (Food) 86077-70169  
Web Site : www.hthlabs.com, e-mail : haryanatesthousecs@gmail.com, testing@hthlabs.com**An ISO 9001:2015, ISO 14001:2015, ISO 45001:2018 Certified Laboratory****TEST REPORT**

<b>Issued To:</b> Asian Paint Ltd Plot No.1, Sector- 30 B, IMT Rohtak (HR)	<b>Report No.</b> : HTH/EP/240622048
	<b>ULR No.</b> : TC781124100004944F
	<b>Party's Ref No.</b> : Nil
	<b>Booking Date</b> : 22/06/2024
	<b>Period of Testing</b> : 22/06/2024 To 29/06/2024
	<b>Reporting Date</b> : 29/06/2024

**Sample Description** : Indoor Air Quality for RSPM

Type of Industry : Paint Industry  
Date & time of sampling : 21/06/2024  
Sample Location : Putti Plant (Packing Area)  
Instrument used : Handy Sampler APM 821 (Sr. No. 835 DTB 2016)  
Instrument Calibration Status : Calibrated (upto 07.07.2024)  
Purpose of analysis : Monitoring  
Sample collected/ supplied by : By our lab. Representative

**A. Observations:**

1. Sampling flow rate (Avg.) : 2.30 LPM
2. Total volume of air sampled : 1.104 m3
3. Period of sampling : 8 Hrs

S.N.	Test Parameters	Unit	Result	Requirement as per OSHA	Test Method
Discipline: Chemical, Group: Atmospheric Pollution					
1	Respirable Aerosols Mass	mg/m3	6.422	5.0 Max	NIOSH 600 : 1998

\*\*\*End of Report\*\*\*

**Remarks** : Limit for Air Contaminants as per OSHA.

*[Signature]*  
20.6.2024  
Review by



Page No.: 1 of 1

Note: 1. Test report shall not be reproduced in whole or in part and cannot be used as an evidence in the court of Law.  
2. This report is only for your guidance, and not for legal purposes, commercial decision, and for advertisement.  
3. Samples will be destroyed after one month from the date of issue of test report unless otherwise specified.

2. The results contained in this test report pertain only to the sample tested and not for the whole lot.  
4. Total liability of Haryana Test House is limited to the invoiced amount only.  
6. Samples not drawn for HTH unless otherwise specified.





# HTH Laboratories Pvt. Ltd.

(Formerly Known as Haryana Test House & Consultancy Services)

Plot No. 50-C, Sector-25 Part-II, HUDA, PANIPAT-132 103 (HR.)

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Web Site : www.hthlabs.com, e-mail : haryanatesthousecs@gmail.com, testing@hthlabs.com



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## TEST REPORT

<b>Issued To:</b> Asian Paint Ltd Plot No.1, Sector- 30 B, IMT Rohtak (HR)	<b>Report No.</b> : HTH/EP/240622049 <b>ULR No.</b> : TC781124100004945F <b>Party's Ref No.</b> : Nil  <b>Booking Date</b> : 22/06/2024 <b>Period of Testing</b> : 22/06/2024 To 29/06/2024 <b>Reporting Date</b> : 29/06/2024
--	--

**Sample Description** : Indoor Air Quality for RSPM

Type of industry : Paint Industry  
Date & time of sampling : 21/06/2024  
Sample Location : Putti Plant (BSM Area)  
Instrument used : Handy Sampler APM 821 (Sr. No. 801 DTL 2016)  
Instrument Calibration Status : Calibrated (upto 07.07.2024)  
Purpose of analysis : Monitoring  
Sample collected/ supplied by : By our lab. Representative

### A. Observations:

1. Sampling flow rate (Avg.) : 2.40 LPM
2. Total volume of air sampled : 1.152 m3
3. Period of sampling : 8 Hrs

S.N.	Test Parameters	Unit	Result	Requirement as per OSHA	Test Method
Discipline: Chemical, Group: Atmospheric Pollution					
1	Respirable Aerosols Mass	mg/m3	6.389	5.0 Max	NIOSH 600 : 1998

\*\*\*End of Report\*\*\*

**Remarks** : Limit for Air Contaminants as per OSHA.

*[Signature]*  
29-06-2024  
Review by

*[Signature]*  
29/06/2024  
Sr. Manager (Env.)

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4. The details received from customer on its own responsibility. Lab does not confirm about it and hence does not taken any responsibility whatsoever.  
5. The results contained in this test report pertains only to the sample tested not for the whole lot.  
6. Total liability of Haryana Test House is limited to the invoiced amount only.  
7. Sample not drawn by HTH unless otherwise specified.



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Contact : (Off.) 86077-70160, 0180-4067223, (Env.) 86077-70164, (BM) 86077-70166, (Food) 86077-70169

Web Site : www.hthlabs.com, e-mail : haryanatesthousecs@gmail.com, testing@hthlabs.com

**An ISO 9001:2015, ISO 14001:2015, ISO 45001:2018 Certified Laboratory****TEST REPORT**

<b>Issued To:</b> Asian Paint Ltd Plot No.1, Sector- 30 B, IMT Rohtak (HR)	<b>Report No. :</b> HTH/EP/240622050 <b>ULR No. :</b> TC781124100004946F <b>Party's Ref No. :</b> Nil  <b>Booking Date :</b> 22/06/2024 <b>Period of Testing :</b> 22/06/2024 To 29/06/2024 <b>Reporting Date :</b> 29/06/2024
--	--

**Sample Description :** Indoor Air Quality for RSPM

Type of Industry	: Paint Industry
Date & time of sampling	: 21/06/2024
Sample Location	: PMG (Nr. Machine 103)
Instrument used	: Handy Sampler APM 821 (Sr. No. 838 DTB 2017)
Instrument Calibration Status	: Calibrated (upto 07.07.2024)
Purpose of analysis	: Monitoring
Sample collected/ supplied by	: By our lab. Representative

**A. Observations:**

- |                                |            |
|--------------------------------|------------|
| 1. Sampling flow rate (Avg.)   | : 2.50 LPM |
| 2. Total volume of air sampled | : 1.200 m3 |
| 3. Period of sampling          | : 8 Hrs    |

S.N.	Test Parameters	Unit	Result	Requirement as per OSHA	Test Method
Discipline: Chemical, Group: Atmospheric Pollution					
1	Respirable Aerosols Mass	mg/m3	3.417	5.0 Max	NIOSH 600 : 1998

\*\*\*End of Report\*\*\*

**Remarks :** Limit for Air Contaminants as per OSHA.

*[Signature]*  
29.06.2024  
Review by



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  5. Samples will be destroyed after one month from the date of issue of test report unless otherwise specified.
  6. Sample not drawn by HTH unless otherwise specified.
  7. The details received from customer on its own responsibility. Lab does not confirm about it and hence does not taken any responsibility whatsoever.





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**HTH Laboratories Pvt. Ltd.**

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Plot No. 50-C, Sector-25 Part-II, HUDA, PANIPAT-132 103 (HR.)

Contact : (Off.) 86077-70160, 0180-4067223, (Env.) 86077-70164, (BM) 86077-70166, (Food) 86077-70169

Web Site : www.hthlabs.com, e-mail : haryanatesthousecs@gmail.com, testing@hthlabs.com



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**TEST REPORT**

<b>Issued To:</b> Asian Paint Ltd Plot No.1, Sector- 30 B, IMT Rohtak (HR)	<b>Report No.</b> : HTH/EP/240622051 <b>ULR No.</b> : TC781124100004947F <b>Party's Ref No.</b> : Nil  <b>Booking Date</b> : 22/06/2024 <b>Period of Testing</b> : 22/06/2024 to 29/06/2024 <b>Reporting Date</b> : 29/06/2024
--	--

**Sample Description** : Indoor Air Quality for RSPM

Type of Industry	: Paint Industry
Date & time of sampling	: 21/06/2024
Sample Location	: FG (Nr. Battery Charging)
Instrument used	: Handy Sampler APM 821 (Sr. No. 1001 DTL 2019)
Instrument Calibration Status	: Calibrated (upto 19.12.2024)
Purpose of analysis	: Monitoring
Sample collected/ supplied by	: By our lab. Representative

**A. Observations:**

- |                                |            |
|--------------------------------|------------|
| 1. Sampling flow rate (Avg.)   | : 2.30 LPM |
| 2. Total volume of air sampled | : 1.104 m3 |
| 3. Period of sampling          | : 8 Hrs    |

S.N.	Test Parameters	Unit	Result	Requirement as per OSHA	Test Method
Discipline: Chemical, Group: Atmospheric Pollution					
1	Respirable Aerosols Mass	mg/m3	2.736	5.0 Max	NIOSH 600 : 1998

\*\*\*End of Report\*\*\*

**Remarks** : Limit for Air Contaminants as per OSHA.

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Review by

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29/06/2024  
Sr. Manager (Env.)

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TC-7811

**TEST REPORT**

Issued To: Asian Paint Ltd Plot No.1, Sector- 30 B, IMT Rohtak (HR)	Report No. : HTH/EP/240622052 ULR No. : TC78112410004948F Party's Ref No. : Nil Booking Date : 22/06/2024 Period of Testing : 22/06/2024 To 29/06/2024 Reporting Date : 29/06/2024
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Sample Description : Indoor Air Quality for RSPM

Type of Industry : Paint Industry  
Date & time of sampling : 21/06/2024  
Sample Location : Polymer (1st Floor)  
Instrument used : Handy Sampler APM 821 (Sr. No. 1002 DTL 2019)  
Instrument Calibration Status : Calibrated (upto 19.12.2024)  
Purpose of analysis : Monitoring  
Sample collected/ supplied by : By our lab. Representative

**A. Observations:**

1. Sampling flow rate (Avg.) : 2.10 LPM
2. Total volume of air sampled : 1.008 m<sup>3</sup>
3. Period of sampling : 8 Hrs

S.N. Test Parameters	Unit	Result	Requirement as per OSHA	Test Method
Discipline: Chemical, Group: Atmospheric Pollution				
1 Respirable Aerosols Mass	mg/m <sup>3</sup>	3.988	5.0 Max	NIOSH 600 : 1998

\*\*\*End of Report\*\*\*

Remarks : Limit for Air Contaminants as per OSHA.

*[Signature]*  
29.06.2024  
Review by

*[Signature]*  
29.06.2024  
Sr. Manager (Env.)

Page No.: 1 of 1

- Note : 1. Test report shall not be reproduce in whole or in part and cannot be used as an evidence in the court of Law.  
2. The results contained in this test report pertains only to the sample tested not for the whole lot.  
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DOC No. HTH/QF/7.8

**HTH Laboratories Pvt. Ltd.**

(Formerly Known as Haryana Test House &amp; Consultancy Services)

Plot No. 50-C, Sector-25 Part-II, HUDA, PANIPAT-132 103 (HR.)

Contact : (Off.) 86077-70160, 0180-4067223, (Env.) 86077-70164, (BM) 86077-70166, (Food) 86077-70169

Web Site : www.hthlabs.com, e-mail : haryanatesthousecs@gmail.com, testing@hthlabs.com

An ISO 9001:2015, ISO 14001:2015, ISO 45001:2018 Certified Laboratory



TC-7811

**TEST REPORT****Issued To:**

Asian Paint Ltd

Plot No.1, Sector- 30 B, IMT Rohtak (HR)

**Report No.**

: HTH/EP/240622053

**ULR No.**

: TC781124100004949F

**Party's Ref No.**

: Nil

**Booking Date**

: 22/06/2024

**Period of Testing**

: 22/06/2024 To 29/06/2024

**Reporting Date**

: 29/06/2024

**Sample Description** : Indoor Air Quality for RSPM.

Type of Industry : Paint Industry  
Date & time of sampling : 21/06/2024  
Sample Location : RMG (Nr. Charging Area)  
Instrument used : Handy Sampler APM 821 (Sr. No. 1002 DTL 2019)  
Instrument Calibration Status : Calibrated (upto 19.12.2024)  
Purpose of analysis : Monitoring  
Sample collected/ supplied by : By our lab. Representative

**A. Observations:**

1. Sampling flow rate (Avg.) : 2.55 LPM
2. Total volume of air sampled : 1.224 m3
3. Period of sampling : 8 Hrs

S.N. Test Parameters	Unit	Result	Requirement as per OSHA	Test Method
Discipline: Chemical, Group: Atmospheric Pollution				
1 Respirable Aerosols Mass	mg/m3	3.317	5.0 Max	NIOSH 600 : 1998

\*\*\*End of Report\*\*\*

**Remarks** : Limit for Air Contaminants as per OSHA.

Review by



Page No.: 1 of 1

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Plot No. 50-C, Sector-25 Part-II, HUDA, PANIPAT-132 103 (HR.)

Contact : (Off.) 86077-70160, 0180-4067223, (Env.) 86077-70164, (BM) 86077-70166, (Food) 86077-70169  
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TC-7811



## TEST REPORT

**Issued To:**

Asian Paint Ltd

Plot No.1, Sector- 30 B, IMT Rohtak (HR)

Report No. : HTH/EP/240622054  
ULR No. : TC781124100004941F  
Party's Ref No. : Nil

Booking Date : 22/06/2024  
Period of Testing : 22/06/2024 To 29/06/2024  
Reporting Date : 29/06/2024

Sample Description : Indoor Air Quality for RSPM

Type of Industry : Paint Industry  
Date & time of sampling : 22/06/2024  
Sample Location : RMG (Nr. Bag Folding Area)  
Instrument used : Handy Sampler APM 821 (Sr. No. 835 DTB 2016)  
Instrument Calibration Status : Calibrated (upto 07.07.2024)  
Purpose of analysis : Monitoring  
Sample collected/ supplied by : By our lab. Representative

**A. Observations:**

1. Sampling flow rate (Avg.) : 2.30 LPM
2. Total volume of air sampled : 1.104 m3
3. Period of sampling : 8 Hrs

S.N. Test Parameters	Unit	Result	Requirement as per OSHA	Test Method
Discipline: Chemical, Group: Atmospheric Pollution				
1 Respirable Aerosols Mass	mg/m3	5.616	5.0 Max	NIOSH 600 : 1998

\*\*\*End of Report\*\*\*

Remarks : Limit for Air Contaminants as per OSHA.

*[Signature]*  
29.06.2024  
Review by

*[Signature]*  
29/06/2024  
Sr. Manager (New)

Page No.: 1 of 1

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Web Site : www.hthlabs.com, e-mail : haryanatesthouseecs@gmail.com, testing@hthlabs.com

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**TEST REPORT**

<b>Issued To:</b> Asian Paint Ltd Plot No.1, Sector- 30 B, IMT Rohtak (HR)	<b>Report No. :</b> HTH/EP/240622055 <b>ULR No. :</b> TC781124100004942F <b>Party's Ref No. :</b> Nil  <b>Booking Date :</b> 22/06/2024 <b>Period of Testing :</b> 22/06/2024 To 29/06/2024 <b>Reporting Date :</b> 29/06/2024
--	--

**Sample Description :** Indoor Air Quality for RSPM

Type of Industry : Paint Industry  
Date & time of sampling : 22/06/2024  
Sample Location : RMG (Unloading Area)  
Instrument used : Handy Sampler APM 821 (Sr. No. 801 DTL 2016)  
Instrument Calibration Status : Calibrated (upto 07.07.2024)  
Purpose of analysis : Monitoring  
Sample collected/ supplied by : By our lab. Representative

**A. Observations:**

1. Sampling flow rate (Avg.) : 2.20 LPM
2. Total volume of air sampled : 1.056 m3
3. Period of sampling : 8 Hrs

S.N. Test Parameters	Unit	Result	Requirement as per OSHA	Test Method
Discipline: Chemical, Group: Atmospheric Pollution				
1. Respirable Aerosols Mass	mg/m3	6.051	5.0 Max	NIOSH 600 : 1998

\*\*\*End of Report\*\*\*

**Remarks :** Limit for Air Contaminants as per OSHA.

*[Signature]*  
06/06/2024  
Review by

*[Signature]*  
22/06/2024  
Sr. Manager (Env.)

Page No.: 1 of 1

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DOC No. HTH/QF/7.8

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Plot No. 50-C, Sector-25 Part-II, HUDA, PANIPAT-132 103 (HR.)

Contact : (Off) 86077-70160, 0180-4067223, (Env.) 86077-70164, (BM) 86077-70186, (Food) 86077-70169  
Web Site : www.hthlabs.com, e-mail : haryanatesthousecs@gmail.com, testing@hthlabs.com

TC-7811

**An ISO 9001:2015, ISO 14001:2015, ISO 45001:2018 Certified Laboratory****TEST REPORT**

<b>Issued To:</b> Asian Paint Ltd Plot No.1, Sector- 30 B, IMT Rohtak (HR)	<b>Report No. :</b> HTH/EP/240622056 <b>ULR No. :</b> TC781124100004943F <b>Party's Ref No. :</b> Nil  <b>Booking Date :</b> 22/06/2024 <b>Period of Testing :</b> 22/06/2024 To 29/06/2024 <b>Reporting Date :</b> 29/06/2024
--	--

**Sample Description :** Indoor Air Quality for RSPM

Type of Industry	: Paint Industry
Date & time of sampling	: 22/06/2024
Sample Location	: RMG (Nr. Silo Side)
Instrument used	: Handy Sampler APM 821 (Sr. No. 838 DTB 2017)
Instrument Calibration Status	: Calibrated (upto 07.07.2024)
Purpose of analysis	: Monitoring
Sample collected/ supplied by	: By our lab. Representative

**A. Observations:**

- |                                |            |
|--------------------------------|------------|
| 1. Sampling flow rate (Avg.)   | : 2.10 LPM |
| 2. Total volume of air sampled | : 1.008 m3 |
| 3. Period of sampling          | : 8 Hrs    |

S.N. Test Parameters	Unit	Result	Requirement as per OSHA	Test Method
Discipline: Chemical, Group: Atmospheric Pollution				
1. Respirable Aerosols Mass	mg/m3	4.067	5.0 Max	NIOSH 600 : 1998

\*\*\*End of Report\*\*\*

**Remarks :** Limit for Air Contaminants as per OSHA.

*[Signature]*  
19.06.2024  
Review by



Page No.: 1 of 1

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Plot No. 50-C, Sector-25 Part-II, HUDA, PANIPAT-132 103 (HR.)

Contact : (Off.) 86077-70160, 0180-4067223, (Env.) 86077-70164, (BM) 86077-70166, (Food) 86077-70169

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TC-7811

**TEST REPORT**

Issued To:

Asian Paint Ltd

Plot No.1, Sector- 30 B, IMT Rohtak (HR)

Report No. : HTH/EP/240622057

ULR No. : TC781124100004938F

Party's Ref No. : Nil

Booking Date : 22/06/2024

Period of Testing : 22/06/2024 To 29/06/2024

Reporting Date : 29/06/2024

Sample Description : Indoor Air Quality for RSPM

Type of Industry : Paint Industry  
Date & time of sampling : 22/06/2024  
Sample Location : WBP (Nr. Dust Collector No. 9)  
Instrument used : Handy Sampler APM 821 (Sr. No. 1001 DTL 2019)  
Instrument Calibration Status : Calibrated (upto 19.12.2024)  
Purpose of analysis : Monitoring  
Sample collected/ supplied by : By our lab. Representative

**A. Observations:**

1. Sampling flow rate (Avg.) : 2.30 LPM
2. Total volume of air sampled : 1.104 m<sup>3</sup>
3. Period of sampling : 8 Hrs

S.N.	Test Parameters	Unit	Result	Requirement as per OSHA	Test Method
Discipline: Chemical, Group: Atmospheric Pollution					
1	Respirable Aerosols Mass	mg/m <sup>3</sup>	3.623	5.0 Max	NIOSH 600 : 1998

\*\*\*End of Report\*\*\*

Remarks : Limit for Air Contaminants as per OSHA.

*[Signature]*  
29.06.2024  
Review by



Page No.: 1 of 1

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**TEST REPORT**

<b>Issued To:</b> Asian Paint Ltd Plot No.1, Sector- 30 B, IMT Rohtak (HR)	<b>Report No. :</b> HTH/EP/240622058 <b>ULR No. :</b> TC781124100004939F <b>Party's Ref No. :</b> Nil  <b>Booking Date :</b> 22/06/2024 <b>Period of Testing :</b> 22/06/2024 To 29/06/2024 <b>Reporting Date :</b> 29/06/2024
--	--

Sample Description : Indoor Air Quality for RSPM

Type of Industry : Paint Industry  
Date & time of sampling : 22/06/2024  
Sample Location : WBP (Nr. Dust Collector No. 5)  
Instrument used : Handy Sampler APM 821 (Sr. No. 1002 DTL 2019)  
Instrument Calibration Status : Calibrated (upto 19.12.2024)  
Purpose of analysis : Monitoring  
Sample collected/ supplied by : By our lab. Representative

**A. Observations:**

1. Sampling flow rate (Avg.) : 2.10 LPM
2. Total volume of air sampled : 1.008 m<sup>3</sup>
3. Period of sampling : 8 Hrs

S.N. Test Parameters	Unit	Result	Requirement as per OSHA	Test Method
Discipline: Chemical, Group: Atmospheric Pollution				
1. Respirable Aerosols Mass	mg/m <sup>3</sup>	3.394	5.0 Max	NIOSH 600 : 1998

\*\*\*End of Report\*\*\*

Remarks : Limit for Air Contaminants as per OSHA.

*[Signature]*  
29.06.2024  
Review by



Page No.: 1 of 1

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TC-7811

**An ISO 9001:2015, ISO 14001:2015, ISO 45001:2018 Certified Laboratory****TEST REPORT****Issued To:**

Asian Paint Ltd

Plot No.1, Sector- 30 B, IMT Rohtak (HR)

Report No. : HTH/EP/240622059  
ULR No. : TC781124100004940F  
Party's Ref No. : NilBooking Date : 22/06/2024  
Period of Testing : 22/06/2024 To 29/06/2024  
Reporting Date : 29/06/2024**Sample Description :** Indoor Air Quality for RSPMType of Industry : Paint Industry  
Date & time of sampling : 22/06/2024  
Sample Location : Scrap Yard  
Instrument used : Handy Sampler APM 821 (Sr. No. 1140 E 23 P)  
Instrument Calibration Status : Calibrated (upto 12.06.2025)  
Purpose of analysis : Monitoring  
Sample collected/ supplied by : By our lab. Representative**A. Observations:**

1. Sampling flow rate (Avg.) : 2.55 LPM
2. Total volume of air sampled : 1.224 m<sup>3</sup>
3. Period of sampling : 8 Hrs

S.N.	Test Parameters	Unit	Result	Requirement as per OSHA	Test Method
Discipline: Chemical, Group: Atmospheric Pollution					
1	Respirable Aerosols Mass	mg/m <sup>3</sup>	2.631	5.0 Max	NIOSH 600 : 1998

\*\*\*End of Report\*\*\*

**Remarks :** Limit for Air Contaminants as per OSHA.  
Review by

Page No.: 1 of 1

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# — ENVIRO-INTERNATIONAL —

Lab Recognised Under: Ministry of Environment, Forest & Climate Change, Govt. of India  
Gazette Notification S.O. 3744 (E), S. No. 32, N.A.B.L. TC-6545, U.P.P.C.B. H-01600/CL/89



## TEST REPORT

ISSUED TO: <b>M/s ASIAN PAINTS LIMITED</b> Plot No. - 01, IMT, Kheri Sadh, Rohtak (Haryana) - 24001 India.	SUBJECT : Air Quality Monitoring. <b>INSTRUMENTS: RDS/HANDY SAMPLER/VOC SAMPLER, GC.</b>
Sample Details: <b>AIR</b> Sample Reference: <b>EIL/ APL-R/07/24/WZ-30-X</b>	Sample Collection Date: <b>20/07/24</b> Sample Reporting Date: <b>29/07/24</b>

Sampling Site	Unit	Contractor Yard-Welding Fume	Standard*
		(W5)	
Work Zone No.	--	W - 30-x	--
Sampling Environment	--	During Production Hours	--
Unit Status	--	Medium	--
Environmental Status	--	Medium	--
Average Operating Hours	--	8 Hours	--
Sampling Duration	Sec.	28800	--
Flow Rate of SPM	Q3 0111010	1.80	--
Flow Rate of Gases	LPM	1.80	--
Work Zone Ambient Temperature	K	302	--
Iron Oxide Fumes	ug/m <sup>3</sup>	02	<5
Lead	ug/m <sup>3</sup>	B.D.L	< 0.15
Oil Mist Minerals	ug/m <sup>3</sup>	B.D.L	< 5
Carbon Mono Oxide	ug/m <sup>3</sup>	19	< 55
Oxide of Nitrogen	ug/m <sup>3</sup>	02	< 6
Oxide of Sulphur	ug/m <sup>3</sup>	03	< 5
PM - 2.5	ug/m <sup>3</sup>	124	Not Specified
PM-10	ug/m <sup>3</sup>	171	Not Specified

N.B.: \*\* STANDARD AS PER "TIME WEIGHTED AVERAGE" (TWA) CONCENTRATION -PPM / SECOND SCHEDULE SECTION 41 F THE FACTORIES ACT. 1948. B.D.L: Below Detection Limit \*\*\* Humidity 40-60%.

Checked By  
R. P. Narayan

Lab-In-Charge  
Dr. Vipul Kumar  
Greater Noida  
ENVIRO-INTERNATIONAL

### N.B.:-

- The Sampler/Samples received shall be destroyed after 2 weeks unless specified otherwise
- The Result Indicated only refer to the tested samples
- The Certificate shall not be used in any media or as evidence in the court of law without prior written consent of the laboratory.



Off & Lab : 138-139, Udyog Kendra-II Extn, Eco Tech-III, Greater Noida-201 306  
9810098684, 9810725666, 9910233668  
vipul\_kumar4@rediffmail.com  
envirointernationalec@gmail.com

ISO : 9001 : 2015, ISO : 14001 : 2015  
ISO : 45001 : 2018



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Lab Recognised Under: Ministry of Environment, Forest & Climate Change, Govt. of India  
Gazette Notification S.O. 3744 (E), S. No. 32, N.A.B.L. TC-8545, U.P.P.C.B. H-01600/CL/89



## TEST REPORT

<b>ISSUED TO :</b> <b>M/s ASAIN PAINTS LIMITED</b> Plot No. - 01, IMT, Kheri Sadh, Rohtak (Haryana) - 24001 India..		<b>SUBJECT :</b> AMBIENT ZONE NOISE MONITORING <b>PRINCIPLE &amp; METHODS:</b> Based on EPA: dB eq. <b>INSTRUMENTS :</b> Noise Level
<b>Sample Details :</b> Noise-Day <b>Sample Reference:</b> EIL/APL-R/07/24/WN - 72-81		<b>Sample Collection Date:</b> 17-20/07/24 <b>Sample Reporting Date:</b> 29/07/24
Sampling Station	Monitoring Report Day	Prescribed Standard As per EPA-1986 dB(A)
Near Gate No.1	58.7	75
Near Gate No 2	66.3	75
Near Gate No 3	64.1	75
Engg. Store	57.9	75
RMG Park	53.6	75
FPH Back Side	52.2	75
PMG Back Side	57.5	75
ETP Watch Tower	55.8	75
Storm Water Tank	51.9	75
Green Belt Area 1	53.3	75

Checked By  
R.P. Marwaha

EIL/Lab-In-Charge  
Dr. Vipul Kumar



### N.B.:-

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- The Result indicated only refer to the tested samples.
- The Certificate shall not be used in any media or as evidence in the court of law without prior written consent of the laboratory.



Off. & Lab  
138-139, Udyog Kendra-II Extn, Eco Tech-III, Greater Noida-201 306  
9810098664, 9810725666, 9910233666  
vipul\_kumar4@rediffmail.com  
envirointernationalco@gmail.com

ISO : 9001 : 2015, ISO : 14001 : 2015  
ISO : 45001 : 2018



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Gazette Notification S.O. 3744 (E), S. No. 32, N.A.B.L. TC-6545, U.P.P.C.B. H-01600/CL/89



## TEST REPORT

<b>ISSUED TO :</b> <b>M/s ASAIN PAINTS LIMITED</b> Plot No. - 01, IMT, Kheri Sadh, Rohtak (Haryana) - 24001 India..		<b>SUBJECT :</b> PERSONAL WORK ZONE NOISE MONITORING <b>PRINCIPLE &amp; METHODS:</b> Based on EPA: dB eq. <b>INSTRUMENTS :</b> Noise Level Meter /Dose Meter	
<b>Sample Details :</b> Personal Noise Monitoring - TWA <b>Sample Reference:</b> EIL/APL-R/07/24/WN - 41-71		<b>Sample Collection Date:</b> 17-26/07/24 <b>Sample Reporting Date:</b> 29/07/24	
Sampling Station	Sampling Person Name	Monitoring Report	Prescribed Standard As per Factories Act 1948 (For 8 hrs working in dB)
Polymer Ground Floor	Mr Jai Kishan	72.4	90
Polymer First Floor	Mr Deepender	74.7	90
RMG FIBC -D	Mr Jagdish	73.1	90
RMG Fork lift Operator	Mr Devender	75.8	90
WBP Ground Floor Old Block	Mr Azzad	73.0	90
WBP Ground Floor New Block	Mr Sombeer	70.7	90
PEL Lab	Mr Prveen	64.8	90
LQC	Mr Anil Sen	62.4	90
WBP First Floor Old Block	Mr Rajesh Kumar	74.5	90
WBP First Floor New Block	Mr Sandeep	72.8	90
Packing Area Old Block	Mr Amar	73.6	90
Packing Area New Block	Mr Namder	71.6	90
QA Lab	Mr Pradeep	62.5	90
MTF	Mr Saurabh	68.2	90
Putty Plant IInd Floor	Mr Satyender	71.8	90
Putty Plant Packing Line	Mr Ram Niwas	74.6	90
Finished Goods Area Outside	Mr Mohan	63.6	90
PMG Line-10B	Mr Praveen	72.4	90
Gate no. 01	Mr Lalit	58.1	90
Gate No.02	Mr Deepak	59.0	90
Gate No.03	Mr Surender	62.4	90
ETP Blower Area	Mr Dheeraj	63.3	90

### N.B.:-

- The Sample/Samples received shall be destroyed after 2 weeks unless specified otherwise.
- The Result indicated only refer to the tested samples.
- The Certificate shall not be used in any media or as evidence in the court of law without prior written consent of the laboratory.

Off. & Lab  
138-139, Udyog Kendra-II Extn, Eco Tech-III, Greater Noida-201 306  
9810098864, 9810725666, 9910233668  
vipul\_kumar4@rediffmail.com  
envirointernationalleo@gmail.com

ISO : 9001 : 2015, ISO : 14001 : 2015

ISO : 45001 : 2018



elacil  
Environmental Laboratory  
Certification  
10-24-100





# — ENVIRO-INTERNATIONAL —

Lab Recognised Under: Ministry of Environment, Forest & Climate Change, Govt. of India  
Gazette Notification S.O. 3744 (E), S. No. 32, N.A.B.L. TC-6545, U.P.P.C.B. H-01600/CL/89



## TEST REPORT

FG Bridge Profiler Area	Mr Anil Kumar	74.1	90
EHS Lab	Mr karan	63.9	90
PMG Crane Side	Mr Anil Kumar	74.0	90
Utility Chiller Area	Mr Vikas	74.6	90
Utility Cooling Area	Mr Kapil	71.9	90
Putty BSM Area	Mr Satynder	71.7	90
RMG FIBC- G	Mr G Ravinder	75.3	90
RMG FIBC-C	Mr Pawan	72.9	90

Checked By  
R.P. Marwah

EIL/Lab-In-Charge  
Dr. Vipul Kumar



### N.B.:-

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- The Result indicated only refer to the tested samples.
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9810098664, 9810725686, 9910233668  
vipul\_kumar4@rediffmail.com  
envirointernationalco@gmail.com

ISO : 9001 : 2015, ISO : 14001 : 2015

ISO : 45001 : 2018



# ENVIRO-INTERNATIONAL

Lab Recognised Under: Ministry of Environment, Forest & Climate Change, Govt. of India  
Gazette Notification S.O. 3744 (E), S. No. 32, N.A.B.L. TC-6545, U.P.P.C.B. H-01600/CL/89



## TEST REPORT

<b>ISSUED TO:</b> <b>M/s ASAIN PAINTS LIMITED</b> Plot No. - 01, IMT, Kheri Sadh, Rohtak (Haryana) - 24001 India..		<b>SUBJECT :</b> WORK ZONE NOISE MONITORING <b>PRINCIPLE &amp; METHODS:</b> Based on EPA: dB eq. <b>INSTRUMENTS :</b> Noise Level Meter
<b>Sample Details : Noise</b> <b>Sample Reference:</b> EIL/APL-R/07/24/WN - 1-40		<b>Sample Collection Date:</b> 17-20/07/24 <b>Sample Reporting Date:</b> 29/07/24
Sampling Station	Monitoring Report	Prescribed Standard As per Factories Act 1948 (For 8 hrs working in dB)
Polymer PET 418	66.3	90
Polymer Near UCRA Pump	84.2	90
Polymer Pet 414	69.7	90
Polymer Reactor 404	65.9	90
ETP Near Blower No.1	68.2	90
PMG Crane 2 Front Side	70.5	90
PMG Line no. 312	73.8	90
PMG Reject Line 1-51-10	72.2	90
RMG BLR-1210	83.4	90
RMG BLR-246	81.9	90
RMG BLR 168	84.2	90
RMG FIBC-C	78.3	90
ECT Machine	64.7	90
WB Block Centre of TSD-107 & 108	66.6	90
WBP Block Centre of TSD 105 & 106	81.3	90
DG Area	77.2	90
WBP Block TSD 114	72.6	90
WBP Block Centre of 113-114	68.9	90
Packing Area Line 104 Carton Maker.	64.3	90
LQC Near Vibro Shaker	66.7	90
PEL Lab TSD 50 Ltr.	71.2	90
EHS Lab Near BOD Incubator	61.6	90

### N.B.:-

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- The Result indicated only refer to the tested samples
- The Certificate shall not be used in any media or as evidence in the court of law without prior written consent of the laboratory

Off & Lab 138-139, Udyog Kendra-II Extn, Eco Tech-III, Greater Noida-201 366  
 9810098664, 9810725665, 9810233668  
 vipul\_kumar4@rediffmail.com  
 envirointernationaleco@gmail.com





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## TEST REPORT

RM Lab GC Room Fume Hood	73.5	90
Instrument Room ( Solicitor )	84.2	90
PMQA drop test machine M/c	88.0	90
Packing Area near centre of line no. 105 & 108 Robot Area	70.3	90
Packing Area Line no 111 & 112 Filter Area	66.2	90
Packing g Area Line no 106 Pack Lab	68.9	90
FPH ( Fire Pump Hydrant Jockey Pump)	77.4	90
FPH( Fire pump RO 502 DMF feed pump)	79.4	90
FPH ( Fire Pump Man Electrical pump-1)	88.7	90
FPH ( Fire Pump DG pump no 3)	90.2	90
Utility Chiller Area R- 501	80.9	90
Utility Chiller Area Compressor R- 503	83.5	90
Utility ( DG/ Boiler Area) R-508	79.3	90
Utility ( DG/ Boiler Area DG -501)	78.2	90
Finished Goods Area - Bridge Profiler PFST-2	66.6	90
Finished Goods Area - DAIFUKU Station	64.8	90
SILo Area Blower BLR-1231	86.3	90
SILo Area Blower- BLR-1205	82.2	90

Checked By  
R.P. Marwah



### N.B.:-

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- The Result indicated only refer to the tested samples.
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9810098664 9810725666, 9910233668  
vipul\_kumar4@rediffmail.com  
envirointernationalec@gmail.com

ISO : 9001 : 2015, ISO : 14001 : 2015

ISO : 45001 : 2018

**Annexure 19: Detailed Traffic Survey Data**

<b>Client</b>	Asian Paints Ltd. Rohtak
<b>Date of Survey</b>	11/05/2023
<b>Point of Survey</b>	Enterence & Exit of IMT
<b>Name of the Road</b>	IMT Road
<b>Traffic Flow Towards</b>	APL
<b>Width of the Road</b>	7.0 mtr

	Mechanized Vehicles									Non-mechanized Vehicles			
	2- Wheelers			3-Wheelers	4-Wheelers								
Time	Scooters	Motor Cycles	Total	Auto	Cars/Jeep & Vans	Trucks	Buses	Tractors	Total	Bicycles	Carts	Cycle Rickshaw	Total
6:00-6:15	6	10	16	2	5	2	2	1	10	2	0	0	2
6:15-6:30	9	15	24	4	4	5	3	0	12	3	0	0	3
6:30-6:45	17	15	32	3	6	8	1	1	16	1	0	0	1
6:45-7:00	9	10	19	6	7	4	1	0	12	3	0	0	3
	41	50	91	15	22	19	7	2	50	9	0	0	9
7:00-7:15	20	11	31	9	10	3	2	1	16	5	0	0	5
7:15-7:30	26	20	46	6	15	4	1	2	22	3	0	0	3
7:30-7:45	18	15	33	2	20	2	1	1	24	4	0	0	4
7:45-8:00	20	30	50	7	17	1	2	1	21	3	0	0	3
	84	76	160	24	62	10	6	5	83	15	0	0	15
8:00-8:15	10	17	27	6	13	3	0	1	17	3	0	0	3
8:15-8:30	16	25	41	8	9	1	2	0	12	4	0	0	4
8:30-8:45	19	24	43	4	9	5	0	2	16	5	0	0	5
8:45-9:00	22	21	43	3	17	3	1	1	22	4	0	0	4
	67	87	154	21	48	12	3	4	67	16	0	0	16
9:00-9:15	15	15	30	6	10	4	1	1	16	3	0	0	3
9:15-9:30	18	26	44	9	19	2	0	2	23	6	0	0	6
9:30-9:45	22	15	37	7	20	3	1	0	24	9	0	0	9
9:45-10:00	21	25	46	9	24	1	1	1	27	2	0	0	2
	76	81	157	31	73	10	3	4	90	20	0	0	20
10:00-10:15	16	20	36	6	18	5	0	1	24	3	0	0	3
10:15-10:30	15	21	36	8	23	3	1	0	27	4	0	0	4
10:30-10:45	25	17	42	9	19	4	0	1	24	2	0	0	2
10:45-11:00	21	24	45	6	13	3	1	0	17	1	0	0	1
	77	82	159	29	73	15	2	2	92	10	0	0	10
11:00-11:15	15	21	36	9	16	6	2	1	25	3	0	0	3



	Mechanized Vehicles									Non-mechanized Vehicles				
	2- Wheelers			3-Wheelers	4-Wheelers									
Time	Scooters	Motor Cycles	Total	Auto	Cars/Jeep & Vans	Trucks	Buses	Tractors	Total	Bicycles	Carts	Cycle Rickshaw	Total	
11:15-11:30	20	33	53	7	17	4	1	0	22	1	0	0	1	1593
11:30-11:45	20	27	47	9	14	3	0	1	18	5	0	0	5	
11:45-12:00	17	17	34	6	12	6	1	0	19	6	0	0	6	
	72	98	170	31	59	19	4	2	84	15	0	0	15	
Morning	417	474	891	151	337	85	25	19	466	85	0	0	85	
12:00-12:15	16	24	40	9	24	4	0	0	28	4	0	0	4	
12:15-12:30	18	23	41	7	16	2	1	1	20	2	0	0	2	
12:30-12:45	24	27	51	8	10	6	0	1	17	6	0	0	6	
12:45-13:00	21	20	41	9	18	4	1	0	23	4	0	1	5	
	79	94	173	33	68	16	2	2	88	16	0	1	17	
13:00-13:15	19	26	45	6	18	2	2	2	24	6	0	0	6	
13:15-13:30	21	27	48	3	21	6	0	1	28	2	0	0	2	
13:30-13:45	18	22	40	7	19	1	1	0	21	4	0	0	4	
13:45-14:00	24	33	57	8	17	4	0	1	22	1	0	0	1	
	82	108	190	24	75	13	3	4	95	13	0	0	13	
14:00-14:15	28	31	59	6	16	3	0	1	20	6	0	0	6	
14:15-14:30	23	27	50	7	11	2	2	0	15	3	0	0	3	
14:30-14:45	21	34	55	8	16	2	1	1	20	4	0	0	4	
14:45-15:00	27	21	48	5	21	4	0	0	25	2	0	0	2	
	99	113	212	26	64	11	3	2	80	15	0	0	15	
Noon	260	315	575	83	207	40	8	8	263	44	0	1	45	966
15:00-15:15	13	45	58	9	19	3	2	1	25	3	0	0	3	
15:15-15:30	24	31	55	2	16	6	0	0	22	6	0	0	6	
15:30-15:45	21	28	49	6	15	2	1	1	19	4	0	0	4	
15:45-16:00	27	28	55	7	18	3	0	0	21	2	0	0	2	
	85	132	217	24	68	14	3	2	87	15	0	0	15	
16:00-16:15	24	31	55	6	10	3	1	1	15	2	0	0	2	
16:15-16:30	23	27	50	9	13	2	0	1	16	6	0	0	6	
16:30-16:45	25	33	58	7	15	1	2	1	19	4	0	0	4	
16:45-17:00	27	28	55	5	18	3	1	0	22	3	0	0	3	
	99	119	218	27	56	9	4	3	72	15	0	0	15	
17:00-17:15	21	31	52	6	10	4	1	1	16	5	0	0	5	
17:15-17:30	24	27	51	3	19	2	0	0	21	6	0	0	6	
17:30-17:45	21	29	50	7	17	1	1	1	20	2	0	0	2	
17:45-18:00	26	22	48	8	16	3	0	0	19	4	0	0	4	
	92	109	201	24	62	10	2	2	76	17	0	0	17	

	Mechanized Vehicles									Non-mechanized Vehicles			
	2- Wheelers			3-Wheelers	4-Wheelers								
Time	Scooters	Motor Cycles	Total	Auto	Cars/Jeep & Vans	Trucks	Buses	Tractors	Total	Bicycles	Carts	Cycle Rickshaw	Total
18:00-18:15	21	20	41	6	14	4	0	1	19	2	0	0	2
18:15-18:30	16	24	40	8	16	2	2	0	20	6	0	0	6
18:30-18:45	23	31	54	9	13	1	1	1	16	3	0	0	3
18:45-19:00	16	20	36	7	18	3	0	1	22	4	0	0	4
	76	95	171	30	61	10	3	3	77	15	0	0	15
19:00-19:15	18	23	41	8	20	4	1	1	26	2	0	0	2
19:15-19:30	21	27	48	6	21	3	0	0	24	6	0	0	6
19:30-19:45	15	31	46	3	23	4	1	1	29	8	0	0	8
19:45-20:00	12	20	32	2	17	2	0	2	21	2	0	0	2
	66	101	167	19	81	13	2	4	100	18	0	0	18
Evening	418	556	974	124	328	56	14	14	412	80	0	0	80
20:00-20:15	18	23	41	2	15	4	1	0	20	3	0	0	3
20:15-20:30	20	27	47	3	18	2	2	1	23	6	0	0	6
20:30-20:45	15	28	43	5	16	4	1	0	21	4	0	0	4
20:45-21:00	22	29	51	4	10	3	0	1	14	2	0	0	2
	75	107	182	14	59	13	4	2	78	15	0	0	15
21:00-21:15	16	21	37	1	10	5	1	0	16	1	0	0	1
21:15-21:30	17	24	41	2	8	6	0	1	15	3	0	0	3
21:30-21:45	12	15	27	3	7	3	0	0	10	6	0	0	6
21:45-22:00	20	12	32	5	6	5	1	1	13	2	0		2
	65	72	137	11	31	19	2	2	54	12	0	0	12
22:00-22:15	4	8	12	2	8	3	0	1	12	1	0	0	1
22:15-22:30	11	24	35	3	11	6	0	1	18	3	0	0	3
22:30-22:45	8	10	18	2	4	4	1	0	9	0	0	0	0
22:45-23:00	4	16	20	1	6	6	0	1	13	1	0	0	1
	27	58	85	8	29	19	1	3	52	5	0	0	5
23:00-23:15	7	8	15	0	5	2	1	1	9	2	0	0	2
23:15-23:30	8	10	18	1	3	6	0	1	10	0	0	0	0
23:30-23:45	3	8	11	2	4	4	0	0	8	1	0	0	1
23:45-00:00	2	16	18	1	3	7	0	1	11	3	0	0	3
	20	42	62	4	15	19	1	3	38	6	0	0	6
00:00-00:15	0	7	7	0	2	8	0	1	11	2	0	0	2
00:15-00:30	8	2	10	0	1	6	1	0	8	0	0	0	0
00:30-00:45	0	4	4	1	2	8	0	1	11	1	0	0	1
00:45-01:00	2	0	2	0	4	6	0	0	10	0	0	0	0
	10	13	23	1	9	28	1	2	40	3	0	0	3



	Mechanized Vehicles									Non-mechanized Vehicles			
	2- Wheelers			3-Wheelers	4-Wheelers								
Time	Scooters	Motor Cycles	Total	Auto	Cars/Jeep & Vans	Trucks	Buses	Tractors	Total	Bicycles	Carts	Cycle Rickshaw	Total
01:00-01:15	4	3	7	1	3	6	0	0	9	1	0	0	1
01:15-01:30	0	6	6	1	2	5	0	1	8	1	0	0	1
01:30-01:45	5	4	9	0	0	4	1	0	5	0	0	0	0
01:45-02:00	9	0	9	1	1	6	0	1	8	1	0	0	1
	18	13	31	3	6	21	1	2	30	3	0	0	3
02:00-02:15	11	0	11	0	2	5	1	1	9	1	0	0	1
02:15-02:30	0	6	6	1	3	6	0	0	9	0	0	0	0
02:30-02:45	2	0	2	0	1	4	0	1	6	1	0	0	1
02:45-03:00	3	0	3	0	0	4	0	0	4	0	0	0	0
	16	6	22	1	6	19	1	2	28	2	0	0	2
03:00-03:15	0	0	0	1	0	6	0	0	6	1	0	0	1
03:15-03:30	4	0	4	0	1	4	0	0	5	0	0	0	0
03:30-03:45	6	6	12	0	2	5	0	0	7	1	0	0	1
03:45-04:00	0	0	0	1	0	6	0	0	6	0	0	0	0
	10	6	16	2	3	21	0	0	24	2	0	0	2
04:00-04:15	5	3	8	1	1	6	1	0	8	1	0	0	1
04:15-04:30	0	5	5	3	1	10	0	1	12	1	0	0	1
04:30-04:45	1	0	1	0	0	9	0	0	9	0	0	0	0
04:45-05:00	0	3	3	1	1	7	0	0	8	1	0	0	1
	6	11	17	5	3	32	1	1	37	3	0	0	3
05:00-05:15	5	3	8	1	1	2	0	0	3	2	0	0	2
05:00-05:30	7	4	11	0	0	1	1	1	3	1	0	0	1
05:30-05:45	2	6	8	2	0	3	0	0	3	3	0	0	3
05:45-06:00	0	5	5	1	1	2	1	0	4	1	0	0	1
Night	14	18	32	4	2	8	2	1	13	7	0	0	7
	261	346	607	53	163	199	14	18	394	58	0	0	58
Sub Total	1356	1691	3047	411	1035	380	61	59	1535	267	0	1	268
													5261

**Annexure 20: Submission proof of Wildlife Conservation Plan for Schedule-I species.**

Asian Paints Limited  
Asian Paints House  
6A, Shantinagar  
Santacruz (E)  
Mumbai 400 055  
T : (022) 6218 1000  
F : (022) 6216 1111  
www.asianpaints.com

04/09/2024

To,  
**Conservator of Forests,**  
Centre Circle, Rohtak Forest Department,  
Van Complex, Jhang Colony, Nr. Vijay Park,  
Rohtak  
District - Rohtak

**Sub: Approval of Conservation plan for Schedule-I species present in the study area of the Proposed Integrated Paint Manufacturing Plant Located at Plot No-1, Sector 30-B, HSIIDC, IMT Rohtak, State -Haryana**

Dear Sir,

M/s. Asian Paints Limited has proposed an expansion EC for its integrated paint manufacturing plant located at Plot No-1, Sector 30-b, HSIIDC, IMT Rohtak, State -Haryana.

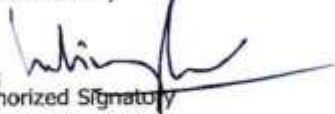
As per the schedule of the EIA Notification 2006 as amended till date, the proposed project expansion lies in Project Activity 5 (h) Integrated Paint Industry, Screening Category B as project is located in the Haryana State Industry & Infrastructure Development Corporation.

To meet the requirement of ToR granted by MoEF&CC, we have to submit the Conservation plan for Schedule I species recorded from the study area.

We request you to kindly consider the attached conservation plan with a budget and approve the same at the earliest.

Thanking You,

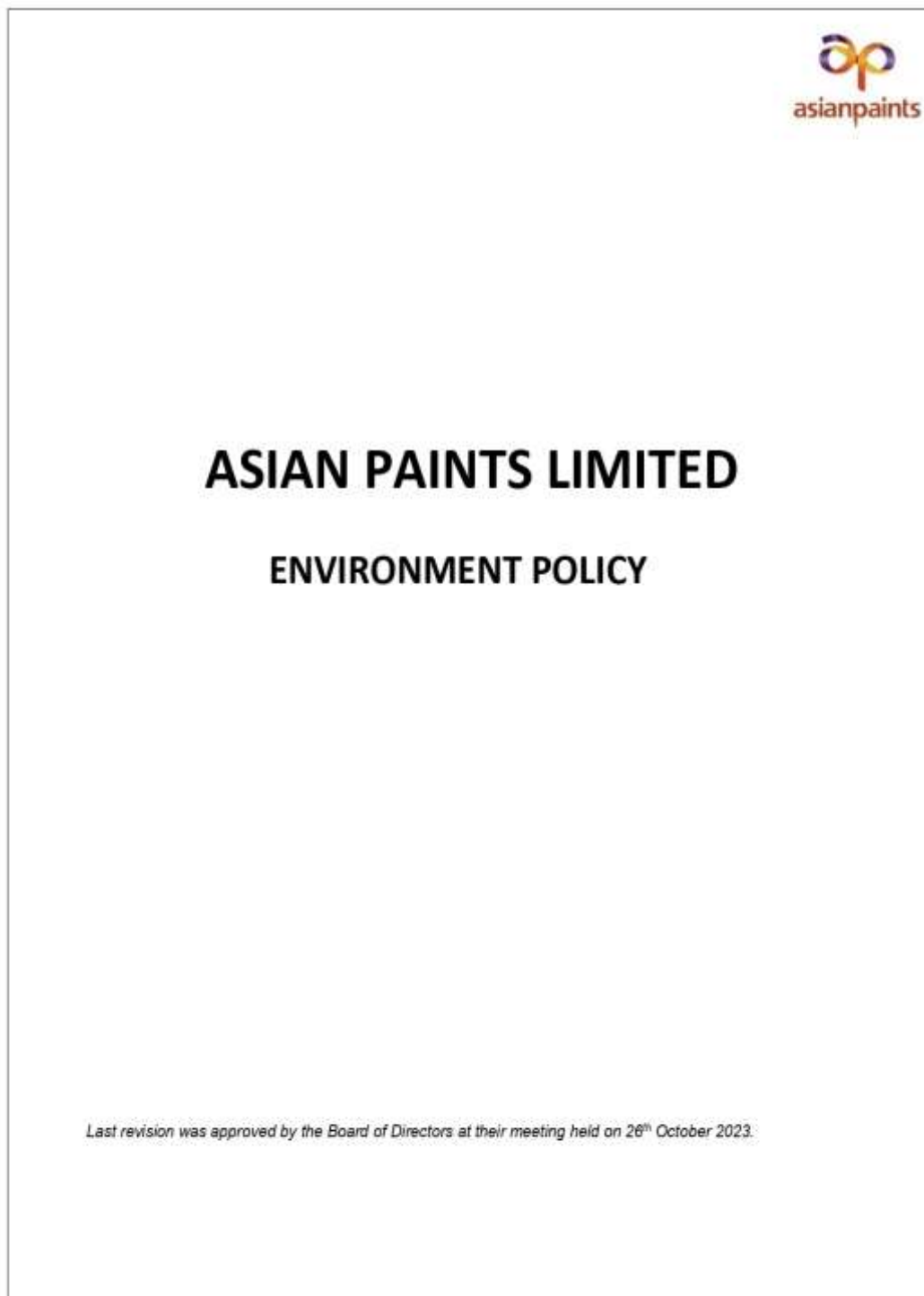
Yours Faithfully

  
Authorized Signatory

Received by  
CP Central  
Rohtak  
06/09/24

**Annexure 21: Specimen of Annual medical check-up reports**

<b>Medical Examination for Contract Labour</b>			
A.	Annual Medical Examination Tests	B.	Periodic Medical Examination (Half yearly) Tests By FMO
1.	Complete Blood Count (CBC)		1. Blood Pressure
2.	Pulmonary Function test (PFT)		2. Vision Test
3.	Urine test		3. Physical Examination
4.	Blood Pressure		
5.	Eye Examination for "far" & "near" vision & colour test, through Examination in case Myopia is detected		
6.	Audiometry Test		
7.	General Health Examination		
8.	Examination for Vertigo, Epilepsy & work at Height phobia.		
<b>Medical Examination for Driver &amp; Food Handlers.</b>			
A.	Annual Medical Examination Tests	B.	Periodic Medical Examination (Half yearly) Tests By FMO
<b>1</b>	<b>FOR DRIVERS</b>		
1.	Complete Blood Count (CBC)		1. Blood Pressure
2.	Pulmonary Function test (PFT)		2. Vision Test
3.	Urine test		3. Physical Examination
4.	Blood Pressure		
5.	Eye Examination for "far" & "near" vision & colour test, through Examination in case Myopia is detected		
6.	Audiometry Test		
7.	General Health Examination		
8.	Examination for Vertigo, Epilepsy & work at Height phobia.		
9.	Peripheral Vision Test		
<b>2</b>	<b>FOR FOOD HANDLERS</b>		
1.	Complete Blood Count (CBC)		1. Blood Pressure
2.	Pulmonary Function test (PFT)		2. Vision Test
3.	Urine test		3. Physical Examination
4.	Blood Pressure		4. Stool Test
5.	Eye Examination for "far" & "near" vision & colour test, through Examination in case Myopia is detected		5. VDRL Test
6.	General Health Examination		<b>Weekly tests in OHC</b>
7.	Examination for Vertigo, Epilepsy & work at Height phobia.		1. Nasal Discharge
8.	Stool Test		2. Nail Examination
9.	VDRL Test		3. Grooming/Hair
10.	WIDAL Test		4. Cut/Wound

**Annexure 22: Copy of Environment Policy**



**Asian Paints Limited**  
Asian Paints House  
6A, Shantinagar  
Santacruz (E)  
Mumbai 400 055  
T : (022) 6218 1000  
F : (022) 6218 1111  
[www.asianpaints.com](http://www.asianpaints.com)

### Environment Policy of Asian Paints Limited

Asian Paints is committed to manage its operations including deployment of resources using principles of sustainable development to minimize impact on environment communities.

- We shall comply with all statutory requirements. We consider compliance to statutory EHS requirements as the minimum performance standard and are committed to go beyond and adopt stricter standards. We shall work in partnership with the Government and Industry Associations for policy and regulatory reforms related to environment. We shall annually publish our environment performance to all stakeholders.
- We shall source our materials and products from vendors that comply with the child labor laws and other statutory regulations.
- We shall continually improve our products with an intention to reduce their environmental footprint. We shall inform the customers about the environment impact and safe use of our products.
- We are committed to protecting the environment by:
  - Adhering to highest operational standards for handling hazardous materials
  - Preventing Pollution & leveraging the 3R (Reduction, Recycle, Reuse) Principle and moving towards Zero Industrial Effluent Generation and Zero Hazardous Solid Waste Generation
  - Minimizing impact of end-of-life plastics generated out of our packaging material
  - Reducing Energy-Intensity, Carbon-Intensity and increasing contribution of Energy from Renewable Sources
  - Leveraging Rain Water Harvesting, Water Conservation & Water Replenishment and utilizing waste water as an alternate source
  - Nurturing Biodiversity within and outside our factory premises
- We are committed to continual improvement in environment related parameters in all business processes and shall track such improvements through measurable indicators.

**AMIT  
SYNGLE**

Digitally signed  
by AMIT SYNGLE  
Date: 2020.08.26  
20:03:36 +05'30'

**Amit Syngle**  
Managing Director & CEO  
26<sup>th</sup> August, 2020

**Annexure 23: Copy of analysis reports of product for Lead (as Pb) content & photographs of products showing labelling regarding Lead contents.****AES  
LABORATORIES****AES Laboratories (P) Ltd.**

analysing today for an assured tomorrow ...

Laboratory: B-118 Phase-II, Noida, U.P. 201305

Ph.: 0120-4646700, 4646711, 4646731, 011-45066390

E-mail: support@aeslabs.com

GSTIN : 09AAACP0657B1ZQ

MSME No. : UP28E0011437

CIN No. U74899DL1991PTC045168

**TEST CERTIFICATE****Issued To :** Asian Paints Limited  
Plot No.1, Phase-1,  
IMT Rohtak, Village: Kherisadh  
Distt.-Rohtak, Haryana - 124027**Report No:** 50-210324-01 to 02**Report Date:** 22/03/2024**Sample Received On :** 21/03/2024**Sampled By:** Customer**Parameter :** Lead (as Pb)**Analysis Start Date :** 21/03/2024**Analysis End Date :** 22/03/2024**Test Method :** USEPA 6010 D : 2018

Page 1 of 1

**RESULTS**

S.No.	Sample Code	Results (mg/kg)	Sample Description
1	50-210324-01	BLQ (<5)	Said to be Paint, Product Description: CC Yellow Fine Paste 509, Inspection Lot No: INB3243445, Quantity of Sample: 1 Tube
2	50-210324-02	BLQ (<5)	Said to be Paint, Product Description: CC Yellow Fine Paste 509, Inspection Lot No: INB3243444, Quantity of Sample: 1 Tube



Verify

**AUTHORISED SIGNATORY****Terms & Conditions**visit us at <http://www.aeslabs.com>

AES/QCD/F-7.8-I

- The results indicated only refer to the tested samples and listed parameters and do not endorse any product.
- Total liability of the laboratory is limited to the involved amount.
- This certificate shall not be reproduced wholly or in part without prior written consent of the laboratory.
- Samples received shall be destroyed after four weeks from the date of issue of the certificate unless specified otherwise.
- This certificate shall not be used in any advertising media or as evidence in the court of law without prior written consent of the laboratory.



***Annexure 24: Criteria and Status of Polluted River stretches in India by CPCB.*****POLLUTED RIVER STRETCHES IN INDIA****CRITERIA AND STATUS****CENTRAL POLLUTION CONTROL BOARD**

## IDENTIFICATION OF POLLUTED RIVER STRETCHES

CPCB is monitoring the water quality in India under National Water Quality Monitoring Programme. The water quality data is analysed and monitoring locations exceeding the water quality criteria are identified as polluted locations with respect to risk. Priority levels of polluted stretch is based on the risk. Risk is defined as;

**RISK= FREQUENCY OF VIOLATION OF CRITERIA X CONSEQUENCE (MAGNITUDE)**

The degree of violation is with respect to water quality criteria for drinking water source with conventional treatment with respect to BOD (Annexure-I- Water Quality Criteria).The polluted locations in a continuous sequence are defined as polluted river stretches.

### **Criteria for Priority 1**

- ◆ Monitoring locations exceeding BOD concentration 30 mg/l has been considered as it is the standard of sewage treatment plant and in river it appears without dilution.(River locations having water quality exceeding discharge standards for BOD to fresh water sources)
- ◆ All monitoring locations exceeding BOD concentration 6 mg/l on all occasions.
- ◆ Monitoring locations exceeding 3 mg/l BOD are not meeting desired water quality criteria but does not affect to Dissolved Oxygen level in water bodies. If BOD exceeds 6mg/l in water body, the Dissolved Oxygen is reduced below desired levels.
- ◆ The raw water having BOD levels upto 5 mg/l are does not form complex chemicals on chlorination for municipal water supplies. Hence the water bodies having BOD more than 6 mg/l are considered as polluted and identified for remedial action.
- ◆ List of identified stretches enclosed.

### **Criteria for Priority 2**

- ◆ Monitoring locations having BOD between 20-30 mg/l.
- ◆ All monitoring locations exceeding BOD concentration 6 mg/l on all occasions.
- ◆ List of identified stretches enclosed.

**Criteria for Priority 3**

- ◆ Monitoring locations having BOD between 10-20 mg/l.
- ◆ All monitoring locations exceeding BOD concentration 6 mg/l on all occasions.
- ◆ List of identified stretches enclosed.

**Criteria for Priority 4**

- ◆ Monitoring locations having BOD between 6-10 mg/l.
- ◆ List of identified stretches enclosed.

**Criteria for Priority 5**

- ◆ Monitoring locations having BOD between 3-6 mg/l.
- ◆ The locations exceeding desired water quality of 3mg/l BOD.
- ◆ List of identified stretches enclosed.

**OUTCOME:-** The priority wise number of river stretches are given below:-

Priority	Number of Stretches
Priority 1	35
Priority 2	15
Priority 3	26
Priority 4	38
Priority 5	36
<b>Total</b>	<b>150</b>

**ANNEXURE-I****Approach to Water Quality Management**

The water quality management in India is performed under the provision of Water (Prevention and Control of Pollution) Act, 1974. The basic objective of this Act is to maintain and restore the wholesomeness of national aquatic resources by prevention and control of pollution. The Act does not define the level of wholesomeness to be maintained or restored in different water bodies of the country. The Central Pollution Control Board (CPCB) has tried to define the wholesomeness in terms of protection of human uses, and thus, taken human uses of water as base for identification of water quality objectives for different water bodies in the country.

It was considered ambitious to maintain or restore all natural water body at pristine level. Planning pollution control activities to attain such a goal is bound to be deterrent to developmental activities and cost prohibitive. Since the natural water bodies have got to be used for various competing as well as conflicting demands, the objective is aimed at restoring and/or maintaining natural water bodies or their parts to such a quality as needed for their best uses.

Thus, a concept of "designated best use" (DBU) was developed. According to this concept, out of several uses a water body is put to, the use which demands highest quality of water is termed as "designated best use", and accordingly the water body is designated. Primary water quality criteria for different uses have been identified. A summary of the use based classification system is presented in table -1.

**Table:1- Use based classification of surface waters in India**

Designated-Best-Use		Class of water	Criteria
Drinking Water Source without conventional treatment but after disinfection		A	1. Total Coliforms Organism MPN/100ml shall be 50 or less 2. pH between 6.5 and 8.5 3. Dissolved Oxygen 6mg/l or more 4. Biochemical Oxygen Demand 5 days 20°C 2mg/l or less
Outdoor bathing (Organised)		B	1. Total Coliforms Organism MPN/100ml shall be 500 or less 2. pH between 6.5 and 8.5 3. Dissolved Oxygen 5mg/l or more 4. Biochemical Oxygen Demand 5 days 20°C 3mg/l or less
Drinking water source after conventional treatment and disinfection		C	1. Total Coliforms Organism MPN/100ml shall be 5000 or less 2. pH between 6 to 9 3. Dissolved Oxygen 4mg/l or more 4. Biochemical Oxygen Demand 5 days 20°C 3mg/l or less

Propagation of Wild life and Fisheries	D	1. pH between 6.5 to 8.5 2. Dissolved Oxygen 4mg/l or more 3. Free Ammonia (as N) 1.2 mg/l or less
Irrigation, Industrial Cooling, Controlled Waste disposal	E	1. pH between 6.0 to 8.5 2. Electrical Conductivity at 25°C micro mhos/cm Max.2250 3. Sodium absorption Ratio Max. 26 4. Boron Max. 2mg/l

The entire water resources of the country were classified according to their designated best uses and a "Water Use Map" was prepared. For identification of the water bodies or their parts where water quality is at variance with water quality criteria, it was felt important to measure water quality of that water body or its part. It would help in preparation of "Water Quality Map" of India. The idea was to superimpose "Water Quality Map" on "Water Use Map" to identify the water bodies or their parts, which are in need of improvement (restoration). Subsequently through a wide network of water quality monitoring, water quality data are acquired. A large number of water bodies were identified as polluted stretches for taking appropriate measures to restore their water quality. Today almost all policies and programmes on water quality management are based on this concept including the Ganga Action Plan and National River Action Plans.

POLLUTED RIVER STRETCHES (BOD>30mg/l and BOD exceeding 6mg/l on all occasions )				
River	Polluted Stretch	Source/Town	Monitoring Location	BOD (mg/l)
<b>ANDHRA PRADESH</b>				
1. Musi	• D/s Hyderabad & Rangareddy	Hyderabad & Secundrabad	1.Nagole, Rangareddy	34
			2. Hyderabad D/s	23
2. Nakkavagu	• D/s Medak	Medak	1.Bachugudem, Medak	50
<b>ASSAM</b>				
3. Bharalu	• D/S Guwahati	Guwahati Sewage	1.D/S Guwahati	31.5
4. Kalong	• D/s of Nagaon (Elangabeel System)	Nagaon- Sewage	1. Elangabeel System Pond	50
<b>CHANDIGARH</b>				
5. Patiala ki Rao	• Patiala Ki Rao	Chandigarh	1.Patiala Ki Rao	50
6. Attawa Choe	• Attawa Choe (N-Choe)	Chandigarh	2.Attawa Choe (N-Choe)	50
7. Sukhna Choe	• Sukhna Choe	Chandigarh	3.Sukhna Choe	50
<b>DELHI</b>				
8. Yamuna	• Wazirabad to Okhla	Industrial & Domestic Waste from Delhi	1.Nizamuddin	55
			2.Okhla Bridge	32
			3.D/S Of Okhla A/C Shahdara Drain	70
<b>GUJARAT</b>				
9. Sabarmati	• Ahmedabad to D/S of Vautha	Discharge from Meshwa & Ahmedabad	1. After Conf. With Meshwa At Vautha (Near Dhokla),	48
			2. At Ahmedabad At V.N. Bridge,	31
			3. At Vill. Miroli Taluka Dascroi, Ahmedabad	103
			4. At railway Bridge,Ahmedabad	29
			5. At Kheroj Bridge	12
			6. At Hansol Bridge	15
10. Amlakhadi	• Along Ankeshwar	Industrial & Domestic waste from Ankeshwar	1.Amlakhedi after confluence of wastewater from Ankleshwar	46
11. Bhogavo	• Surendranagar		1.D/s of Surendranagar	50
12. Daman Ganga	• Vapi D/S to Confl. with sea	Industrial & Domestic waste from Vapi,Salvas,Daman & Kachigaon	1.Kachi Gaon D/s	30
<b>HARYANA</b>				
13. Ghaggar	• Interstate border of Punjab & Haryana to Ottu wier at Sirsa	Industrial & Municipal waste from Patiala, Derabassi, Sirsa	1. Before Ottu Weir (Before Mixing Of Satluj Canal Water)	50
			2. Gh-1 At Road Brdg. Sirsa,Debwali Road	33.2
			3. Gh-2 At Chandarpur Syphon,	40
			4. Near Bankarpur, Dera Bassi	22
			5. U/S Dhakansu Nallah	21
14. Markanda	• Kala Amb to Narayan Garh	Industrial & Domestic waste	1.Kala Amb D/S	590



15. Western Yamuna Canal	• D/s of Yamuna Nagar	from Kala Amb Yamuna Nagar Industrial & Domestic wastewater	1.100 metre D/s after receiving Industrial & Sewage effluent 2.At Damla d/s of Yamuna Nagar	247 188
<b>HIMACHAL PRADESH</b>				
16. Sukhna	• D/s Parwanoo	Parwanoo sewage	1.At Parwanoo, Solan	36
<b>MADHYA PRADESH</b>				
17. Khan	• Indore	Indore Sewage	1.Sakkar Khadi (Near Indore) 2.Sanwer 3.Kabit Khedi	50 50 50
18. Chambal	• Nagda D/s	Industrial & domestic wastewater of Grasim Township & Nagda	1.Nagda D/s	34
<b>MAHARASHTRA</b>				
19. Bhima	• Vitthalwadi to Takli	Pune – Sewage Daunt -Sewage	1. Pune, D/S Of Bundgarden 2. Pune U/S Vitthalwadi 3. Pargaon (After confluence with Mule Martha)	40 28.2 16
20. Godavari	• Nashik D/s to Paithan	Nasik Sewage	1.Nashik D/s 2.Jayakwadi Dam, Raheer 3.U/S Of Gangapur Dam, Nasik 4.U/s of Paithan, Jayakwadi 5.D/s of Paithan, Pathegaon 6.Near Someshwar Temple 7.Hanuman Ghat, Nashik 8. Nasik D/S 9.Panchavati At Ramkund 10.KapilaGodavari, confl.Point, Tapovan 11.Saikheda 12. Tapovan	36 6.5 6 6.8 7.4 7.5 9 18 12 14 16 20
21. Mula & Mutha	• D/s Pune city	City Sewage of Pune	1.Mula-Mutha River at Mundhawa Bridge 2.Mula at Aunth Bridge 3.Mula –Harrison Bridge 4.Mutha at sangam Bridge	36  50 32
22. Pawna	• Pune-Sangavi Gaon	Pune Sewage	1.Pune-Sangavi Gaon	36
23. Indrayani	• Alandi to confluence with Bhima	Pune Sewage	1.Alandi Gaon	36
24. Koyna	• Karad D/s	Karad Sewage	1.At Karad	35.5
25. Mithi	• Mumbai Stretch	Mumbai	1. Mithi river	50
26. Kundalika	• Are Khurd	Roha sewage	1.Are Khurd 2. Kundalika At Roha city	50 6.5
<b>PUNJAB</b>				
27. Satluj	• D/S of Zenith Paper Mill to	Sewage from Ludhiana &	1.100m D/S Budha Nala	48

	Bridge Harike, Amritsar	Jalandhar	Confl., Ludhiana	
			2. D/S East Bein	6.2
			3. Boat Bdg. Dharmkotnakodar Road,	18
		Jalandhar		
			4. 1 Km. D/S of Zenith	22
28. Ghaggar	<ul style="list-style-type: none"> <li>Mubarkpur to Sardulgarh (Entire length in Punjab)</li> </ul>	Municipal & Industrial discharge from Patiala, Chandigarh, Sukhna paper mills & Dera Bassi, Sardulgarh, Moonak,	1. D/S Dhakansu Nallah	32
			2. D/S Jharmal Nadi	32
			3. D/S Sardulgarh	45
			4. 100m D/S Conf. With	40
			R. Saraswati (Patiala)	
			5. Ratanheri, D/S Of	50
			Patiala Nadi (After Confl.)	
			6. Moonak,	38
			7. U/S Jharmal Nadi,	40
			8. U/S Sardulgarh,	45
			9. D/s Chhatbir	10
			10. Mubarakpur Rest House (Patiala)	10
			11. Near Bankarpur, Dera Bassi	12
			12. U/s Dhakansu Nallah	18
<b>TAMIL NADU</b>				
29. Adyar	<ul style="list-style-type: none"> <li>Along Chennai</li> </ul>	Chennai- Industrial & Municipal Wastewater	Nandambakkam, Ekattuthangal, Jaferkhanpet, Maraimalai bridge, Kotturpuram bridge, Boat club	43
30. Coovum	<ul style="list-style-type: none"> <li>Along Chennai</li> </ul>	Chennai- Industrial & Municipal wastewater	Annanagar, Arumbakkam, Amanjikarai, Poonamalle, College Road, Central Jail, Napier Bridge	105
31. Cauvery	<ul style="list-style-type: none"> <li>Erode D/s</li> </ul>	Erode Sewage	1. Erode near Chirapalanyam	38
<b>UTTAR PRADESH</b>				
32. Yamuna	<ul style="list-style-type: none"> <li>Kosi Kalan to Jhika</li> </ul>	Sewage from Agra, Mathura, Bateshwar, Vrindavan & Etawah	1. D/S Of Agra, U.P.	33
			2. Mazawali	37
			3. Bateswar, U.P	26
			4. Etawah, U.P.	27
			5. Mathura U/S, U.P.	20
33. Hindon	<ul style="list-style-type: none"> <li>Saharanpur to confluence with River Yamuna</li> </ul>	Sewage & Industrial effluent from Ghaziabad, Saharanpur & Muzaffarnagar	1. Ghaziabad D/S, U.P.	36
			2. Confl. With R. Krishna & Kali Near Binauli Town, Meerut	36
			3. Pura mahadev	34
			4. Saharanpur D/s	24
34. Western Kali	<ul style="list-style-type: none"> <li>Muzaffar Nagar to Confluence with Hindon</li> </ul>	Sewage & Industrial effluents from Muzaffar nagar & Mansoorpur	1. Kalinadi At U/S Of Muzaffar Nagar	32
			2. Kalinadi At D/S Of Muzaffar Nagar	364
35. Kali Nadi	<ul style="list-style-type: none"> <li>Kannauj</li> </ul>	Industrial and Municipal sewage	1. At Kannauj (Before Conf.)	120

Eastern		from Meerut, Modinagar, Bulandsahar, Hapur, Gulaothi and Kannauj	2. U/S Of Gulaothi Town In Bulandsahar,	183
<b>POLLUTED RIVER STRETCHES (BOD between 20 &amp; 30 mg/l)</b>				
River	Polluted Stretch	Source/Town	Monitoring Location	BOD (mg/l)
<b>KARNATAKA</b>				
1. Bhadra	• D/s of Bhadravathi to confluence with Tunga	Industrial & Domestic Waste water from Bhadravathi	1. D/S Of Bhadravathi 2. D/s of KIOCL Road Bridge, Near Holebunnur	22.5 7.8
<b>MAHARASHTRA</b>				
2. Tapi	• M.P. Border to Bhusaval	Bhusaval Sewage	1. Ajnand Village 2. Uphad Village 3. Bhusawal U/s	21 22 19
3. Girna	• Malegaon to Jalgaon	Malegaon Sewage Jalgaon Sewage	1. Malegaon (Mannad) 2. Jalgaon	23 10
4. Nira	D/s of Jubilant Organosis, Pune	Industrial wastewater	1. D/s of Jubilant Organosis, Pune	21.2
<b>MANIPUR</b>				
5. Nambul	• Hump Bridge to Heirangoithong	Sewage	1. Heirangoithong 2. Hump Bridge	24 26
<b>RAJASTHAN</b>				
6. Jojari	• Along Jodhpur	Industrial & Domestic waste from Jodhpur	1. D/S Jodhpur	10.5-25.1
7. Bandi	• Along Pali	Industrial & Domestic waste from Pali	1. D/S Pali	30-141
8. Berech	• D/S of Udaipur	Industrial & Domestic waste from Udaipur and Chittorgarh	1. D/S Udaipur	6.2-22.1
9. Khatri	• Along Khatri	Industrial & Domestic waste from Khatri	1. D/S Khatri Complex	8.1-31.2
<b>TAMIL NADU</b>				
10. Noyyal	• Along coimbatore, Tirupur, Palyanakotti	Industrial & domestic wastewater from coimbatore, Tirupur, Palyanakotti	1. Vicinity of Tirupur	>26
<b>UTTAR PRADESH</b>				
11. Bagad	• D/S of Gajraula	Industrial effluent of Jubilant organics	1. D/s of Jubilant Organics	BOD - >26
12. Ganga	• Kannauj D/S to Kanpur D/s (Jajmau Pumping station)	Industrial effluent from Kanpur	1. Kanpur D/S (Jajmau Pumping Station) 2. Kannauj D/s, U.P. 3. Kanpur U/s (Ramghat), U.P.	21 6 6.4
<b>UTTARAKHAND</b>				
13. Kosi	• D/S of Kashipur	Sewage & Industrial waste from Kashipur	1. D/S of Kashipur	13
14. Dhela & Kichha	• D/S of Kashipur	Sewage & Industrial waste from Kashipur	1. Dhela D/S of Kashipur 2. Kichha D/S of Kashipur	187 17
15. Bahalla	• D/S of Kashipur	Sewage & Industrial waste from Kashipur	1. D/S of Kashipur	15-22

POLLUTED RIVER STRETCHES(BOD between 10 & 20 mg/l)				
River	Polluted Stretch	Source/Town	Monitoring Location	BOD (mg/l)
<b>ANDHRA PRADESH</b>				
1. Manjira	• D/s Gowdicharla	Industrial effluent of Ganpati sugar & Impact of Nakavagu	1.Gowdicharla a/c with Nakavagu	16
			2.Near Ganpati sugars	18
<b>ASSAM</b>				
2. Deepar Bill	• D/s Guwahati	Guwahati	1.Deepar Bill	11
<b>GUJARAT</b>				
3. Khari	• Lali village, Ahmedabad	Municipal & Industrial waste from Ahmedabad	1.Lali Village Near Ahmedabad	19
4. Kolak	• D/s Patalia.		1.At Patalia Bdg.	12
			2. At Railway Bridge No. 313 Vapi, Valsad	8
5. Mindhola	• D/s State Highway Bridge Sachin		1.Mindhola At State Highway Bridge Sachin	12
6. Shedi	• Along Kheda	Kheda Sewage	1. At Kheda	19
<b>HARYANA</b>				
7. Gurgaon Canal	• D/s of Delhi	Delhi	1. GC-1 Near Badarpur Border	24
<b>JHARKHAND</b>				
8. Subarnrekha	• D/s of Ranchi (Tatisilwal)	Industrial & domestic waste from Ranchi	1.Ranchi(tatisilwal)	10.5
			2. Namkum Road bridge	6.8
<b>KARNATAKA</b>				
9. Tunga	• D/S of Shimoga	Shimoga Sewage	1.D/S Of Shimoga Town	13.5
10. Tungabhadra	• Harihar D/S to Hara cuhalli Bridge. & Ullanur	Harihar Sewage & Grasin waste	1.Haralahalli Bridge	16.5
11. Laxmantirtha	• D/s of Hunsur Town	Hunsur Sewage	1.D/s of Hunsur town	10
<b>KERALA</b>				
12. Karamana	• Karamana At Moonnattumukku		1.Karamana At Moonnattumukku	11
<b>MADHYA PRADESH</b>				
13. Kshipen	• Ujjain to confluence with Chambal	Ujjain- sewage	1.Ramghat At Ujjain,	15
			2.Trivenisangam (1 Km. D/S Of Sangam)	14
			3.Siddhawati D/S of Ujjain	8
14. Narmada	• Hoshangabad	Industrial & Domestic Wastewater	1.Hoshangabad D/s	11.4
<b>MAHARASHTRA</b>				
15. Weinganga	• D/S Ashti	Municipal sewage of Ashti town	1.At Ashti	10.5
			2.After Confluence of Kanhan	9
			3. D/s of Ellora Paper mill	9.4
			4.U/s of Ellora paper mill	8.6
			5.U/s of Gaurav paper mills, Jackwell	9

			6. D/s of Gaurav paper mills, Jackwell	7.8	
16	Wardha	• Along Rajura village	Paper mill waste	1.Rajura Bridge	11
				2.D/s of ACC Ghuggos	13
				3.At confluence point of Pangange & Wardha at Jaud	8.5
17	Bhima	• Narsinghpur D/s	Nira – discharge	1. Narsinghpur,(D/S)After.Confl.With R.Nira),	16.2
18	Krishna	• Dhordam to Kolhapur	Sewage & Industrial waste from Karad & Sangli	1. Krishna Bridge, Karad,	11.6
				2. At Kshetra Mahuli	12
				3. Krishna Vennasangam at Mahuli	17.6
				4. At Wai	12.6
				5. Mahabaleshwar Dhom Dam Near Koina Dam,	8.6
19	Purna	• Andura village		1. D/s of confl. of Morna & Purna, Andura village	10.2
				2. Purna at Dhupeshwar	
20	Nira	• Along Pulgaon	Pulgaon Cotton Mill	1.Pulgaon Cotton Mill, Wardha	11.8
				2.Sarole Bdg.On Pune-Banglore Highway	
21	Chandrabhaga	• Along Pandharpur Town	Sewage Of	1. D/S Of Pandharpur Town	12
			Pandharpur Town	2. U/S Of Pandharpur Town	10.5
22	Venna River	• Varye, Satara		1. Satara D/s	12
TRIPURA					
23	Agartala Canal	• D/s Agartala	Agartala sewage	1.Near Pragati Vidyabawan, Agartala,	14.6
UTTAR PRADESH					
24	Gomti	• Lucknow to Jaunpur	Sewage & Industrial effluent from Lucknow and Jaunpur.	1. Jaunpur D/S, U.P.	12
				2. Lucknow D/S, U.P.	14
25	Ganga	• Varanasi D/S	Discharge through Kalinadi & Ramganga sewage & Industrial effluent from Kannauj and Kanpur	1.Varanasi D/S (Malviya Bridge)	14
26	Ramganga	• Upstream Kannauj	Sewage & Industrial waste water from Ramnagar & Moradabad	1.Ramganga At Kannauj (Before Conf.)	16

POLLUTED RIVER STRETCHES (BOD Between 6-10 mg/l)				
River	Polluted Stretch	Source/Town	Monitoring Location	BOD (mg/l)
<b>ANDHRA PRADESH</b>				
1. Krishna	• Wadepally		1.Krishna at Wadepally A/c with River Musi	8
2. Godavari	• D/S of Rajamundry	Rajamundry	1.Rajamundry D/S	6
3. Maner	• Warangal U/S	Warangal	1.Warangal U/s	6.1
<b>ASSAM</b>				
4. Burhidihing	• Margherita to Dulaijan	Margherita	1.Burhidihing At Margherita	7.9
			2.Burhidihing at Dulaijan	7
<b>BIHAR</b>				
5. Sikrana	• Sikrana At Champatiya	Champatiya	1.Champatiya	8
<b>CHATTISGARH</b>				
6. Arpa	• Arpa river D/S of Bilaspur	Bilaspur	1.D/S Bilaspur	7
7. Seonath	U/S Rajnandgaon		1.U/S Rajnandgaon	7.1
<b>GUJARAT</b>				
8. Mahi	• D/s Sevalia and Vasad	Municipal waste from Sevalia & Vasad	1.Vasad	6.8
			2.Near Rajasthan border at Kadana Dam	8.2
9. River Dhadar	• D/s Kothada	Kothada	1.River Dhadar At Kothada	9
10. Tapi	• Rander Bridge to Surat	Municipal & Industrial waste from Surat	1.Rander Bridge, Surat	7.4
			2.Tapi at ONGC bridge, Surat	6
11. Kim	• D/s Surat	Municipal Sewage	1.Sahol Bridge, Olpad Hansol Road, Surat	6
<b>HIMACHAL PRADESH</b>				
12. Markanda	• D/S of Paonta Sahib	Water from Paonta Sahib	1.Markanda At Paonta, Distt. Sirmour	8.2
13. Beas	• D/S of Mandi	Domestic waste from Mandi	1. D/s Mandi	7.6
<b>JHARKHAND</b>				
14. Sankh	• Along Bolba	Municipal Sewage	1.Bolba	6.2
<b>KARNATAKA</b>				
15. Kali	• Along Dandeli Town	West Coast Paper Mill waste	1.D/S West Coast Paper Mill	7
16. Krishna	• U/S Of Ugarkhurd Barrage		1. U/S Of Ugarkhurd Barrage	9.8
<b>MADHYA PRADESH</b>				
17. Tons	• Tons Along Madhavgarh	Sewage	1.Tons At Madhavgarh	8
18. Kalisot	• Mandideep	Sewage & industrial effluent	1.Near road bridge, Mandideep	6
19. Betwa	• Raisen	Sewage from Raisen	1.At Nayapur D/s, Mandideep Industrial Area No.1, Raisen	6.8
<b>MAHARASHTRA</b>				
20. Kalu	• Atale village to Confl. with Ulhas	Municipal & Industrial waste water	1.Atale village	7.5
21. Kanhan	• D/S Nagpur	Industrial & Domestic Waste of	1.D/S of Nagpur	8.8



		Nagpur	2.U/s of M/s Vidharbha paper mill, Sinora	8.8
			3.D/s of M/s Vidharbha paper mill, Sinora	9.8
22. Kolar	• Along Kamptee	Municipal waste water	1.Before Confluence To Kanhan At Kamptee	7
23. Ulhas	• Mohane	Industrial & Domestic runoff Ulhasnagar	1.U/S Of Nrc Bund At Mohane	6
			2.Jhambul Water Works	7.5
24. Panchganga	• Kolhapur	Industrial & Municipal sewage of Kolhapur	1.D/S Of Kolhapur Town	6.4
25. Patalganga	• Khopoli to Estuarine region	Industrial & Municipal sewage from khopoli, Rasayani & Paundh	1. Shalghata	6
			2. Near Intake Of Mide W/W	9
26. Rangavali	• Along Navapur	Sewage of Navapur	1.D/S Of Navapur	8.4
<b>MEGHALAYA</b>				
27. Kharkhala	• Near Sutnga Khlieri, Jaintia Hills		1.Near Sutnga Khlieriat, Jaintia Hills Dt.	7
28. Umtrew	• Umtrew At Byrnihat East		1.Umtrew At Byrnihat East	7.7
<b>ORISSA</b>				
29. Kathjodi	• Along Cuttack	Cuttack Sewage	1.Cuttack D/S	6.4
<b>PONDICHERRY</b>				
30. Arasalar	• Along Karaikal	Domestic waste of Karaikal	1.Arasalar River Karaikal Region,	7
<b>RAJASTHAN</b>				
31. Chambal	• D/S Kota city	Industrial & Domestic waste from Kota	1.Kota D/S (2 Km. From City)	6.2
<b>TAMIL NADU</b>				
32. Vaigai	• Along Madurai	Madurai-Industrial & domestic wastewater	1.Vicinity of Madurai	>6
33. Tambiraparani	• Along Ambasamudam	Madurai Coats Industrial waste	1.Rail Bdg. Nr. Ambasamudam	6
34. Cauvery	• Tiruchirappalli to Grand Anaicut	Municipal sewage of Erode, Tiruchirappalli	1.Tiruchirappalli D/S	6
			2. Trichy, Grand Anaicut	7.8
			3. 1Km D/s of Bhavani river confluence	7.3
35. Bhavani	• Bhavani	Municipal sewage	1.Bhavani Sagar Bhavani	7.6
			2. Bhavani at Bhavani	6.8
<b>UTTAR PRADESH</b>				
36. Ganga	• D/s of Haridwar		1.D/s of Haridwar	7.6
<b>WEST BENGAL</b>				
37. Damodar	D/s Asansol		1.Narainpur After Confl. Of Nunia Nallah	6.8
			2.Near Mujher Mana Village After Conf. of Tamla Nallah	6.8
38. Ganga	D/s Dakshineswar	Industrial waste & sewage from Dakshineswar	1.Dakshineswar	6

POLLUTED RIVER STRETCHES (BOD between 3& 6 mg/l)			
River	Polluted Stretch	Monitoring Location	BOD (mg/l)
ANDHRA PRADESH			
1. TUNGABHADRA	• D/s Manthralayam	1. Manthralayam , Kurnool	3.3
2. KRISHNA	• Thangadi , Mahaboobnagar	1. Thangadi , Mahaboobnagar	3.1
3. PENNAR	• Puspagini,	1. A/C Papagni, Puspagini	3.2
CHHATTISGARH			
4. MAHANADI	• Rajim U/s to interstate boundary with Orissa	1.U/s Rajim	3.2
		2.Interstate Boundry	3.1
GUJARAT			
5. MAHI	• D/s Muijpur	1. At Umeta Bridge	3.1
		2. At Muijpur	3.2
6. PANAM	• D/s Lunawada	1. At Lunawada	3.7
7. SABARMATI	• Dharoi Dam to Mahudi jain Temple	1. Dharoi Dam	3
		2. At Mahudi Jain Temple	3.5
8. AMBIKA	• D/s Bilimora	1. At Bilimora	4.2
9. ANAS	• D/s Dahod	1. Anas At Dahod,(Kushalgarh),Dist. Panchmahal	3.8
10. BALESHWAR KHADI	•	1. Baleshrwar Khadi At N.H. No. 8	4.5
11. KAVERI	•	1. Bridge At Billimora-Valsad Road	3
HARYANA			
12.YAMUNA	• Kalanaur to Sonapat	1.Hathnikund	3
		2. At Kalanaur	4
		3. At Sonapat	5
		4. U/s Paonta Sahib	3
KARNATAKA			
13 TUNGABHADRA	• Ullanur D/s	1. At Ullanur	3.1
14 HUNDRI	• Joharpur D/s	1. Joharpur(V), Near Temple, Kurnool	3.1
15 KUNDU	• Nandayal D/s	1. Nandynl, Near Over Bdg., Kurnool	3.1
16 ARKAVATI	• D/s of Kanakapura	1. D/S of Kanakapura Town	5
17 MALPRABHA	• D/s of Khanapur	1. D/S of Khanapur Village	4.1
KERALA			
18 PUZHACKAL	•	1. At Puzhackal Bridge	4
19 KADAMBAYAR	• D/s Brahmapuram	1. At Brahmapuram	3
MADHYA PRADESH			
20 NARMADA	• Hoshangabad D/s	1.at Sethanighat	3.1
		2. at Hoshangabad	3.2
21 MANDAKINI	• D/s Chitrakut	1. At Chitrakut	5

<b>MAHARASHTRA</b>				
22	ULHAS	• Along Badlapur	1. U/s of Badlapur,	3.4
23	BHATSA	• Along Pise village	1. D/s of Pise Dam Near Pise Village (Ulhas)	3.3
<b>NAGALAND</b>				
24	DHANSIRI	• Along Dimapur	1. Near Check Gate (Dimapur Khutkhuti Road)	3.2
			2. Full Nagarjan	3.6
			3. Nuton Basti	4.8
			4. Town Boundary Bridge (Diphu Road)	3.2
<b>ORISSA</b>				
25	BRAHMANI	• Panposh to Rourkela	1.D/s Panposh	4.6
			2.Rourkela D/s	3
26	MAHANADI	• Cuttack D/s	1.Cuttack D/s	4.6
27	KUAKHAI	• Along Bhubaneswar	1. At Bhubaneswar	3.2
<b>SIKKIM</b>				
28	TEESTA	• D/s Gangtok	1. After confluence with River Ranichu at Singtam	3
			2. After confluence with Rangichu after meeting the industrial effluents from the Town Ranichu	3.1
			3. At Melli downstream	3.2
29	RANICHU	• D/s Gangtok	1. Before confluence with River Teesta at Singtam	3.5
			2. After confluence of Ranichu and Rorachu at Ranipool	3.2
30	DIKCHU	• D/s Gangtok	1. Before confluence with River Teesta Near NHPC Hydroelectric Power Project	3.4
31	MANEY KHOLA	• D/s Gangtok	1. After Confluence with Ray Khola at Adampool after meeting waste of STP	3.2
			2. At Burtak near Army Base Camp, 4 Km U/s of Gangtok	3.2
<b>TAMILNADU</b>				
32	PALAR	• Along Vellore	1. Vaniyambadi Water Supply Head Work	4
<b>TRIPURA</b>				
33	HAORA	• Agartala D/s	1. Chandrapur, Agartala D/s of Haora	3.5
<b>UTTAR PRADESH</b>				
34	SARYU	• Along Ayodhya	1. At Ayodhya at main Bathing Ghat	3
35	RIHAND	• Along Renukut	1. Renukut U/S	3.3
			2. Renukut D/S	3.2
<b>WEST BENGAL</b>				
36	BARAKAR	• D/s Asansol	1. At Asansol (Water Intake Point)	3.8

**Photographs 12-1: Products showing labelling regarding Lead content. (All the products shows lead content below 90 ppm)**



**Annexure 25: Undertakings by the Project Proponent**

Asian Paints Limited  
Plot No. 1, Sector - 30B  
IHLT, HSIIDC, Rohtak  
Haryana - 124021  
T : (01262) 20 4610  
www.asianpaints.com

Ref. No. Ref. No.: EC/2025/1

Date: 20/02/2025

**TO WHOMSOEVER IT MAY CONCERN**

We, Asian Paint Limited, are proposing expansion of Integrated Paint Manufacturing Plant Located at Plot No-1, Sector 30-B, HSIIDC, IMT Rohtak, State -Haryana.

The proposed expansion project is classified as Category "B" project and falls under Activity 5(h) (NABET Sector 23): Integrated Paint Industry as per schedule of EIA Notification dated September 14, 2006 as amended till date.

We have appointed Kadam Environmental Consultants, an EIA consultancy organization, duly accredited for the Sector(s) 23 (Integrated Paint Industry Category 'B') by NABET for conducting the EIA study.

We hereby give and undertaking that the data and the information given in the EIA report and its relevant enclosures, prepared by Kadam Environmental Consultant are factually correct to the best of our knowledge and belief.

Yours truly,

**For, Asian Paints Limited**



Authorized Signatory

Registered Office : Asian Paints Limited, 6A & 6B, Shantinagar Santacruz (East) Mumbai - 400 055. tel : (022) 6218 1000 fax : (022) 6218 1111

Corporate Identification Number : L24220MH1945PLC024598  
For shares related queries, email to investor.relations@asianpaints.com  
For consumer queries, email to customercare@asianpaints.com

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**Annexure 26: Undertakings by the EIA Consultant****KADAM ENVIRONMENTAL CONSULTANTS**

(An ISO 9001:2015 Certified Company)

871 / B / 3, NEAR HIMALAYA MACHINERY,  
GIDC MAKARPURA, VADODARA-390010.  
PHONE : (0265) - 6131000/6131001  
E-MAIL: kadamenviro@kadamenviro.com  
www.kadamenviro.com



Ref. No.

Date: 14/10/2024

**TO WHOMSOEVER IT MAY CONCERN**

We, Kadam Environmental Consultants, have been hired by M/s Asian Paints Limited for conducting an EIA study in compliance with the EIA Notification dated September 14, 2006, as amended till date, and the prescribed ToRs issued by the State Level Environmental Impact Assessment Authority (SEIAA)/ State level environmental assessment Committee (SEAC) Haryana, File No. SEAC/HR/2024/116, Dated: 31/05/2024 have been complied with.

We hereby give an undertaking that the data and the information given in the EIA Report and its relevant enclosures, are factually correct to the best of our knowledge and belief and that the prescribed ToRs issued by State Level Environmental Impact Assessment Authority (SEIAA)/ State level environmental assessment Committee (SEAC) Haryana, have been complied with.

Yours truly,

**Authorized Signatory****Sangram A. Kadam****Director, Kadam Environmental Consultants****871/ B/3, Near Himalaya Machinery,****GIDC Makarpura, Vadodara-390010.**



**Annexure 27: NABET Accreditation Certificate of EIA Consultant**



**QUALITY COUNCIL  
OF INDIA**  
Creating an Ecosystem for Quality



**NABET**

**National Accreditation Board  
for Education and Training**



**NABET**

**Certificate of Accreditation**

**Kadam Environmental Consultants**  
871/B/3, GIDC Makarpura, Vadodara- 390010, Gujarat

The organization is accredited as **Category-A** under the QCI-NABET Scheme for Accreditation of EIA Consultant Organization, Version 3: for preparing EIA-EMP reports in the following Sectors –

S. No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals including Open cast/ Underground mining	1	1 (a) (i)	A
2	Offshore and onshore oil and gas exploration, development & production	2	1 (b)	A
3	Thermal power plants	4	1 (d)	A
4	Coal Washeries	6	2 (a)	A
5	Mineral beneficiation including pelletisation	7	2 (b)	A
6	Metallurgical industries (ferrous & non ferrous)	8	3 (a)	A
7	Cement plants	9	3 (b)	B
8	Petroleum refining industry	10	4 (a)	A
9	Coke oven plants	11	4 (b)	A
10	Chlor-alkali industry	13	4 (d)	A
11	Soda ash Industry	14	4 (e)	A
12	Chemical Fertilizers	16	5 (a)	A
13	Pesticides industry and pesticide-specific intermediates (excluding formulations)	17	5 (b)	A
14	Petro-chemical complexes	18	5 (c)	A
15	Manmade fibers manufacturing	19	5 (d)	A
16	Petrochemical based processing	20	5 (e)	A
17	Synthetic organic chemicals industry	21	5 (f)	A
18	Distilleries	22	5 (g)	A
19	Integrated paint industry	23	5 (h)	B
20	Pulp & paper industry	24	5 (i)	A
21	Oil & gas transportation pipeline	27	6 (a)	A
22	All ship breaking yards including ship breaking units	30	7 (b)	A
23	Industrial estates/ parks/ complexes/ Areas	31	7 (c)	B
24	Common hazardous waste treatment, storage and disposal facilities (TSDFs)	32	7 (d)	A
25	Bio-medical waste treatment facilities	32A	7 (da)	B
26	Ports, harbours, breakwaters and dredging	33	7 (e)	A
27	Highways	34	7 (f)	B
28	Common effluent treatment plants (CETPs)	36	7 (h)	B
29	Common Municipal Solid Waste Management Facility (CMSWMF)	37	7 (i)	B
30	Building and construction projects	38	8 (a)	B
31	Townships and Area Development projects	39	8 (b)	B

**Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in SAAC minutes dated Sep. 14, 2021 and supplementary minutes dated Dec. 14, 2021 and Mar.25, 2022 posted on QCI-NABET website.**

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no. QCI/NABET/ENV/ACO/22/2319 dated Apr.19, 2022. The accreditation needs to be renewed before the expiry date by Kadam Environmental Consultants, Vadodara following due process of assessment.



**Sr. Director, NABET**  
Dated: Apr. 19, 2022

Certificate No.  
**NABET/EIA/2023/SA 0164**

**Valid up to**  
**Mar. 19, 2023**

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to QCI-NABET website.



**QUALITY COUNCIL  
OF INDIA**  
Creating an Ecosystem for Quality



## National Accreditation Board for Education and Training



### Certificate of Accreditation

#### Kadam Environmental Consultants, Vadodara

871/B/3, GIDC Makarpura, Makarpura, Vadodara, Gujarat- 390010

The organization is accredited as **Category-A** under the QCI-NABET Scheme for Accreditation of EIA Consultant Organization, Version 3: for preparing EIA-EMP reports in the following Sectors –

S.No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals including Open cast/ Underground mining	1	1 (a) (i)	A
2	Offshore and onshore oil and gas exploration, development & production	2	1 (b)	A
3	Thermal power plants	4	1 (d)	A
4	Coal Washeries	6	2 (a)	A
5	Mineral beneficiation including pelletisation	7	2 (b)	A
6	Metallurgical industries	8	3 (a)	A
7	Petroleum refining industry	10	4 (a)	A
8	Coke oven plants	11	4(b)	A
9	Chlor-alkali industry	13	4 (d)	A
10	Soda ash industry	14	4 (e)	A
11	Chemical Fertilizers	16	5 (a)	A
12	Pesticides industry and pesticide specific intermediates	17	5 (b)	A
13	Petro-chemical complexes	18	5 (c)	A
14	Manmade fibers manufacturing	19	5 (d)	A
15	Petrochemical based processing	20	5 (e)	A
16	Synthetic organic chemicals industry	21	5 (f)	A
17	Distilleries	22	5 (g)	A
18	Integrated paint industry	23	5 (h)	B
19	Pulp & paper industry	24	5 (i)	A
20	Oil & gas transportation pipeline	27	6 (a)	A
21	Isolated storage & handling of Hazardous chemicals	28	-	B
22	Airports	29	7(a)	A
23	All ship breaking yards including ship breaking units	30	7 (b)	A
24	Industrial estates/ parks/ complexes/ Areas, export processing zones, Special economic zones, Biotech parks, Leather complexes	31	7 (c)	A
25	Common hazardous waste treatment, storage, and disposal facilities	32	7 (d)	A
26	Bio-medical waste treatment facilities	32A	7 (da)	B
27	Ports, harbours, break waters and dredging	33	7 (e)	A
28	Highways	34	7 (f)	A
29	Common effluent treatment plants (CETPs)	36	7 (h)	B
30	Common Municipal Solid Waste Management Facility (CMSWMF)	37	7 (i)	B
31	Building and construction projects	38	8 (a)	B
32	Townships and Area Development projects	39	8 (b)	B

*Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in RAAC minutes dated August 29, 2023 posted on QCI-NABET website.*

*The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no QCI/NABET/ENV/ACO/23/2941 dated Oct 11, 2023. The accreditation needs to be renewed before the expiry date by Kadam Environmental Consultants, Vadodara following due process of assessment.*

Sr. Director, NABET  
Dated: Oct 11, 2023

Certificate No.  
NABET/EIA/2326/RA 0303

Valid up to  
March 19, 2026

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to the QCI-NABET website.







**QUALITY COUNCIL  
OF INDIA**  
Creating an Ecosystem for Quality



## National Accreditation Board for Education and Training



### Certificate of Accreditation

#### Kadam Environmental Consultants, Vadodara

871/B/3, GIDC Makarpura, Makarpura, Vadodara, Gujarat- 390010

The organization is accredited as **Category-A** under the QCI-NABET Scheme for Accreditation of EIA Consultant Organization, Version 3: for preparing EIA-EMP reports in the following Sectors –

S.No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals including Open cast/ Underground mining	1	1 (a) (i)	A
2	Offshore and onshore oil and gas exploration, development & production	2	1 (b)	A
3	Thermal power plants	4	1 (d)	A
4	Coal Washeries	6	2 (a)	A
5	Mineral beneficiation including pelletisation	7	2 (b)	A
6	Metallurgical industries	8	3 (a)	A
7	Cement plants	9	3 (b)	A
8	Petroleum refining industry	10	4 (a)	A
9	Coke oven plants	11	4 (b)	A
10	Chlor-alkali industry	13	4 (d)	A
11	Soda ash Industry	14	4 (e)	A
12	Chemical Fertilizers	16	5 (a)	A
13	Pesticides industry and pesticide specific intermediates	17	5 (b)	A
14	Petro-chemical complexes	18	5 (c)	A
15	Manmade fibers manufacturing	19	5 (d)	A
16	Petrochemical based processing	20	5 (e)	A
17	Synthetic organic chemicals industry	21	5 (f)	A
18	Distilleries	22	5 (g)	A
19	Integrated paint industry	23	5 (h)	B
20	Pulp & paper industry	24	5 (i)	A
21	Oil & gas transportation pipeline	27	6 (a)	A
22	Isolated storage & handling of Hazardous chemicals	28	-	B
23	Air ports	29	7 (a)	A
24	All ship breaking yards including ship breaking units	30	7 (b)	A
25	Industrial estates/ parks/ complexes/ Areas, export processing zones, Special economic zones, Biotech parks, Leather complexes	31	7 (c)	A
26	Common hazardous waste treatment, storage, and disposal facilities	32	7 (d)	A
27	Bio-medical waste treatment facilities	32A	7 (da)	B
28	Ports, harbours, break waters and dredging	33	7 (e)	A
29	Highways,	34	7 (f)	A
30	Common Effluent Treatment Plants (CETPs)	36	7 (h)	B
31	Common Municipal Solid Waste Management Facility (CMSWMF)	37	7 (i)	B
32	Building and construction projects	38	8 (a)	B
33	Townships and Area Development projects	39	8 (b)	B

**Note:** Names of approved EIA Coordinators and Functional Area Experts are mentioned in RAAC minutes dated August 29, 2023, and Supplementary Assessment minutes dated February 16, 2024 posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no QCI/NABET/ENV/ACO/23/2941 dated Oct 11, 2023. The accreditation needs to be renewed before the expiry date by Kadam Environmental Consultants, Vadodara following due process of assessment.

Sr. Director, NABET  
Dated: July 15, 2024

Certificate No.  
NABET/EIA/2326/RA 0303\_Rev.01

Valid up to  
March 19, 2026

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to the QCI-NABET website.



**Annexure 28: NABL Accreditation Certificate of EIA Consultant**

		<b>National Accreditation Board for Testing and Calibration Laboratories</b>
<b>CERTIFICATE OF ACCREDITATION</b>		
<b>KADAM LABS PRIVATE LIMITED</b>		
has been assessed and accredited in accordance with the standard		
<b>ISO/IEC 17025:2017</b>		
<b>"General Requirements for the Competence of Testing &amp; Calibration Laboratories"</b>		
for its facilities at		
871/B/3, GIDC MAKARPURA, VADODARA, GUJARAT, INDIA		
in the field of		
<b>TESTING</b>		
Certificate Number:	TC-13450	
Issue Date:	09/04/2024	Valid Until: 08/04/2026
This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL. (To see the scope of accreditation of this laboratory, you may also visit NABL website <a href="http://www.nabl-india.org">www.nabl-india.org</a> )		
Name of Legal Entity: KADAM LABS PRIVATE LIMITED		
Signed for and on behalf of NABL		
	 N. Venkateswaran Chief Executive Officer	



**Annexure 29: Certificate of Plagiarism Check****KADAM ENVIRONMENTAL CONSULTANTS**

(An ISO 9001:2015 Certified Company)

871 / B / 3, NEAR HIMALAYA MACHINERY,  
GIDC MAKARPURA, VADODARA-390010.  
PHONE : (0265) - 6131000/6131001  
E-MAIL: kadamenviro@kadamenviro.com  
www.kadmenviro.com



Ref. No.: KEC/EIA/2254572306/APL, Rohtak

Date: February 27, 2025

**Certificate of Plagiarism Check**

<b>Title of EIA Report</b>	Proposed Expansion of Integrated Paint Manufacturing Plant Located at Plot No.1, Sector-30B, HSIIDC, IMT Rohtak, Haryana
<b>Name of the Accredited Organization:</b>	Kadam Environmental Consultants, Vadodara, Gujarat, India
<b>Project Number:</b>	2254572306
<b>Name of the EIA Co-Coordinator (EC):</b>	Ms. Parul Patel
<b>Name of the Software:</b>	Plagiarism Checker X
<b>Date of Check:</b>	February 27 <sup>th</sup> 2025
<b>Time of Check:</b>	10:00 am

Declaration by the Head of the accredited organization / authorized person

I hereby certify that this EIA report has been evaluated using online/in-house software viz., **Plagiarism Checker X**. The report produced has been analysed by the system, and based on it; I certify that the EIA report produced following good scientific practice.

**Date and Signature of EIA Coordinator:**

<b>Name (Date):</b>	Parul Patel (27.02.2025)
<b>Signature</b>	
<b>Designation:</b>	Senior Consultant

**Signature of Head of Accredited Organization and date:**

<b>Name (Date):</b>	Sangram Kadam (27.02.2025)
<b>Signature</b>	
<b>Designation:</b>	Director

**Name of the EIA consultant organization:** Kadam Environmental Consultants, Vadodara, Gujarat, India

**Name of Head of Accredited Organization:** Mr. Sangram Kadam, Director

**NABET Certificate No. & Issue Date:** NABET/EIA/2023/SA 0164 valid from 19.04.2022 up to 19.03.2023; Extension of Validity of Accreditation till 13-06-2023 NABET Letter No. QCI/NABET/ENV/ACO/23/2709 dated 14th March 2023; Extension of Validity of Accreditation till 11-09-2023 NABET Letter No. QCI/NABET/ENV/ACO/23/2778 dated 12<sup>th</sup> June 2023. NABET Certificate No. NABET/EIA/2326/RA 0303, Issued on 11-10-2023, valid up to 19-03-2026



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# Kadam

Environmental Consultants  
*[www.kadamenviron.com](http://www.kadamenviron.com)*

**Environment *for* Development**

#### CONTACT DETAILS

Vadodara (Head Office)

871/B/3, GIDC Makarpura, Vadodara, India – 390 010.

E: [kadamenviron@kadamenviron.com](mailto:kadamenviron@kadamenviron.com); T: +91 265 6131000

Delhi / NCR

Spaze IT Park, Unit No. 1124, 11th Floor, Tower B-3, Sector 49, Near Omaxe  
City Center Mall, Sohna Road, Gurgaon, India – 122 002

E: [delhi@kadamenviron.com](mailto:delhi@kadamenviron.com); T: +91 124 4242430 to 2436