# EXECUTIVE SUMMARY

*for*

## Expansion in "Chemicals & APIs Manufacturing Unit"

At

**Village Fatehgarh, Channa, Tehsil & District Barnala, Punjab - 148101**

| | |
|---|---|
| Type of Project | Brownfield Project (Expansion) |
| Cost of Project | **Existing Cost**: ₹ 1315.6 Crores<br>**Proposed Cost**: ₹ 735 Crores<br>**After Expansion**: ₹ 2050.6 Crores |
| Capacity after Expansion | **Chemical & API Production**: 1699.05 TPD<br>**Co-generation Power Plant:** 49.75 MW<br>**By-Product**: 734.70 TPD<br>**Formulation product (exempted from EC): 1125 lakh per Day** |
| TOR Details | **File No. IA-J-11011/98/2024-IA-II(I) dated 15th March 2024** |
| Monitoring Season and Laboratory | 1st October 2023 to 31st December ,2023 (Ecobal Reserch & Development Center ((ECOBAL ENERGY SYSTEM LLP) JV with J. P Test House & Research Centre Shahibabad Industrial Area Shahibabad Ghaziabad (UP);<br>**NABL Accreditated- Certificate No. TC-11604 valid till 01/05/2025** |
| NABET Accreditation No. | **NABET/EIA/2225/RA0303 dated 18.09.2023 (Valid till 23.11.2025)** |
| Category | **Major**: Schedule **5(f);** Synthetic Organic Chemicals<br>**Minor** : Schedule **1(d)**: Thermal power plant **Category A** |

## Project Proponent

IOL Chemicals And Pharmaceuticals Limited

**M/s IOL CHEMICALS AND PHARMACEUTICALS LIMITED**

Village Fatehgarh, Channa, Tehsil & District Barnala, Punjab

## ENVIRONMENTAL CONSULTANT:

(Approved Consultant)


**M/s EQMS Global Pvt Ltd. (formerly known as EQMS India Pvt. Ltd.)**

304-305, 3rd Floor, Plot No. 16, Rishabh Corporate Tower, Community Centre, Karkardooma, Delhi – 110092

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# EXECUTIVE SUMMARY

## 1. INTRODUCTION

**M/s IOL Chemicals and Pharmaceuticals Ltd** is a leading organic chemicals & API manufacturer and supplier in India. The company manufactures active pharmaceutical ingredients, organic chemicals and intermediates. The company was incorporated in the year 1986. The existing plant is located at Village Fatehgarh, Channa, Tehsil & District Barnala, Punjab. The unit was granted earlier environmental clearance dated 18th July 2003, 24th August 2009, 23rd August 2019, 20th May 2021 and Latest Environmental clearance was granted for the project vide letter SEIAA/MS/2021/4624 dated 10th August 2021. Later the unit was granted **no increase in pollution load** certificate from Punjab pollution control board vide **File.no 3615 dated 6th October 2023** and the unit has valid consent to operate for Air & Water granted from Punjab Pollution Control Board vide order no **PBIP/PPCB/3252 and PBIP/PPCB/3255 dated 23rd November 2023 respectively.** chronology of the project is given below in **Table 1.**

**Table 1 : Chronology of Project**

| S. No. | Type of Approval | F. No./ Order No. | Production | Remark |
|---|---|---|---|---|
| 1. | Earlier Environmental Clearance | J-11011/08/2003-IA II dated 18th July 2003 | 95 TPD | Environment clearance letter is attached as **Annexure -IV.** |
| 2. | Environmental Clearance | J-11011/976/2008-IA II (I) dated 24th August 2009 | API Production: 657.5 TPD; Co-generation Power plant: 17 MW | Environment clearance letter is attached as **Annexure -V.** |
| 3. | No increase in pollution load | EE/Mega/2018/4859 dated 13 February 2018 | API Production: 526.45 TPD; Co-generation Power plant: 17 MW; | No increase in pollution letter is attached as **Annexure -VI.** |
| 4. | Environmental Clearance | J-11011/976/2008-IA II (I) dated 23rd August 2019 | API Production: 654.95 TPD; Co-generation Power plant: 17 MW | Environment clearance letter is attached as **Annexure -VII.** |

| S. No. | Type of Approval | F. No./ Order No. | Production | Remark |
|---|---|---|---|---|
| 5. | Environmental Clearance | SEIAA/MS/2021/4175 dated 20th May 2021 | API Production: 890.35 TPD. Co-generation Power plant: 29.75 MW | Environment clearance letter is attached as **Annexure -VIII.** |
| 6. | Environmental Clearance | SEIAA/MS/2021/4624 dated 10th August 2021. | API Production: 890.35 TPD. Co-generation Power plant: 29.75 MW | No change in total production, amendment was taken for the merging of production capacity of APIs products. Amend Environments Clerance letter is attached as **Annexure IX.** |
| 7. | No Increase in Pollution Load | No. 3615 dated 06.10.2023 | API Production: 860. 35 TPD. Co-generation Power plant: 29.75 MW | No Increase in pollution load is attached as **Annexure-X.** |

The proposed expansion also involves development of Rice husk/Coal/Paddy straw pellets based captive power plant i.e, Activity 1(d); Thermal Power Plants. However, as per Office Memorandum vide File No. J-13011/81/2006-IA. II(I) dated 06.02.2007 by MoEF&CC, it has been decided that the consideration of integrated projects having components from industry, power projects etc. sectors by various expert committees will be done as below:
***"If the core proposal is for "Industry sector along with captive power plant", it will be considered by the industry committee."***

It is hereby requested for consideration and appraisal of the project under ***Expert Appraisal Committee (Industry-3)*** as per EIA Notification, 2006 & its subsequent amendments.

As per the Government of India (Ministry of Environment, Forests & Climate Change (MoEF&CC) EIA Notification 2006 and further amendments, the proposed project must obtain prior environmental clearance. The proposed expansion project is covered under ***Schedule 5(f); Category 'A'***; ***Major Category*** as per the Schedule of EIA Notification and

hence requires environmental clearance from MoEF&CC, New Delhi. The proposed expansion also involves development of Rice husk/Coal/Paddy straw pellets based captive power plant i.e, ***Activity 1(d); Thermal Power Plants. .*** Project being located outside notified industrial area public hearing is applicable The application for the scoping of the said project was submitted to the Expert Appraisal Committee (EAC) Industry-III, MoEF&CC, New Delhi and the project was granted Standard Terms of Reference vide **File No.: IA-J-11011/98/2024-IA-II(I)** dated **15th March 2024**.

Details of total production capacity of plant have been provided in the following **Table 2:**

Table 2: Details of Products and By-product

| S. No | As per EC dated 10.08.2021 | | As per NIIPL | | As per CTO | | Proposed | | After Expansion | | Cas NO | Product End Use |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Product Name | Production Capacity TPD | Product Name | Production Capacity TPD | Product Name | Production Capacity TPD | Product Name | Production Capacity TPD | Product Name | Production Capacity TPD | | |
| 1 | Ethyl Acetate | 450 | Ethyl Acetate | 350 | Ethyl Acetate | 350 | Ethyl Acetate | 100 | Ethyl Acetate | 450 | 141-78-6 | Used as Solvent in Many Industries |
| 2 | Acetic Anhydride | 70 | Acetic Anhydride | 100 | Acetic Anhydride | 100 | Acetic Anhydride | 0 | Acetic Anhydride | 100 | 108-24-7 | Raw Material of Mono Chloro Acetic Acid and Paracetamol |
| 3 | Monochloro acetic acid | 60 | Monochloro acetic acid | 60 | **Monochloro acetic acid** | **40** | Monochloroacetic Acid | 0 | Monochloroacetic Acid | 60 | 79-11-8 | Raw Material of Ibuprofen |

| S. No | As per EC dated 10.08.2021 | | As per NIIPL | | As per CTO | | Proposed | | After Expansion | | Cas NO | Product End Use |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Product Name | Production Capacity TPD | Product Name | Production Capacity TPD | Product Name | Production Capacity TPD | Product Name | Production Capacity TPD | Product Name | Production Capacity TPD | | |
| 4 | Acetyl chloride | 48 | Acetyl chloride | 48 | **Acetyl chloride** | **32** | Acetyl Chloride | 0 | Acetyl Chloride | 48 | 75-36-5 | Raw Material of Ibuprofen |
| 5 | Iso Butyl Benzene | 60 | Iso Butyl Benzene | 60 | Iso Butyl Benzene | 60 | Iso Butyl benzene | 0 | Iso Butyl benzene | 60 | 538-93-2 | Raw Material of Ibuprofen |
| 6 | MIBT | 20 | MIBT | 20 | **MIBT** | **10** | MIBT | 0 | MIBT | 20 | *5160-99-6* | Used as Solvent in Many Industries |
| 7 | Propyl Acetate | 20 | Propyl Acetate | 20 | **Propyl Acetate** | **0** | Propyl Acetate | 0 | Propyl Acetate | 20 | 109-60-4 | Used as Solvent in Many Industries |

| S. No | As per EC dated 10.08.2021 | | As per NIIPL | | As per CTO | | Proposed | | After Expansion | | Cas NO | Product End Use |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Product Name | Production Capacity TPD | Product Name | Production Capacity TPD | Product Name | Production Capacity TPD | Product Name | Production Capacity TPD | Product Name | Production Capacity TPD | | |
| 8 | Pharmaceutical Intermediates | 16 | Intermediates | 16 | **Intermediates** | **1.5** | Intermediates | 5 | Intermediates | 21 | | used as intermediates in Pharmaceutical industries. |
| 9 | Active Pharmaceutical Ingredients | 146.35 | Active Pharmaceutical Ingredients | 146.35 | **Active Pharmaceutical Ingredients** | **112.2** | Active Pharmaceutical Ingredients | 90 | Active Pharmaceutical Ingredients | 236.35 | | Medicine for Management of pain, Diabeties, Chlostrols, Heart Disesase, Hypertension, |

| S. No | As per EC dated 10.08.2021 | | As per NIIPL | | As per CTO | | Proposed | | After Expansion | | Cas NO | Product End Use |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Product Name | Production Capacity TPD | Product Name | Production Capacity TPD | Product Name | Production Capacity TPD | Product Name | Production Capacity TPD | Product Name | Production Capacity TPD | | |
| | | | | | | | | | | | | Allergy, Anxiety disorder etc. |
| 10 | | | Dimethyl amine | 22 | **Dimethyl amine** | **0** | Dimethyla mine | 23 | Dimethyla mine Hydrochlori de | 45 | 506-59-2 | |
| 11 | | | N-Methyl-2-Pyrolidon e | 18 | **N-Methyl-2-Pyrolidon e** | **0** | N-Methyl-2-Pyrolidone | 12 | N-Methyl-2-Pyrolidone | 30 | 872-50-4 | Used as Solvent in Many Industries |
| 12 | | | | | | | Chloro Alkali | 100 | Chloro Alkali | 100 | **7646-69-7** | Used in Many reactions and |

| S. No | As per EC dated 10.08.2021 | | As per NIIPL | | As per CTO | | Proposed | | After Expansion | | Cas NO | Product End Use |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Product Name | Production Capacity TPD | Product Name | Production Capacity TPD | Product Name | Production Capacity TPD | Product Name | Production Capacity TPD | Product Name | Production Capacity TPD | | |
| | | | | | | | | | | | | Neutralizing agent |
| 13 | | | | | | | Chlorine | 88 | Chlorine | 88 | 7782-50-5 | Used in Mono Chloro Acetic Acid and Acetyl Chloride |
| 14 | | | | | | | Hydrochloric Acid (33%) | 20 | Hydrochloric Acid (33%) | 20 | 7647-01-0 | Used in Many reactions and Neutralizing agent |
| 15 | | | | | | | Hydrogen | 2.4 | Hydrogen | 2.4 | 1333-74- | Raw material of |

| S. No | As per EC dated 10.08.2021 | | As per NIIPL | | As per CTO | | Proposed | | After Expansion | | Cas NO | Product End Use |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Product Name | Production Capacity TPD | Product Name | Production Capacity TPD | Product Name | Production Capacity TPD | Product Name | Production Capacity TPD | Product Name | Production Capacity TPD | | |
| | | | | | | | | | | | 0 | Paracetamol |
| 16 | | | | | | | Sodium Hypochlorite | 20 | Sodium Hypochlorite | 20 | 7681-52-9 | Used in many reactions and bleaching agent |
| 17 | | | | | | | PNCB | 52.3 | PNCB | 52.3 | 100-00-5 | Used as raw material in Many Pharmaceutical Industries |
| 18 | | | | | | | ONCB/MNCB | 25 | ONCB/MNCB | 25 | 88-73-3 | Used as raw material |

| S. No | As per EC dated 10.08.2021 | | As per NIIPL | | As per CTO | | Proposed | | After Expansion | | Cas NO | Product End Use |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Product Name | Production Capacity TPD | Product Name | Production Capacity TPD | Product Name | Production Capacity TPD | Product Name | Production Capacity TPD | Product Name | Production Capacity TPD | | |
| | | | | | | | | | | | | in Many Pharmaceutical Industries |
| 19 | | | | | | | MCB/PDCB /ODCB | 10 | MCB/PDCB /ODCB | 10 | 121-73-3 | Used as raw material in Many Pharmaceutical Industries |
| 20 | | | | | | | Caffiene & derivatives | 50 | Caffiene & derivatives | 50 | 58-08-2 | Used as raw material in Many Pharmaceutical Industries |

| S. No | As per EC dated 10.08.2021 | | As per NIIPL | | As per CTO | | Proposed | | After Expansion | | Cas NO | Product End Use |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Product Name | Production Capacity TPD | Product Name | Production Capacity TPD | Product Name | Production Capacity TPD | Product Name | Production Capacity TPD | Product Name | Production Capacity TPD | | |
| 21 | | | | | | | Methyl Amines & derivatives | 50 | Methyl Amines & derivatives | 50 | 74-89-5 | Used as raw material in Many Pharmaceutical Industries |
| 22 | | | | | | | TMA HCL | 20 | TMA HCL | 20 | 75-24-1 | Used as Solvent in Many Industries |
| 23 | | | | | | | Dimethyl Acetamide | 20 | Dimethyl Acetamide | 20 | 127-19-5 | Used as Solvent in Many Industries |
| 24 | | | | | | | Acetonitrile | 20 | Acetonitrile | 20 | 75-05-8 | Used as Solvent in Many |

| S. No | As per EC dated 10.08.2021 | | As per NIIPL | | As per CTO | | Proposed | | After Expansion | | Cas NO | Product End Use |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Product Name | Production Capacity TPD | Product Name | Production Capacity TPD | Product Name | Production Capacity TPD | Product Name | Production Capacity TPD | Product Name | Production Capacity TPD | | |
| | | | | | | | | | | | | Industries |
| 25 | | | | | | | Poly Aluminium Chloride | 90 | Poly Aluminium Chloride | 90 | 1327-41-9 | Used in Paper Industries |
| 26 | | | | | | | NBB | 1 | NBB | 1 | 104-51-8 | Used as Solvent in Many Industries |
| 27 | | | | | | | Diketene and Derivatives | 40 | Diketene and Derivatives | 40 | 674-82-8 | Used as raw material in Many Pharmaceutical Industries |

| S. No | As per EC dated 10.08.2021 | | As per NIIPL | | As per CTO | | Proposed | | After Expansion | | Cas NO | Product End Use |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Product Name | Production Capacity TPD | Product Name | Production Capacity TPD | Product Name | Production Capacity TPD | Product Name | Production Capacity TPD | Product Name | Production Capacity TPD | | |
| | Total | 890.35 | Total | 860.35 | Total | 705.7 | Total | 838.7 | Total | 1699.05 | | |
| 1 | Co-generation Power Plant (MW) | 29.75 | Co-generation Power Plant (MW) | 29.75 | Co-generation Power Plant (MW) | 17 | Co-generation Power Plant (MW) | 20 | Co-generation Power Plant (MW) | 49.75 | | |

By-Product

| S. No | By Products | Existing TPD | Proposed TPD | After Expansion TPD |
|---|---|---|---|---|
| 1 | Green Acid | 155 | 85 | 240 |
| 2 | Poly Aluminum Chloride (9%) | 124 | 106 | 230 |
| 3 | Higher Hydrocarbon | 10 | 15 | 25 |
| 4 | Potassium Methyl Sulphate | 2.3472 | 7 | 9.3472 |

| S. No | By Products | Existing TPD | Proposed TPD | After Expansion TPD |
|---|---|---|---|---|
| 5 | Ammonium Sulphate | 0.315 | 1 | 1.315 |
| 6 | Sodium Sulphate | 1.74 | 5 | 6.74 |
| 7 | Potassium Carbonate | 5 | 0 | 5 |
| 8 | Potassium Chloride | 1.8 | 2 | 3.8 |
| 9 | Dilute Ester | 2.1 | 2 | 4.1 |
| 10 | Hydrochloric Acid | 14 | 20 | 34 |
| 11 | Mixture of 3-4 iso butyl Acetophenone | 0 | 6.4 | 6.4 |
| 12 | N,N Dimethyl Hydrazine and Di methylmelamine | 0 | 5 | 5 |
| 13 | Sodium Chloride | 0 | 87 | 87 |
| 14 | Dilute Acetic Acid | 0 | 35 | 35 |
| 15 | Saturated Recovered Hydrocarbon | 0 | 10 | 10 |
| 16 | Tartaric Acid | 0 | 5 | 5 |
| 17 | Sodium Acetate | 0 | 2 | 2 |
| 18 | Dilute Caustic Lye | 0 | 25 | 25 |
| | **Total** | **316.3** | **418.4** | **734.7** |

Formulation Products

| S.No | Name of Products | Existing in Lacs/day | Proposed in Lacs/day | After Expansion in Lacs/day |
|---|---|---|---|---|
| 1 | Tablets | 0 | 500 | 500 |
| 2 | Capsules | 0 | 500 | 500 |
| 3 | Injectables (Ampules) | 0 | 50 | 50 |
| 4 | Injectables (Vials) | 0 | 25 | 25 |
| 5 | Liquid (Oral) | 0 | 25 | 25 |

| S.No | Name of Products | Existing in Lacs/day | Proposed in Lacs/day | After Expansion in Lacs/day |
|---|---|---|---|---|
| 6 | Ointments | 0 | 25 | 25 |
| | **Total** | **0** | **1125** | **1125** |

Table 3 : Salient Features of the Project

| S. No. | Particulars | Unit | Existing | Proposed/ Additional Details | After Expansion | Remarks |
|---|---|---|---|---|---|---|
| 1 | Total Project Cost | Rs. (In Crore) | 1315.6 | 735 | 2050.6 | Increase |
| 2 | **AREA DETAILS** | | | | | |
| a. | Total Plot Area | $m^2$ | 451588 (111.58 Acre) | 271646 (67.12 Acre) | 723234 (178.715 Acre) | Increase |
| b. | Green Area | $m^2$ | 153982 (38.04 Acre) | 110480.06 (27.30 Acre) | 264462.06 (65.35 Acre) | Increase |
| 3 | **POPULATION** | | | | | |
| a. | Workers/ Staff | No. | Permanent: 2700 | Permanent: 2000 | Permanent: 4700 | Increase |
| | | | Temporary: 95 | Temporary: 55 | Temporary: 150 | Increase |
| 4 | **SERVICE DETAILS & ENVIRONMENTAL ASPECTS** | | | | | |
| a. | Fresh Water Requirement | KLD | 1717 | 2333 | 4050 | Increase |
| b. | Wastewater Generation | KLD | 1672 | 1198 | 2870 | Increase |
| | Domestic Sewage & | | Industrial: 1587 | Industrial: 1083 | Industrial: 2670 | Increase |

| S. No. | Particulars | Unit | Existing | Proposed/ Additional Details | After Expansion | Remarks |
|---|---|---|---|---|---|---|
| | Industrial Effluent) | | Domestic: 85 | Domestic 115 | Domestic: 200 | |
| c. | Wastewater Treatment Schemes/Capacity | KLD | ETP: 1000<br>MEE: 200<br>RO: 800<br>STP: 150<br>MVR: 200 | ETP: 1200 KLD<br>MEE: 700 KLD<br>RO: 1900 KLD<br>STP: 75 KLD | ETP: 2200 KLD<br>MEE: 900 KLD<br>RO: 2700 KLD<br>STP: 225 KLD<br>MVR: 200 KLD | Increase |
| d. | Recycled water | KLD | 1625 | 1143 | 2768 | Increase |
| e. | Power Requirement | kVA | 29150 | 50000 | 79150 | Increase |
| f. | DG Sets (Backup) | kVA | 1 x 625;<br>2 x 1000;<br>2 x 2250 | 1 x 1000;<br>1 x 2250 | 1 x 625<br>3 x 1000<br>3 x 2250 | Increase |

## 2. DESCRIPTION OF THE ENVIRONMENT

*Site Characteristics*

Existing M/s IOL chemicals and Pharmaceuticals Limited is located at **Village Fatehgarh, Channa, Tehsil & District Barnala, Punjab- 148101.** The coordinates from centre of the project are **Latitude**: 30°17'52.76"N; **Longitude**: 75°30'9.56"E. It is a brown field project having a existing total plot area of 4,51,588 $m^2$ and total plot area of **7,23,233 $m^2$ after expansion**. The site is located near Handiaya (2.12 km N from the project site) and well connected with National Highway-703 located at 0.84 km in North-West direction. The nearest Railway station is Handiaya Railway Station which is located 4.71 km in North direction from the Project Site. Nearest Airport from the project site is Shaheed Bhagat Singh International Airport, Chandigarh located at 130 km in North-East direction. The nearest settlement to the site is Handiaya located about 1.69 km N of the site. There are no major surface water bodies present within the 10 km of project site only one canal is present.

There are no environmentally sensitive components such as National Park, Wildlife Sanctuary, Elephant / Tiger Reserve, migratory routes of fauna and wet land present within 10 Km radius of plant site.

Topography and Meteorology

**Topography of Barnala District** *:* The terrain of the district is flat level plain with mean elevation 227 metres from mean sea level (745 feet). The slope of the district is from north-east to south-west.

**Topography of Study Area** ***(10Km):*** The topographical levels of the 10 Km area vary from 235 to 266 amsl.

**Topography of Project Site***:* The project site is undulated and elevation of site ranges between 244 to 265 amsl.

*Climate and Meteorology*

**Temperature–** The Annual mean minimum temperature of around $2^0$C and annual mean maximum temperature of around $43.9^0$C. May is the hottest month with daily mean maximum temperature at $43.9^0$C and January is the coldest month with daily mean minimum temperature of $2.0^0$C.

**Relative Humidity-** Highest relative humidity is recorded as 93% in Months of January during day and lowest 26% in Month of May during night. Highest relative humidity in monsoon season is recorded as 83% in the morning and 50% in the evening.

**Rainfall–** Total annual mean rainfall was observed to be 791.1 mm. Around 79% of total rainfall occur in the months of June to Sep. The maximum total monthly rainfall is 217.1 mm and minimum monthly rainfall during monsoon is 3.9 mm.

**Wind Speed–** Mean wind speed was observed from 2.3 kmph (November) to 6.6 kmph (June).

***Baseline Period***

The baseline environmental data generation has been done for the period of **October -2023 to December -2023**. The study area within a 10-km radius around the proposed plant site has been considered as impact zone for EIA study. Primary and secondary data has been collected for 10 Km radius of the project site.J. P Test House & Research Centre along with EQMS Team carried out sampling and testing.

***Site Specific Met Data***

**Temperature –** During the study period daily minimum temperature was 8 deg C and daily maximum temperature was 38 deg C.

**Wind Speed–**The average wind speed is 1.76 m/s.

**Wind Direction –** The predominant wind direction is North- West.

***Soil Quality***

Six locations were monitored for checking soil Quality in study area. Based on Nutrient Index Value for N, P & K, the soils of study area fall into "**MEDIUM *FERTILITY STATUS"***. Soils have medium organic carbon and are capable of *moderately supporting for agriculture*. The soils of study area area and project site is slightly alkaline in nature as pH value of soils in all analyzed samples is less than 8.5 and simultaneously the value of EC is less than 1 dS/m (1000 µmhos/cm).

***Water Quality (Ground Water & Surface Water)***

**Six locations** were monitored and assessed for surface water quality. Comparing the values as per classification for designated best use water quality criteria CPCB, **surface water locations SW-1 (Nala 100 Meter Upstream at Project Site), SW-5 (Dhaula Pond) & SW-6 (KahneKe Pond) fall under "Category -C" i.e,** Drinking water source after conventional treatment and disinfection **, SW-3 (**Canal 100 Meter Upstream at Near Dhaula**) & SW-4 (**Canal 100 Meter Downstream at Near Dhaula**) fall under "Category-B" while SW-1 (**Nala 100 Meter Downstream at Project Site ) **fall under "Category D" i.e., Propagation of Wildlife & Fisheries.**

8 samples of ground water locations were surveyed and assessed. The analysis results indicate that the pH ranged between **7.24 to 7.78** which are well within the

specified standard of 6.5 to 8.5 limit. Total hardness levels were recorded in the range between **191 to 430 mg/l** that is within permissible limits of 600 mg/l. Total dissolved solids were recorded in the range of **348 to 1071 mg/l** that falls within permissible limits of 2000 mg/l. Chloride levels were recorded between **54 to 142 mg/l** that falls within the range of permissible limit i.e.,1000 mg/l.

Bacteriological studies reveal that no coliform bacterial are present in the samples. The heavy metal contents were observed to be in below detectable limits. Parameters for toxic substances were recorded within the permissible limits.

***Air Quality***

AAQ monitoring was done at Eight locations within the study area considering dominant wind direction, populated area and sensitive receptors. The ambient air quality monitoring during post -monsoon Season (October-2023 to December -2023) was conducted, on 24- hourly twice a week basis for PM10, PM2.5, NOX, SO2, CO & NH3 was 90 µg/m3, 56 µg/m3, 16.4 µg/m3, 13.2 µg/m3, 0.26 mg/m3 & <20 µg/m3 respectively. On the criteria of AQI the AQI Category for each monitoring station has been found **satisfactory** for all locations.

***Noise***

8 noise sampling locations were monitored and assessed. The noise levels at all locations were observed to be within CPCB limits except at NQ-3 (Near NH-7) & NQ-7 (Near NH-703) due to excessive vehicular traffic and community noise in the area.

***Traffic***

The site is accessible through NH-703. Site is well connected to 10 m wide industrial road through entry/exit. The transportation of material will be through industrial Road which is further connected to the NH-703. During the study period maximum traffic in the study area was observed during evening. Less traffic movement is found during early morning hours. With the operation of the proposed project, the traffic volume would increase. However, the incremental will be very less in comparison to the carrying capacity of the road. At Maximum the expected PCU/hr from the site will be 37 PCU/day which is very less in comparison to the carrying capacity of the Road. Thus, no major impact is anticipated in the nearby road due to the proposed project.

***Socio-Economic***

As per the census records 2011, the total population of 10-km radius study area was recorded as 227740 persons of 24 revenue villages/towns of Barnala District in Punjab. All study area revenue villages/towns are mainly under 2 tehsils namely *Barnala and Tapa* of Barnala District in Punjab.

Total number of 'Households' was observed as 45918 in the whole study area. Male-

female wise total population was recorded as 122429 males and 105311females respectively.

There are only three towns named Barnala (MC), Handiaya (NP) and Dhanaula (MC) in the study area comes under 2 tehsils namely *Barnala and Tapa* of Barnala district in Punjab. the data reveals the sex ratio as 860 females for every 1000 males in the study area. The child sex ratio in the study area was observed as 832 female children per 1000 male children (0-6years). This shows declination of female child. The 'Scheduled Castes' population was observed as 66696 consisting of 35220 males and 31476 females respectively which accounts as 29.3% to the total population (227740) in the study area. No 'Scheduled Tribes' population was observed in the study area. It implies that the rest population out of the total population (about 70.7%) belongs to the General category. Total literates' population was recorded as 144370 (63.4%) in the study area. Data reveals that Male-Female wise literates are observed as 81364 & 63006 respectively.

***Ecology & Biodiversity***

Project site as well as the 10 km radius area of the proposed site does not support any critical habitat, like Biosphere Reserves, Wildlife Sanctuaries, National Parks, Tiger Reserves, Important bird area, bird sanctuary, migratory bird's habitat, migratory route of animals, wetland etc.

**Flora:**

**Flora at Project Site:** The proposed expansion site is already developed site located within the project permises. There is no vegetation present on the land identified for proposed expansion.

**Vegetation in Core Zone:** The project site is located at village Fatehgarh, Channa, Tehsil & District Barnala, Punjab. The land use of the site is already industrial. Proposed expansion shall be done within the existing plant premises. The vegetation in existing premises is present in the form of greenbelt developed by the IOL. The common tree species present in core zone of the site are Eucalyptus, Popular, *Melia azedarach*, Karanj (*Pongamia pinnata*),Amaltas (*Acacia fistula),* Neem (*Azadirachta indica*), *Conocarpus,* Gulmohar *(Delonix Regia),* Bottlebrush, Casurina, Tecoma, Terminalia, Mango (*Mangifera indica*), Kachnar (*Bauhinia variegata*), Kaner (*Nerium indicum*), *Thevetia peruviana etc*. The species reported in core zone are Shisham (*Dalbergia sissoo*), Kikar (*Acacia nilotica*), Beri (*Zizyphus mauritiana*), Kuri (*Nyctanthes arboretristis*), Panch phulli (*Lantana camara*), Garna (*Carrissa opaca*), Kaner (*Nerium indicum*), Gandla (*Murraya koenigii*), Basuti (*Adhatoda vasica*), and Ak (*Calotropis procera*) etc.

**Flora in Buffer Zone:** Most of the land around the study area (10 km radius around

the project site) is under agriculture and residential uses. No national parks, wildlife sanctuary, biosphere reserve is present within 10 km area of the project site. No Reserve Forest and protected forests are present within the study area. Because there is no forest in the study area and the vegetation is restricted along roadside and other open areas. The vegetation is meager in spite of the favorable environmental conditions. At some places, area is covered with thick vegetation. The plants are a significant characteristic comprises of mainly Eucalyptus etc. Some trees of Kikar, subabul, Toot, are also found in the area. Around village roads, Pipal (*Ficus religiosa*), Bargad (Ficus benghalensis), Neem (*Azadirachta indica*), Karanj (*Pongamia pinnata*), Babul (*Acacia niotica*), Dhak (*Butea monosperma*), Jamun (*Syzygium cumini*), Nilgiri (*Eucalyptus globulus*) and Amaltash (*Cassia fistula)* were commonly observed.

Among the fruit trees, the important ones were *Ziziphus mauritiana (Ber), Syzgium cumini (jamun) and* Psidium *guajava (Amrud). Dischanthum annuatum,* a fodder grass was growing on normal soils while *Cenchrus celaris* another fodder species grows on sandy soil patches. Other grasses s found in the study area are *Diplachne fusca, Heteropogon controutus, Sporobolous maraginatus, Aristida hixtrix, Dactylon centicem,* etc. shrubs species like *Calotropis gigantea, Ricinus communis, Alternanthera sessilis* and *Achyranthes aspera* were commonly observed on the banks of fields.

**Rare and Endangered Plant Species in the Study Area**: No rare and endangered plant species was observed in the study area (Source: Red data Book of Indian Plants).

**Fauna:**

***Fauna in Core Zone:***

The project site is located at village Fatehgarh, Channa, Tehsil & District Barnala, Punjab. The land use of the site is already industrial. Proposed expansion shall be done within the existing plant premises. No tree cutting is required. No major vegetation is present within the core zone except Eucalytus plantation hence no wildlife exists within the core zone. However, the presence of reptiles and amphibian species has been reported by the local people. Common avifaunal species has also been observed in the core zone.

***Fauna in Buffer Zone***

The listed fauna found in study area has been cross-checked with Red Data Book of Indian Animals (Zoological Survey of India). There is no endangered or critical faunal species in the study area.

**MAMMALS:** Eleven species of mammals were found/reported from secondary sources as well as from the primary survey and consultations. Out of reported species one species i.e., *Felis chaus* and *Hystrix indica* is Schedule-I species. Other

reported species belong to Schedule -II, III, IV and V. As per IUCN criteria (2010).

**AMPHIBIAN AND REPTILES:** There were 1 species of amphibians, 4 species of snakes and 2 species of lizards recorded/confirmed in the study area of which Russell's Viper and Rat snake belong to Schedule-I of WPA,1972, amended December 2022

**RET Avifauna**

As per present study, 50 avifauna species have been reported in the study area and as per the WPA 1972 amended in Dec 2022 out of the total species reported about only *Pavo cristatus* species belongs to schedule-I. These species were also reviewed as per the IUCN Red list and no RET species reported from the study area.

Wildlife Conservation plan for the schedule -I species is prepared and submitted to wildlife conservator for approval with the budgetary allocation of 25 lacs.

## 3. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

***Air Pollution***

Air quality may get impacted in the area during construction/installation phase due to various project activities including excavation and filling, Transportation and storage of raw materials & debris, movement of construction vehicle, Operation of construction machinery & equipment and Operation of DG sets. All these activities have potential to generate fugitive dust emissions. Major pollutants will be dust, $SO_2$, $NO_2$ & CO. Operation of DG sets, construction equipment/machinery and vehicles may also generate exhaust which affects the air quality of the area. Existing highways shall be used for transportation and present road conditions are reasonably good. Water Sprinkling shall be done at site at regular intervals to reduce the dust emissions. Locally available raw material will be preferably used. Storage of raw materials like cement, sand, soil, etc. shall be done in covered sheds or should be covered by tarpaulin cover.

During operation phase, the proposed expansion is in the existing unit. As per the baseline data assessment, it is found that all the parameters monitored, i.e., PM (10), PM (2.5), SO2, NOx and Acid Mist are well within the permissible limit. However, cumulative and continuous emissions from existing and proposed industries in an area may increase the pollutant level in the air. Thus, use of efficient mitigation measures and air pollution control system is required.

Efficient fuel and Conventional methods will be used in the plant to reduce the emission. All sources of emission shall be provided by appropriate air pollution control system and stack height as per CPCB norms to maintain the emission norms given by CPCB/MoEF&CC/PPCB. A continuous online Ambient Air quality Monitoring

system and stack monitoring system will be installed at the plant to monitor the parameters are within the limit. Various mechanisms have been planed in plant to control the emission. IOLCP will have defined systems in place at each step of plant, process, and packing. These systems consist of Dust collector's, Air Handling Unit's, close Reactor systems, etc. Boilers will be provided with Bag filter with cyclone followed by 32 m stack height to achieve the emission levels. Quarterly Air pollution monitoring will be done by an external agency to ensure the effective working of pollution control equipment's & compliances of Air pollution norms.

***Noise Pollution***

There will be noise generation during construction phase in the project site due to construction activities such as site levelling, foundation; operation of construction machinery such as machinery and other activities. Also, there will be noise generation from movement of vehicles carrying material, loading & unloading activities, operation of DG set, etc. However, magnitude of the impact will depend upon the type and nature of the machinery, time schedule of operations, construction method and management practices followed during activities. The construction activities will be limited, to the extent possible, to day hours only.

During Operation Phase, the plant has various machines like dryers, blowers, vacuum pumps, process pumps, compressors, etc. along with DG sets, Boiler, which generates noise. These machines come with inbuilt appropriate control measures to maintain the noise levels within limits. The equipment like Compressors, blowers, fans, various drums and elevators will be provided with Acoustic pad insulation / Acoustic enclosures to limit the noise level as per the standard. Noise level at Boundary Fence will be controlled by providing green belt throughout the boundary wall of plant. The noise levels at the periphery of the plant will be maintained within 70 -75 dB (A). Placing of unwanted material as noise barriers along noise emitting area shall be done. Transporters shall be instructed to follow road safety and use well maintained trucks and tankers. A wide green belt is proposed as a noise barrier.

***Water Pollution***

The existing total water requirement of the plant is **3342** KLD. Fresh water is being met through borewell and canal water. NOC for 900 KLD Ground Water from Punjab Water regulation Authority the same is obtain vide no PWRDA/I/05/2023/L3/I dated 16.05.2023 and Canal water permission for Department of Water resources for 1.74 cusec (4257 KLD). After expansion, total water requirement shall increase to **6818 KLD** out of which **4050 KLD** freshwater requirement shall met through borewell and canal water and **approx. 2768 KLD** will be met from in-house treatment schemes i.e., ETP, MEE, RO and STP.

In the pharamaceuticals industry the main source of water pollution is the manufacturing process and use of water in other utilities. The sources of wastewater from the plant are process, boiler blow down, Softener, Blow down, cooling tower blow down, canteen facilities, etc., The wastewater If not properly disposed off, then it can deteriorate the surface water quality of nearby water body. The wastewater and oil spillage from machinery can deteriorate the surface water quality of nearby water body by increase in the no. of pathogens, BOD, COD, TSS, etc if not disposed off properly. Many new techniques, efficient and sustainable manufacturing process is proposed to be adopted to reduce the water requirement.

Existing effluent generation from plant is 1672 KLD (Domestic: 85 + Industrial: 1587 KLD). Domestic effluent is being treated in existing STP of capacity 150 KLD and Industrial/Toxic effluent is being treated in ETP/RO/MEE/MVR.

**After expansion**, the effluent generation will increase to 2870 KLD (Domestic: 200 + Industrial: 2670). The source of effluent will be Domestic use, Process, Boiler, APCM scrubbers, utility, and cooling towers. Effluent management Break up as per below:

- Low COD streams (1000 KLD), Boiler Blowdown (350 KLD), Floor washing (180 KLD) & MEE reject (646 KLD) will be treated in ETP. After ETP treatment, 2156 KLD of treated effluent will be sent to Activated carbon/ Sand Filters. After the activated carbon/ sand filters treated water will be send to RO for further treatment. After the RO treatment, Treated water (2223 KLD) will be recycle and RO reject send to MEE.
- High TDS/COD effluent of 680 KLD & RO reject (393 KLD) will be treated in MEE. After treatment in MEE, MEE reject will be treated in ETP and Treated water will be recycled in the project site.
- Domestic sewage (200 KLD) will be sent to STP and treated water will be reused in the greenbelt.

The project will be a **"Zero-liquid Discharge"** Project.

***Waste Management***

Construction activities lead to generation of sand, gravel, concrete, stone, bricks, wood, metal, glass, polythene sheets, plastic, paper etc. as waste. Various operations during the construction activities lead to the varied compositions in the total solid waste stream and affect the site. Improper storage and disposal of waste may enhance the risk of microbial contamination and enhance the risk of disease occurrence and cause foul smell. Thus, this waste is required to be collected, segregated and disposed of in manner that it does not mixes or polluting air, water and soiling environment. Excavated topsoil shall be used for backfilling/ greenbelt

development & plantation. Municipal waste will be minimal as most of the construction workforce will come from near areas. The waste generated will be collected and segregated and will be disposed off suitably. Hence impacts will be insignificant and for short duration only. These impacts will be confined to the construction site only and no adverse impact on the surroundings is anticipated. As soon as the construction will be over, all wastes from the site will be cleared with due care, meeting regulatory requirement, if any.

During Operation phase, There is generation of various categories of Industrial hazardous waste from the existing plant.. Hazardous Wastes are dried, packed and stored in separate designated hazardous waste storage facility before its disposal. IOL chemicals and Pharmaceuticals Limited strictly complies with the rules and regulations with regards to handling and disposal of hazardous waste in accordance with Hazardous & Other Waste (Management and Transboundary Movement) Amendment Rules, 2023. The same will be followed after expansion.

***Land Environment***

There will be no land use change as this is an expansion of existing pharamaceuticals project. The proposed expansion shall be undertaken within the existing site of the project and the present land use of the existing site is industrial. There will be no physical changes outside the project boundary or any development of labour colony outside the site. Majority of the labor will be hired from nearby villages and if required housing or shelter facilities required for construction workers will be provided at the site. Solid Waste Management Rules, 2016 and Construction and Demolition Waste Management Rules, 2016 shall be adhered.

***Soil Quality***

During Construction Phase, Excavation of development of components under proposed expansion may lead to soil erosion, loss of soil layer, destabilization of landscape and decrease in fertility of soil. Movement of construction vehicles and equipment will lead to compaction of soil. Spillage of construction materials like paint, grease, used oil and fuel like HSD may contaminate the soil. Due to improper disposal of solid waste & liquid waste includes the leaching from biodegradable waste and effect on flora from spillage of waste on soil. Also, soil if disposed in improper on unscientific manner may impact the soil quality, air quality and water quality of the area significantly.

During Operation Phase, spillage of material like effluent, chemical, Hazardous waste, used oil and fuel may contaminate the soil. Due to improper disposal of solid waste & liquid waste includes the leaching from biodegradable waste and effect on flora from spillage of waste on soil. Liquid effluent will be collected through closed loop channel to treatment scheme. Only treated water will be used for gardening after assuring standards norms of irrigation. No untreated water will be discharged on the land. All underground tanks will be provided with extra prevention to avoid leakage. Sensors will be provided to detect leakage. Separate room with paved area will be provided at plant for storage of Hazardous waste. Solid waste collection and disposal area will be paved area to avoid contamination of soil through leachate. Water less cleaning will be adopted wherever spill occurs to avoid runoff. No area shall be left excavated or open after any repair & maintenance works.

***Ecology and Biodiversity***

There is very limited flora and fauna present in the core zone. The expansion is proposed within the existing premises and there is no vegetation present on the identified land proposed for the expansion. Most of the study area has scattered vegetation and in the case of the faunal component also no significant distinction could be perceived. From Environmental Impact Evaluation, it was observed that only very minor and negligible impact is anticipated on the flora and fauna during the construction phase of the project. No ecologically hazardous materials are expected to be generated during this phase. Currently the concentration of noxious gases such as SOx, NOx and hydrocarbons in the project area are within the prescribed standards. The following impacts are predicted on ecology and biodiversity during construction phase.

During the construction, the local level of particulate matter (PM) may marginally increase because of the movement of vehicles and equipment and other construction related activities.

During construction phase, increase in deposition of dust and dust settling on the vegetation may alter or limit plant's abilities to photosynthesize and/or reproduce.

Excavation and filling up operation may result in fugitive dust emission. The dust deposition on pubescent leaves of the surrounding vegetation may leads to temporary reduction of photosynthesis. Such impacts would however be confined mostly to the initial period of the construction phase and would minimize through paving of roads, surface treatment, regular water sprinkling in dust generating areas. The impact on the ecology of the surrounding area during the construction stage will be insignificant in nature.

No tree cutting shall be required for the project development hence the direct impact on terrestrial ecology (loss of flora and fauna) is likely to be insignificant. Overall impact on terrestrial ecosystem will be negligible. Construction activities generate dust and this dust when get settled on leaves may impact the photosynthesis capacity of the plants. Also, Vehicular emission like NO2, NO etc. can inhibit the growth of plants and pre-mature leaves senescence. Due to noise generation fauna may get disturb resulting in their relocation and thus reducing the biodiversity of an area.

During operation phase, the impact on the surrounding ecology during the operation of the project will mainly occur from the deposition of air pollutants. Air pollution affects the biotic and abiotic components of the ecosystem individually and synergistically with other pollutants. Chronic and acute effects on plants and animals may be induced when the concentration of air pollutants exceeds threshold limits.

***Socio-Economic Environment***

During Construction Phase, Approximately 400 no. of labour shall be required for installation/commissioning of machinery for the proposed expansion. Most of the unskilled and semi-skilled labour will be hired from nearby villages. The project construction activity will have positive impact on the social environment. Accident and Noise related problems in the plant are the main concerns for local labour. Accident may cause disability or life loss and working in noisy area may cause speech interference, annoyance, hearing impairment, increase in heartbeat/ blood pressure of the human. Thus, measures are necessary to be adopted to overcome these impacts.

During Operation Phase, There will be increment in staff of 2055 no. workers for proposed expansion unit. Indirect employment opportunities being generated in various activities like raw material and final products transportation, contractual manpower for non-critical activities at the plant (canteen, gardening, housekeeping etc.). The industrial growth of the region will help in infrastructure development in the area.

However, due to operation & maintenance there may be various risks for the staff and other nearby people. The risks associated are accident of people, collapse of structures, fall/slip while working, electrical shocks, electrical fire, fire in DG sets & fuel tanks, health impact due to air & noise pollution etc. Various safety measures are proposed to be followed which should be taken to prevent the accidents and near

miss. Also, improper storage and disposal of waste may decrease the aesthetic value, lead to risk of disease may occur foul smell which will cause nuisance in staff and nearby area. At the extent all possible measures are already adopted by unit to reduce impact on staff and nearby area.

## 4. ENVIRONMENTAL MONITORING PROGRAMME

Environmental monitoring plan will be implemented as per regulatory requirement to comply the necessary compliances. As per the MoEF&CC guideline, Environment monitoring report and compliance of conditions mentioned in the environment clearance will be submitted to the RO-MoEF&CC, SPCB, MoEF&CC online portal i.e., parivesh and shall be uploaded on company's website. Compliances will be submitted in month of June and December for the period of October to March and April to September respectively. Third party laboratory (approved MoEF&NABL laboratory) shall be appointed for carrying out the monitoring. Also, self-environmental audit, Health & safety audit and Energy audit shall be conducted annually.

## 5. ADDITIONAL STUDIES

Detailed Risk Analysis was done, and the following outcomes and recommendations were made:

- Sulphuric acid is highly corrosive acid capable of causing severe chemical pain/burns. It should be handled very carefully with hand gloves, apron and other PPE's..
- In case of hot acid use breathing apparatus in addition of other PPE's to avoid inhalation of vapors.
- Spils: Its spills or leaks: contain and soak up spill with absorbent that does not react with spilled product. Place used absorbent into suitable, covered, labelled containers for disposal.
- Large spills or leaks: contain and soak up spill with absorbent that does not react with spilled product. Dike spilled product to prevent runoff. Remove or recover liquid using pumps or vacuum equipment. Place used absorbent into suitable, covered, labelled containers for disposal. Store recovered product in suitable containers that are: corrosion-resistant. Contaminated absorbent poses the same hazard as the spilled product.
- Electrical installation in storage area must be resistant to ammonia vapors

- Thermal radiation from pool fires are well within the boundary. It is recommended that the adjacent tanks shall be thermaly protected by firewater.
- Use corrosion-resistant structural materials and lighting and ventilation systems in the storage area.
- Storage tanks should be above ground and surrounded with dikes capable of holding entire contents.
- Limit quantity of material in storage up to 80 %.
- Restrict access to storage area.
- Post warning signs when appropriate.
- Keep storage area separate from populated work areas.
- Inspect periodically for deficiencies such as damage or leaks.
- Have appropriate fire extinguishers available in and near the storage area.

## 6. PROJECT BENEFITS

- It will fulfil the demand supply gap of API.
- It will reduce the cost of drugs in India.
- It is expected to improve the profitability of the pharmaceutical unit.
- It will maintain stability in Indigenous/domestic market.
- There will be employment generation during construction & Operation period.
- It will ease the availability of other pharmaceuticals.

Total cost for proposed expansion is **Rs 2050.6 Crores**. Construction will be started after getting all approval from concern department. Construction and installation of machinery will be completed in 12-24 months after start of installation. M/s IOL Chemicals and pharmaceuticals Limited has spent Rs. **4442.2** Lakhs (Capital Cost) & Rs. **3187** Lakhs/yr (Recurring Cost) in the last 2-3 years on EMP. The industry shall contribute Additional Rs. 3615 Lakhs (Capital Cost) and Rs. 5933 Lakhs/yr (Recurring Cost) under proposed expansion for EMP.