

हरियाणा राज्य औद्योगिक
एवं संरचना विकास
निगम लिमिटेड



Haryana State Industrial And
Infrastructure Development
Corporation Ltd.

CIN No.: U29199HR1967SGC034545

(A State Government Undertaking)

INDUSTRIAL ESTATE
BARWALA (PANCHKULA)
(Near Vill. Alipur)
Telefax : 01733-258507

No. HSIIDC:IA:BRW:2020: 1126

Dated: 30-06-2020

To
The Director,
Expert Appraisal Committee (Infra-1),
Ministry of Environment, Forest and Climate Change,
Indira Paryavaran Bahwan
JorBagh Road, New Delhi-110003.

Subject:- Environment Clearance w.r.t Development of Industrial Estate, Phase - II, Barwala,
Distt. Panchkula, Haryana.

Ref: - 1. Terms of Reference letter no.F.No.21-36/2015-IA.III dated 18th June., 2015.
2. ADS Generated on dated : - 04.10.2019

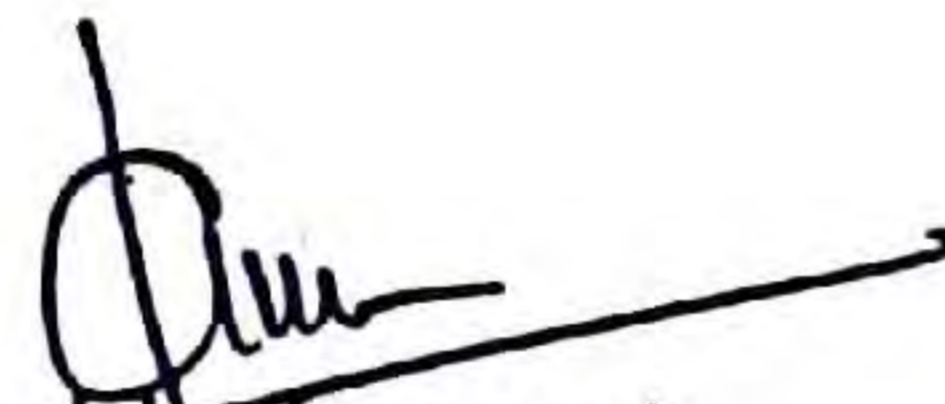
Dear Sir,

With reference to the above cited subject, we are hereby submitting the point wise reply
of the ADS by MoEF&CC, New Delhi dated 04.06.2020 for our above said project.

We hope that you will find it in order.

Kindly grant us the Environmental Clearance at the earliest and oblige.

Thanking you,
Yours Sincerely,


(Rohit Kanwar)
Sr. Manager (IA)
HSI IDC, Indl. Estate
Barwala (Pkl.)

Encl:- As above.

HSI IDC - your partner in progress

पंजीकृत कार्यालय : नं. सी. 13 - 14, सेक्टर - 6, पंचकूला - 134 109

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NEW DELHI OFFICE : TEL. : 23347680-81-82, FAX : 91 (11) 23347688, E-MAIL : hsidc@vnsnl.net



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Reply to the ADS generated dated :- 4th Oct., 2019 w.r.t Development of Industrial Estate (Phase-II) at Barwala, District - Panchakula, Haryana by M/s Haryana State Industrial & Infrastructure Development Corporation Ltd. (HSIIDC)

SL. No	Query	Reply
1	Submit revised EIA/EMP report as per generic structure defined in the EIA Notification, 2006 as amended from time to time.	Revised EIA/EMP Report is enclosed as Annexure-I.
2	Submission of Form-2 in hard copy.	Enclosed as Annexure-II.
3	Details of commitments made by proponent during Public Hearing in tabular form.	Details are enclosed as Annexure-III.
4	Detailed plan for achieving 100% ZLD for the proposed project.	ZLD Plan is enclosed as Annexure-IV.
5	Details of CER (on slab basis) as per provisions of Ministry's OM dated 1st May, 2018.	CER Plan is attached as Annexure-V.
6	Undertaking that no activity has been started for this project.	Undertaking regarding the same is attached as Annexure-VI.
7	Undertaking that proposed site is not situated in the critically polluted area as identified by CPCB.	Undertaking regarding the same is attached as Annexure-VII.

**Final
Environmental Impact Assessment And
Environmental Management Plan**

“Industrial Estate Phase-II”

At

Barwala, Dist. Panchkula, Haryana.

Category – ‘A’ Project

Schedule – 7 (C), industrial estates/ parks/ complexes/ areas, export processing Zones (EPZs), Special Economic Zones (SEZs), Biotech Parks, Leather Complexes,

Period – October-2015 to December-2015)



By

M/s HSIIDC

HSIIDC *Your Partner in Progress*
A Government of Haryana Undertaking



PREPARED BY:

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(QCI/NABET ACCREDITED NO. NABET/EIA/1619/RA0064)

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GRC INDIA TRAINING & ANALYTICAL LABORATORY
(NABL ACCREDITATION TC-7501, MOEFCC NO. S.O. 388 (E))

A unit of GRC India

Annexure – VII
DECLARATION BY EXPERTS

Declaration by Experts contributing to the EIA for Development of Industrial Estate Phase – II, Barwala, District - Panchkula, Haryana.

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

EIA coordinator:

Name: Dr. Dhiraj Kumar Singh

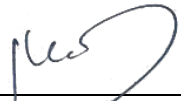




Signature and Date:

Period of involvement: **May 2015 to Till date**

Contact information : 8377904041

Functional area experts:

S. No.	Functional areas	Name of the expert/s	Involvement (period and task**)	Signature and date
1	AP*	Dr. Dhiraj Kr. Singh/Ms. Sadhna Singh-Cat. B	Selection of Baseline monitoring locations, interpretation of baseline environment data, Suggestions on Prevention and Control of air pollution and proposed EMP for air environment (May 2015 to Till Date)	
2	WP*	Dr. Dhiraj Kr. Singh/ Ms. Sadhna Singh-Cat. B	Selection of Baseline monitoring locations, interpretation of baseline environment data, Suggestions on Prevention and Control of water pollution and proposed EMP for water environment (May 2015 to Till Date)	
3	SHW*	Dr. Dhiraj Kr. Singh	Quantification of solid waste, anticipated impact assessment and mitigation measures (May 2015 to Till Date)	
4	SE*	Mr. B.N Chaudhari	Interpretation and analysis of baseline socio-economic data (May 2015 to Till Date)	
5	EB*	Dr. Dhiraj Kr. Singh	Analysis of primary and secondary data collected through questionnaire & site observation sheet (May 2015 to Till Date)	
6	HG*	Mr. Tapan Majumdar	Proposed the mitigation measures (May 2015 to Till Date)	
7	GEO*	Mr. Tapan Majumdar	Proposed the mitigation measures (May 2015 to Till Date)	

8	SC*	Mr. N.P.S Varde	Interpretation of data, Proposed mitigation measures, management plan (May 2015 to Till Date)	
9	AQ*	Ms. Mudita Singh Tomar	Impact prediction, Quantification of incremental air pollution using ISCST-3 model, Proposed mitigation measures for air pollution control (May 2015 to Till Date)	
10	NV*	Mr. Sanjay Shevkar	Interpretation of baseline environment data, Proposed mitigation measures/management plan (May 2015 to Till Date)	
11	LU*	Mr. N.P.S Varde/Mr. B.N Chaudhari	Interpretation and analysis of landuse through overlapping of satellite images and SoI toposheet (May 2015 to Till Date)	
12	RH*	Mr. S. K.Bandopadhyay	Anticipated risks, hazards and proposed the management plan for same (May 2015 to Till Date)	

*One TM against each FAE may be shown

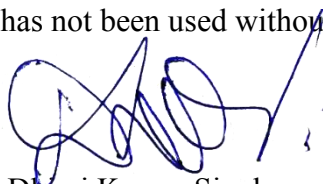
**Please attach additional sheet if required

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

I, **Dr. Dhiraj Kumar Singh** hereby, confirm that the above mentioned experts prepared the EIA for Development of Industrial Estate Phase – II, Barwala, District - Panchkula, Haryana. and also confirm that EIA Coordinator (EC) has gone through the report, and the consultant organization shall be fully accountable for any misleading information.

It is certified that no unethical practices, plagiarism involved in carrying out the work and external data / text has not been used without proper acknowledgement while preparing this EIA report.

Signature:



Name: Dr. Dhiraj Kumar Singh

Designation: Managing Director

Name of the EIA consultant organization: **Grass Roots Research & Creation India (P) Ltd., Noida**

NABET Certificate No.& Issue : **NABET/EIA/1619/RA0064 dated 02nd August 2017 and valid till 18th August 2020. (NABET Certificate and Extension letter is enclosed).**

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F.No.21-36/2015-IA.III
Government of India
Ministry of Environment, Forest & Climate Change
(IA.III Section)

Indira Paryavaran Bhawan,
Jor Bagh Road,
New Delhi - 110 003.

Dated: 18th June, 2015

To
**M/s Haryana State Industrial and
Infrastructure Development Corp. Ltd. (HSIIDC),**
Industrial Estate, C 13-14, Sector-6,
Panchkula - 134 109, Haryana

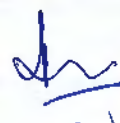
**Subject: Development of Industrial Estate (Phase-II), Barwala, Haryana by
M/s Haryana State Industrial & Infrastructure Development Co.
Ltd. (HSIIDC) -Terms of Reference (ToR) - Reg.**

Sir,

This has reference to your letter No. HSIIDC:IA:BRW:2015 dated 20.02.2015 forwarding along with application seeking for Terms of Reference for the aforesaid project.

2. The proposal was considered by the Expert Appraisal Committee (EAC) in its 148th meeting held on 19th - 21st May, 2015 and the proponent has informed that:

- i. The project "Industrial Estate (Barwala)" is located at village Barwala, District Panchkula, Haryana by Haryana State Industrial and Infrastructure Development Corporation.
- ii. This industrial estate will be developed over total land area of 660.74 acres.
- iii. The existing phase (Phase I) has total area of 102.99 acres. Phase II of the project will be developed on 557.75 acres.
- iv. The industrial estate will have Industrial plots, commercial and institutional areas, CETP, ESI Dispensary, Fire Station and other amenities. The development will be of required standards with provision of power, water supply, roads, sewerage, and effluents disposal system with treatment, storm water disposal and solid waste management to enable enterprises to function in a state of development environment. The project envisages the establishment of mainly pollution free industries based on advanced technologies. Mainly automobiles industries, mechanical industries, general manufacturing industries will be coming in the HSIIDC Barwala Phase-II.
- v. The area under road, green area and open space will be 218.81 acres.
- vi. The total water demand of the project will be 10.80 MLD that will be provided through the tubewells.
- vii. Total wastewater generated from the project will be 6.31 MLD. Wastewater will be treated in the CETP of 6.5 MLD capacity.
- viii. Total power requirement for the project is 66 KVA that will be provided by Uttar Haryana Bidhut Vitran Nigam (UHBVN).



- ix. Total solid waste generated from the project will be 40.05 MT.
- x. The land cost of the scheme is Rs. 277.59 Crores and development cost is 238.23 Crores.

3. The project was examined by the EAC in its 148th meeting held on 19th – 21st May, 2015 and recommended the project for the TOR with the following specific TOR with general conditions for preparation of the Environment Impact Assessment (EIA) Report and Environment Management Plan (EMP) in respect of the **Development of Industrial Estate (Phase-II), Barwala, Haryana by M/s Haryana State Industrial & Infrastructure Development Co. Ltd. (HSIIDC):**

- (i) Declaration regarding no archaeological site falling in project area.
- (ii) No ground water extraction would be allowed.
- (iii) A detailed clarification from HUDA regarding availability of water in the area and corresponding summation of commitments made to various projects to be obtained by the PP.
- (iv) Reasons for selecting the site with details of alternate sites examined/rejected/selected on merit with comparative statement and reason/basis for selection. The examination should justify site suitability in terms of environmental damage, resources sustainability associated with selected site as compared to rejected sites. The analysis should include parameters considered along with weightage criteria for short-listing selected site.
- (v) Submit details of the land use break-up for the proposed project. Details of land use around 10 km radius of the project site. Analysis should be made based on latest satellite imagery for land use with raw images.
- (vi) Submit details of environmentally sensitive places, land acquisition status, rehabilitation of communities/ villages and present status of such activities.
- (vii) Examine the impact of proposed project on the nearest settlements.
- (viii) Examine baseline environmental quality along with projected incremental load due to the project taking into account of the existing developments nearby.
- (ix) Environmental data to be considered in relation to the project development would be (a) land, (b) groundwater, (c) surface water, (d) air, (e) bio-diversity, (f) noise and vibrations, (g) socio economic and health.
- (x) Submit a copy of the contour plan with slopes, drainage pattern of the site and surrounding area.
- (xi) Details regarding project boundary passing through any eco-sensitive area and within 10 km from eco- sensitive area.

- (xii) Green buffer in the form of green belt to a width of 15 meters should be provided all along the periphery of the industrial area. The individual units should keep 33% of the allotted area as a green area.
- (xiii) Submit details of the trees to be felled for the project.
- (xiv) Submit details of the infrastructure to be developed.
- (xv) Submit the present land use and permission required for any conversion such as forest, agriculture etc.
- (xvi) Submit details regarding R&R involved in the project
- (xvii) Zoning of the area in terms of 'type of industries' coming-up in the industrial area based on the resource requirement along with likely pollutants with quantity from the various industries.
- (xviii) The project boundary area and study area for which the base line data is generated should be indicated through a suitable map. Justification of the parameters, frequency and locations shall be discussed in the EIA.
- (xix) Submit Legal frame work for implementation of the Environmental Clearance conditions - to be clearly spelt out in the EIA report.
- (xx) Submit roles and responsibility of the developer for compliance of environmental regulations under the provisions of EP Act.
- (xxi) Site justification of the identified industry sectors from environmental angle and details of the studies conducted if any.
- (xxii) Ground water classification as per the Central Ground Water Authority.
- (xxiii) Submit the source of water, requirement vis-à-vis waste water to be generated along with treatment facilities, use of treated waste water along with water balance chart taking into account all forms of water use and management.
- (xxiv) Rain water harvesting proposals should be made with due safeguards for ground water quality. Maximize recycling of water and utilization of rain water.
- (xxv) Examine soil characteristics and depth of ground water table for rainwater harvesting.
- (xxvi) Examine details of solid waste generation treatment and its disposal.
- (xxvii) Examine and submit details of use of solar energy and alternative source of energy to reduce the fossil energy consumption.
- (xxviii) In case DG sets are likely to be used during construction and operational phase of the project, emissions from DG sets must be taken into consideration while estimating the impacts on air environment.



- (xxix) Examine road/rail connectivity to the project site and impact on the traffic due to the proposed project. Present and future traffic and transport facilities for the region should be analysed with measures for preventing traffic congestion and providing faster trouble free system to reach different destinations in the city.
- (xxx) A detailed traffic and transportation study should be made for existing and projected passenger and cargo traffic.
- (xxxii) Examine details of transport of materials for construction which should include source and availability.
- (xxxiii) Examine details of National Highways/State Highways/ expressways falling along the corridor and the impact of the development on them.
- (xxxiv) Examine noise levels - present and future with noise abatement measures.
- (xxxv) Identify, predict and assess the environmental and sociological impacts on account of the project. A detailed description with costs estimates of CSR should be incorporated in the EIA/EMP report.
- (xxxvi) Examine separately the details for construction and operation phases both for Environmental Management Plan and Environmental Monitoring Plan with cost and parameters.
- (xxxvii) Submit details of a comprehensive Disaster Management Plan including emergency evacuation during natural and man-made disaster.
- (xxxviii) Any further clarification on carrying out the above studies including anticipated impacts due to the project and mitigative measure, Project Proponent can refer to the model ToR available on Ministry website "<http://moef.nic.in/Manual/Industrial Estate>".

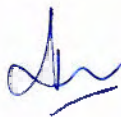
General Guidelines

- (i) The EIA document shall be printed on both sides, as far as possible.
- (ii) All documents should be properly indexed, page numbered.
- (iii) Period/date of data collection should be clearly indicated.
- (iv) Authenticated English translation of all material provided in Regional languages.
- (v) The letter/application for EC should quote the MoEF&CC File No. and also attach a copy of the letter prescribing the TOR.
- (vi) The copy of the letter received from the Ministry on the TOR prescribed for the project should be attached as an annexure to the final EIA-EMP Report.



- (vii) The final EIA-EMP report submitted to the Ministry must incorporate the issues in TOR and that raised in Public Hearing. The index of the final EIA-EMP report, must indicate the specific chapter and page no. of the EIA-EMP Report where the specific TOR prescribed by Ministry and the issue raised in the P.H. have been incorporated. Questionnaire related to the project (posted on MoEF&CC website) with all sections duly filled in shall also be submitted at the time of applying for EC.
- (viii) Grant of TOR does not mean grant of EC.
- (ix) Grant of TOR/EC to the present project does not mean grant of approvals in other regulations such as the Forest (Conservation) Act 1980 or the Wildlife (Protection) Act, 1972.
- (x) Grant of EC is also subject to Circulars issued under the EIA Notification 2006, which are available on the MoEF&CC website: www.envfor.nic.in.
- (xi) The status of accreditation of the EIA consultant with NABET/QCI shall be specifically mentioned. The consultant shall certify that his accreditation is for the sector for which this EIA is prepared.
- (xii) On the front page of EIA/EMP reports, the name of the consultant/consultancy firm along with their complete details including their accreditation, if any shall be indicated. The consultant while submitting the EIA/EMP report shall give an undertaking to the effect that the prescribed TORs (TOR proposed by the project proponent and additional TOR given by the MoEF) have been complied with and the data submitted is factually correct (Refer MoEF office memorandum dated 4th August, 2009).
- (xiii) While submitting the EIA/EMP reports, the name of the experts associated with/involved in the preparation of these reports and the laboratories through which the samples have been got analysed should be stated in the report. It shall clearly be indicated whether these laboratories are approved under the Environment (Protection) Act, 1986 and the rules made there under (Please refer MoEF office memorandum dated 4th August, 2009). The project leader of the EIA study shall also be mentioned.
- (xiv) All the TOR points as presented before the Expert Appraisal Committee (EAC) shall be covered.

4. A detailed draft EIA/EMP report should be prepared in terms of the above additional ToRs and should be submitted to the State Pollution Control Board for conduct of Public Hearing. Public Hearing to be conducted for the project in accordance with the provisions of Environmental Impact Assessment Notification, 2006 and the issues raised by the public should be addressed in the Environmental Management Plan. The Public Hearing should be conducted based on the ToR letter issued by the Ministry and not on the basis of Minutes of the Meeting available on the web-site.



5. You are required to submit the detailed final EIA/EMP prepared as per ToRs including issues raised during Public Hearing to the Ministry for considering the proposal for environmental clearance within 3 years as per the MoEF&CC O.M. No.J-11013/41/2006-IA-II(I) (P) dated 08.10.2014.

6. The consultants involved in the preparation of EIA/EMP report after accreditation with Quality Council of India/National Accreditation Board of Education and Training (QCI/NABET) would need to include a certificate in this regard in the EIA/EMP reports prepared by them and data provided by other Organization(s)/Laboratories including their status of approvals etc. vide notification of the MoEF dated 19.07.2013.

7. The prescribed ToRs would be valid for a period of three years for submission of the EIA/EMP Reports.


(Dr. Ranjini Warriar)
Director

Copy to:
Member Secretary, Haryana State Pollution Control Board, C-11, Sector-6,
Panchkula.

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Tor Points & Their Compliance

S.No.	ToR Condition	Reply	Reference
I.	Declaration regarding no archaeological site falling in project area.	Undertaking stating that no archaeological site is falling in project area.	Attached as Annexure – XII
II.	No ground water extraction would be allowed.	Ground water is the only source for water consumption. NOC from CGWB has been obtained vide NOC no. CGWA/NOC/INF/ORIG/2019/4844 dated-12 th March 2019.	Attached as Annexure-XIII
III.	A detailed clarification from HUDA regarding availability of water in the area and corresponding summation of commitments made to various projects to be obtained by the PP in the command/ reference area.	Water supply will be through ground water and water withdrawal permission has been obtained from CGWB vide NOC no. CGWA/NOC/INF/ORIG/2019/4844 dated-12 th March 2019; hence clarification from HUDA is not required	Attached as Annexure-XIII.
IV.	Reasons for selecting the site with details of alternate sites examined/rejected/selected on merit with comparative statement and reason/basis for selection. The examination should justify site suitability in terms of environmental damage, resources sustainability associated with selected site as compared to rejected sites. The analysis should include parameters considered along with weightage criteria for short-listing selected site.	No alternate site has been selected for development of project. This site is selected as per the land allotted to HSIIDC. As per developmental plan, the land use of this site is reserved for Industrial estate. There are important points which make the site completely feasible for establishing the Industrial Estate. The details are incorporated in chapter-5	Details are given in Chapter No - 5 (Under- 5.5)
V.	Submit the details of the land use break-up for the proposed project. Details of land use around 10 km radius of the project site. Analysis should be made based on latest satellite imagery for land use with raw images	The detailed land use break-up for the proposed project has been incorporated under chapter-2. The detailed land use around 10 km radius of the project site has been incorporated under chapter-3 Site plan of the project site as well as land use map of the surrounding 10 km of the project site	Details are given in Chapter - 2, (Under-2.1, table-2.1, 2.2 & 2.3) Details are given in Chapter-3, (Under-3.3.5.2)

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		is attached as Annexure-III	Land Use Map is attached as Annexure- III
VI.	Submit details of environmentally sensitive places, land acquisition status, rehabilitation of communities/ villages and present status of such activities.	List of environmental sensitive places has been incorporated in Chaper-2 Land acquisition status and R&R action plan has been incorporated in Chapter-7	Details are given in Chapter-7 (Under-7.15)
VII.	Examine the impact of proposed project on the nearest settlements.	Impact of proposed project on the nearest settlements has been incorporated in CH-4	Details are given in Chapter-4 (Under- 4.5.10)
VIII.	Examine baseline environmental quality along with projected incremental load due to the project taking into account of the existing developments nearby.	Baseline environment quality details are given in chapter-3.	All details are covered in Chapter-3
IX.	Environmental data to be considered in relation to the project development would be (a) land, (b) groundwater, (c) surface water, (d) air, (e) bio-diversity, (f) noise and vibrations, (g) socio-economic and health.	All details of land, Ground water, air, bio-diversity, noise and vibration, socio economic and health are given in Chapter-3.	All details are covered in Chapter-3
X.	Submit a copy of the contour plan with slopes, drainage pattern of the site and surrounding area.	Contour plan and drainage map of the surrounding area are attached as Annexure-IV	Attached as Annexure-IV
XI.	Details regarding project boundary passing through any eco- sensitive area and within 10 km from eco- sensitive area.	Project boundary is not passing through any Eco sensitive area, however details of eco sensitive area within 10km of the project site is enclosed as Annexure-XIV .	Attached as Annexure-XIV
XII.	Green buffer in the form of green belt to a width of 15 meters should be provided all along the periphery of the industrial area. The individual units should keep 33% of the allotted area as a green area.	Green buffer in form of green belt to a width of 15 mt. will be provided all along the periphery. The individual units will keep 33% of the allotted area as a green area. Green Area proposed for this industrial estate is	Details are Given in Chapter-2 .

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		27429 sq.mt (6.78 Acre)																									
XIII.	Submit the details of the trees to be felled for the project	Total 673 no. of trees in 2.14 Ha. area to be felled for the project. Regarding the diversion of forest land	Letter of forest department is attached as Annexure- XI.																								
XIV.	Submit the details of the infrastructure to be developed	<p>Detail of the infrastructure is given in table below</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 5%;">S.No.</th> <th style="width: 60%;">Infrastructure</th> <th style="width: 15%;">Area in sq.m.</th> <th style="width: 15%;">Area in acres</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Area Under Industrial Plots</td> <td>982731</td> <td>242.84</td> </tr> <tr> <td>2</td> <td>Area Reserved for Institutional Purpose</td> <td>96881</td> <td>23.94</td> </tr> <tr> <td>3</td> <td>Area Reserved for Commercial Purpose</td> <td>23310</td> <td>5.76</td> </tr> <tr> <td>4</td> <td>Area Reserved for RR Policy</td> <td>186154</td> <td>46.00</td> </tr> <tr> <td>5</td> <td>Utilities</td> <td>956798</td> <td>236.43</td> </tr> </tbody> </table>	S.No.	Infrastructure	Area in sq.m.	Area in acres	1	Area Under Industrial Plots	982731	242.84	2	Area Reserved for Institutional Purpose	96881	23.94	3	Area Reserved for Commercial Purpose	23310	5.76	4	Area Reserved for RR Policy	186154	46.00	5	Utilities	956798	236.43	-----
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XV.	Submit the present land use and permission required for any conversion such as forest, agriculture etc.	There are 6 villages Alipur, Toka, Khangesra, Khatauli, Sukhdarshanpur, Naggal, which are proposed for the land acquisition for the project. There is no forest area near the project area.	Letter of Forest land diversion is attached as Annexure-XI.																								
XVI.	Submit details regarding R&R involved in the project.	Details of Rehabilitation and Resettlement plan covered under ToR point no. (iv).	Details are given in Chapter-7 (Under-7.15)																								
XVII.	Zoning of the area in terms of 'type of industries' coming-up in the industrial area based on the resource requirement along with likely pollutants with quantity from the various industries.	<p>Types of industries proposed in the project will be as follows:-</p> <ul style="list-style-type: none"> • Automobiles Industries • Readymade Garments • General Manufacturing Industries • Electronic and Electric Equipment's 																									

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		<ul style="list-style-type: none"> • Auxiliary Industry • CETP <p>Quantification of the pollutant is not possible as quantification depends on capacity of plant to be installed. Such details will be available only after allotment of plots.</p>	
VIII.	The project boundary area and study area for which the base line data is generated should be indicated through a suitable map. Justification of the parameters, frequency and locations shall be discussed in the EIA.	Monitoring Site selection is based on Coverage value of all the 8 locations, coverage value of these locations is higher in their respective directions. Map (10 km buffer) for which base line data is generated is attached as Annexure-XV	Details are given in Chapter-3 (Under 3.3)
XIX.	Submit Legal frame work for the implementation of Environmental Clearance conditions - to be clearly spelt out in the EIA report.	Pre Construction phase HSIIDC will be responsible for all EC conditions, in post construction particular land owner will be responsible for EC conditions spelt out in EIA report.	----
XX.	Submit Roles and responsibility of the developer etc. for compliance of environmental regulations under the provisions of EP Act.	Roles and responsibilities of the developer has been enclosed as Annexure- XV	Roles and responsibilities of the developer has been enclosed as Annexure- XV
XXI.	Site justification of the identified industry sectors from environmental angle and the details of the studies conducted if any	Site justification of the identified industry sectors from environmental angle has been given in FEIA Reports	----
XXII.	Ground water classification as per the Central Ground Water Authority.	Ground water is classified as the critical zone as per CGWB.	Ground water is classified as the critical zone as per CGWB.
XIII.	Submit the source of water, requirement vis-à-vis waste water to be generated along with treatment facilities, use of treated wastewater along with water balance chart taking into account all forms of water use and management.	During 223 rd EAC meeting the committee asked for the detailed plan for achieving 100 % ZLD. Thus the plan is revised accordingly which reduces the water demand. Total water requirement has been estimated to be 9635 KLD (approx.) in phase-II. Total fresh water	Details are given in Chapter-2 (Under Table – 2.5 & Fig-2.3)

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		requirement of the project phase-II estimated to be approx. 4955 KLD, which will be sourced from ground and water withdrawal permission has been obtained from CGWB. The water balance diagram has been incorporated in EIA.	
XIV.	Rain water harvesting proposals should be made with due safeguards for ground water quality. Maximize recycling of water and utilization of rain water. Examine details.	Rain water harvesting proposals will be made as per the applicable norms	----
XV.	Examine soil characteristics and depth of ground water table for rainwater harvesting.	Panchkula district is conspicuously flat topography. topography represents a flat surface gently sloping from north-east to south-west. The depth to water level during pre-monsoon period in the district ranges between 8.11 mbgl and 29.44mbgl. The Depth to water level during post-monsoon period in the district ranges between 6.78 mbgl and 29.00mbgl.	---
XVI.	Examine details of solid waste generation treatment and its disposal.	Total quantity of solid waste produced in this project will be 40 MT. This being an industrial project we must plan for following: <ol style="list-style-type: none"> 1. Municipal waste 2. Commercial waste 3. Institutional waste 4. Garbage waste 5. Street sweeping waste 6. Construction and demolition waste 7. Sewage waste and 8. Most important i.e. Industrial wastes and hazardous wastes 	
XVII.	Examine and submit details of use of solar energy and alternative source of energy to reduce the fossil energy consumption.	HSI IDC promote the solar energy across the industrial estate that will reduce the fossil energy consumption.	----

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VIII.	In case DG sets are likely to be used during construction and operational phase of the project, emissions from DG sets must be taken into consideration while estimating the impacts on air environment. Examine and submit details.	Incremental 24-h GLC of NO ₂ was 9.258 µg/m ³ . High to moderate wind speed and minimum stack height of 30 m facilitates dispersion at the distance of 400 m East under the influence of local meteorology. Spatial distribution of 24-hours average NO ₂ concentrations (µg/m ³). Moderate to high wind speed and stack height of 30 m facilitates dispersion at long distance of 400 m, East under the influence of local meteorology	----
XIX.	Examine road/rail connectivity to the project site and impact on the traffic due to the proposed project. Present and future traffic and transport facilities for the region should be analysed with measures for preventing traffic congestion and providing faster trouble free system to reach different destinations in the city	Nearest railway station is Chandigarh at 15.22 km in the direction NNW, nearest airport is Chandigarh International Airport at 17.42 in the direction WNW.	----
XX.	A detailed traffic and transportation study should be made for existing and projected passenger and cargo traffic.	<p>Trip Generation for IE</p> <ul style="list-style-type: none"> • No of trips of Car $4081 / 2 = 2040$ • No of trips of 2 Wheelers $10590 / 1.5 = 7060$ • No of trips of Bus $7170/30 = 239$ • No of trips of Cyclist $5842 / 1 = 5842$ <p>Trip Generation from Surrounding Acres</p> <ul style="list-style-type: none"> • Assuming that 10 % additional load will be generated from surrounding areas on main roads • No of trips of Car $2040 / 10 = 204$ • No of trips of 2 Wheelers $7020 / 10 = 702$ • No of trips of Bus $239/10 = 24$ • No of trips of Cyclist $5842 / 1 = 584$ 	-----

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XXI.	Examine the details of transport of materials for construction which should include source and availability.	<p>Trip Generation of Trucks for lifting Product from IE</p> <ul style="list-style-type: none"> • Acre of Industrial = 982739 Sqmtrs • Load generated = $0.01 \times 982739 = 9827$ sqm • Assuming that 40 % material will be lifted by Trucks & 60% material will be lifted by 4 wheelers • Assuming carrying capacity on one truck =10 tons • Assuming Carrying capacity one 4 wheeler = 3 tons • No of Trips of Trucks = $9827 \times 40 \% / 10 = 799.88$ Says 393 Trips • No of Trips of 4 Wheelers = $9827 \times 0.6 / 3 = 1965$ /trips 	
XXII.	Examine the details of National Highways/State Highways/ expressways falling along the corridor and the impact of the development on them.	Site has connectivity with the national highway, NH-73 at 0.8 km in the west direction, It is beneficial for the project, since vehicles for traffic and transportation will be easily access to the project site.	---
XIII.	Examine noise levels - present and future with noise abatement measures	Noise level is below the limit of the CPCB guidelines all the sectors such as Industrial area, residential area, silence zone. Details are mentioned in chapter 3.	---
XIV.	Identify, predict and assess the environmental and sociological impacts on account of the project. A detailed description with costs estimates of CSR should be incorporated in the EIA / EMP report.	<p>Detail of Environmental Impacts are given in chapter-4 and sociological impacts are given in chapter-3.</p> <p>A detail description with costs estimates of CSR is given in chapter-7</p>	Details are given in Chapter-7, Under – 7.13
XV.	Examine separately the details for construction and operation phases both for Environmental		

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	Management Plan and Environmental Monitoring Plan with cost and parameters.		
XVI.	Submit details of a comprehensive Disaster Management Plan including emergency evacuation during natural and man-made disaster.	Disaster Management Plan and risk assessment is given in Chapter-7	Details are given in Chapter-7.
XVII.	Any further clarification on carrying out the above studies including anticipated impacts due to the project and mitigative measure, project proponent can refer to the model ToR available on Ministry website “ http://moef.nic.in/Manual/Industrial Estate ”.	ToR compliance is prepared as suggested.	
ADDITIONAL TOR POINTS (as per 223rd EAC MOM)			
i.	Submit revised EIA/EMP report as per generic structure defined in the EIA Notification, 2006 as amended from time to time.	Revised EIA/EMP report as per generic structure has been uploaded	
ii.	Submission of Form-2 in hard copy.	Hard Copy of Form-2 in accordance with revised EIA has been submitted along with EIA	
iii.	Details of commitments made by proponent during Public Hearing in tabular form.	Details of public hearing along with commitment made by PP has been incorporated in EIA	
iv.	Detailed plan for achieving 100% ZLD for the proposed project.	Revised ZLD plan has been incorporated in EIA	
v.	Details of CER (on slab basis) as per provisions of Ministry’s OM dated 1st May, 2018.	Detailed CER budget has been incorporated in EIA and attached as ANNEXURE	
vi.	Undertaking that no activity has been started for this project.	Undertaking that no activity has been started for this project has been attached as ANNEXURE	
vii.	Undertaking that proposed site is not situated in the critically polluted area as identified by CPCB.	Undertaking has been attached as ANNEXURE	
viii.	Proponent is required to make detailed presentation before EAC providing	Noted	

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	information about all queries raised by EAC during appraisal process of this project.		
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CHAPTER-1
INTRODUCTION

1.1 Purpose of the Report

Environmental Impact assessment (EIA) is a process of identifying, predicting, evaluating and mitigating the biophysical, social and other relevant effects of developmental proposals prior to major decisions being taken. EIA provides general information pertaining to purpose of the report, identification of project and project proponent. It also includes scope of study as well as regulatory scoping and organization of the report. The objective of EIA is to foresee the potential environmental problems that would arise out of a proposed development and address them in the project's planning and design stage. The EIA process will allow for the communication of this information to:

- (a) The project proponent
- (b) The regulatory agencies
- (c) All stakeholders and interest groups.

As per the EIA notification of the Ministry of Environment, Forests and Climate Change Govt. of India (MoEF&CC), dated 14th September 2006 and its amendments, the project falls under activity 7(c) in Schedule of EIA notification and environmental clearance from MoEF&CC is to be obtained as it falls under Category A. Further to assess the impact on environment due to construction and operation of above mentioned units it is necessary to ascertain present Environment status prevailing at the project site. Further prediction of impacts is to be ascertained due to proposed construction and operation on the environment.

1.2 Identification of project & project proponent

The present project is for the development of Industrial Estate located at Barwala, Dist-Panchkula, Haryana. Project site is spread over 660.74 acres, where phase-I of 102.99 acres was conceptualized and developed and now the project is expanding with the proposal to develop phase-II of 557.75 acres, for which environmental clearance has been applied.

Industrial Estate Barwala is established by HSIIDC. HSIIDC is a Public Limited Company wholly owned by the Government of Haryana, set up as a catalyst for promoting and accelerating the pace of industrialization in the State. The corporation provides a wide spectrum of financial

services under one roof- the concept being "Total Financial Support" for its clientele. Being an intrinsically customer - oriented organization, HSIIDC has often gone beyond the call of duty in helping to give concrete shape to the destiny and vision of thousands of entrepreneurs. HSIIDC is proposing to provide the infrastructure facilities in the form of construction of roads along with its allied works i.e. foot path etc., laying of public health services comprising water supply distribution network including OHSR, UGR, sewerage system, drainage network, laying of waste water distribution system, laying of external electrification network, street lights, construction of CETP & Rain water harvesting system etc.

1.3 Scope of Work

The present report is the Final EIA/EMP covered the following points:

- The study area is delineated and is marked on survey of India Topo-sheet Map.
- Assessment of general physico-chemical quality of water in the study area covering ground and surface water sources.
- Assessment of sediment quality and its texture of the water bodies in the study area.
- Collection of information on ecologically sensitive targets (Reserved and protected forest, Wild Life Sanctuary, Bird Sanctuary, Endangered Species of flora and fauna) in the study area of the project.
- Study of Socio-Economic Impact of the Industrial Estate project, developed by Haryana State Industrial and Infrastructure Development Corporation (HSIIDC).
- Prediction of impact of Industrial Estate on biological Environment.
- Study of land use pattern through appropriate techniques.
- Assessment of qualitative and quantitative waste load likely to accrue from the project during pre construction, construction and operation phases of the project.
- Study of land use of project area and impact of the project.
- Establishment of baseline conditions in respect of Ambient Air Quality, Noise Levels and Soil Quality in the study area through primary data collection. The parameters and number of sampling locations has been decided based on requirements indicated in EIA manual prepared by the Ministry of Environment, Forests and Climate Change The Environment Management Plan (EMP) is prepared for all three phases of the project (Pre construction, construction and operation phases) covering the following aspects:

- Environment Monitoring Plan.
- Risk Assessment & Disaster Management Plan (RA & DMP).
- Post Project Monitoring Plan, and
- EMP Implementation Plan.
- EMP Costs.

ToR is awarded for the project on 18th June 2015 vide letter no. [F.No. 21-36/2015-IA.III]. Copy of the same is attached as **Annexure-I**.

1.4 Methodology

Methodology and generic structure of EIA report are discussed as per the EIA notification dated 14.09.2006 of MoEF and its amendments. Baseline data was generated for the post-monsoon season (Oct-Dec 2015) as per the approved ToR vide letter no. F.No. 21-36/2015-IA.III. dated 18th June 2015. Secondary data were procured from Govt. reliable source to compare and validate the data generated at the site. Data was analyzed and discussed as per the generic structure of EIA report as given below.

EIA report consists of twelve chapters:

- Introduction
- Project description
- Description of environment
- Anticipated environment impacts & mitigation measures
- Analysis of alternatives
- Environment monitoring program
- Additional studies
- Project benefits
- Environment cost & benefit analysis
- Environment management plan
- Summary & conclusion
- Consultant Disclosures

As per EIA notification, Draft EIA/EMP report had been submitted to Regional Office of the State Pollution Control Board for public hearing to include public opinion about the project as per the standard procedure of public hearing. Draft EIA/EMP report had been modified and final copy is prepared to be submitted to MoEF for Environment Clearance.

1.5 Need for the Project

An Industrial Estate can be defined as a tract of land developed and sub divided into plots, according to a comprehensive plan with provision for roads, transport and public utilities with or without built up factories, sometimes with common facilities and sometimes without them, for the use of a group of industrialists. Industrial Estates are an important tool for stimulating industrial growth, providing cost-effective infrastructure and communal services.

Industrial development in an area plays significant role in improvement of economy of state and potential of employment generation. Industrial Estate Barwala is being developed as an Industrial hub in the District Panchkula of Haryana. It is anticipated that employment generation may increase up employment in the area. Government of India's decision regarding foreign direct investment has made direct impact in this direction and has given boost to industrialization.

1.5.1 Contributions of Industrial Estate to Economic and Industrial development

Industrial Estate Serve:

- a) To promote rapid industrialization of the country
- b) To increase national and local employment
- c) To attract private investment both national and foreign
- d) To promote the development of small domestically owned industries
- e) To improve product quality and increase productivity
- f) To bring industries and industrial employments to rural areas
- g) To train labors and increase its productivity

1.5.2 Legal Requirement

Industrial Estates come under the schedule 7 (c) according to EIA notification 2006 & its amendments. There are two categories under schedule 7 (c), category "A" & category "B". Category "A" project required clearance from MoEF&CC while category "B" projects required clearance from their respective Authorities (SEIAA). Industrial Estate Barwala comprises of 660.74 acres of land comes under "A" category as the project area has Haryana-Punjab Border lies at a distance of 4.08 km, West, hence it require clearance from MoEF&CC through Application in Form 1 with draft ToR & Pre-Feasibility Report for grant of final TOR and a final EIA/EMP Report after public consultation.

1.6 Generic Structure of the EIA Report

This EIA report presents the existing baseline scenario and the assessment and evaluation of the environmental impacts that may rise during the construction and operational phases of the project. This report also highlights the Environmental Monitoring Program during the construction and operation phases of the project and the post project-monitoring program. The contents of the report are as follows:

Chapter 1: Introduction

The chapter provides description of purpose of the report, identification of the project and project proponent, brief description of the nature, size, location of the project, scope of the study of this report..

Chapter 2: Project Description

This chapter summarizes various aspects of the project (based on the Detailed Project Report study); type of project and also the need of the project along with the environmental aspects that are likely to cause any environmental effects.

Chapter 3: Description of the Environment

This chapter describes the baseline environment conditions in the 10 km study area of the project through monitoring (primary study), discussions and research of published materials (secondary assessment). This also deals with the infrastructural development as a part of project.

Chapter 4: Anticipated Environmental Impacts & Mitigation Measures

This chapter presents the analysis of environment and social aspects of the site as a result of proposed development, thereby suggesting the mitigation measures.

Chapter 5: Analysis of Alternatives

This chapter discusses the various attenuation considered in developing the project. It also compares the technical, financial and environmental feasibility of the project, where applicable

Chapter 6: Environmental Monitoring Plan

This chapter includes the technical aspects of monitoring the effectiveness of mitigation measures which will include the measurement methodologies, frequency, location, data analysis, reporting schedules, for monitoring budget

Chapter 7: Additional Studies

This chapter will detail about the public consultation sought regarding the proposed project and also will assess the social impact of the project on the masses. It will also identify the risks of the Project in relation to the general public and the surrounding environment during construction and operation of the project and thereby presents disaster management plan.

Chapter 8: Project Benefits

The realization of the project activity is envisaged to impart benefits economy in concern. This chapter will identify the benefits coming from the project and summarize them.

Chapter 9: Environmental Cost Benefit analysis

This chapter will cost benefit analysis of the proposed Project. Infrastructure development costs on environment and causes degradation. Technology is applied to increase production, generate employment & business opportunity and improve state economy.

Chapter 10: Environmental Management Plan

It is the key chapter of the study and presents the mitigation plan, covers the institutional and monitoring requirements to implement the proposed environmental mitigation measures and assess their adequacy during project implementation. Budgetary provisions for environmental monitoring are also presented.

Chapter 11: Summary and Conclusion

This chapter will include an overall justification for implementation of the project and explain how the adverse effects have been mitigated.

Chapter 12: Disclosure of the Consultant

Names of consultants engaged in the preparation of the EIA report along with and nature of Consultancy rendered is included within Quality Council of India (QCI) policy in this chapter.

1.7 Government Policies and Its Impact on Industries:

- Government of India's decision regarding foreign direct investment has made direct impact in this direction and has given boost to industrialization in the region.
- State Govt. too has offered incentives or investments to come in India.

- Haryana Industrial & Infrastructure Development Corporation (HSIIDC) is the nodal agency for the purpose.

Industrial development plays significant role in the improvement of economic conditions and employment generation. The Key factors in industrial development are:

- Government
- R&D Institution
- Industry

CHAPTER-2
PROJECT DESCRIPTION

2.1 Type of the Project

The project is an Industrial Estate project of Phase- II Barwala, Industrial will have campuses for industries, Industrial plots, residential facilities, labour housing, multi-specialty hospital, commercial and institutional areas etc. An industrial area is a parcel of improved land developed and subdivided into plots for accommodation of industrial establishments and offered for sale or lease. Its size may allow advantage to be taken of economies of scale in providing the infrastructure, which may be passed on to the occupants. The project is categorized as 7(c) project as per the schedule under the EIA Notification, 2006 and its amendments. project area is 660.74 acres which has been divided into two phases. Phase –I is of 102.99 acres (An existing area developed before 2002) and phase- II 557.75 acres – Expansion of the existing unit. Land has been acquired by HSIIDC under section 4 and section 6 of the Land Acquisition Act 1984. The land documents enclosed as **Annexure-II**.

The details of the area of the land acquired in six villages for the phase-II as per Award No. 4 District Panchkula (for year 2011-12) dated 12/12/2011, announced by Sh.G.S, Virk District Revenue Officer-cum Land Acquisition Collector, Panchkula are given in Table 2.1

Table 2.1: Total area Acquired for Phase-II

S.no.	Land Acquired from villages	Total area to be acquired in Acres	Area in Possession in Acres	Area under Litigation in Acres
1.	Alipur	141.487	140.081	1.405
2.	Toka	24.606	24.606	-
3.	Khangesra	345.706	216.068	129.637
4.	Khatauli	38.518	38.518	-
5.	Sukhdarshanpur	2.962	2.962	-
6.	Naggal	4.468	4.468	-
	Total	557.75	426.703	131.042

The area statement for the Industrial Estate Barwala, Phase-I & II is given in Table 2.2 & 2.3

Table 2.2: Area Statement for phase –I

S.No	Description	Area In acres
1	Area Under Plots	60.73
1.	Area Under Multi Specialty Hospital	5.88
2.	Area Under Bank, Police Station, HSIIDC Office	1.72
3.	Area Under Hotel cum Restaurant	0.72
4.	Area Under Convenience Shopping Center	0.45
5.	Area Under Way side Amenities	2.22
6.	Area Under Tube well/ OHSR	1.50
7.	Area Under Disposal System	1.27
8.	Area Under Green Belt, Open Spaces, Roads etc.	28.50
Total Area Under Scheme		102.99

Table 2.3: Area Statement for phase –II

S.No	Description	Area In sq.m.	Area In acres
1.	Total Area	2257117	557.75
2.	Area to be Planned Later	11250	2.78
3.	Net Planned Area	2245867	554.97
	Land Use		318.54
4.	Area Under Industrial Plots	982731	242.84
5.	Area Reserved for Institutional Purpose	96881	23.94
6.	Area Reserved for Commercial Purpose	23310	5.76
7.	Area Reserved for RR Policy	186154	46.00

	Utilities		236.43
8.	Area Under Electric Substation	12140	3.00
9.	Area Under OHSR	18494	4.57
10.	Area Under Fire Station	8053	1.99
11.	Area Under ESI Dispensary	5544	1.37
12.	Area Under CETP	6030	1.49
13.	Area Reserved for Multilevel Parking	14771	3.65
14.	Area Under Solid Waste Disposal Site	6273	1.55
15.	Area Under Roads & Open Spaces	455069	112.45
16.	Open Area	135090	33.38
17.	Green Area	27429	6.78
18.	Green Belt	25437	6.29
19.	Green Avenue	2,42,447	59.91

2.2 Need for the project

The Proposed Phase-II development project (Area=557.75 Acres) will allot the plots after development as per the final development plan, on completion will be fully grown with necessary infrastructure facilities in all respects and would attract entrepreneurs both local and national players in the state and certainly would lead to economic growth, social inclusion and environmental sustainability of the region in particular and country in general.

2.3 Project location and Site Surroundings

The Industrial Estate will be located at Haryana-Punjab border, near an Air Force station. Geographical coordinates are 30°36'20.00"N & 76°57'22.57"E. The nearest airport to the site is Chandigarh International Airport which is 16.45 km (NW) and the nearest railway station is Chandigarh Railway Station which is 16.45 km (NW). The Punjab State Boundary lies within 4.08(W).

The location plan is given as Figure 2.1. Google map of 500m, 2km, 5km, 10 km is enclosed as Annexure-IV.

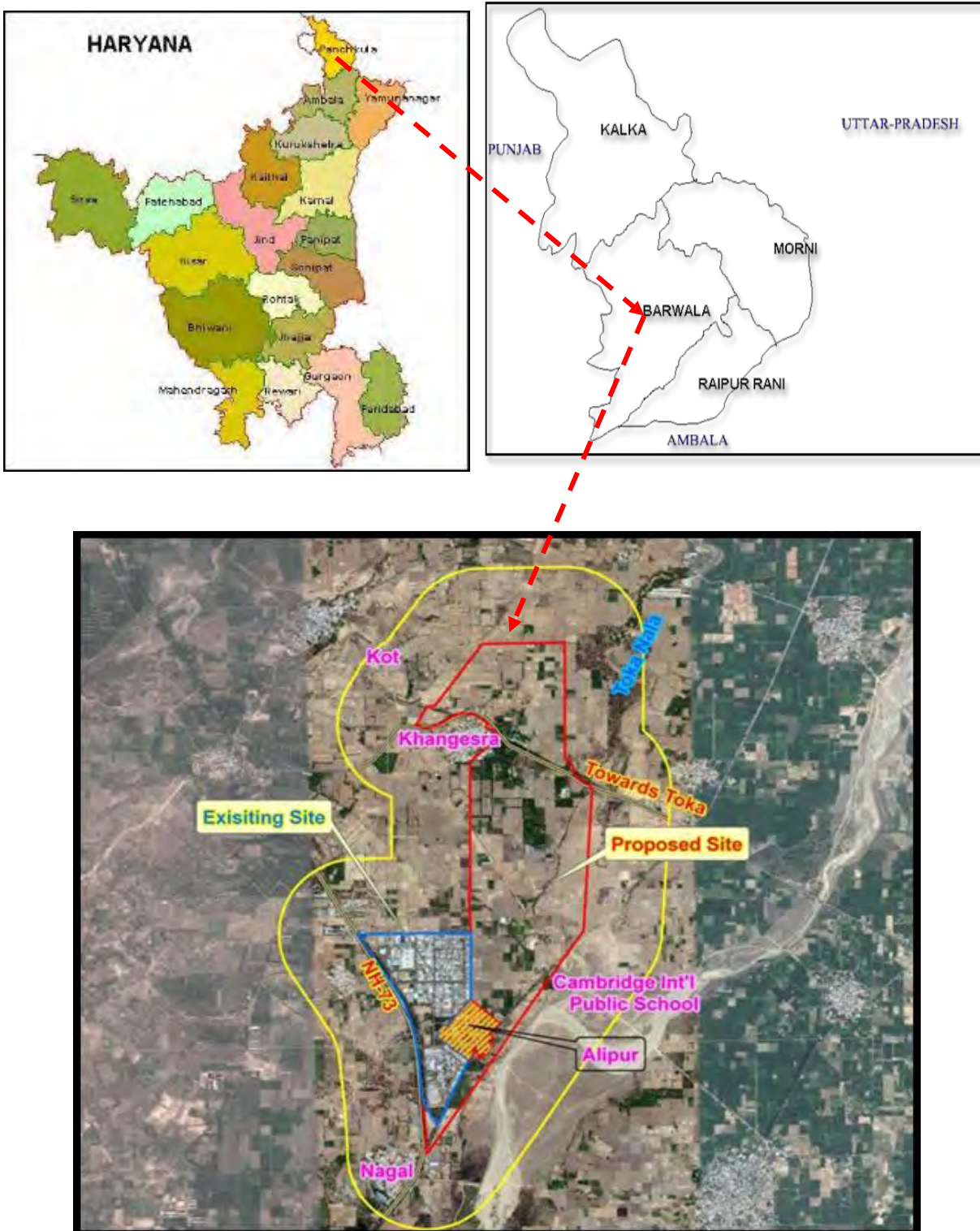


Figure 2.1(a): Location Map of project site





Figure 2.1(b): Project Site Location

2.4 Size and the Magnitude of the Project

The project is spread over an area of 660.74 acres. However, HSIIDC proposes to provide services such as water supply, waste management, sanitation etc. to the villages. Industrial Estate will have campuses for industries, Industrial plots, rehabilitation and resettlement facilities, commercial and institutional areas, multi-specialty hospital, etc.

2.5 Land form, Land use, Ownership

Entire area has been designated for the development of Industrial Estate as per the master plan approved by Dept. of Town & Country Planning, Haryana. The HSIIDC acquired the land from these villages and the details of land acquisition are given in **Annexure- II**

Land use of the project site: Land has been acquired from surrounding villages. Land acquisition has been completed & compensation has already given to the villagers. Documents regarding ownership of HSIIDC on land are attached as **Annexure II**. Proposed land use planning of the site is industrial and same is attached as **Annexure III**.

2.6 Topography

The topography represents a flat surface gently sloping from north-east to south-west. Soil composition is sandy-loam with pH value ranges from 7.0-8.5, which is suitable for agriculture purposes. The soil is good for building construction with bearing capacity of 13 metric tones per square meter at a depth of 2.5 meters. The ground configuration represents good surface gradient for efficient drainage system. The average annual rain fall is about 1105 millimeter. However, the area is free from floods. The sufficient quantity of good quality potable ground water is available in the area. For further details contour plan of the site is attached as **Annexure VI**.

2.7 Population

Populations will include residential population as well as employees. Total population in the residential area will be 8260 persons (3660 + 4600). Total no. of employees after 3 year i.e. at the time of handling over of possession will be 1527 persons (582 in construction + 945 in industrial activities).

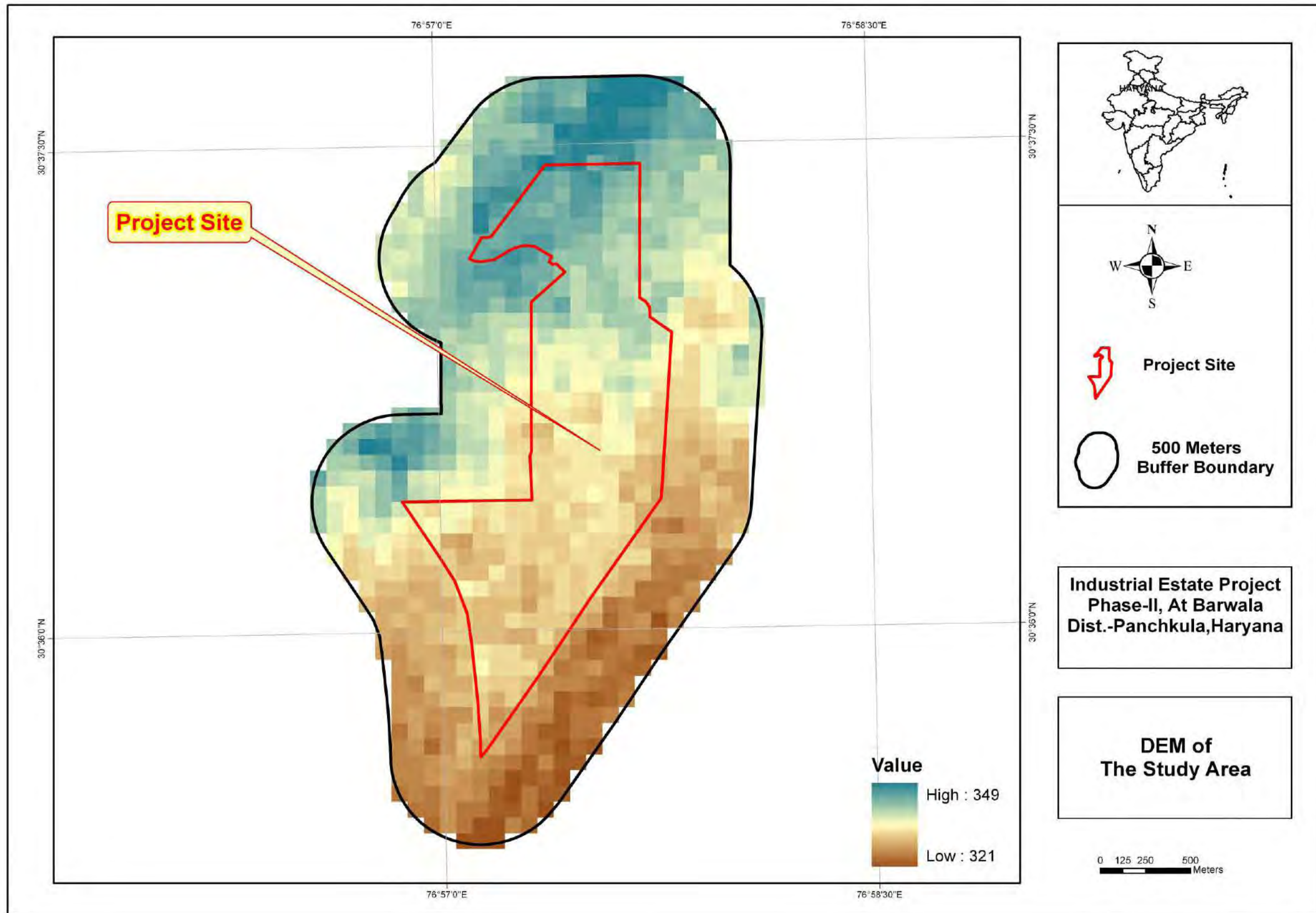


Figure 2.2: DEM of project site

2.8 Types of Industries

Different types of industries will be developed in the Industrial Estate.

Some of them are:

- Manufacturing Industries.
- Automobiles industries.
- Mechanical Industries.
- Rubber industry.
- readymade garments industry
- Other than above mentioned industries will take separate Environment Clearance as per EIA notification 2006 and its amendments, and other statutory clearances from the competent authority if required.

2.9 Infrastructure Development Proposal for Project

1. **Existing Structure:** Phase-I of the Project, at Barwala is already functional. Land for proposed Phase-II, is already acquired but is devoid of infrastructural facilities in which construction is proposed. The site is connected directly with National highway, NH-73 which is passing from the distance 0.8km (west) of project site; SH-1 is passing from the distance 6.3km (ESE) of the project site.

2. **Proposed Structure:** Some other infrastructure facilities will also be provided at the project site such as commercial area, institutional area, R&R, Electric substation, Fire station, ESI Dispensary, CETP, solid waste disposal site, multilevel parking, area under road, green area and open area etc.

Industrial Area - Total area of the project is of phase-II is 557.75 acres. Net planned area of phase-II is 554.97. Out of total plot area, area under industrial plot is 242.84 acres which is 43.76 % of the net planned area.

Commercial area & Institutional use: Commercial area & institutional area of the site covers around 29.70 acres land which is 5.45 % of the net planned area.

Other areas: Other than the commercial area, industrial plots and institutional area, industrial estates includes public utilities, sub stations, club, workers housing & labour welfare centre & chowk, area reserved for green/social infrastructure required for village and green area covers around 282.43 acre which is 50.89 % of the net planned area.

Residential Area – Net plot area of the project is 554.97 acres. Out of total plot area, residential area is 46 acre which is 8.29 % of the net planned area.

Green area open spaces & Parking - An area of 218.81 acre is proposed for Green belts, Open spaces and parking, which is 39.43 % of the net planned area.

Different varieties of plants will be used as per requirements i.e. for parks, parking area, avenues etc. Common trees which are going to be planted are Neem, Amultus, Pipal, Palkhan and Maulsiri, Samel & Alstonia. Fine grassing & landscaping is proposed in all the parks. Side plantation will be carried out as per norms on foot paths

Road Side Plantation		
No. of Plants	6818	nos.
No. of Shrubs	16364	nos.
Rough Grassing Area	25.8	Acres.
Green Parks		
No. of Plants	416	nos.
No. of Shrubs	1592	nos.
Area	6.78	Acres.
Green Belt		
No. of Plants	119	nos.
No. of Shrubs	456	nos.
Area	6.27	Acres.

Administrative Setup: The duties of the administration will depend on the services to be provided. The administration is proposed to have three divisions - managerial, technical and financial. An overview of the responsibilities of the divisions is given in Table 2.4

Table 2.4: Responsibilities of Industrial Estate Administration

DIVISION	RESPONSIBILITIES
Managerial Division	<ul style="list-style-type: none"> • To implement the admission of the sponsors • To enforce the restrictive covenants in lease agreements • To maintain the buildings and services on the estate • To arrange the payment of taxes and all charges that may be levied on the estate and the wages of estate employees • To collect rents and other dues from tenants • To be responsible for the general good order of the estate
Technical Division	<ul style="list-style-type: none"> • This division of the administration is responsible for the common facilities, technical and training services that are provided • Operation of the central workshop and other common facilities • Operation of plant hire scheme • Preparation of feasibility studies and project reports for tenant enterprises • Provision of marketing information • Organization of training schemes
Environment Division	<ul style="list-style-type: none"> • Organization of exhibitions • An Environment Officer is responsible to comply all the environment standards applicable with the specific project.
Financial Division	<ul style="list-style-type: none"> • The functions of the division are • Either to provide direct loans to estate tenants or to guarantee loans extended to tenants by commercial banks • To arrange bulk purchasing of materials • To allocate scarce materials to estate enterprises

2.10 Cost of the Proposed Scheme

As to date HSIIDC have acquired 660.74 acres (Phase I + Phase II) of land has been allocated for project at Barwala.

The project cost that HSIIDC allocated to 557.75 acre:

Land cost : 278 crores

Development cost : 253 crores

Total Cost : 531 crores

This will include common infrastructural facilities, CETP and other necessary development processes that are required for the efficient working of the Industrial Estate.

2.11(a) Power Requirement: For power requirement a 66 kV (Phase-II) sub-station is proposed to supply power in the area.

2.11(b) Water Requirement: During 223rd EAC meeting the committee asked for the detailed plan for achieving 100 % ZLD. Thus the plan is revised accordingly which reduces the water demand. Total water requirement is 9635 KLD in phase-II. Total fresh water requirement of the project phase-II is estimated as 4955 KLD. The water balance diagram is given in Fig. 2.3; the fresh water requirement will be fulfilled by ground water.

Table 2.5: Water Requirement in Phase-II

PHASE WISE DETAILS	FRESH WATER REQUIREMENT	WASTEWATER GENERATION	TOTAL RECYCLED WATER	WATER LOSSES DURING REIRCULATION
PHASE-II	4955 KLD	6100 KLD	4680 KLD	1420 KLD

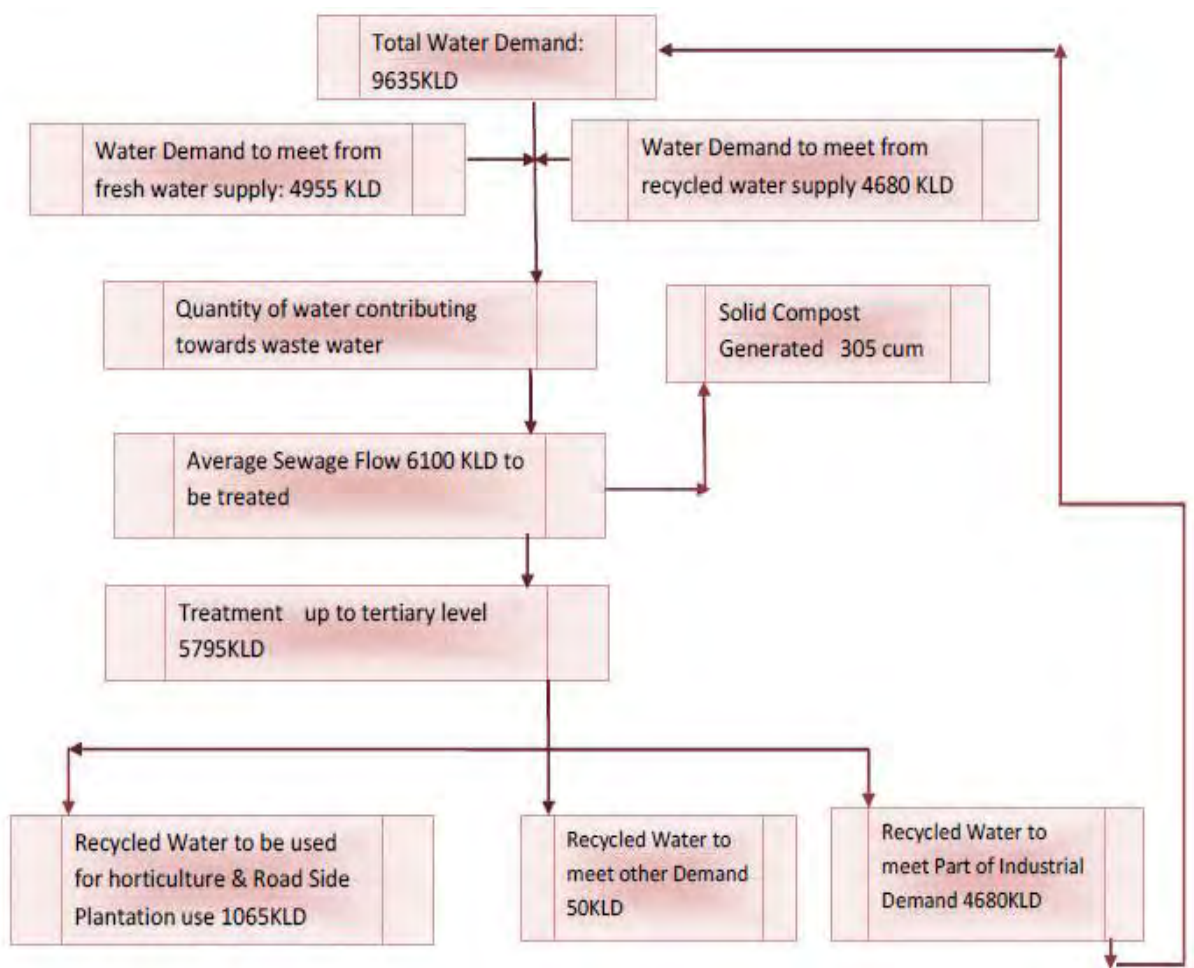


Figure 2.3: Water balance diagram of phase-II

2.12 Estimation of Waste Generation and Disposal Methodology

Industrial revolution followed by the advances in information technology during the last century has radically changed people's lifestyle. Although this development has helped the human race, mismanagement has led to new problems of contamination and pollution. The technical processes evolved during the last century have posed a new challenge for managing of wastes. For example, personal computers (PCs) contain certain components, which are highly toxic, such as chlorinated and brominated substances, toxic gases, toxic metals, biologically active materials, acids, plastics and plastic additives.

The hazardous content of these materials pose an environmental and health threat. The wastes generated from an Industrial Project at Barwala will be varied comprising industrial, domestic, institutional, commercial and landscape wastes. Waste generated will range from biodegradable to non biodegradable Domestic wastes which can be further classified into recyclable and inert wastes, E Waste, Hazardous Waste and Bio Medical Waste from clinics. Industrial wastes will depend upon the types of industry.

Domestic wastes include kitchen wastes, recyclable waste while institutional wastes include paper, packaging wastes, e-wastes etc. Landscape wastes consist of mowed grass, twigs etc. It is aimed to provide an effective solid waste handling scheme in the proposed Industrial Project at Barwala, wherein wastes will be collected and stored temporarily at site. Biodegradable wastes will be composted at site. Recyclable wastes will be sold to recyclers, and authorized recyclers, where applicable. E Waste, Hazardous Waste and Bio Medical Waste will be disposed as per rules. Buy back arrangement will be made for used batteries.

'E-waste' is a popular, informal name for electronic products nearing the end of their useful life. E-wastes are considered dangerous, as certain components of some electronic products contain materials that are hazardous, depending on their condition and density. The hazardous content of these materials pose a threat to human health and environment. Discarded computers, televisions, VCRs, stereos, copiers, fax machines, electric lamps, cell phones, audio equipment and batteries if improperly disposed can leach and lead other substances into soil and groundwater. Many of these products can be reused, refurbished, or recycled in an environmentally sound manner so that they are less harmful to the ecosystem.

Solid waste management would be carried out with following provisions:

- Provision of infrastructure like tricycles, brooms, handcrafts etc.
- Provision of motorized vehicles for collection & transportation.
- Provision of bins for primary collection & construction.
- Installation of bins at different locations.
- Provision of hydraulic vehicles for lifting of bins for transportation of garbage.

The principle aim of waste management is to sustain the environment by ensuring that waste does not contaminate the environment at such rate or in such a form or quantity as to overload natural assimilative processes and cause pollution. Awareness would be created among industrial association and housing societies.

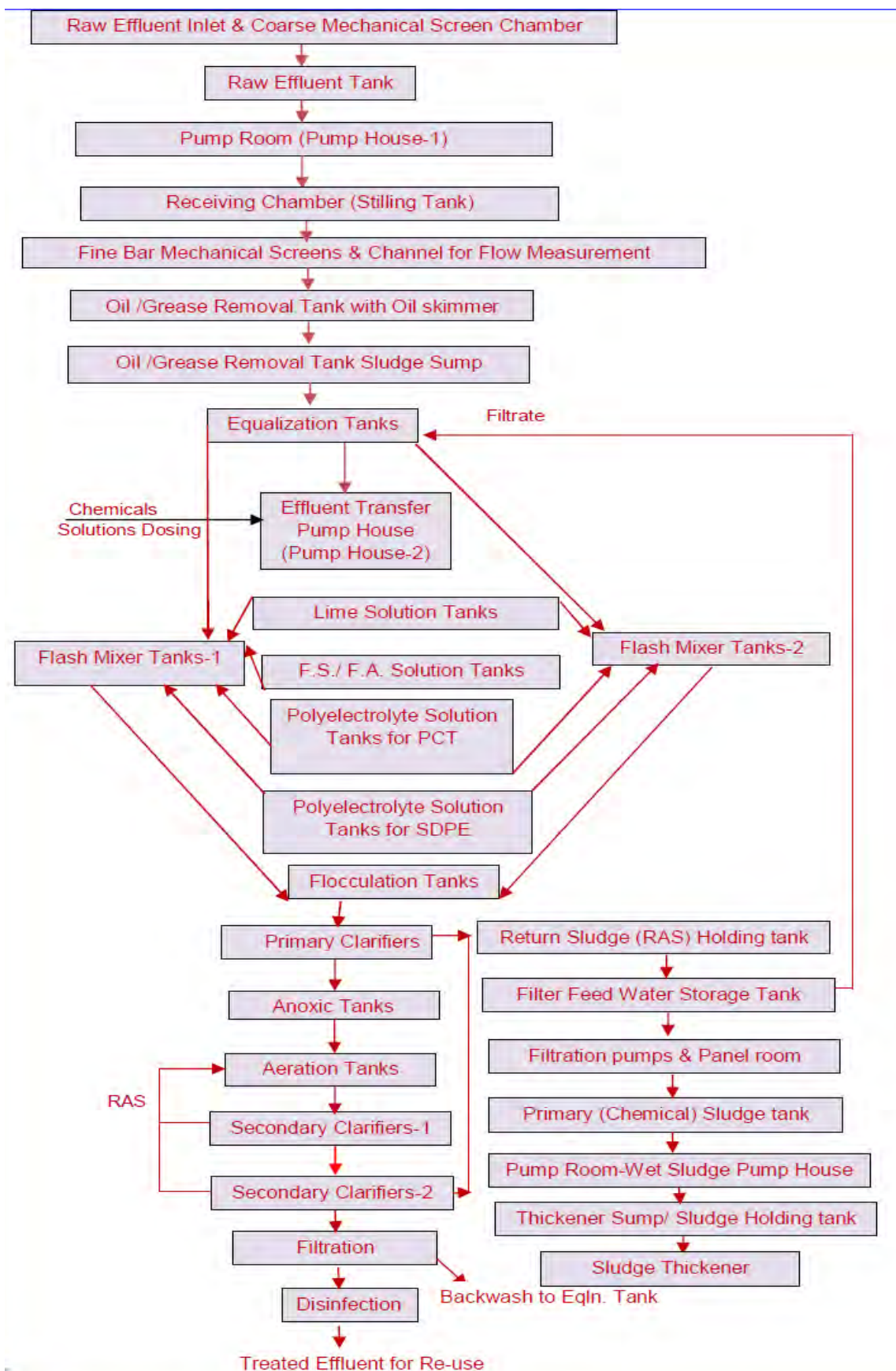
Organic waste such as food waste, wood or other biodegradable waste can be composted and later used as manure. Recyclable waste like plastics, metals etc can be recycled. Use of CETP sludge for agriculture is acceptable only when it is free from hazardous constituents. The primary sludge due to presence of hazardous constituents will be disposed off in TSDF. The secondary sludge from biological treatment containing nutrients shall be used as for the green belts in initial stages.

Adequate means of access would also be provided from the place of storage to a collection point specified by the waste collection authority. Colored wheeled bins would be provided such as dark grey for non-recyclable waste, green for kitchen food/compostable garden waste, blue for paper (generally used for flats, offices etc.) and black box will be used for cans and plastic collection.

The total solid waste generated from residential plots, industrial plots and other areas will be segregated and recyclable material will be sold to government approved vendors. The solid waste will be managed by Solid Waste (Management & Handling), Rules 2000; Hazardous Waste (Management & Handling) Rules 1989 and its amendments.

Some portion of the wastewater generated from the tertiary treatment of CETP will be reused for horticulture, road side plantation, industrial demand, washing, processing and flushing of toilets etc. Schematic flow diagram is given in Fig. 2.4

Fig 2.4 SCHEMATIC FLOW DIAGRAM OF PROPOSED CETP OF 6.5 MLD



Effluent collection Network & Treatment

The waste water estimation has been done on the basis of 25 KL with demand for industrial & Institutional plots & green area while 10 KL/Acre for open area & as per details in annexure 'A'. The assessment of the waste water has been done on the basis of the ultimate requirement of the total area to be developed. Phase II (New area being developed)

- Ultimate Water Contributing towards waste water 9635 KLD
- Ultimate Waste water generated = 6100 KLD

Proposal

- Construction of CETP of 6.1MLD Capacity to cover the requirement of Phase II

Design and Optimization of Wastewater Network

- Design and optimization of Wastewater collection network will be done as per CPHEEO guidelines.

Quality of Effluent

Waste water from the following categories is expected and the quality there off is as described against each.

Transportation Equipment

This category of Industry is light engineering and is expected to generate waste water containing mineral oil and grease, cutting and coolant oil, and domestic/canteen waste water, copper ingredient from wire drawing operation and acidic/alkaline water from cold rolling operation requiring pre- treatment for removal of copper, iron, nickel and heavy metal etc.

Machinery & Equipment

This category of Industry is generally of dry operation and hence it may generate mostly sludge type waste water and traces of heavy metals from floor washing Readymade Garments.

This category of Industry is both dry operated and water intensive such as woven and knitted fabrics and the waste water containing shop solutions and other cleaning detergent and thus need treatment to remove chemicals.

Rubber Industry

This category of Industry generally generates only a small quantity of suspended solids (fine rubber particles, oil and Grease etc.

Auto Mobile Parts

This category of Industries is mostly of dry operation and expected to generate domestic / canteen waste and sludge. The Washing machine and floors of the Industry are likely to generate Oil and Grease, Acidic over Alkaline Waste and traces of heavy metals.

Miscellaneous

These categories of Industries are generally of dry operation except fresh fruits and vegetable and lubricant which generate biodegradable waste, acidic waste and Grease.

The proposed Industrial operation are not highly polluting categories but is expected to have waste water of sludge and acidic / alkaline in nature with moderately high oil and grease contents and light engineering Industries. Where wire dry operations are done may generate waste containing copper ingredients and heavy metals.

Process Design

Based on the practice being followed in HSIIDC, the parameters decided by HSIIDC vide letter no 3230-3248 Dt 31-7-2019, the Treatment based on primary, physicochemical, biological (extended ASP) with Biological nutrient removal, tertiary treatment have been proposed to be adopted.

Proposed Inlet Parameter for Design

The production /manufacturing process will not involve raw leather processing/leather tanning, therefore concentration of pollutants in the effluent shall be mild. The domestic sewage of the industrial area will be mixed with trade effluent. The expected characteristics of composite equalized untreated / raw effluent (assuming that in future few leather dyeing units may also contribute effluent) are given in Table.

The effluent from different industrial units, whose discharges coming to CETP, shall not exceed the discharge of effluent per day than already indicated by them to HSIIDC and consent of the same taken from Haryana State Pollution Control Board and the effluent of individual Industrial Unit shall not exceed the following parameters given in Table-3. HSIIDC to instruct the Industrial Units accordingly to install flow meter and putting up their ETP's so that discharge from the Industrial Units is within the standards prescribed in Table.

It has been learned from the past that the industries in HSIIDC comes in Phases and at the initial stage of infrastructure development, it cannot be assessed that what type of industries

will come in particular Industrial Estate. Hence, to cover all type of permissible industries vide their memo no. 3230-3248 on 31/7/2019 in consultation with HSPCB the inlet parameter are fixed for designing of CETP by HSIIDC.

Accordingly, the following parameters at inlet for design of CETP and outlet parameters after tertiary treatment have been proposed.

Raw Effluent Characteristics:

Raw Effluent characteristics will be as follows:

S.No.	Description of Parameter	Proposed Inlet Parameter for Design
1	pH	5.5-9.0
2	BOD	550 mg/l
3	COD	1550 mg/l
4	TSS	1200 mg/l
5	Oil & Grease	100 mg/l
6	Chromium Total	Less than 5
7	Phenolic Compound	Less than 5

Required Characteristics of Treated Effluent after Tertiary Treatment

S.No.	Description of Parameter	Proposed Inlet Parameter for Design
1.	pH	6.5-8.5
2.	BOD	Less than 5 mg/l
3.	COD	Less than 50 mg/l
4.	TSS	Less than 20 mg/l
5.	Oil & Grease	Less than 5 mg/l
6.	Chromium Total	Less than 2 mg/l
7.	Phenolic Compound	Less than 1 mg/l
8.	Temperature	Less than 25 deg. C
9.	Fecal Coliform Nos.	Less than 100 per 1000
10.	Total residual chlorine	Less than 1.0 mg/l

S.No.	Description of Parameter	Proposed Inlet Parameter for Design
11.	Lead (as Pb)	Less than 0.1 mg/l
12.	Total Kjeldahl nitrogen (as N)	Less than 100 mg/l
13.	Arsenic (as As)	Less than 0.2 mg/l
14.	Cadmium (as Cd)	Less than 1.0 mg/l
15.	Selenium (as Se)	Less than 0.05 mg/l
16.	Nickel (as Ni)	Less than 3.0 mg/l
17.	Dissolved Iron (as Fe)	Less than 0.5 mg/l
18.	Cyanide (as CN)	Less than 0.2 mg/l
19.	Chlorides (as Cl)	Less than 1000 mg/l
20.	Fluoride (as F)	Less than 2.0 mg/l
21.	Sulphate (as SO ₄)	Less than 1000 mg/l
22.	Sulphide (as S)	Less than 2.0 mg/l
23.	Pesticides	Absent
24.	Manganese (as Mn)	Less than 0.5 mg/l
25.	Mercury (as Hg)	Less than 0.01 mg/l
26.	Zinc (as Zn)	Less than 4.0
27.	Colour and odor	Refer Note.

Notes:

1. The permissible standards for Fixed Dissolved Solids (FDS) at inlet and outlet shall be maximum 2100 mg/l or as per CPCB/HSPCB norms.
2. After tertiary treatment, the value of ammonium (NH₄) shall be ≤ 5 , total N shall be ≤ 10 and fecal coliform shall be ≤ 100 .
3. Other parameters and factors for planning & designing of the CETP's will be carried out in compliance of relevant manuals of CPHEEO/guidelines/standards/codes issued by concerned authorities to make the plant efficient, economical and structurally safe.

The common effluent treatment plant would have following treatment units.

- Raw Effluent Inlet
 - Screen chamber/Collecting Tank
 - Fine Screen, Oil cum grease removal traps,
 - Grit removal system / Pre-settlers.
 - Pump House-1
 - Equalization tank
 - Chemical House–Chemicals Store, Solution tanks and dosing pumps.
 - Flash mixing Tanks,
 - Flocculation Tank,
 - Primary Clarifier.
 - Aeration Tank.
 - Anoxic Tank
 - Secondary clarifier
 - Return activated sludge (RAS) Pump House-2
 - Sludge handling system – Filter press.
 - Tertiary Treatment Pump House-3.
 - Dual Media Pressure Filters.
 - Wet sludge pit and Pump House-4
 - Dry Sludge Store / Shed
- The combined effluent from contributing units shall be conveyed under gravity flow through sewer lines approaching to CETP area. A sluice gate shall be provided in the main inlet channel. Effluent shall pass through bar screens (manual cleaned) for removal of pieces & other coarse floating matter. Bar screens would be cleaned regularly in order to prevent surge in level / accumulation of influent into the sewers. The effluent shall enter into wet well and pumped into elevated receiving chamber followed by Oil/grease removal traps. The pumps of Pump house (through MC panel) shall be fitted with on-line flow meters and linked to level controllers for automatic ON / OFF operation.
- Equalization tank of sufficient capacity is provided to dampen the variations in terms of volume and strength and to achieve a consistent effluent quality in downstream processes.

- The combined effluent from equalization tank would flow (under gravity) into three stage flash mixer followed by flocculation tank. Chemical solutions - ferrous sulphate and lime would be added in the first two flash mixers and poly electrolyte solution into the flocculation tank with the help of dosing pumps attached to chemical dosing tanks. Mixing in dosing tanks and flash mixers shall be done through mixers.
- The chemicals with effluent get completely mixed by rapid mixing in flash mixers whereas slow mixing in flocculation tank allows formation of bigger size flocs which results in fast settling in Primary clarifier. The pH of the mixture of ferrous sulphate and effluent in flash mixer is maintained around 8.5 by adjusting dosing of lime solution.
- After floc formation, this mixture enters into Primary clarifier where sludge settles at bottom and the clear effluent collected through launders flows into aeration tank. The sludge from the primary clarifier is withdrawn into wet sludge pit with the help of valve provided in the valve chamber.
- In addition to colour and suspended solids removal, physico-chemical treatment would remove about 20% of BOD load of the raw effluent. The remaining portion of soluble BOD & COD load (organic material present in the effluent) would be removed by biological treatment process.
- The chemically treated effluent from the primary clarifier would be subjected to aerobic biological treatment (activated sludge process) in the aeration tank for removal of residual BOD and COD load up to a desired level. Activated sludge process (ASP) allows for the oxidation of bio-degradable matter in carbon-dioxide, water and conversion into bio-cell mass. The cell mass concentration in the aeration chamber is maintained at required level by maintaining flow rate of sludge recycling from the secondary clarifier. Proper mixing of bio-cells mass with the effluent and necessary oxygen supply for oxidation of bio-degradable matter by aerobic bio-mass in aeration tank is done by means of Activated sludge with fixed type mechanical surface aerators (which have least maintenance).
- The nourishment of good biological activity of microbes requires nutrients i.e. “Nitrogen (N) and “Phosphorous” (P) which are vital elements for the growth of new cells

(biomass) in the effluent. The required DAP and urea shall be added for this purpose. The mixture of treated effluent and bio-mass from the aeration tank would flow into secondary clarifier for separation of bio-mass in the form of sludge. Settled active bio-mass at the bottom of secondary clarifier would be swept by mechanical scrapper into a sludge well provided at the central position of clarifier.

- The sludge slurry is collected under gravity into RAS pump sump, where from active sludge would be recycled in to the aeration tank with the help of pumps so as to maintain the required degree of MLVSS and excess part (waste sludge) would be sent into wet sludge collection pit / irrigation of green belt.
- The colorless and transparent treated effluent (water) over flowing from secondary clarifier outlet launder shall pass through a long channel fitted with 90o V-notch for flow measurement and then it would be collected into Tertiary Treatment Pump House for filtration.
- Activated Carbon filters to be provided for the purpose & thus after chlorination of the treated waste water.

The combined effluent from equalization tank would flow (under gravity) into three stage flash mixer followed by flocculation tank. Chemical solutions - ferrous sulphate and lime would be added in the first two flash mixers and poly electrolyte solution into the flocculation tank with the help of dosing pumps attached to chemical dosing tanks. Mixing in dosing tanks and flash mixers shall be done through mixers

Further it is to ensure that the effluent from different industrial units, whose discharge is coming to CETP, shall not exceed the discharge of effluent per day than already indicated by them to HSIIDC Consent of the same taken from Haryana State Pollution Control Board. The effluent from individual industrial unit shall not exceed the prescribed limit of CPCB. HSIIDC ensures that the industrial units will accordingly install flow-meters and putting up their ETP's so that discharge from the industrial units is within the standards prescribed.

It has been proposed by HSIIDC to reuse treated effluent for horticulture, road side plantation, Industrial demand, flushing, etc.

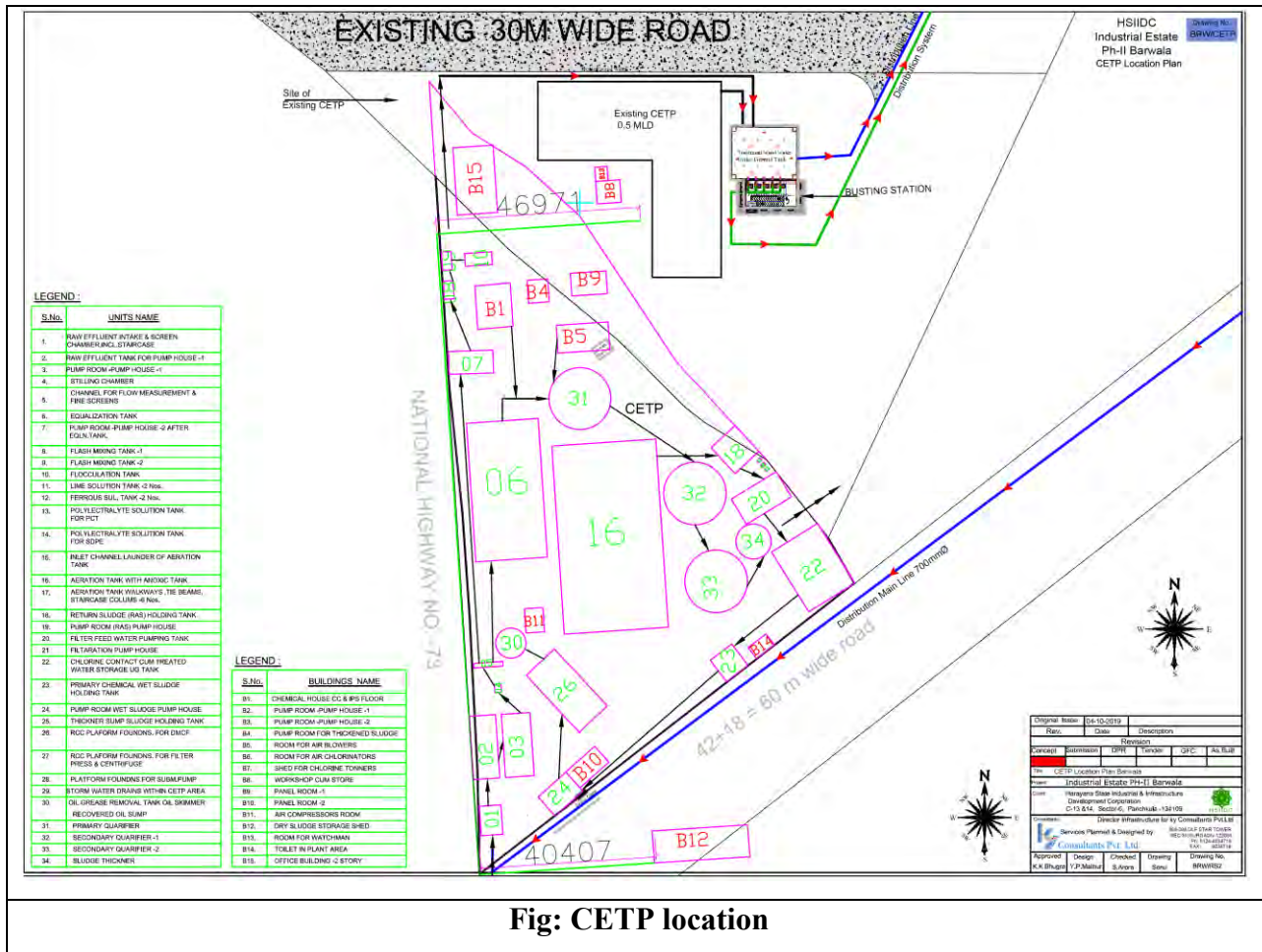


Fig: CETP location

2.13 Storm water drainage scheme: Storm water drains will be laid with RWH pits, RWH tanks and tributary of Dangri river (which is eastern side of project site) for proper rain water management.

2.14 Solid Waste Generation:

The wastes generated from an Industrial Project at Barwala will be varied comprising industrial, domestic, institutional, Bio-medical and landscape wastes. These range from biodegradable to non biodegradable wastes which can be further classified into recyclable and inert wastes. Industrial wastes will depend upon the types of industry. Domestic wastes include kitchen wastes, recyclable waste while institutional wastes include paper, packaging wastes, e-wastes etc. Landscape wastes consist of mowed grass, twigs etc. The estimated wastes generated from the proposed project are given as Table 2.6.

Table 2.6: Calculation of Solid Waste Generation

S. No.	Description	Area in Acre	Habitation	Solid waste generation Kg/capita, kg/10sqm	Total generation	
					Kg.	MT
1	Industrial Plots	242.84		0.25	24568	24.6
2	Reserved for institutional purpose	23.94		0.2	1938	1.9
3	Reserved for commercial purpose	5.76		0.3	699	0.7
4	Reserved for R&R policy	46	4600	0.4	1840	1.8
5	Undetermined use	2.78		0.3	338	0.3
6	Area under Electric substation	3		0.2	243	0.2
7	Area under OHSR	4.57		0.2	370	0.4
8	Area under fire station	1.99		0.2	161	0.2
9	area under ESI dispensary	1.37		0.2	111	0.1
10	Area under CETP	1.49		0.2	121	0.1
11	Area reserved for multilevel Parking	3.65		0.1	148	0.1
12	Area under Solid Waste Disposal Site	1.55		0.2	125	0.1
13	Area under Roads and open Spaces	172.36		0.1	6975	7
14	Green area	6.78		0.2	549	0.5
15	Open Space	33.38		0.1	1351	1.4
16	Green Belt	6.29		0.2	509	0.5
Total		557.75			40046	40.05

It is aimed to provide an effective solid waste handling scheme in the project, wherein wastes will be collected and stored temporarily at site. Biodegradable wastes will be composted at site. Recyclable wastes will be sold to recyclers, and authorized recyclers, where applicable. Buy back arrangement will be made for used batteries. Solid waste will be managed as per Municipal Solid waste (Management & Handling Rule), 2000 & bio-medical wastes will be disposed as per the provisions of the Bio-medical Waste (Management & Handling) Rules, 2011. Inert wastes will be sent to the city landfills. Domestic Waste Management flow diagram is shown in figure 2.5. Solid waste is separated into bio-degradable & non-biodegradable. The later will be provided to govt. approved agency and former will be used as manure after vermin-composting. All the completion of all the phases,

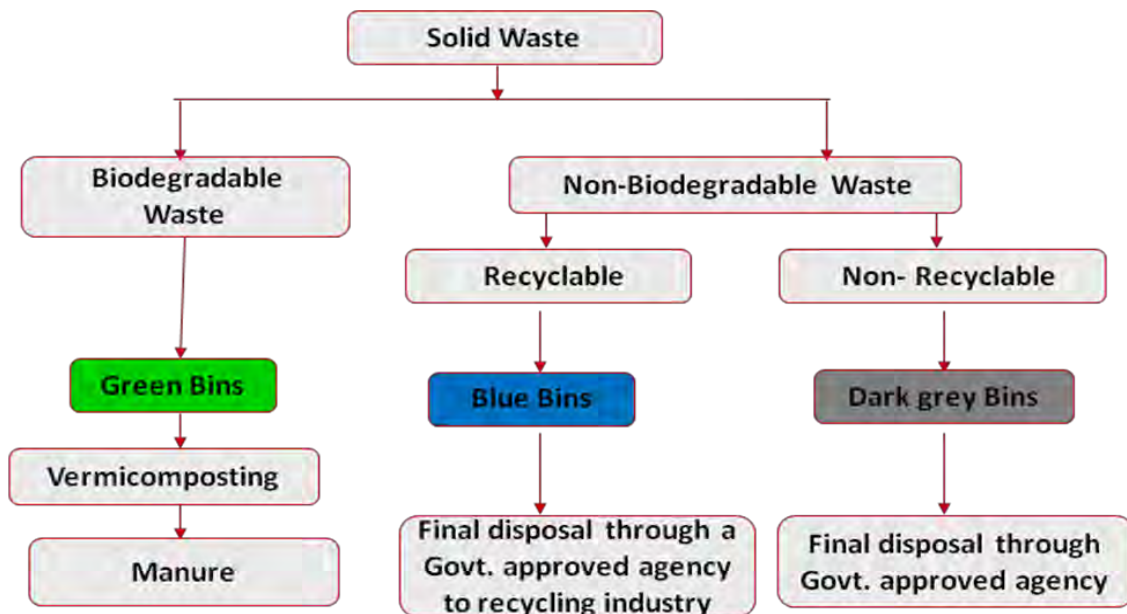


Figure 2.5: Domestic Waste Management Flow Diagram

In addition, all Hazardous Waste will be disposed off as per Hazardous wastes (Management & Handling Rule) 1989 and its amendments. All E Waste will be disposed off as per e-waste (Management and Handling) Rules, 2016. All Bio Medical waste will be managed as per 6. As now there is no hazardous waste generation in the project site. In cases if industries come up with generation of any hazardous waste then it will be disposed to Govt. approved site as per Hazardous wastes (Management & Handling Rule) 1989. There is one location in Haryana state for disposal of hazardous waste to village- Pali, Haryana.

CHAPTER-3

DESCRIPTION OF ENVIRONMENT

3.0 INTRODUCTION

Information on the existing environmental status is essential for assessing the likely environmental impacts of the project.

In order to get an idea about the existing state of the environment, various environmental attributes such as meteorology, air quality, water quality, soil quality, noise level, ecology and socio-economic environment have been studied/ monitored.

3.1 STUDY PERIOD

Baseline environmental data generation for air, water, noise and soil quality monitoring around the project site was completed from Oct 2015 - Dec 2015 representing post-monsoon season.

3.2 STUDY AREA

The present report covers baseline environmental data generated in the study area (10 km radius all around the project site for land use and the sample selection for monitoring also done within 10 km radius of the project site).

3.3 BASELINE MONITORING OF ENVIRONMENTAL COMPONENT

In order to get an idea about the existing state of the environment, various environmental attributes such as meteorology, ambient air quality, water quality, soil quality, noise level, ecology and socio-economic environment have been studied/monitored.

3.3.1 Meteorology

A meteorological station was set up at the project premises. Meteorological data was generated during the Oct-Dec 2015.

The following parameters were recorded at hourly intervals continuously during monitoring period:

- Wind speed
- Wind Direction
- Ambient Air Temperature
- Relative Humidity

Table -3.1 gives summarized meteorological data for the monitoring period (Oct to Dec 2015). Figure-3.1 gives the wind-rose diagram for the monitoring period.

Table 3.1: Summarized Meteorological Data for the Monitoring Period (Oct to Dec 2015)

Month	Wind Speed (Km/h)		Temperature (°C)		Relative Humidity (%)	
	Max.	Min.	Max.	Min.	Max.	Min.
Oct 2015	22.32	3.6	37	14	100	27
Nov 2015	20.52	3.6	32	12	100	22
Dec 2015	22.32	3.6	27	4	100	23

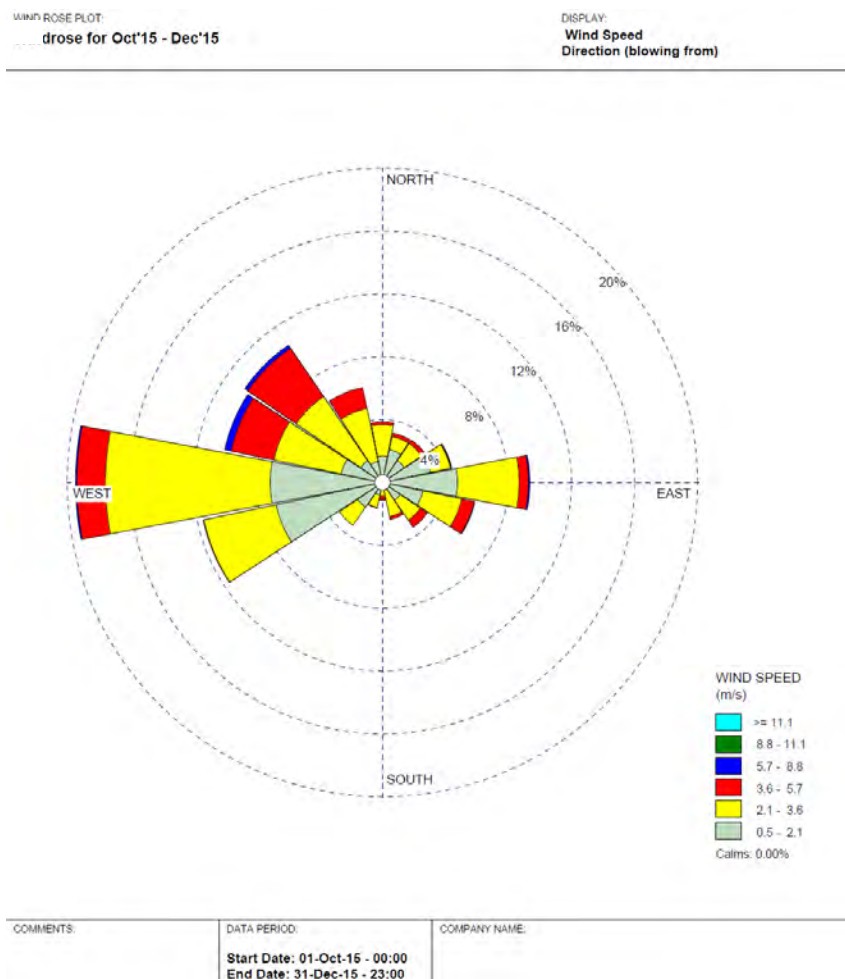


Figure 3.1: The wind-rose diagram at site for three months (Oct 2015 to Dec 2015)

3.3.2 Air Environment

To quantify the impact of the project on the ambient air quality, it is necessary at first to evaluate the existing ambient air quality of the area. The existing ambient air quality, in terms of Particulate Matter (PM₁₀), Particulate Matter (PM_{2.5}), Sulphur-dioxide (SO₂), Oxides of Nitrogen (NO₂), and Carbon Monoxide (CO), has been measured for 24 hrs except CO (1-h), at twice a week at each location.

To assess the ambient air quality level, 9(nine) monitoring stations were set up. **Table-3.2** gives location of the ambient air quality monitoring stations.

Table 3.2: Location of Ambient Air Quality Monitoring Stations

Ambient Air Quality Stations			
Station	Name	Direction	Distance(km)
AAQ1	Project Site	Centre	0
AAQ2	Alipur	E	0.21
AAQ3	Sukhdarshanpur	E	2.64
AAQ4	Batwal	ESE	3.94
AAQ5	Raipur Rani	ESE	6.84
AAQ6	Dhandaruru	SE	5.44
AAQ7	Kheri	SE	5.94
AAQ8	Haripur	SSE	6.87
AAQ9	Rehawar	SSE	5.63

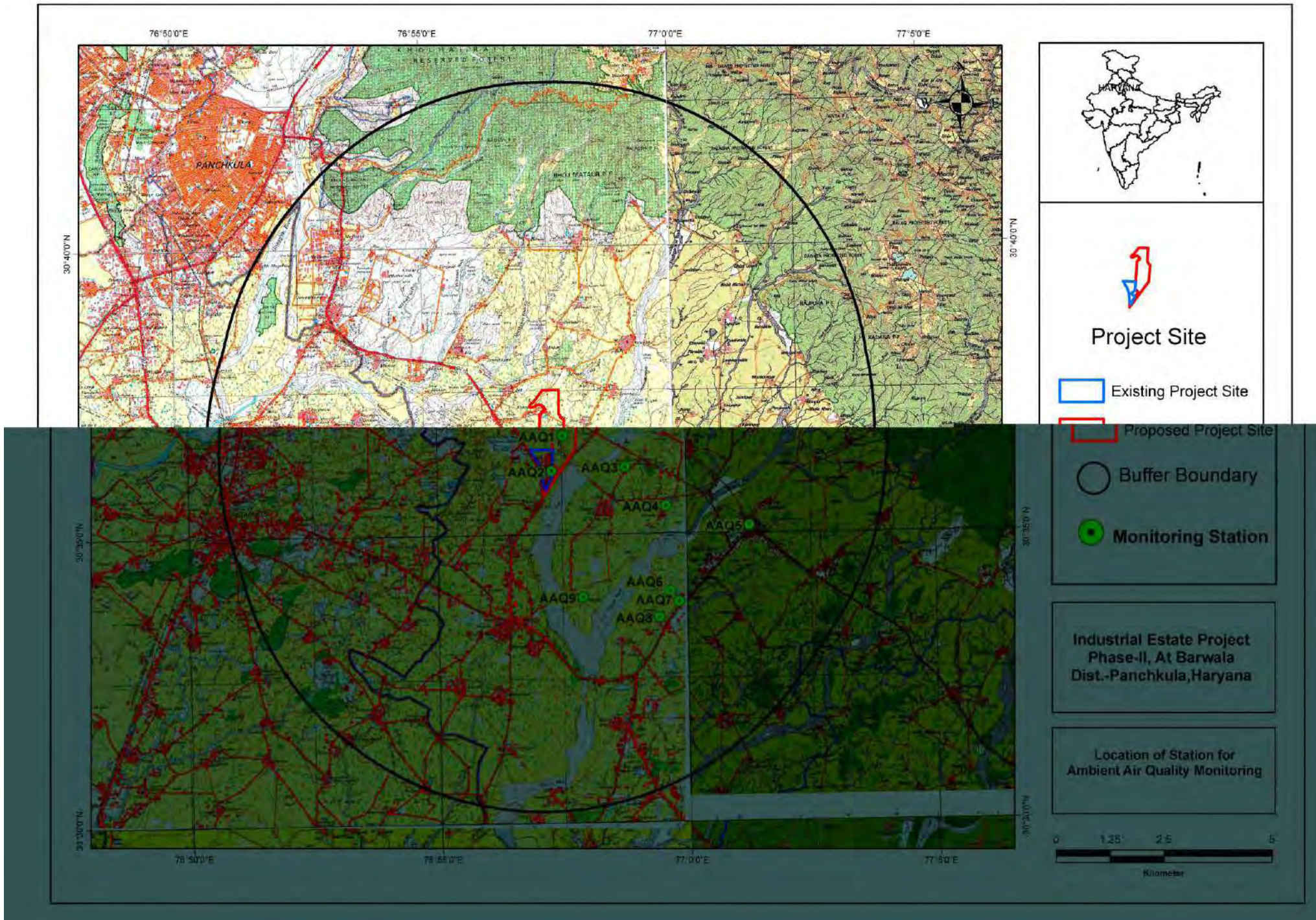


Figure 3.2: Location of Ambient Air Quality monitoring Stations

3.3.2.1 Monitoring Schedule

Ambient air quality monitoring was carried out twice a week with period of 24 hours for three months (12 weeks).

Methods of Sampling and Analysis

Fine particulate Sampler APM MFC550 & APM460BL was used for monitoring Particulate Matter (PM_{2.5} and PM₁₀); gaseous pollutants like SO₂, and NO₂ were collected by Gaseous Pollutant Sampler APM 411 and CO was monitored by Serinous 30 CO Analyser with NDIR detector.

3.3.2.2 Method for measurement of Particulate matter, SO₂ & NO₂

Method for measurement of Particulate Matter (PM₁₀) in ambient air is done by Cyclonic Flow Technique by APM460BL. Particles with aerodynamic diameter less than the cut-point of the inlet are collected by a filter. Ambient air at the monitoring location is sucked through a cyclone. Coarse and non-respirable dust is separated from the air stream by centrifugal forces acting on the solid particles and these particles fall through the cyclone's conical hopper and get collected in the sampling cap placed at the bottom. The fine dust (<10 microns) forming the particulate matter (PM₁₀) passes the cyclone and is retained on the filter paper. The mass of these particles is determined by the difference in filter weights prior to and after sampling. The concentration of PM₁₀ in the designated size range is calculated by dividing the weight gain of the filter by the volume of air sampled. A tapping is provided on the suction side of the blower to provide suction for sampling air through a set of impingers for containing absorbing solutions for SO₂ and NO₂. Samples of gases are drawn at a flow rate of 0.2 liters per minute. The APM MFC 550 is used for PM_{2.5}. This system is a manual method for sampling fine particles (PM_{2.5} fraction) and is based on Impactor designs standardized by USEPA for ambient air quality monitoring.

PM_{2.5} & PM₁₀ have been estimated by gravimetric method. Improved West and Geake method (IS-5182 part-II, 1969) has been adopted for estimation of SO₂ and Modified Jacobs-Hochheiser method (IS-5182 part-VI, 1975) has been adopted for the estimation of NO₂.

3.3.2.3 Method for measurement of Carbon Monoxide – NDIR method

Instrument used: Ecotech Serinus 30 Carbon Monoxide

This analyser is used to measure CO in ambient air, in the range of 0-200 ppm (220mg/m³) to a sensitivity of 0.05 ppm 55µg/m³). The Serinus 30 combines the benefits of Microprocess control with Non-Dispersive Infrared Spectrophotometry technology. CO concentration is automatically corrected for gas temperature and pressure changes.

3.3.2.4 Results and Discussions

The results of AAQ are given in **Annexure-V** in details and summarized in the Table form. The results when compared with National Ambient Air Quality Standards (NAAQS) of Central Pollution Control Board (CPCB) for "Residential, Rural and Other Areas". The results of ambient air quality monitoring are summarized in the Tables below:

Table 3.3 (a) Summary of Ambient Air Quality with respect to PM_{2.5}

Location	AQ 1	AQ 2	AQ 3	AQ 4	AQ 5	AQ 6	AQ 7	AQ 8	AQ9
Min	91.2	89.9	67.4	65.9	69.6	56.9	56.9	80.9	50.7
Max	113.2	107.8	91.6	84.4	88.1	76.7	75.4	99.7	74.9
Average	101.2	99.6	81.1	76.3	79.3	66.7	67.3	90.8	64.1
98 Percentile	112.4	107.5	91.5	84.4	87.7	75.7	75.4	99.3	74.6
NAAQS (For 24 hrly monitoring except CO)	60	60	60	60	60	60	60	60	60

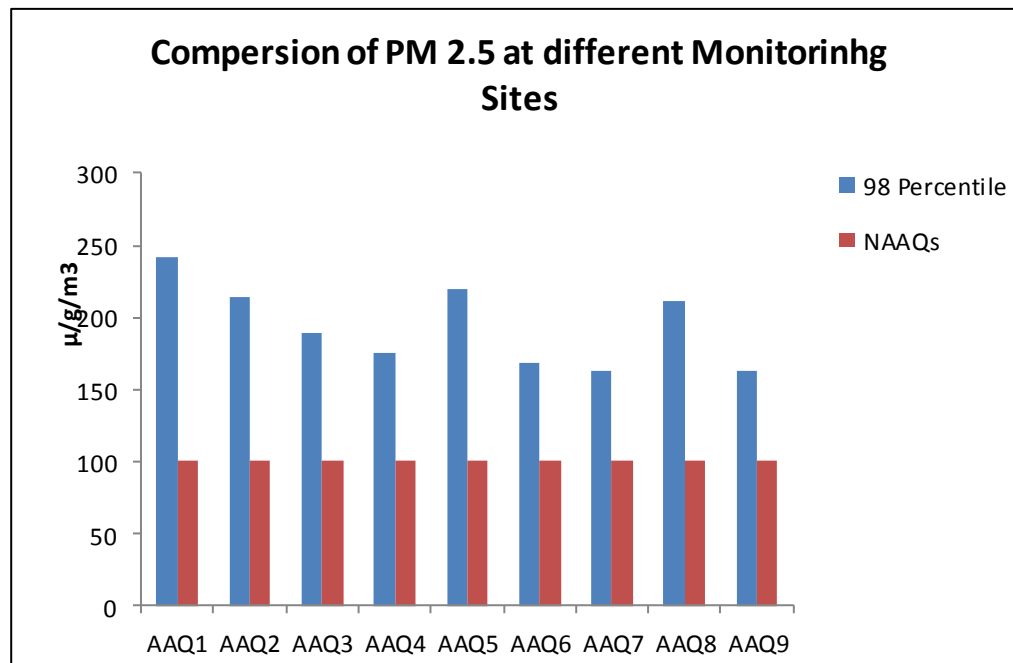


Figure 3.3: Ambient Air Quality Results of PM_{2.5}

It is clear from the above shown graphs that accountability of 98 percentile for PM_{2.5} is higher than permissible values. Reasons behind these values are NH-73 passes from 0.8 km the project; there is 59.45% agricultural area is present in 10 km boundary of the site. Which cause the higher values of PM 2.5.

Table 3.3 (b) Summary of Ambient Air Quality with respects to PM₁₀

Location	AQ 1	AQ 2	AQ 3	AQ 4	AQ 5	AQ 6	AQ 7	AQ 8	AQ 9
Min	208.9	181.8	159.6	145.9	186.7	134.6	132.9	178.8	133.6
Max	243.2	219.3	190.3	176.0	221.8	169.9	163.0	216.3	164.3
Average	223.8	195.3	173.6	161.9	203.8	151.8	149.0	192.3	147.6
98 Percentile	241.4	214.7	189.1	175.1	219.7	167.7	162.4	211.7	163.1
NAAQS (For 24 hrly monitoring except CO)	100	100	100	100	100	100	100	100	100

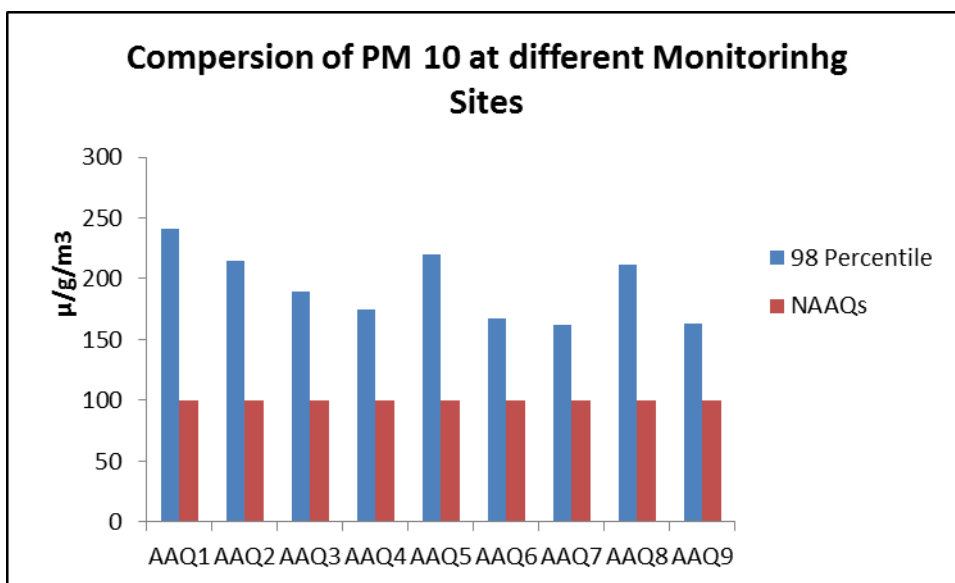


Figure 3.4: Ambient Air Quality Results of PM₁₀

It is clear from the above shown graphs that accountability of 98 percentile for PM₁₀ is higher than permissible values. Reasons behind these values are NH-73 passes FROM 0.8km the project; there is 59.45% agricultural area is present in 10 km boundary of the site. Which cause the higher values of PM 2.5.

Table 3.3 (c) Summary of Ambient Air Quality with respect to SO₂

Location	AQ 1	AQ 2	AQ 3	AQ 4	AQ 5	AQ 6	AQ 7	AQ 8	AQ 9
Min	8.8	7.9	6.1	5.8	6.3	5.6	5.6	6.8	5.1
Max	11.5	10.2	9.3	8.1	9.1	8.4	7.6	9.1	8.3
Average	9.9	8.9	7.7	6.9	7.8	7.2	6.6	7.8	6.7
98 Percentile	11.3	10.0	9.2	8.0	9.0	8.4	7.6	8.9	8.2
NAAQS (For 24 hrly monitoring except CO)	80	80	80	80	80	80	80	80	80

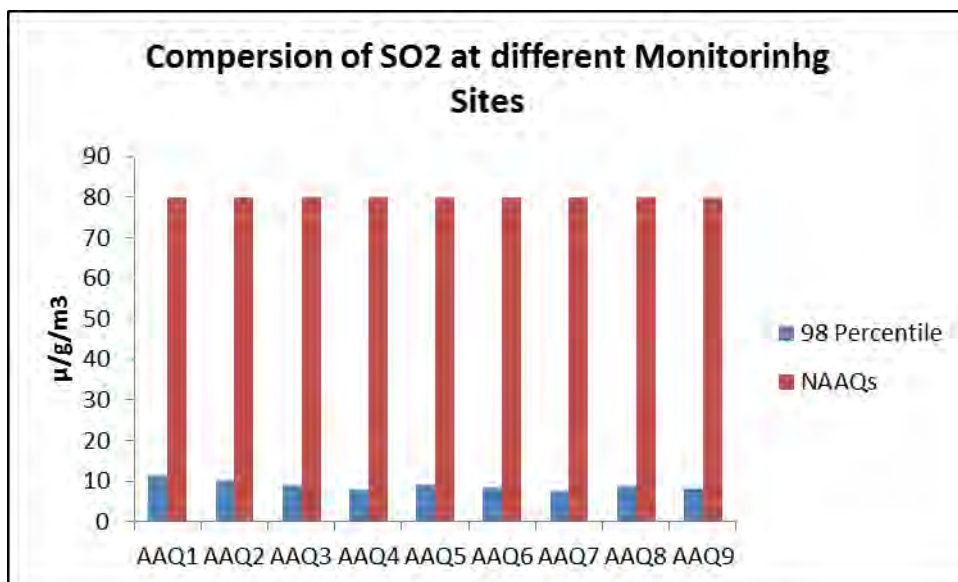


Figure 3.5: Ambient Air Quality Results of SOx

It is clear from the above shown graphs that accountability of 98 percentile for SOx are much lower than the permissible limits.

Table 3.3 (d) Summary of Ambient Air Quality with respect to NO₂

Location	AQ 1	AQ 2	AQ 3	AQ 4	AQ 5	AQ 6	AQ 7	AQ 8	AQ 9
Min	23.8	21.7	19.1	19.5	23.6	21.9	22.2	21.5	16.1
Max	34.9	33.8	30.8	30.5	30.2	29.1	33.2	31.8	27.8
Average	29.0	27.4	24.3	24.7	27.1	25.9	27.4	27.0	21.4
98 Percentile	34.4	33.8	29.9	30.0	30.1	29.0	32.7	31.6	26.9
NAAQS (For 24 hrly monitoring except CO)	80	80	80	80	80	80	80	80	80

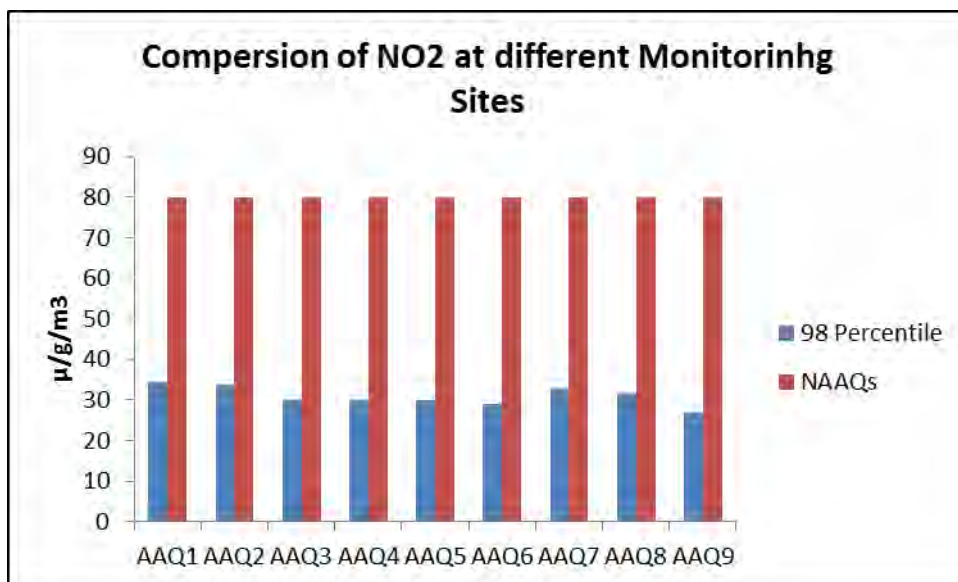


Figure 3.6: Ambient Air Quality Results of NO₂

It is clear from the above shown graphs that accountability of 98 percentile for NO₂ is much lower than the permissible limits.

Table 3.3 (e) Summary of Ambient Air Quality with respect to CO

Location	AQ 1	AQ 2	AQ 3	AQ 4	AQ 5	AQ 6	AQ 7	AQ 8	AQ 9
Min	1460	1360	1040	850	1010	820	820	1060	810
Max	1840	1630	1310	1190	1360	1170	1160	1330	1110
Average	1599	1467	1143	1006	1130	940	976	1167	941
98 Percentile	1799	1616	1301	1185	1314	1124	1155	1316	1101
NAAQS (For 24 hrly monitoring except CO)	4000	4000	4000	4000	4000	4000	4000	4000	4000

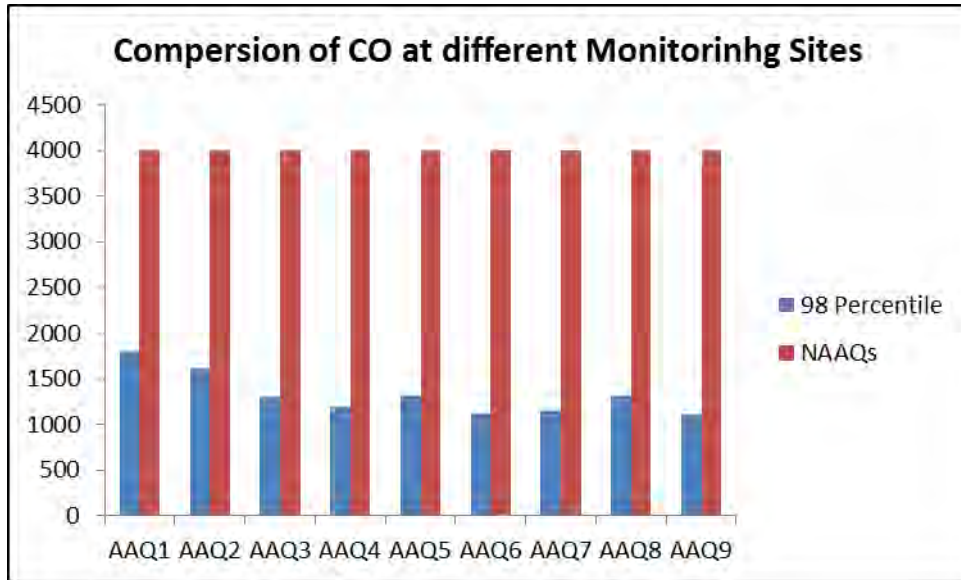


Figure 3.7: Ambient Air Quality Results of CO

It is clear from the above shown graphs that accountability of 98 percentile for CO is much lower than the permissible limits.

3.3.3 Noise Levels

Noise is one of the most undesirable and unwanted by-products of our modern life style. Excessive noise can cause neurological disturbances and physiological damage to the hearing mechanism in particular. It is therefore, necessary to measure the quantity of noise in and around the site.

3.3.3.1 Methodology

The intensity of sound energy in the environment is measured in a logarithmic scale and is expressed in a decibel, dB (A) scale. In a sound level meter, an additional circuit (filters) is provided, which modifies the received signal in such a way that it replicates the sound signal as received by the human ear and the magnitude of sound level in this scale is denoted as dB (A). The sound levels are expressed in dB (A) scale for the purpose of comparison of noise levels, which is universally accepted by the international community.

Noise levels were measured using an Integrating sound level meter manufactured by Pulsar Instruments Plc, Model NO. 91 (SL.No.B21625). It has an indicating mode of Lp and Leq. Keeping the mode in Lp

for few minutes and setting the corresponding range and the weighting network in “A” weighting set the sound level meter was run for one hour time and Leq was measured at all locations.

The day noise levels have been monitored during 6.00am to 10.00pm and night noise levels, during 10.00 pm to 6.00 am at all the 5 locations, which covers industrial area (project site) residential areas, and silence zones, available within 10 km radius of the study area.

3.3.3.2 Sampling Locations.

A preliminary survey was undertaken to identify the major noise generating sources in the area. The noise survey was conducted to assess the background noise levels in different zones. Gazettes Notification (S.O. 123(E)) of MoEF dated February 14, 2000 on ambient air quality standards has different noise levels for different zones viz. industrial, residential and silence zones.

5 sampling locations were selected for the sampling of noise levels. The sampling locations are given in Table-3.4.

Table 3.4: Noise Level at the Monitoring Stations in the Study Area

Noise Quality Monitoring Stations			
Station	Name	Direction	Distance (km)
NQ1	Project Site	Centre	0
NQ2	Alipur	E	0.21
NQ3	Raipur Rani	ESE	6.84
NQ4	Balaji Medicentre	NW	9.83
NQ5	Mt. Litera Zee School	NNW	2.26

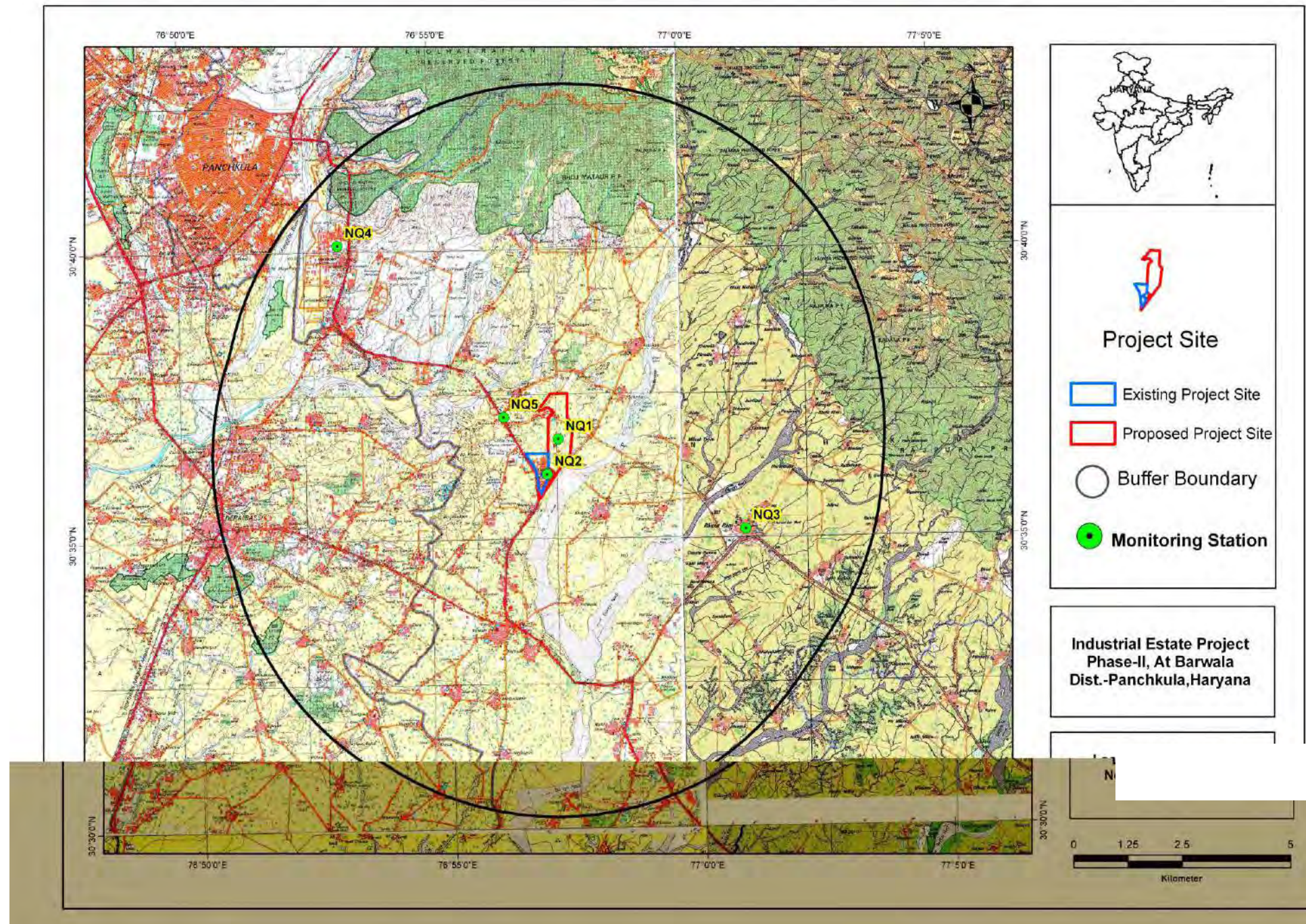


Figure 3.8: Locations of Ambient Noise Monitoring Sites

3.3.3.3 Ambient Noise Standards

MoEF & CC has notified the noise standards vide gazette notification dated February 14, 2000 for different zones under the Environment Protection Act (1986). These standards are given in **Table-3.5**.

Table 3.5 Ambient Quality Standards in respect of Noise

Area Code	Category of Area	Noise dB (A) L_{eq}	
		Daytime*	Night time*
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone	50	40

Note:

1. Daytime is from 6.00am to 10.00 pm and Nighttime is from 10.00 pm to 6.00 am.
2. Silence zone is defined as area up to 100 meters around premises of hospitals, educational institutions and courts. Use of vehicle horns, loud speakers and bursting of crackers are banned in these zones.

Ref.: MOEF Notification *vide S.O. 123(E), dated 14.2.2000* and amendments made after.

3.3.3.4 Results and Discussion

The noise data compiled on noise levels during October 2015 is given in **Table - 3.6**. It can be seen that the night time L_{eq} (L_n) varies from 36.5 to 51.2 dB (A) and the daytime L_{eq} (L_d) varies from 51.3 to 63.4 dB (A) within the study area. Low noise level is due to absence of any construction activity in the area. The results are attached as an **Annexure-VI**.

Table3.6: Noise Quality data

Noise Quality data October-2015						
S.No.	Locations	ZONE	LIMIT (as per CPCB Guidelines),Leq		RESULT (Leq)	
			DAY*	NIGHT**	DAY*	NIGHT**
1	Project Site	Industrial Area	75	70	63.4	51.2
2	Alipur	Residential Area	55	45	56.8	46.7
3	Raipur Rani	Residential Area	55	45	53.3	36.5
4	Balaji Medicentre	Silence zone	50	40	52.9	39.6
5	Mt.Litera Zee School	Silence zone	50	40	51.3	38.6

*	Day time	(6.00AM TO 10.00PM)
**	Night time	(10.00PM TO 6.00AM)

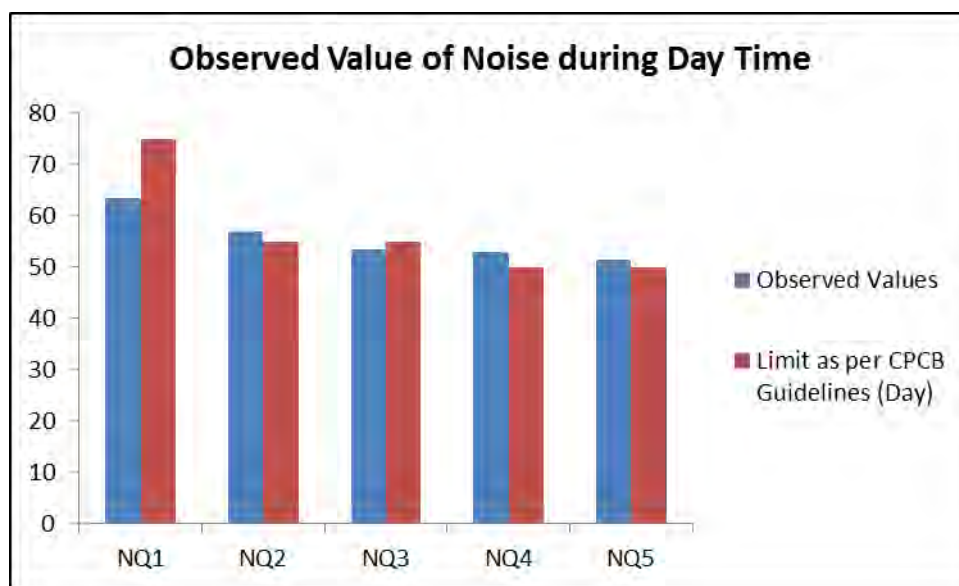


Figure 3.9: Comparison of Observed with permissible values of noise during daytime

The status of noise quality within the 10 km zone of the study area during day time is within the CPCB standards.

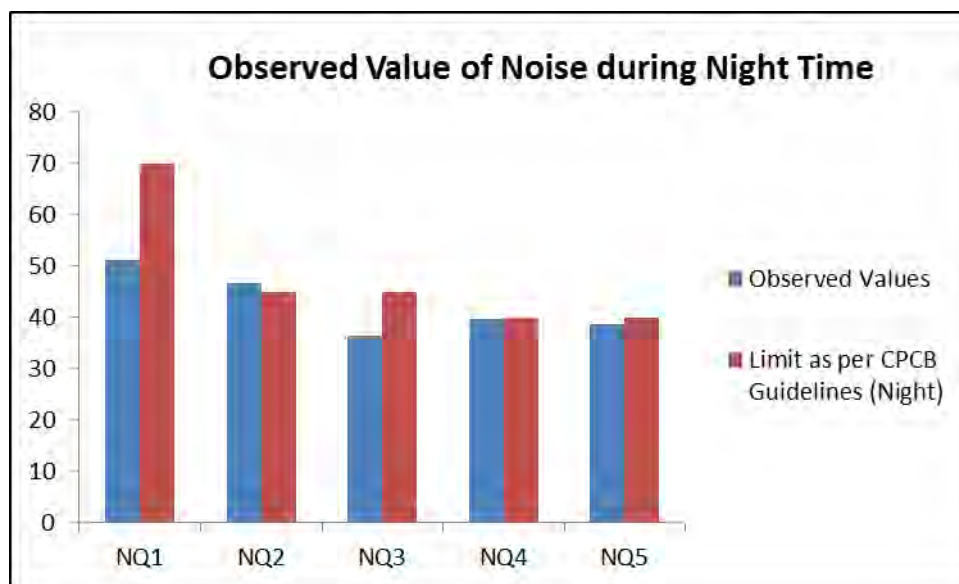


Figure 3.10: Comparison of Observed with permissible values of noise during night

The status of noise quality within the 10 km zone of the study area during night time is within the CPCB

standards.

3.3.4 Water Environment

3.3.4.1 Water Quality

Water quality assessment is one of the essential components of EIA study. Such assessment helps in evaluating the existing health of water body and suggesting appropriate mitigation measures to minimize the potential impact from development projects. Water quality of ground water has been studied in order to assess proposed water-uses in construction, drinking, cooling and horticulture purpose.

The water quality at the site and other locations within the 10 km impact zone was monitored during Oct-Dec 2015. The location of the monitoring sites are depicted in **Fig. 3.11** and **Table 3.8** and the result of the monitoring and analysis of ground water and surface water is presented in the **Annexure-VII**.

3.3.4.2 Sampling Frequency and Sampling Techniques

Parameters for analysis of water quality were selected based on the utility of the particular source of water as per MoEF & CC guidance. Hence quality of ground water was compared with IS: 10500: (Reaffirmed May: 2012) for drinking purposes. Surface water quality was analyzed for parameters as mentioned in the ‘Methods of Monitoring & Analysis published by CPCB (in **Annexure –VII** of CPCB guidelines)’ and it was rated according to the CPCB Water Quality Criteria against A, B, C, D, & E class of water based on parameters identified in the criteria. Water samples were collected as grab water sample from sampling location in a 5 liter plastic jerry can and 500 ml sterilized clean glass/pet bottle for complete physico-chemical and bacteriological tests respectively. The samples were analyzed as per standard procedure / method given in IS: 3025 (Revised Part) and standard method for examination of water and wastewater Ed. 22nd, published jointly APHA, AWWA and WPCF.

The surface water quality is compared with CPCB water quality criteria mentioned in **Table 3.7**:

Table 3.7: Water Quality Criteria as per Central Pollution Control Board

Designated-Best-Use	Class of water	Criteria
Drinking Water Source without conventional treatment but after disinfection	A	Total Coliforms Organism MPN/100ml shall be 50 or less pH between 6.5 and 8.5 Dissolved Oxygen 6 mg/l or more Biochemical Oxygen Demand 5 days 20°C 2mg/l or less
Outdoor bathing (Organised)	B	Total Coliforms Organism MPN/100ml shall be 500 or less; pH between 6.5 and 8.5; Dissolved Oxygen 5mg/l or more Biochemical Oxygen Demand 5 days 20°C 3mg/l or less
Drinking water source after conventional treatment and disinfection	C	Total Coliform Organism MPN/100ml shall be 5000 or less; pH less
Propagation of Wild life and Fisheries	D	pH between 6.5 to 8.5 Dissolved Oxygen 4mg/l or more Free Ammonia (as N) 1.2 mg/l or less
Irrigation, Industrial Cooling, Controlled Waste disposal	E	pH between 6.0 to 8.5 Electrical Conductivity at 25°C micro mhos/cm Max.2250 Sodium absorption Ratio Max. 26 Boron Max. 2mg/l
	Below-E	Not Meeting A, B, C, D & E Criteria

As per the standard practice, one sample from each station was taken each month in the study period. Sampling was done by standard sampling technique as per the Standard Methods. Necessary precautions were taken for preservation of samples.

Table 3.8: Location of Water Sampling Sites

Ground Water Monitoring Stations			
Station	Name	Direction	Distance (km)
GW1	Project Site	Centre	0
GW2	Alipur	E	0.21
GW3	Sukhdarshanpur	E	2.64
GW4	Batwal	ESE	3.94
GW5	Raipur Rani	ESE	6.84
GW6	Dhandaruru	SE	5.44
GW7	Kheri	SE	5.94
GW8	Haripur	SSE	6.87
GW9	Rehawar	SSE	4.63
Surface Water Monitoring Stations (Ghaggar River)			
SW1	Upstream	WNW	8.82
SW2	Centre	WNW	8.89
SW3	Downstream	W	9.77

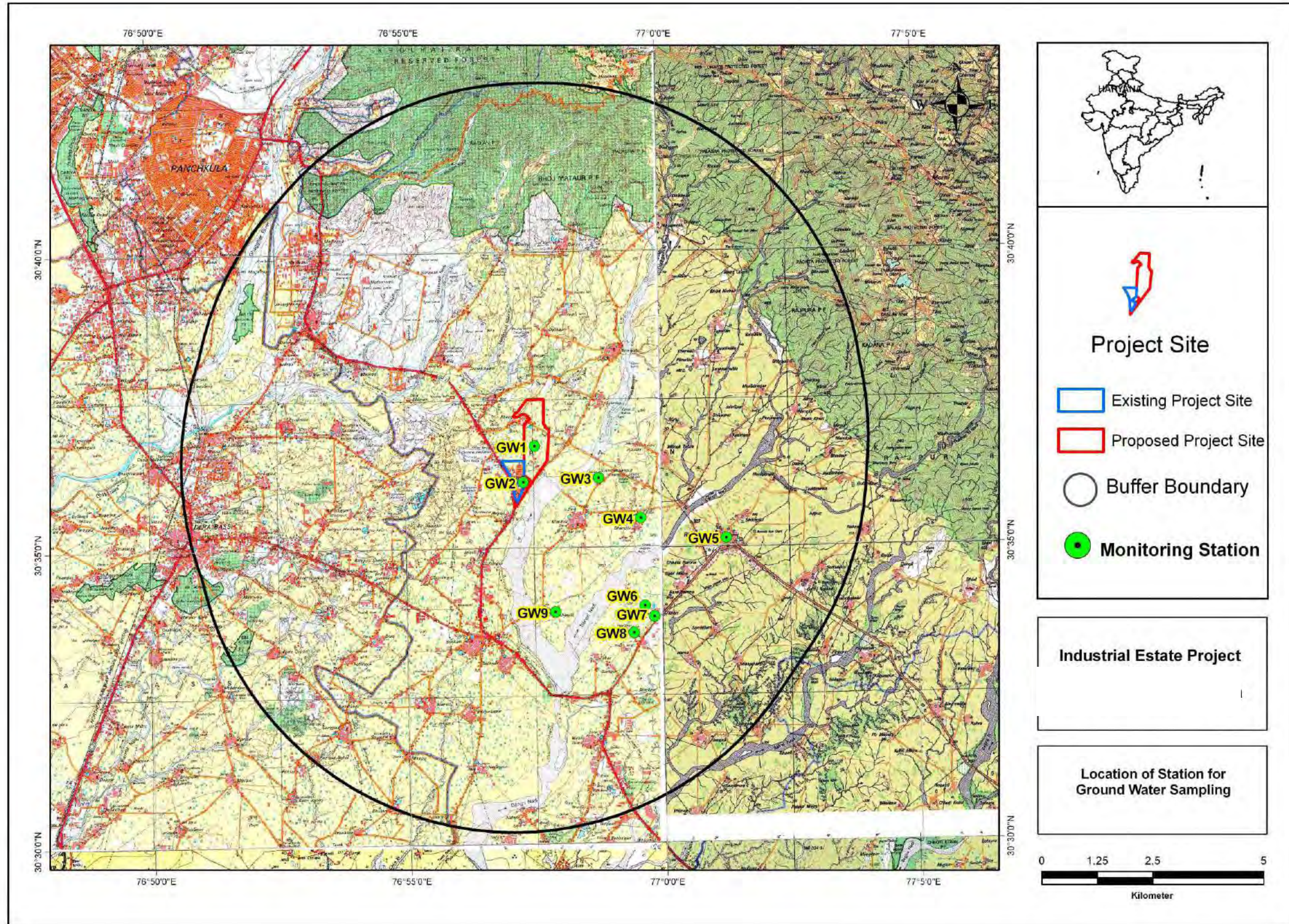


Figure 3.11: Location of Ground Water Sampling Sites

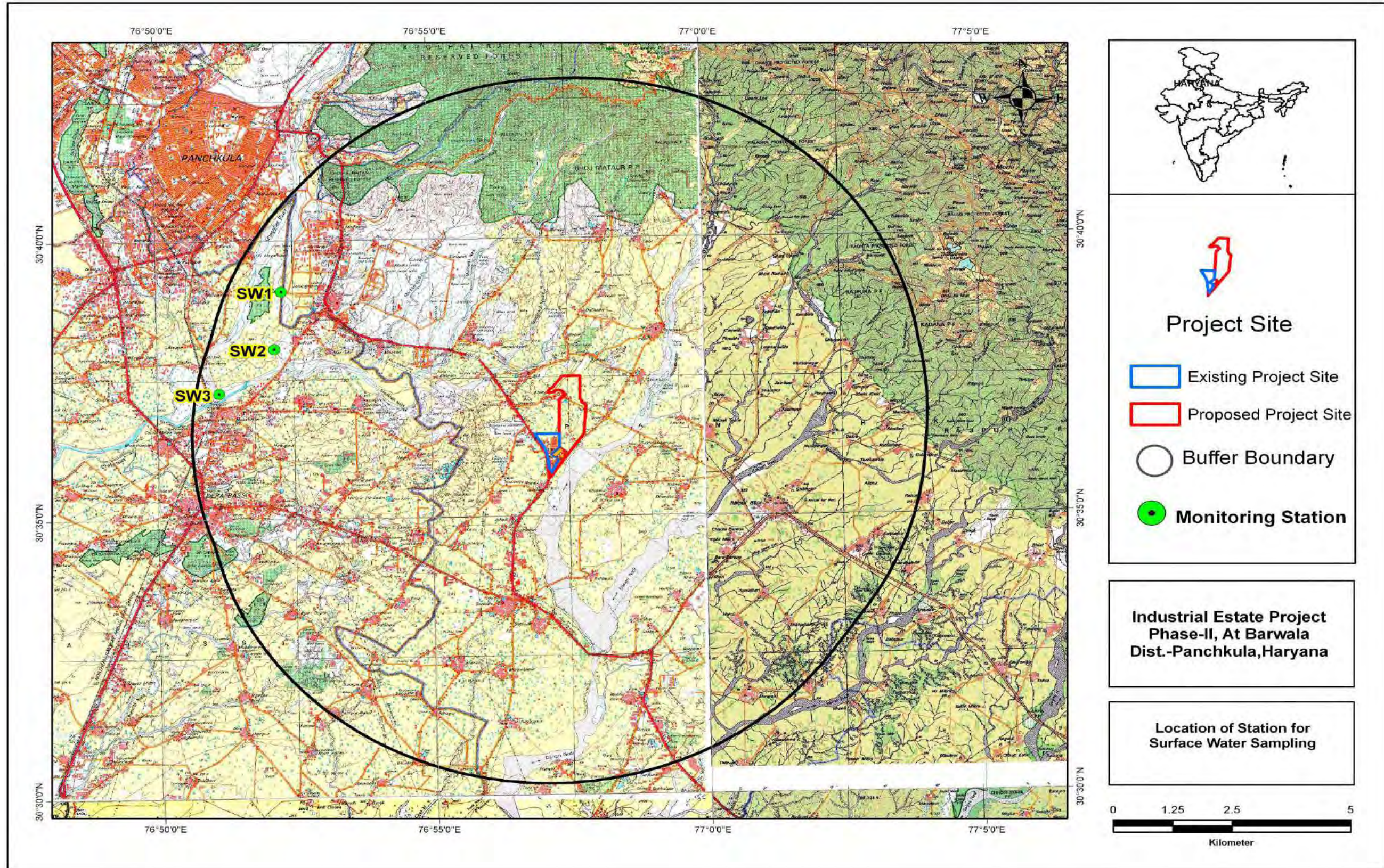


Figure 3.12: Location of Surface Water Sampling Sites

3.3.4.3 Result & Conclusion: The results of analysis of ground water are given in **Annexure-VII**.

The water quality in the impact zone was assessed through physico-chemical and bacteriological analysis of ground and surface water samples. The results have been compared with the drinking water quality standards specified in IS: 10500. It was observed that all the physico-chemical parameters and heavy metals from surface and ground water samples are below stipulated drinking water standards.

pH of the monitoring sites are in neutral to slight alkaline range i.e. 7.51-7.96. Alkalinity & TDS are under the permissible limits but still the values are considerably high as compared desired. Heavy metals such as Cu, Hg, Cd, Pb, and Zn are below the desirable limit. Hardness of water depends upon the presence of Ca^{2+} & Mg^{2+} contents in water, which is higher than desirable limit and below the permissible limit. All the ground water samples analyzed can be considered fit for drinking purpose in the absence of alternate sources.

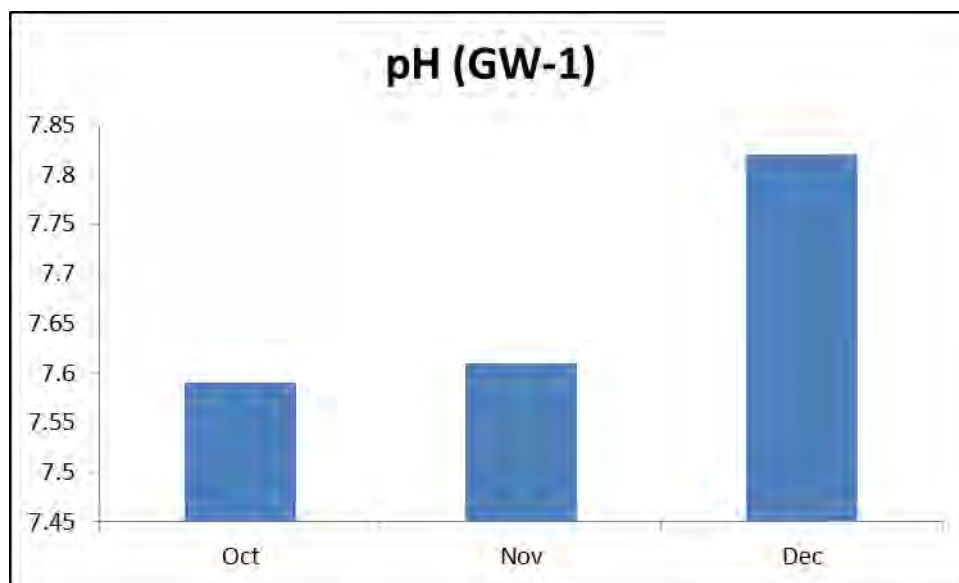


Fig:3.13 Variation in pH values of ground water at monitoring sites-1 (Oct-Dec 2015)

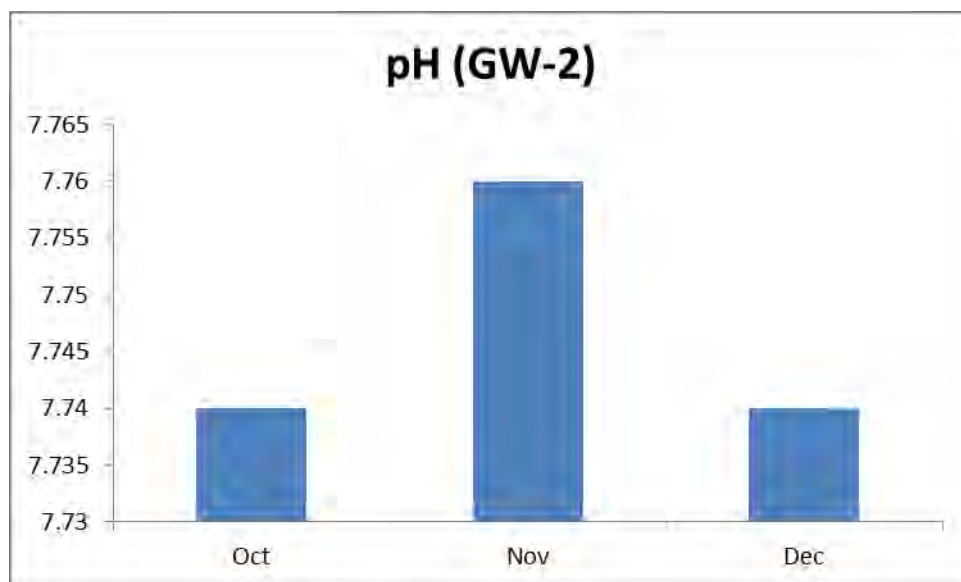


Fig:3.14 Variation in pH values of ground water at monitoring site-2 (Oct-Dec 2015)

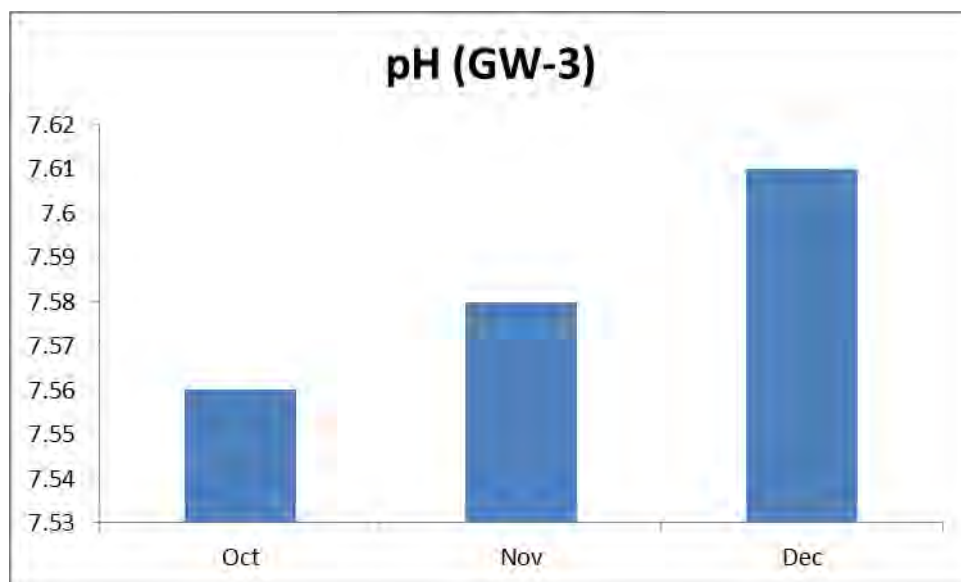


Fig:3.15 Variation in pH values of ground water at monitoring site 3 (Oct-Dec 2015)

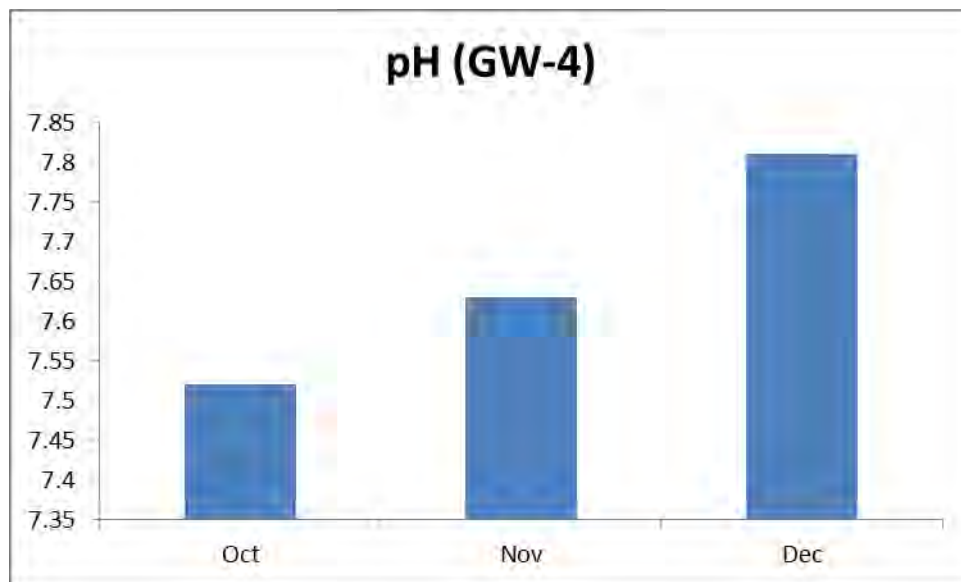


Fig:3.16 Variation in pH values of ground water at monitoring site 4 (Oct-Dec)

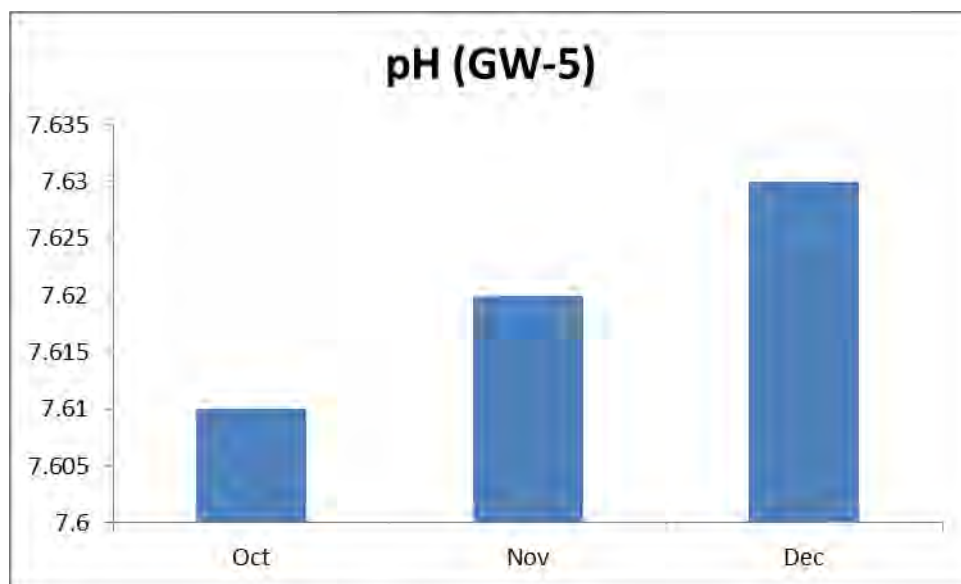


Fig:3.17 Variation in pH values of ground water at monitoring site 5 (Oct-Dec)

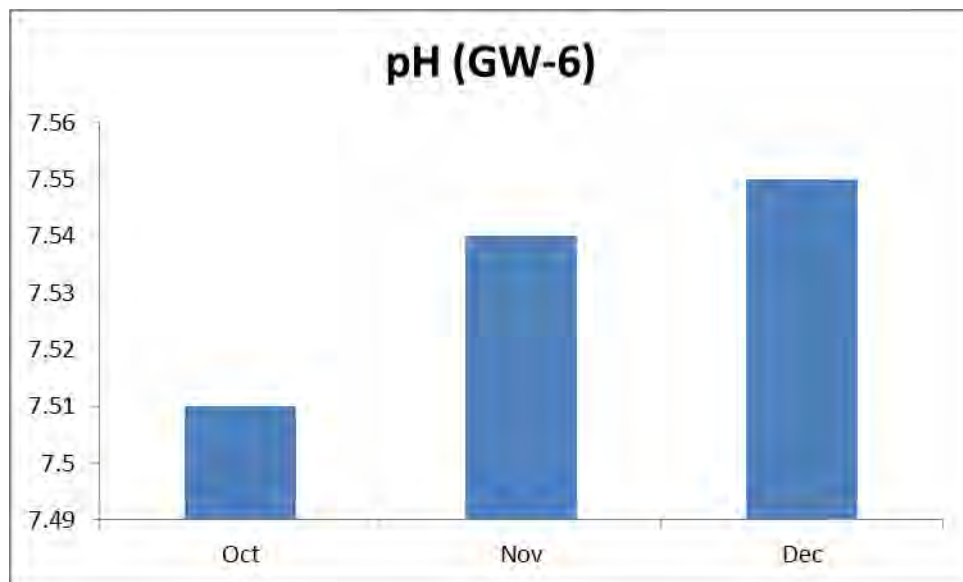


Fig:3.18 Variation in pH values of ground water at monitoring site 6 (Oct-Dec)

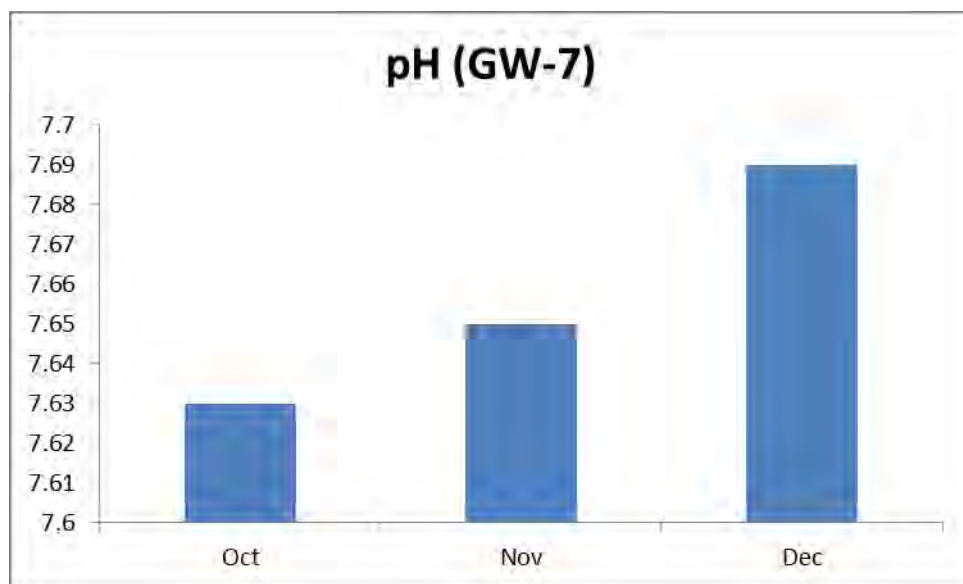


Fig:3.19 Variation in pH values of ground water at monitoring site 7 (Oct-Dec)

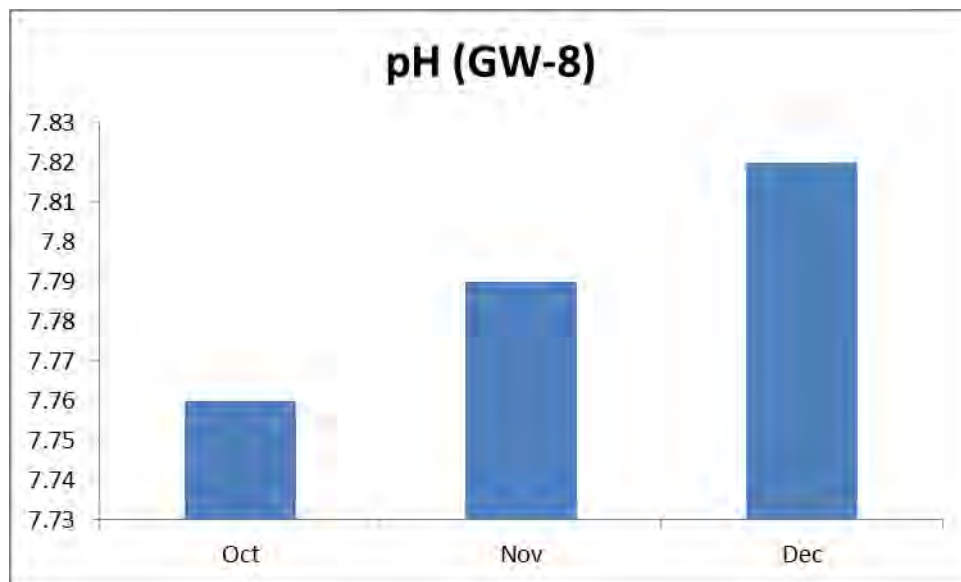


Fig:3.20 Variation in pH values of ground water at monitoring site 8 (Oct-Dec)

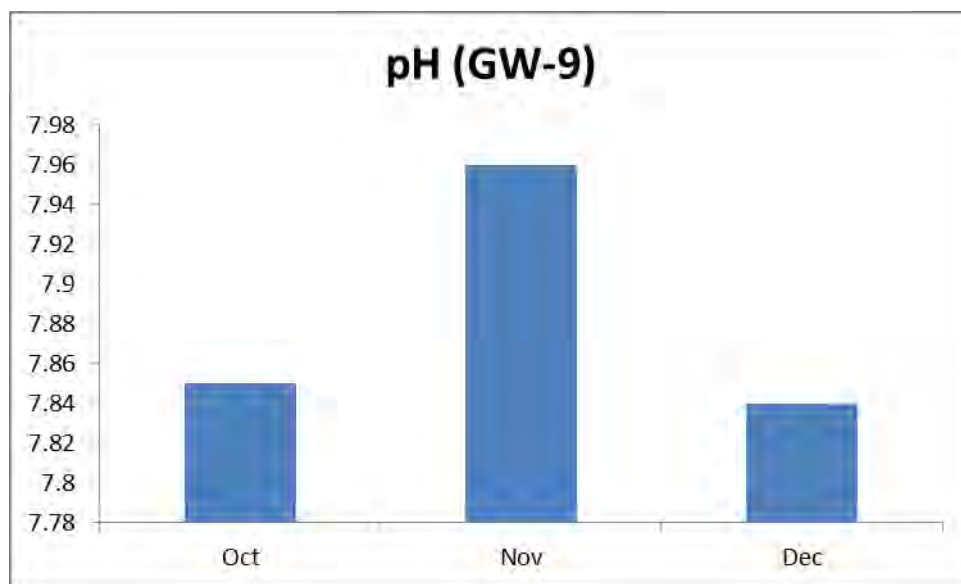


Fig:3.21 Variation in pH values of ground water at monitoring site 9 (Oct-Dec)



Fig.3.22 Hardness variation of ground water at different monitoring stations (Oct-Dec 2015)

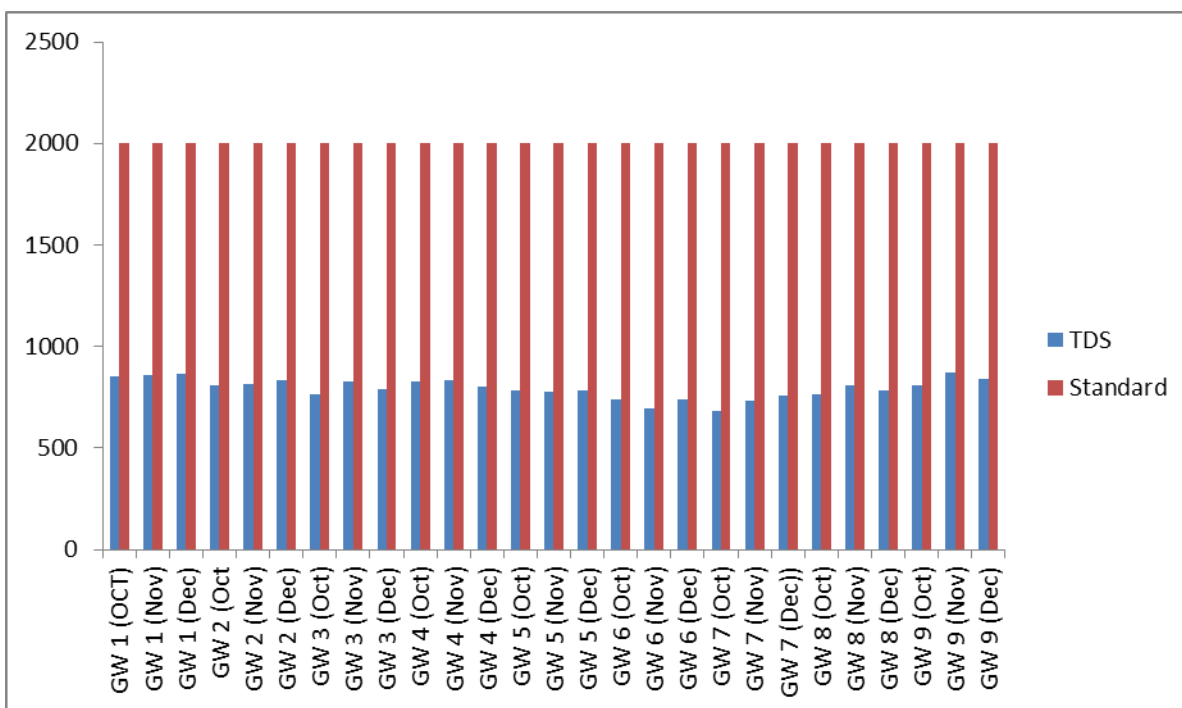


Fig.3.23 TDS variation of ground water at different months (Oct-Dec 2015)

The results of analysis of surface water are also given in Annexure-VII.

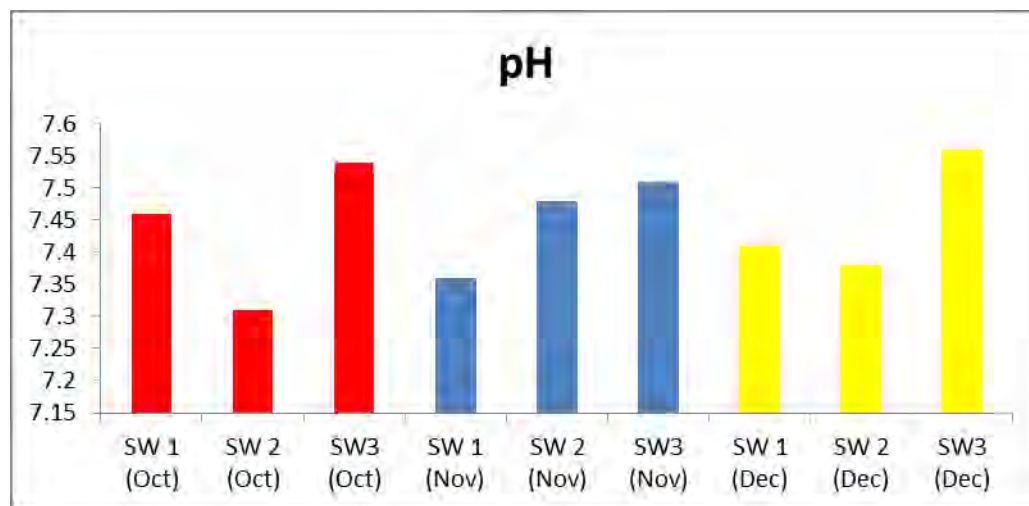


Fig: 3.24 pH variation of surface water at different months (Oct-Dec 2015)

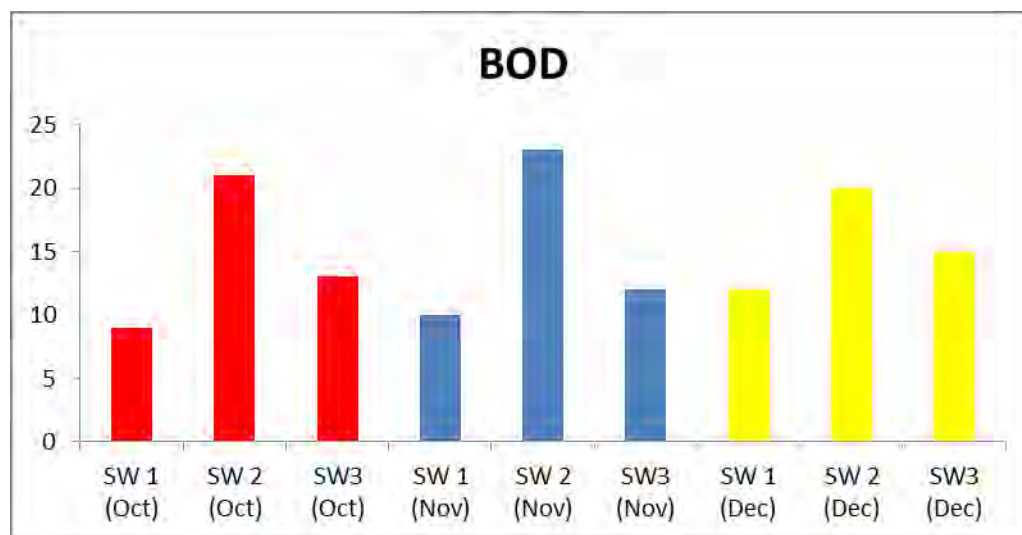


Fig:3.25 BOD variation of surface water at different months (Oct-Dec 2015)

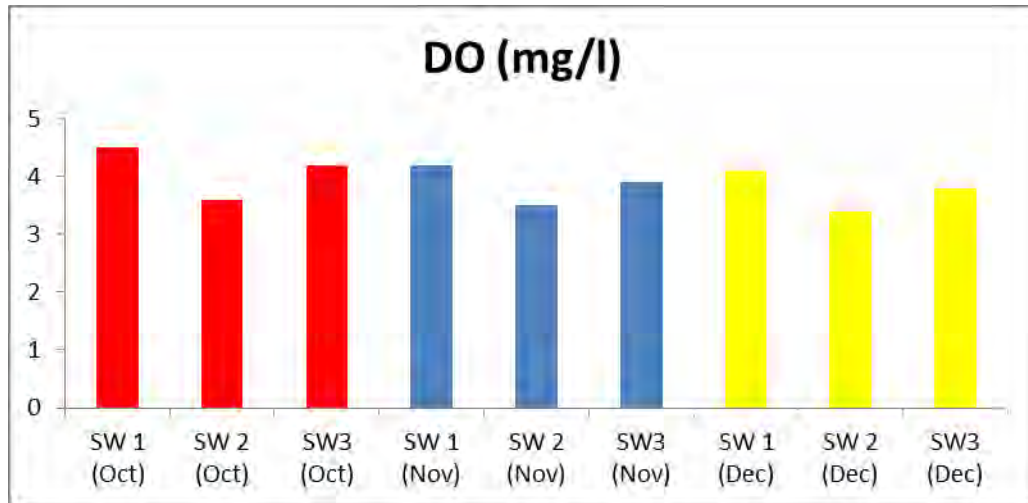


Fig:3.26 DO variation of surface water at different months (Oct-Dec 2015)

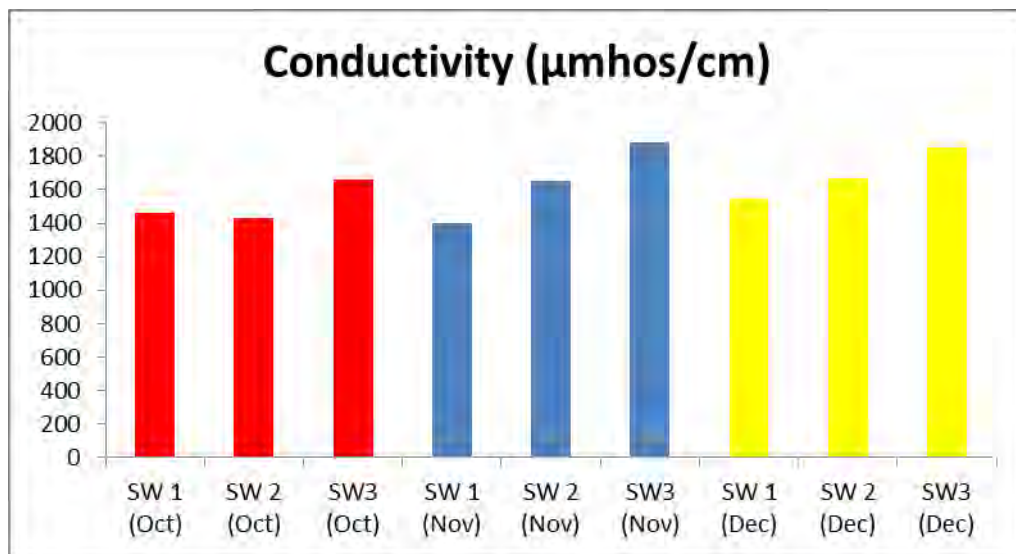


Fig: 3.27 Conductivity variation of surface water at different months (Oct-Dec 2015)

Comparing the values of pH, DO, BOD and total coliforms with ‘Use based classification of surface waters’ published by Central Pollution Control Board; it can be seen that the analyzed surface waters can be compared with class ‘C’ and can be used for drinking water source after conventional treatment and disinfection, Bacteriological examination of surface water indicates the presence of total coli forms, which may be due to human activities observed during the study period.

Surface water is mainly alkaline in nature. pH ranges from 7.31-7.56. BOD of the surface water found to vary between 9 to 23 mg/l in all the three months. Dissolved oxygen is considerably high in the surface water which shows that water is clear to a considerable extent.

3.3.5 Land environment

Land is one of the most vital resources for sustenance of life and degradations of land due to industrialization, urbanization and population growth is a matter of concern. Therefore, it is necessary to establish the existing land use pattern to optimize the land use as well as minimize degradation due to the developmental activities. Also it is necessary to the landform of the project site and the quality of the soil as soil erosion further deteriorates the quality of the land.

3.3.5.1 Topography

The topography represents a flat surface gently sloping from north-east to south-west. Soil composition is sandy-loam with pH value ranges from 7.0-8.5, which is suitable for agriculture purposes. The soil is good for building construction with bearing capacity of 13 metric tones per square meter at a depth of 2.5 meters. The ground configuration represents good surface gradient for efficient drainage system. The average annual rain fall is about 1105 millimeter. However, the area is free from floods. The sufficient quantity of good quality potable ground water is available in the area.

3.3.5.2 Land use–description

The landuse / landcover of the project site were done to identify the landuse pattern and landcover pattern of the study area. The study of land use in the area enables one to know about the land that can be used for various development activities envisaged in post project scenario. It also enables to envisage the scenario emerging due to the increase in demand for land with increase in population and the impacts arising due to the interface with the various project activities.

Objectives of the Study

The objectives of the present study are:

- To map the study area with respect to various land use/land cover change over the past 10 years.
- To identify the sensitive areas within 10 km radius around the project site.

Land use of project site:

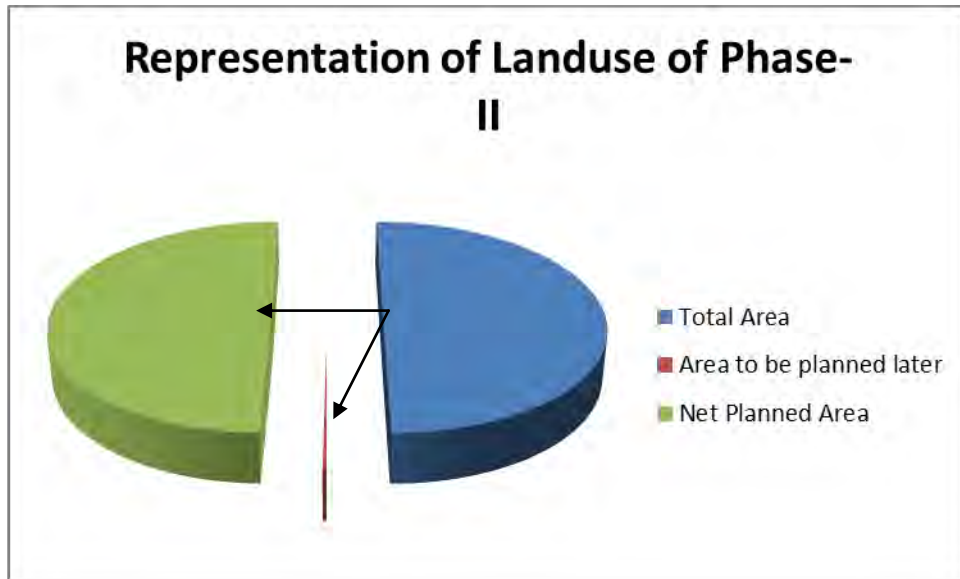


Fig:3.28 Land use of Phase-II

Out of total plot area 557.75 acre of land, 2.78 acre will be planned later, however 554.97 is planned area, details of which are presented in figure 3.29

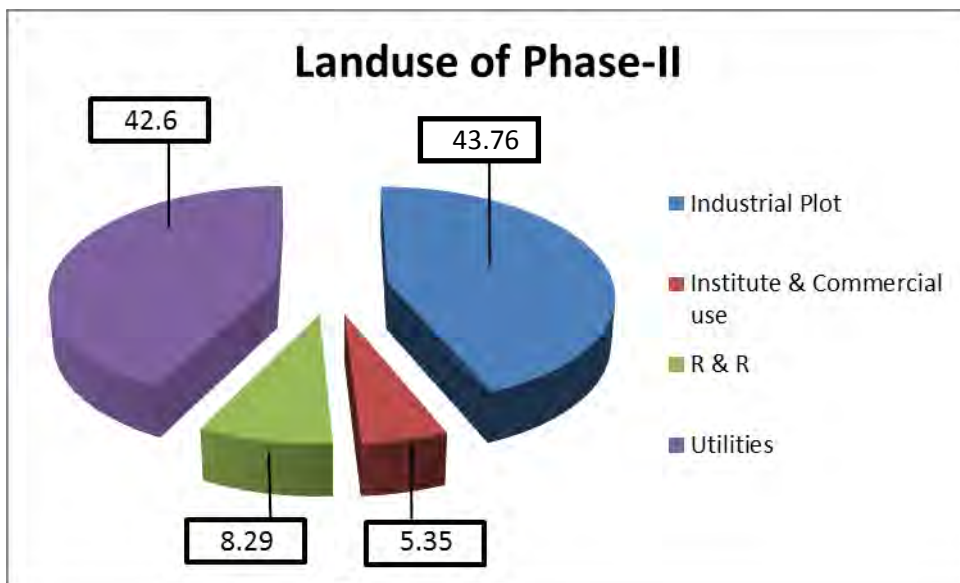


Fig:3.29 Land use of Phase-II

About 43.76 % of the net plot area will be under industrial plot, 5.35 % under institute and commercial use, area 50.89% will be under utilities, sub stations, club, workers housing & labour welfare centre & chowk, area reserved for green/social infrastructure required for village and green area. However green area is 13.07% of total plot area.

Methodology opted for landuse of 10 km: The landuse/landcover pattern of 10 km has been established on the analysis of the data received from satellite imagery by making landuse/landcover map with the help of GIS technique. The data based on Census of India, 2001 was referred and landuse study was done within 10 km radius area with limited ground truth verifications. Ground and ancillary information have been used to identify the sensitive places within 10 km radius of the project.

Land Use Pattern Classification and description

The classification of landuse/landcover pattern of the study area is mainly dominated by agricultural land, River with dry channel, open scrub, Open land, vegetation & settlements. The agricultural land covers the majority of the land which is about 59.45% of the study area. Open scrub covers second highest pattern of land use covering about 13.64% and settlement covers the third highest pattern of the land use covering about 6.88 % of the total land within 10 km radius. The land use data are presented in **Table 3.9** and also highlighted with a pie chart at **Figure 3.30**. The land use /land cover map is presented in **Figure 3.31**.

Table 3.9: Landuse/Landcover Pattern of 10km the Study area

LU Class	Area in Ha	Percentage (%)
Settlement	2723.46	6.88
Water bodies	47.8	0.12
Forest	3832.6	9.68
River	2328.96	5.88
Vegetation	590.64	1.49
Open Land	1126.66	2.86
Open Scrub	5401.54	13.64
Agricultural Land	23536.57	59.45
Total	39588.23	100

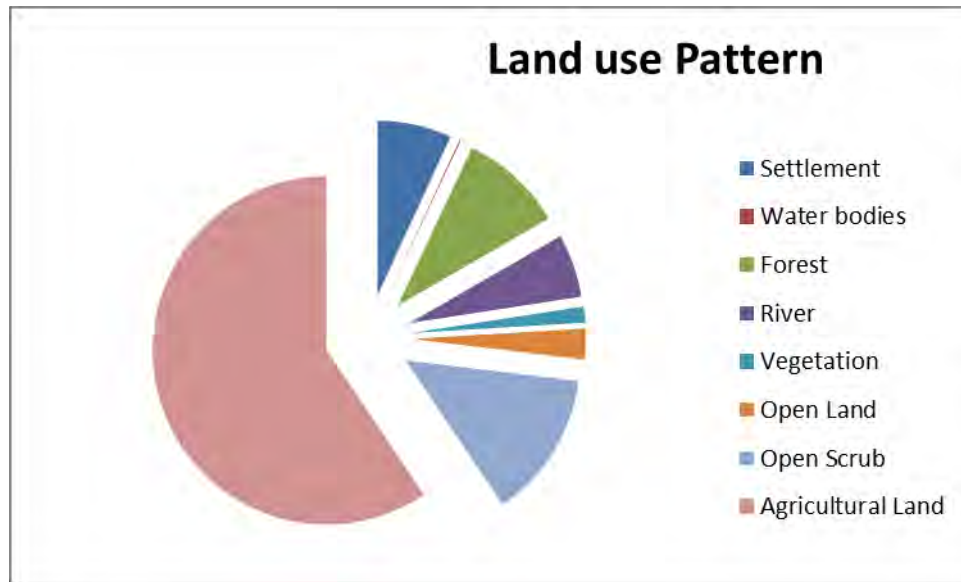


Figure 3.30 Land use/Land cover Pattern of 10km the Study area

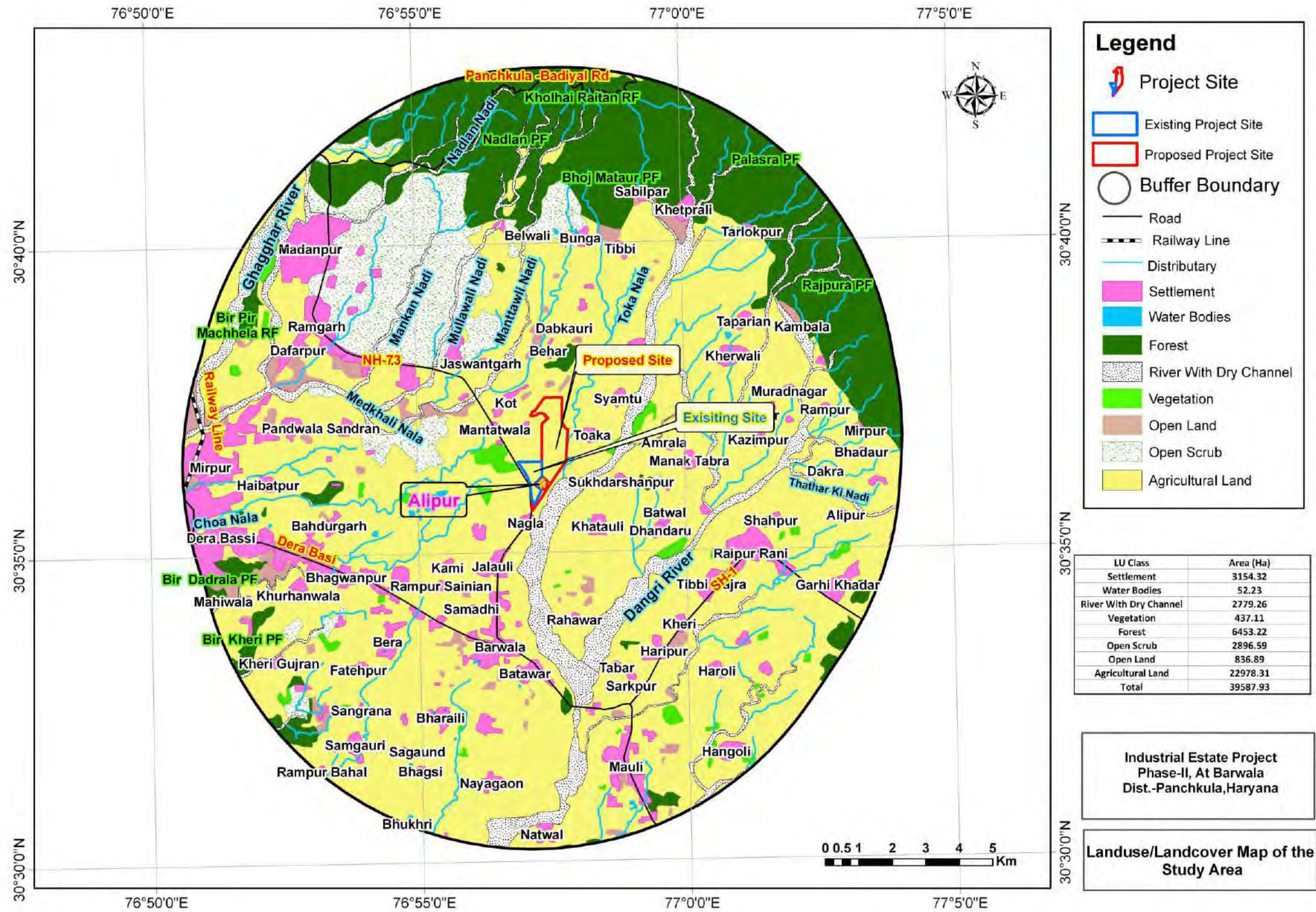


Figure 3.31: Land use map of project site

3.3.5.3 Soil Characteristics

The composite soil samples were collected from site and the study area and were analyzed for characterization. The locations of the monitoring sites are depicted in **Table 3.11**, and **Figure 3.32** and the result of the monitoring and analysis is presented in the **Table 3.12**

Methodology

The soil samples were collected in the month of oct, nov, dec 2015 from 9 locations as given in **Table 3.11**. At each of these locations 9 sub-locations were identified randomly from where soil was collected from 30 cm below the surface. The final 5 samples represent homogenously mixed soil from these 5 sub-locations for each location. The samples were filled in polythene bags, labeled in the field with number and site name and sent to laboratory for analysis. Soil samples were sealed and temperature and moisture content were retained. **Table 3.10** gives the idea of the frequency and methodology of selection of soil sampling stations and monitoring process.

Table 3.10: Frequency and Methodology for Soil Sampling & Monitoring

Particulars	Details
Frequency	One *grab sample from each station– once during the Study Period
Methodology	Composite grab samples of the topsoil were collected from 3 depths, and mixed to provide a representative sample for analysis. They were stored in airtight Polythene Bags and analyzed at the laboratory

**Grab sample- a single sample or measurement taken at a specific time or over as a short period as feasible*

Table 3.11: Soil Sample Collection Points

Station	Name	Direction	Distance
SQ1	Project Site	Centre	0
SQ2	Alipur	E	0.21
SQ3	Sukhdarshanpur	E	2.64
SQ4	Batwal	ESE	3.94
SQ5	Raipur Rani	ESE	6.84
SQ6	Dhandaruru	SE	5.44
SQ7	Kheri	SE	5.94
SQ8	Haripur	SSE	6.87
SQ9	Rehawar	SSE	4.63

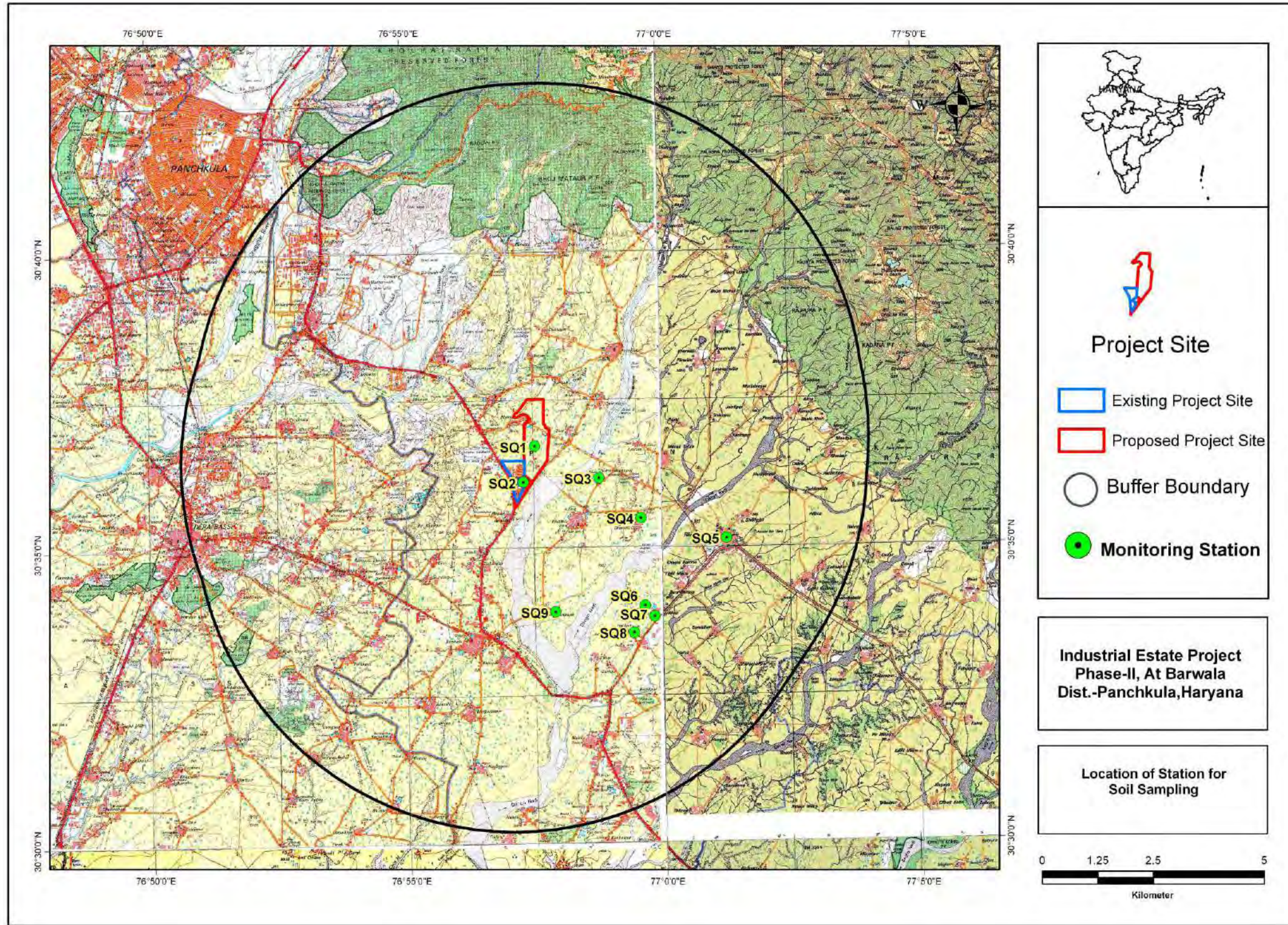


Figure 3.32: Location of Soil Sampling Sites

Soil analysis Results: The result of soil quality is given below:

Table 3.12: Physico-Chemical Properties of Soil

Soil Quality Data (October- to December-2015)											
S.No	Parameter	Unit	Project Site	Alipur	Sukhdarshanpur	Batwal	Raipur Rani	Dhandaruru	Kheri	Haripur	Rehawar
1	Texture	-	Sandy Clay Loam	Sandy Loam	Sandy Clay Loam	Sandy Loam	Clay Loam	Sandy Clay Loam	Sandy Loam	Sandy Clay Loam	Sandy Clay Loam
	Sand	%	59.7	65.8	60.6	65.6	48.9	64.3	66.8	63.4	60.3
	Silt	%	18.4	15.5	18.2	16.1	22.8	13.4	15.9	15.5	18.5
	Clay	%	21.9	18.7	21.2	18.3	28.3	22.3	17.3	21.1	21.2
2	pH (1:2)	-	7.63	7.52	7.21	7.36	6.86	7.36	7.41	7.52	7.23
3	Electrical Conductivity (1:2)	µmhos/cm	356	325	305	285	226	315	295	306	294
4	Cation exchange capacity	meq/100 gm	14.2	15.6	13.8	15.4	14.4	14.3	15.7	13.6	15.7
5	Exchangeable Potassium	meq/100 gm	0.12	0.15	0.16	0.17	0.16	0.14	0.18	0.16	0.15
6	Exchangeable Sodium	meq/100 gm	0.39	0.41	0.38	0.41	0.37	0.32	0.42	0.52	0.43
7	Exchangeable Calcium	meq/100 gm	10.23	11.21	9.85	11.26	10.21	10.12	11.20	9.76	11.23
8	Exchangeable Magnesium	meq/100 gm	3.45	3.85	3.45	3.51	3.62	3.74	3.85	3.12	3.85
9	Sodium Absorption Ratio	-	0.47	0.47	0.47	0.48	0.44	0.38	0.48	0.65	0.50
10	Water Holding Capacity	%	25.3	24.3	26.2	25.3	29.3	25.1	24.8	24.7	26.3
11	Porosity	%	36.1	37.2	39.3	38.2	34.1	36.3	38.2	36.1	37.2
12	Permeability	cm/hr	2.1	2.3	2.1	2.2	1.8	2.3	2.1	2.2	2.3
13	Total kjehdahl Nitrogen	%	0.046	0.033	0.041	0.039	0.051	0.043	0.036	0.043	0.042
14	Phosphorus(Olsen's)	mg/kg	7.3	5.9	7.6	7.1	10.2	8.1	5.9	8.1	7.3
15	Organic Matter	%	0.28	0.26	0.29	0.26	0.35	0.32	0.26	0.35	0.31

The result of soil quality is attached as an **Annexure-VIII**.

Physical characteristics of soil were characterized through specific parameters viz porosity, water holding capacity, pH, electrical conductivity and texture. Soil pH plays an important role in the availability of nutrients. Soil microbial activity as well as solubility of metal ions is also dependent on pH. In the study area, variations in the pH of the soil were found to be little alkaline (6.86 to 7.63). Electrical conductivity (EC) is a measure of the soluble salts and ionic activity in the soil. In the collected soil samples the conductivity ranged from 226 to 356 $\mu\text{mhos/cm}$.

3.4.6 Biological Environment

3.4.6.1 Introduction

Biodiversity reflects the potential of a regional ecosystem. Biota of a particular area is considered as indicators of the environment as they quickly respond not only to one environmental factor but also an interactive group of factors. These communities influence and react sensitively to changes in the balance of environmental stresses.

Biological diversity comprises the variability of genus, species and ecosystems and is very crucial for maintaining the basic processes on which the life depends. On the basis of biological physiology biodiversity broadly can be divided into two category *i.e.* the floral diversity and faunal diversity. Conservation of the biodiversity is essential for the sustainable development as it not only provides the food, fodder and medicine, but also contributes to improvement of essential environmental attributes like air, water, soil, etc. Before starting any Environmental Impact Assessment study, it is necessary to identify the baseline of relevant environmental parameters which are likely to be affected as a result of the operation of the project. A similar approach has been adopted for conducting the study on Biological Environment for this Project. Both terrestrial and aquatic ecosystems have been studied to understand the biological environment nearby the project site.

The study was conducted in the project area to assess all possible consequences on the biological environment. Flora and fauna surveys and data collection conducted for assessing the biological diversity and its status over a period of time that forms an integral part of Impact Assessment Techniques. The present study is highlighting the various issues pertaining to floristic diversity and the faunal wealth in the core area *i.e.* Industrial Estate Project, Phase-II at Barwala, District Panchkula, (Haryana) and buffer zone *i.e.* area within 10 km radius.

3.4.6.1.1 Description of Study Area

Industrial Estate Project, Phase-II, Barwala is executed over an area of 557.75 acres and located near in the District Panchkula (Haryana) under the Seismic Zone –IV as per IS 1893 (Part I): 2002.

Panchkula district of Haryana is located in Northern part of Haryana State and lies between 30°.26' to 30°.55' N and 76°.46' to 77°.10' E. Himachal Pradesh bound the district, in North in the east by Uttar Pradesh, in west by Ambala district, in south by Karnal and Kurukshetra districts. Total geographical area of the Panchkula district is 570 sq. km.

The present project area is surrounded by agriculture land along with some human settlement. The main crop of the area is Paddy followed by millets (Marua, Gondli and Maize), pulses, wheat oilseed (Sarguja and groundnut) and vegetables. Panchkula district lies under the tropical climatic condition. The district comprises of tropical moist deciduous vegetation due to high temperature and humidity. Land use/land cover map and Location of Industrial Estate Project (HSI IDC) in the 500 m buffer map shown in Fig. 3.33 and 3.34.

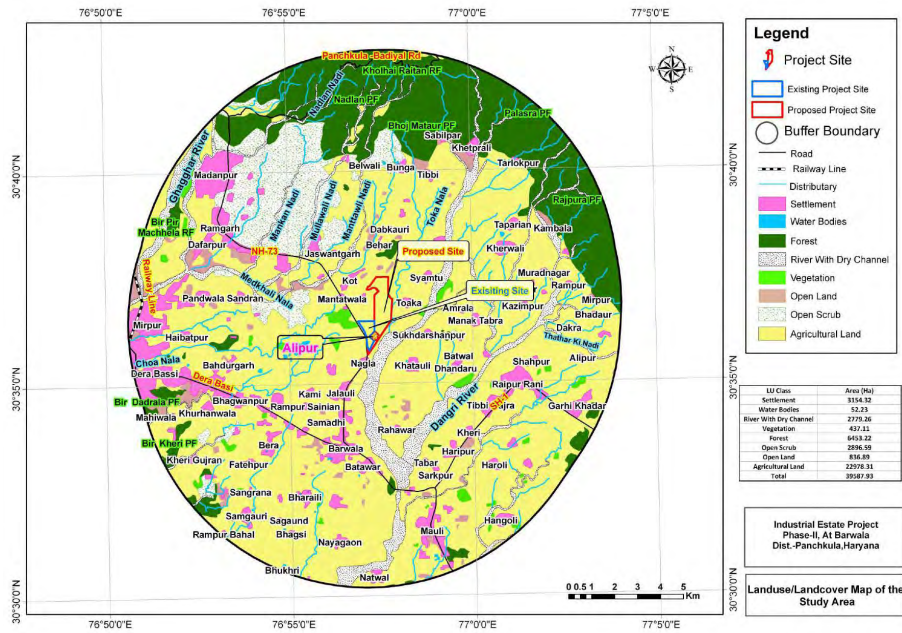


Fig. 3.33: Location Map of Industrial Estate Project, Phase-II, Barwala, Panchkula

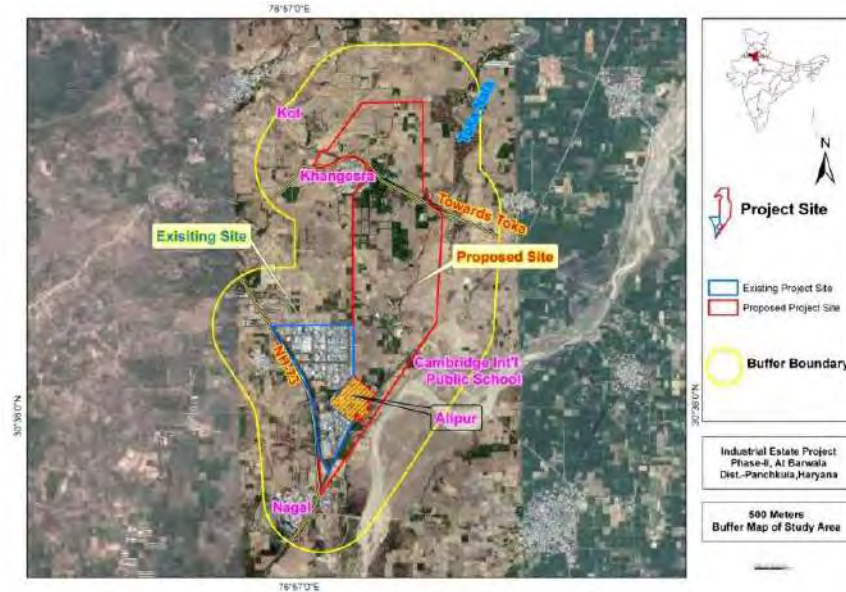


Fig. 3.34: Location Present Project with 500 meter Buffer Map, Barwala, Panchkula

3.4.6.1.2 Climate

The average rainfall in the Panchkula district recorded is 1050-1150 mm. The climate of Panchkula can be classified as subtropical monsoon, mild & dry winter, hot summer and sub-humid which is mainly dry with hot summer and cold winter except during monsoon season when moist air of oceanic origin penetrates into the district.

3.4.6.1.3 Soil

Panchkula district is conspicuously flat topography. The soil type in district Panchkula is loamy sand soil.

3.4.6.1.4 Drainage

The Panchkula district is mainly drained by the River Ghaggar and its tributaries. A small patch of northwest part of the district is drained by northwesterly flowing Sirsa Nadi, as its tributaries east - west direction before joining Sirsa Nadi, which is tributary of Sutlej River.

3.4.6.2 Methodology

3.4.6.2.1 Period of Sampling

The ecological survey has been conducted during Post monsoon season for the collection of primary data of flora-fauna, vegetation, soil and other environmental observations. The details are given as below:

Post-monsoon: October to December

Core zone : At the project site

Buffer zone : Around 10 km radius of the project site

3.4.6.2.2 Mode of Data Collection

Detailed survey was conducted to evaluate floral and faunal composition of the study area. Primary data on floral and faunal composition was recorded during site visit and secondary data was collected from the Forest Department and published relevant literature. Inventory of flora and fauna has been prepared on the basis of collected data. The mode of data and parameters considered during field investigations is given in Table 3.13.

Table 3.13: Mode of Data Collection & Parameters Considered During the Survey

Aspect	Data	Mode of Data Collection	Parameters Monitored
Terrestrial Ecology	Primary data collection	By field survey	Floral and Faunal diversity
	Secondary data collection	4 * Forest Department of Haryana, 5 * An official website of district administration Panchkula	Floral and Faunal diversity, Types of vegetation, forest type, Importance etc.

3.4.6.3 Biological Component of Core Zone

3.4.6.3.1 Flora

The core zone comprises flat agricultural land where construction operation is proposed. Some trees are present in the proposed construction area such as Eucalyptus, Mango, Sal, Neem, Babool, Ber, Sisham, Safeda along with seasonal grasses etc. The project shall also not lead to any change in land use of surroundings except proposed construction area.

3.4.6.3.2 Fauna

Core zone of the construction project is located on flat land. During the field survey, some domesticated mammal species reported from buffer zone of project site were common grazing animals like cow, goat and buffaloes etc. Permanent habitat of mammals and avifauna in the core zone were not observed. There is no any aquatic habitat in the core zone, so aquatic fauna also does not exist in the proposed construction area.

3.4.6.4 Biological Component of Buffer Zone

3.4.6.4.1 Flora

3.4.6.4.1.1 Forests

Out of total geographical area (816 Sq. km) of Panchkula district, 20 sq. km is covered with forest. Some open forest patches are present in the buffer area. The Panchkula district is comparatively enriched with forest to others in Haryana. In district Panchkula, the total forest area is 20 sq. km. The

forest of the district comprises of tropical moist deciduous vegetation due to high temperature and humidity. National Parks, Sanctuary or Ecologically sensitive areas within the 10 km periphery of the proposed construction area are not present.

3.4.6.4.1.2. Vegetation in and Around Human Settlement

Vegetation pattern in villages and surrounding areas in the Panchkula district are slightly different from the rest of the areas. Most of the area of Panchkula district is agriculture and barren land without major vegetation. The common species grown near villages are mostly edible or useful plants are *Artocarpus integrifolia*, *Azadirachta indica*, *Delonix regia*, *Eucalyptus* sp., *Ficus religiosa*, *Mangifera indica*, *Madhuca indica*, *Sizygium cumini* and *Tamarindus indica*.

3.4.6.4.1.3 Terrestrial Flora of the Buffer Zone

Buffer zone of the present project is mainly agricultural land. Several species of flowering plants were recorded in the respective buffer area of present project. Common medicinal plants found in the area include *Achyranthes aspera*, *Aconitum balfourii*, *Angelica glauca*, *Arisaema tortuosum*, *Berberis aristata*, *Berberis lycium*, *Centella asiatica*, *Delphinium denudatum*, *Rheum australe*, *Podophyllum hexandrum*, and *Zanthoxylum armatum*. There are some Reserved and Protected Forest present in the buffer zone which is as follows:

1. Nadlan Protected Forest,
2. Palasra Protected Forest,
3. Bir Dadrala Protected Forest,
4. Bir Kher Protected Forest,
5. Bir Pur Machhela Reserved Forest,
6. Kholhai Raithan Reserved Forest

Plant species comes under the RET category are not observed in the core and buffer zone present mining area. The most common plant species observed in the buffer zone of project are listed in

Table 3.14.

Table 3.14: List of Flora of Buffer Area of Present Project

S. No.	Scientific name	Local name	Family
Trees			
1	<i>Aegle marmelos</i>	Bel	Rutaceae
2	<i>Albizia lebbek</i>	Bhandir or Siris	Leguminosae
3	<i>Alnus nepalensis</i>	Utis	Betulaceae
4	<i>Bauhinia variegata</i>	Kachnar	Leguminosae
5	<i>Bombax ceiba</i>	Semal	Malvaceae
6	<i>Cedrela toona</i>	Toon	Meliaceae
7	<i>Celtis australis</i>	Kharak	Ulmaceae

8	<i>Citrus limon</i>	Nimu	Rutaceae
9	<i>Citrus sp.</i>	Malta	Rutaceae
10	<i>Cupressus torulosa</i>	Surai	Cupressaceae
11	<i>Dalbergia sissoo</i>	Shisham	Fabaceae
12	<i>Emblica officinalis</i>	Amla	Euphorbiaceae
13	<i>Ficus auriculata</i>	Timal	Moraceae
14	<i>Ficus bengalensis</i>	Bargad	Moraceae
15	<i>Ficus palmate</i>	Bedu	Moraceae
16	<i>Ficus religiosa</i>	Pipal	Moraceae
17	<i>Grevillea robusta</i>	Silver oak	Proteaceae
18	<i>Juglans regia</i>	Akhrot	Juglandaceae
19	<i>Mallotus philippinensis</i>	Ruin	Euphorbiaceae
20	<i>Mangifera indica</i>	Aam	Anacardiaceae
21	<i>Melia azedarach</i>	Dhenk	Meliaceae
22	<i>Morus alba</i>	Tut	Moraceae
23	<i>Musa paradisiacal</i>	Kela	Musaceae
24	<i>Phoenix humilis</i>	Khajoor	Palmae
25	<i>Pinus roxburghii</i>	Chil	Pinaceae
26	<i>Prunus armeniaca</i>	Chuli	Rosaceae
27	<i>Prunus communis</i>	Aloocho	Rosaceae
28	<i>Prunus persica</i>	Aroo	Rosaceae
29	<i>Punica granatum</i>	Aanar	Punicaceae
30	<i>Pyrus pashia</i>	Mehal	Rosaceae
31	<i>Sapindus mukorossi</i>	Ritha	Sapindaceae
32	<i>Sapium insigne</i>	Khinna	Euphorbiaceae
33	<i>Syzygium cumini</i>	Jamun	Myrtaceae
34	<i>Toona serrata</i>	Kakuru	Meliaceae
Shrubs			
1	<i>Adhatoda vasica</i>	Basinga	Acanthaceae
2	<i>Agave Americana</i>	Rambans	Agavaceae
3	<i>Berberis aristata</i>	Karmshal or Kashmoi	Berberidaceae
4	<i>Calotropis gigantea</i>	Aak	Asclepiadaceae
5	<i>Cannabis sativa</i>	Bhang	Cannabaceae
6	<i>Carissa spinarum</i>	Karonada	Apocynaceae
7	<i>Colebrookea oppositifolia</i>	Bindu	Lamiaceae
8	<i>Coriaria nepalensis</i>	Makhoi	Coriariaceae
9	<i>Debregeasia hypoleuca</i>	Sihanru	Urticaceae
10	<i>Eupatorium adenophorum</i>	Kala bansa	Asteraceae
11	<i>Euphorbia royleana</i>	Shuru	Euphorbiaceae
12	<i>Jatropha curcas</i>	Arand	Euphorbiaceae
13	<i>Lantana camara</i>	Lantana	Verbenaceae
14	<i>Opuntia dillenii</i>	Nagphani	Cactaceae
15	<i>Plectranthus coesta</i>	Chichiri	Lamiaceae

16	<i>Princepia utilis</i>	Bhekal	Rosaceae
17	<i>Pyracantha crenulata</i>	Ghingaru	Rosaceae
18	<i>Ricinus communis</i>	Arandi	Euphorbiaceae
19	<i>Rosa brunonii</i>	Kunja	Rosaceae
20	<i>Rubus ellipticus</i>	Hinsar	Rosaceae
21	<i>Rubus niveus</i>	Hinsalu	Rosaceae
22	<i>Rumex hastatus</i>	Bhilmora	Polygonaceae
23	<i>Urtica parviflora</i>	Kandali	Urticaceae
24	<i>Woodfordia floribunda</i>	Dhaura	Lythraceae
25	<i>Zanthoxylum alatum</i>	Timbur	Rutaceae
26	<i>Ziziphus mauritiana</i>	Ber	Rhamnaceae
Herbs			
1	<i>Achyranthes aspera</i>	Puthkanda	Amaranthaceae
2	<i>Argemone mexicana</i>	Prickly poppy	Papaveraceae
3	<i>Artemisia capillaris</i>	Pati	Asteraceae
4	<i>Bidens bipinnata</i>	Kuru	Asteraceae
5	<i>Bergenia ligulata</i>	Silphara	Saxiferaaceae
6	<i>Cassia tora</i>	Chakunda	Caesalpinaceae
7	<i>Cestrum verutum</i>	Kanjalu	Solanaceae
8	<i>Chenopodium album</i>	Bathwa	Chenopodiaceae
9	<i>Datura suaveolens</i>	Datura	Solanaceae
10	<i>Euphorbia hirta</i>	Dudhi	Euphorbiaceae
11	<i>Fragaria indica</i>	Bhumla	Rosaceae
12	<i>Galinsoga parviflora</i>	Marchya	Asteraceae
13	<i>Hedychium spicatum</i>	Banhaldu	Zingiberaceae
14	<i>Oxalis corniculata</i>	Amrit Sak	Oxalidaceae
15	<i>Polygonum chinense</i>	Jangli palak	Polygonaceae
16	<i>Sonchus asper</i>	Dudhi	Asteraceae
17	<i>Thalictrum foliolosum</i>	Mamiri	Ranunculaceae
18	<i>Tridax procumbens</i>	Ground weed	Amaranthaceae
Climbers			
1	<i>Bauhinia vahlii</i>	Malo	Leguminosae
2	<i>Clematis connata</i>	Kanguli	Ranunculaceae
3	<i>Ipomea purpurea</i>	Besharam	Convolvulaceae
Grasses			
1	<i>Apluda mutica</i>	Tachula	Gramineae
2	<i>Cynodon dactylon</i>	Dhub	Gramineae
3	<i>Chrysopogon fulvus</i>	Godia	Gramineae
4	<i>Parthenium hysterophorus</i>	Congress grass	Compositae
Ferns			
1	<i>Pteris sp.</i>	Fern	Pteridaceae
2	<i>Adiantum sp.</i>	Fern	Pteridaceae
Source: GRC Survey Data supported by Department of Forest, Haryana.			

3.4.6.4.1.4 Aquatic Flora of the Buffer Zone

Aquatic flora referred to as phytoplankton and macrophytes (Plants that have adapted to living in aquatic environment such as River, lakes, Ponds, dams). During the present investigation, some Phytoplankton and Macrophytic vegetation were collected from Ghaggar River and others streams present in the buffer area is given in Table 3.3 and 3.4.

Table: 3.15: Phytoplankton recorded from different Aquatic Habitat of Buffer Zone of Present Project

Sl. No.	Name of the Individuals	
	Chlorophyceae	Cyanophyceae
1	<i>Ankistrodesmus</i> sp.	1 <i>Anacystis</i> sp.
2	<i>Ankistrodesmus falcatus</i>	2 <i>Aphanocapsa montana</i>
3	<i>Cosmarium</i> sp.	3 <i>Aphanothece</i> sp.
4	<i>Coelastrum</i> sp.	4 <i>Arthrospira massartiia</i>
5	<i>Oocystis</i> sp.	5 <i>Chroococcus</i> sp.
6	<i>Scenedesmus</i> sp.	6 <i>Gloeocapsa</i> sp.
7	<i>Scenedesmus dimorphos</i>	7 <i>Lyngbya</i> sp.
8	<i>Scenedesmus armatus</i>	8 <i>Merismopedia</i> sp.
9	<i>Spirogyra</i> sp.	9 <i>Microcystis flos-aquae</i>
10	<i>Tetraedron</i> sp.	10 <i>Nostoc</i> sp.
11	<i>Westella</i> sp.	11 <i>Oscillatoria</i> sp.
	Bacillariophyceae	12 <i>Spirulina</i> sp.
1	<i>Achnanthes</i> sp.	Euglenophyceae
2	<i>Amphora ovalis</i>	1 <i>Euglena</i> sp.
3	<i>Ceratonies arcus</i>	2 <i>Euglena acus</i>
4	<i>Cyclotella</i> sp.	3 <i>Trachelomonas</i> sp.
5	<i>Cymbella tumida</i>	Dinophyceae
6	<i>Fragillaria</i> sp.	1 <i>Ceratium</i> sp.
7	<i>Melosira granulata</i>	Xanthophyceae
8	<i>Navicula grimmii</i>	1 <i>Tribonema</i> sp.
9	<i>Nitzschia</i> sp.	
Source: GRC Survey Data.		

Table: 3.16: Aquatic vegetation recorded from different Aquatic Habitat of Buffer Zone of Present Project

Sl. No.	Name of the Taxa
1	<i>Azolla pinnata</i>
2	<i>Ceratophyllum demersum</i>
3	<i>Cyperus alopecuroides</i>
4	<i>Cryptocoryne</i> sp.
5	<i>Eichhornia crassipes</i>
6	<i>Hydrilla verticillata</i>
7	<i>Ipomoea aquatica</i>
8	<i>Ipomea obscura</i>
9	<i>Lemna minor</i>
10	<i>Ludwigia repens</i>
11	<i>Ludwigia</i> sp.
12	<i>Najas graminea</i>
13	<i>Ottelia alismoids</i>
14	<i>Phragmites australis</i>
15	<i>Potamogeton nodosus</i>
16	<i>Spirodela polyrhiza</i>
17	<i>Typha angustata</i>
Source : GRC Survey Data	

3.4.6.4 Fauna of the Buffer Zone

The major part of the buffer zone of present project lies under agriculture field which restrict the wildlife habitat significantly. There is no any wildlife sensitive corridor is present for the movement of wildlife animals. A list of animals of the study area has been prepared on the basis of present survey, inquiry from local people and from the available published literatures. The animals thus recorded were cross checked with Wildlife Protection Act (1972) for their schedule.

3.4.6.4.1 Mammals

Domesticated mammal species like Cow, Goat and Buffalo etc. were noticed in the buffer zone. During present survey and Inquiry from village people regarding wild animals reveals that Fruits bat and Indian Fox etc. are often seen in the area. List of Mammal species present in the buffer zone is given in **Table 3.17**.

Table 3.17: Mammal Species Found in Buffer Zone of Present Project, District Panchkula

SL. No	English Name	Scientific Name	Schedule Status (WPA-1972)	IUCN Status
1	Bandicoot Rat	Bandicota indica	V	LC
2	Barking deer	Muntiacus muntjac	III	LC
3	Common Mongoose	Herpestes edwardsi	II	NA
4	Fulvous Fruit Bat	Rousettus leschenaulti	V	LC
5	Golden Jackal	Canis aureus	II	LC
6	Grey Musk Shrew	Suncus murinus	-	LC
7	Himalayan black bear	Ursus thibetanus	-	VU
8	Indian Bush Rat	Golunda ellioti	V	LC
9	Indian Field Mouse	Mus booduga	V	LC
10	Indian Flying Fox Bat	Pteropus giganteus	V	LC
11	Indian Giant Squirrel	Ratufa indica	II	LC
12	Indian Grey Mongoose	Herpestes edwardsii	IV	LC
13	Indian Hare	Lepus nigricollis	IV	LC
14	Indian langur	Semnopithecus	-	-
15	Indian porcupine	Hystrix indica	IV	LC
16	Indian Wild Boar	Sus scrofa	III	LC
17	Jungle cat	Felis chaus	II	LC
18	Rhesus macaque	Macaca mulatta	II	LC
19	Sambar	Cervus unicolor	III	VU
20	Three-striped Palm Squirrel	Funambulus palmarum	II	LC
21	Wild boar	Sus scrofa	III	LC
Source: GRC Survey Data supported by Department of Forest, Haryana.				
IUCN Status: LC: Least Concern, VU: Vulnerable, EN: Endangered, NT: Near Threatened.				

3.4.6.4.2 Reptiles and Lizard

During the present survey period some of the reptiles and lizard species were recorded in the buffer zone of the present proposed construction area while some information were also noted down by verbal communication of the people living surroundings in the buffer area. A list of reptiles and lizard species observed in the buffer area is given in **Table 3.18**.

Table 3.18: Reptiles and Lizard Species Present in Buffer Zone of proposed Construction Project

Sl. No.	Common name	Scientific name	Schedule Status (WPA,1972)	IUCN Status
1	Common Krait	<i>Bungarus caeruleus</i>	IV	NA
2	Banded Krait	<i>Bungarus fasciatus</i>	IV	NA
3	Red Sand Boa	<i>Eryx johnii</i>	-	NA
4	Indian Cobra	<i>Naja naja</i>	II	LC
5	Rat Snake	<i>Ptyas mucosus</i>	II	NA

Lizards				
1	Rock Lizard	<i>Agama buberculatus</i>	-	DD
2	Chameleon	<i>Chamelion calcarata</i>	II	DD
3	Indian House Gecko	<i>Hemidactylus flaviviridus</i>	-	DD
Source: GRC Survey Data supported by Department of Forest, Haryana. IUCN Red list: DD: Data Deficient, LC: Least Concern.				

3.4.6.4.3 Avian Fauna

During the present investigation it was observed that the various avian fauna are moving across the proposed construction project area in the buffer zone. But, no fixed pattern in migratory behavior is noticed. No bird's habitats like nesting, breeding and forging patterns are noticed in the core zone as well as buffer zone. A list of birds observed in the buffer zone of proposed Construction Project is given in **Table 3.19**.

Table 3.19: Avian Fauna Present in the Buffer Zone of proposed Construction Project

SL. No	English Name	Scientific Name	Schedule Status (WPA,1972)	IUCN Status
1	Jungle Myna	<i>Acridotheres fuscus</i>	IV	LC
2	Common Myna	<i>Acridotheres tristis</i>	IV	LC
3	Common Kingfisher	<i>Alcedo atthis</i>	IV	LC
4	House Swift	<i>Apus nipalensis</i>	IV	LC
5	Spotted Owlet	<i>Athene brama</i>	IV	LC
6	Red-rumped Swallow	<i>Cecropis daurica</i>	IV	LC
7	Purple Sunbird	<i>Cinnyris siaticus</i>	IV	LC
8	Rock Pigeon	<i>Columba livia</i>	IV	LC
9	Jungle Crow	<i>Corvus macrorhynchos</i>	IV	LC
10	House Crow	<i>Corvus splendens</i>	IV	LC
11	Common Quail	<i>Coturnix coturnix</i>	IV	LC
12	Common Cuckoo	<i>Cuculus canorus</i>	IV	LC
13	Indian Cuckoo	<i>Cuculus micropterus</i>	IV	LC
14	Black Drongo	<i>Dicrurus macrocercus</i>	IV	LC
15	Red Jungle fowl	<i>Gallus gallus</i>	IV	LC
16	White Wagtail	<i>Motacilla alba</i>	IV	LC
17	House Sparrow	<i>Passer domesticus</i>	IV	LC
18	Jungle Bush Quail	<i>Perdica asiatica</i>	IV	LC
19	Grey Bushchat	<i>Saxico laferreus</i>	IV	LC
20	Common Babbler	<i>Turdoides caudata</i>	IV	LC
21	Common Hoopoe	<i>Upupa epops</i>	IV	LC
Source: GRC Survey supported by data of Department of Forest, Haryana. IUCS status- LC: Least Concern, NE: Not Evaluated, EN: Endangered, NT: Near Threatened.				

3.4.6.4.4 Aquatic Fauna

I. Zooplankton

Zooplankton is commonly found in all types of aquatic habitats. These are recognized as secondary producers and considered as one of the best tools for environmental monitoring programme. During the present survey zooplankton diversity of different habitats was assessed. List of zooplankton species recorded from different water bodies present in the buffer zone of present project is given in **Table 3.20**.

Table: 3.20: Zooplankton Species Recorded from different Aquatic Habitats of Buffer zone Present, Panchkula

Name of the Groups	Name of the Taxa
Protozoa	<i>Arcella</i> sp.
	<i>Centropyxis</i> sp.
	<i>Diffflugia</i> sp.
	<i>Paramoecium</i> sp.
Rotifera	<i>Asplanchna brightwelli</i>
	<i>Brachionus angularis</i>
	<i>Brachionus calciflorus</i>
	<i>Brachionus falcatus</i>
	<i>Brachionus</i> sp.
	<i>Cephalodella gibba</i>
	<i>Filinia longiseta</i>
	<i>Keratella cochlearis</i>
	<i>Keratella tropica</i>
	<i>Lecane closterocera</i>
	<i>Lecane luna</i>
Copepoda	<i>Cyclops</i> sp.
	<i>Mesocyclops</i> sp.
	<i>Thermocyclops</i> sp.
	<i>Diaptomus</i> sp.
	Nauplius larvae
Cladocera	<i>Alona intermediate</i>
	<i>Bosmina</i> sp.
	<i>Bosmina longirostris</i>
	<i>Chydorus</i> sp.
	<i>Daphnia</i> sp.
	<i>Daphnia pulex</i>
	<i>Diaphanosoma excisum</i>
Ostracoda	<i>Cypris</i> sp.

	<i>Stenocypris</i> sp.
Source: GRC Survey Data	

II. Macro-invertebrates

Macro-invertebrates are commonly found in all types of aquatic habitats such as streams, rivers, wetlands, lakes and ponds. These animals generally include insects, crustaceans, molluscs and annelids. They are significant within the food chain as larger animals such as fish and birds rely on them as a food source. Various macro-invertebrate species were collected and identified from different habitats present in the buffer zone of present project is given in **Table 3.21**.

Table: 3.21: Macro-invertebrates Species Recorded from different Aquatic Habitats of Buffer zone Present Project

Name of the Groups	Name of the Taxa
Mollusca	<i>Corbicula</i> sp.
	<i>Corbicula striata</i>
	<i>Gyraulus</i> sp.
	<i>Lamellidens</i> sp.
	<i>Melanoides scabra</i>
	<i>Thira tuberculata</i>
Diptera	<i>Chironomus</i> sp.
	<i>Chironomus plumosus</i>
	<i>Tendipes kiefferulus</i>
Oligochaete	<i>Dero dagitata</i>
	<i>Pheretima</i> sp.
	<i>Tubifex tubifex</i>
Crustacea	<i>Gammarus pulex</i>
	<i>Palemone</i> sp.
Trichoptera	<i>Glossosoma</i> sp.
	<i>Hydropsyche</i> sp.
Ephemeroptera	<i>Baetis nymph</i>
	<i>Caenis runlorum</i>
Source: GRC Survey Data	

III. Amphibian

Amphibians are commonly at the places along the margin of aquatic and terrestrial systems. Due to presence of several water bodies like river and streams *etc.* the study area is providing shelter to many amphibian species. During the present survey period, some amphibian species commonly observed in the buffer zone of the present mining project are given in **Table 3.22**.

Table: 3.22: Amphibian Species Recorded from different Aquatic Habitats Situated in the Buffer Zone of Present Project

Sl. No.	Common name	Scientific name	Schedule Status (WPA,1972)	IUCN Status
1	Common Indian toad	<i>Duttaphrynus melanostictus</i>	IV	NA
2	Indian skipper frog	<i>Euphlyctis cyanophlyctis</i>	IV	NA
3	Indian bull frog	<i>Hoplobatrachus tigerinus</i>	IV	NA

Source: GRC Survey Data supported by Department of Forest, Haryana, Himachal Pradesh and U. P.

IV. Fishes

Buffer area of Present Construction project comprises several River/ Streams which supports some fish species. List of fauna present in the different water bodies in the buffer zone of present construction project (Barwala) are listed in **Table 3.23**.

Table 3.23: Fish Species in Present in the different Water Bodies in the Buffer Zone

Family	Scientific Name	Local Name	IUCN Status
Order- Beloniformes			
Family: Belonidae	<i>Xenentodon cancila</i>	Kakia/ Kauwa	LC
Order- Cyprinidontiforms			
Family: Aplocheilidae	<i>Aplocheilus panchax</i>	Kanpona	DD
Family: Cyprinidae	<i>Amblypharyngodon mola</i>	Mourula	LC
	<i>Puntius conchonius</i>	Puntius	VU
	<i>Labeo calbasu</i>	Kalbasu	LC
	<i>Labeo bata</i>	Bata	LC
Order- Clupeiformes			
Family: Clupeidae	<i>Gudusia chapra</i>	Khaira	LC
Order- Perciformes			
Family: Nandidae	<i>Nandus nandus</i>	Bheda	LC

Family: Osphronemidae	<i>Colisa fasciata</i>	Khalisa	LC
	<i>Colisa lalia</i>	Khalisa	NE
Order- Siluriformes			
Family: Pangasidae	<i>Pungasius pungasius</i>	Pangus	LC
Family: Sisoridae	<i>Bagarius bagarius</i>	Garua	VU
Family: Siluridae	<i>Heteropneustes fossilis</i>	Singil	LC
Family: Mastacembelidae	<i>Macrognathus pancalus</i>	Pankal	NT
	<i>Macrognathus aculeatum</i>	Ban	LC
Order- Tetraodontiformes			
Family: Tetraodontidae	<i>Tetraodon fluviatilis</i>	Potka	NE
Source: GRC Survey Data supported by Department of Fisheries, Haryana. IUCN Status=LC: Least Concern, NE: Not Evaluated, EN: Endangered, NT: Near Threatened.			

3.4.6.5 Agricultural Land

Agriculture is the predominant occupation in Panchkula District but it mostly dependent on monsoon. This region is characterized as low rainfall and dry with vast marginal lands. Agro-climatically a number of crops can be grown in Panchkula district but major portion of cultivable land is occupied by wheat, paddy, sugarcane, bajra and arhar. The significant area shift towards these crops reflects their respective profitability and ease with which these crops can be cultivated as per land suitability.

3.4.6.6 Fishery

The Haryana State has very good water resources in the shape of rivers, canals, drains, natural and manmade lakes, reservoirs, micro-water sheds and village ponds to enable promotion of fisheries. The district Panchkula is highly blessed with several natural aquatic resources in the form of rivers, ponds, canals, ponds etc. Fish culture in Haryana is little difficult due to non-availability of fishermen community and mostly vegetarian population. The fisheries sector has been recognized as a powerful income and employment generator as it stimulates growth of a number of subsidiary industries and is a source of low cost animal protein to the people particularly to the economically weaker sections of the society and thereby it is an advantageous position to ensure national food security. The average annual fish production in the state is 6000 kg/hectare.

3.4.6.7 Occurrence of Schedule-I and Rare, Endangered and Threatened Species (RET)

Overall studies of present construction project of Barwala (District Panchkula) reveal that, Schedule-I species as well as plant species under the category of RET were not observed from the buffer and

core zone. However, all care will be taken for protection of others flora & fauna also, if any in the lease hold area.

CHAPTER-4

ANTICIPATED ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

4.1 INTRODUCTION

This chapter discusses identification and appraisal of various environmental impacts due to the “Industrial Estate project at Barwala”. Generally, the environmental impacts can be categorized as either primary or secondary. The construction and functional phase of the project comprise various activities, each of which may have some adverse impact on environmental parameter. Various impacts during the construction and operation phase on the environmental parameters have been studied to estimate the impact on environment.

Industrial Estate at Barwala will be constructed and developed gradually in the time span of 5 years (approx.). In development phase, basic infrastructure facilities like internal road, CETP system, storm water drainage, street lighting etc. will be developed.

For proper evaluation and assessment of the environmental impacts due to construction and functional phase of proposed project understanding to the various activities associated with the Industrial Estate project is essential. Various activities related to the project would be different, in terms of nature during the construction and functional phase.

The impact identification and prediction process aims to:

- Identify potential source or cause of impact throughout the life of project.
- Characterize the potential impacts affecting a target or receptor (physical, human and socio-economic).
- Assess the potential of changing likely-hood of impact through Environmental Management Plan (EMP)
- Prediction of the impacts due to the construction and functional activities encompass the developmental processes to be undertaken during construction and functional phases.

For each category of environmental receptor (such as ambient air quality, water quality, soils, land etc.) the potential impacts of activities has been assessed and discussed in detail in following sub sections. In each case, cognizance has been taken for mitigation measures inherited in the construction and operation phases.

Hierarchy of elements of mitigation plan

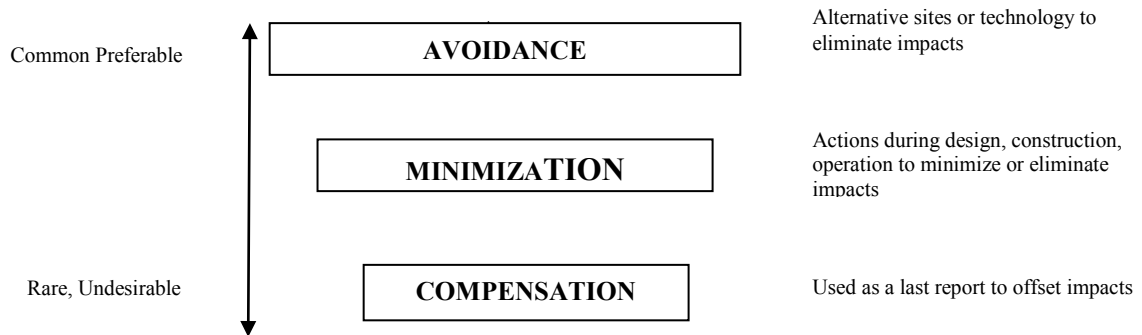


Figure 4.1: Elements of Mitigation

An EIA practice requires technical understanding of relevant issues and measures that work in such circumstances. The priority of selection of mitigation measures should be in the following order:

Step One: Impact avoidance:

This step is most effective when applied at an early stage of project planning. It can be achieved by:

- Not undertaking certain projects or elements that could result in significant adverse impacts
- Avoiding areas that are environmentally sensitive; and
- Putting in place the preventative measures to stop adverse impacts from occurring, for example, release of effluent from a project to water bodies.

Step Two: Impact minimization

This step is usually taken during impact identification and prediction to limit or reduce the degree, extent, magnitude, or duration of adverse impacts. It can be achieved by:

- scaling down or relocating the proposal
- redesigning elements of the project
- taking supplementary measures to manage the impacts

Step Three: Impact compensation:

This step is usually applied to remedy unavoidable residual adverse impacts after a project has become operational. It can be achieved by rehabilitation of the affected site or environment, for example, by habitat enhancement.

- restoration of the affected site or environment to its previous state or better, as typically required for mine sites, forestry roads and seismic lines
- replacement of the same resource values at another location. For example, by wetland engineering to provide an equivalent area to that lost to drainage or infill.

4.2 POLLUTION SOURCES

Pollutants generated in the development of “Industrial Estate Project” at Barwala during both the construction and functional phases are solid, liquid and gaseous in nature. Also the generation of pollution could be continuous, periodic or accidental. Sources of pollutants and their characteristics during the construction and operation phases are given below in **Table 4.1**.

Table 4.1: Pollutant Sources

SI. No.	Activity/Area	Pollutant	Sources	Frequency
CONSTRUCTION PHASE				
1.	Site preparation and construction activities	Air emission- PM, SO ₂ , & NO ₂ .	Dust from construction activities and excavation. Particulates matter, NO ₂ and SO ₂ from vehicle exhaust.	Temporary during construction phase only. Bulk of the emissions is expected from ground work and leveling.
		Earth/Solid waste	Solid waste from construction activity and excavation.	Periodic.
		Hazardous waste generation such as used oil and paints.	From D.G. Sets and painting of the buildings.	Periodic and temporary
		Noise	Noise generated from construction equipment and machinery	Temporary lasting the construction phase.

SI. No.	Activity/Area	Pollutant	Sources	Frequency
2.	Labour Camps	Sewage	Sewage generated from temporary labor camps on site.	Temporary-during the initial construction phase
		Solid Waste	Solid Waste generated from temporary labor camps on site.	Temporary- during the initial construction phase
OPERATIONAL PHASE				
1.	Vehicular movement, industrial emission	Air emissions and noise	Vehicle exhaust emissions & industrial emissions	Continuous/ periodic
	Industrial activity	Noise	Noise due to running of equipment in proposed industries	Continuous/ periodic
2.	Diesel generators/ industrial processing	Air emissions	SO ₂ , NO ₂ , PM, CO etc. from fuel burning	Occasional- during power failure & periodic
		Noise	Noise from running of equipment	Occasional - during power failure & periodic
		Hazardous Waste	Used Oil Generation & industrial waste. depending on the industries.	Occasional Continuous
3.	Effluent/Main tenance / House-keeping	Waste Water	Process effluents, Floor washing	Continuous
		Solid waste	Residential, Commercial, industrial and garden wastes	Continuous
5.	Vehicle Parking	Oil spills	Minor oil leaks Parking space	Continuous
7.	Storm water drains	Rainwater	Contamination discharge from site- mainly suspended solids	During rainy season

4.3 IMPACT IDENTIFICATION

The areas of environmental concerns for which the impacts and their predictions are taken into consideration are mainly:

- Air Environment
- Water Environment
- Noise Environment
- Land Environment
- Biological Environment
- Socio economic Environment

The impacts can be further categorized as positive impacts and negative impacts depending upon their nature, potential and magnitude.

4.3.1 Environmental Aspects of Development & Construction Operations

- Generation, storage and disposal of construction wastes;
- Noise pollution from plant, machinery, equipments and vehicle movement;
- Air pollution from plant, machinery, equipments and vehicle movement;
- Generation and discharge of wastewater;
- Impact on ecology;
- Consumption of resources such as water, electricity, and diesel.
- Physical change in landscape due to earth work excavation and related activities.
- Soil erosion caused due to loss of vegetation and other construction activities.

4.3.2 Environmental Aspects of operation

Impacts identified during operation of the Industrial Estate project and their use includes major concerns such as:

- Discharge of Industrial Effluent.
- Disposal of solid waste generated in the Industrial Model Township at Baawala from residents, commercial, industrial and horticultural activities.
- Increase in noise level due to transport & running of machineries in industries.
- Consumption of water and impact on water resources
- Impact on traffic
- Storm water during rains

Various activities from the proposed project are likely to have some negative as well as positive impact on the environmental constituents during its construction as well as operational phase. The impact assessment matrix given in Table 4.2 reveals the impact associated with each activity of the project on various environmental parameters during construction and functional phase respectively before any mitigation measures are implanted. To assess the severity of the impacts, they are categorized as follows:

Table 4.2: Potential Environmental Impacts of Proposed Industrial Estate Project

Environmental Parameters	Nature of Potential Impacts during Construction and Operation Phases										
	Local	Regional	Short Term	Long Term	Reversible	Irreversible	Adverse	Beneficial	No Impact	Significant	Insignificant
Topography	√								√		
Drainage	√								√		
Soil	√								√		
Water Resources	√		√		√		√				√
Water Quality	√								√		
Land Use	√			√		√		√		√	
Air Quality	√		√		√		√				√
Noise	√		√		√		√				√
Flora	√			√		√		√		√	
Fauna	√			√		√		√		√	
Employment	√			√		√		√		√	

4.4 ASSESSMENT OF ENVIRONMENTAL IMPACTS DURING DEVELOPMENT AND CONSTRUCTION PHASE

4.4.1 Topography

Impact: The project site lies in Panchkula District, which comprises mainly plain area.

Mitigation Measure: Since there is no significant impact on topography from the project, no detailed mitigation measures are proposed. It is however proposed that apart from the proposed plantation greens, turfing with local species will be carried out extensively.

4.4.2 Land Use Pattern

Impact: Detailed Land use pattern is given in chapter-3.

4.4.3 Land Environment

Impact: To avoid loss of top soil during excavation, it is proposed to temporarily store the top soil in an earmarked area which will be used to be laid over areas to be used for plantation. Rest of the soil shall be transported by road to fill up low lying areas elsewhere. Proper drainage system will be provided to channelize storm water. Hence the impact on soil during construction phase will be reversible in the nature.

Mitigation: To ensure minimum or temporary disturbance to soil, it is proposed to remove vegetative cover only from the specific area on which construction will take place and minimize disturbance to the vegetation in adjacent areas. Land clearing activities only confined to necessary areas. The top soil will be stripped from constructional areas and stockpiled for later use in landscaping. The number, frequency and area of movement of heavy vehicles will be restricted on soil surface.

4.4.4 Water Environment

4.4.4.1 Surface Water Quality

Impact: The primary concerns relating to surface water quality associated with construction activities are pointed out below:

- Runoff related to unpaved and excavated areas during the rain shower.
- Sediments transported to runoff from the construction site.
- Run off related to area where lubricant, fuel other materials are stored, used and disposed, off.

Ghaggar River is present at the site as surface water body. Surface water quality may be affected with the discharge of the runoff from the project site. The impact to the surface water bodies could arise from the increased soil erosion from excavated site only causing increase in the suspended particles and turbidity of runoff water from the site. However, this impact will be minimized by planning garland drains and settling pits to collect sediments and discharge only clean water to natural water bodies. Also, this will be temporary in the nature and would be observed in first rain only and after the first monsoon, the excavated soil at site would be stabilized. But in this case phase-I is operational and water supply of this phase is also from Ghaggar River. Hence, more precautions are required.

Mitigation Measures:- The impact on surface water quality can be minimized by adopting following measures;

- Excavation during dry season and proper management of excavated soils,
- Clearing all debris from site as soon as construction is over.
- By providing hutment and toilet facilities for construction labour,
- Through the proper disposal of wastewater generated at site.
- Canal is bunded from the sides to prevent any kind of pollution to enter.

4.4.4.2 Ground water Quality

Impact: No hazardous chemical and material will be used during construction phase of industrial estate. Debris and wastes generated during this phase will be collected and disposed suitably. Therefore, possibility of contamination of ground water will be negligible. Hence, no impact is anticipated on the ground water quality during the construction phase.

Mitigation: A well planned solid waste management plan will be followed during the construction phase including timely collection, segregation and disposal as per legal requirements.

4.4.4.3 Surface and Ground Water Hydrology

Surface Water Hydrology

Impact: Runoff during rains take way to natural drains and storm water drains laid in the area.

Mitigation Measures: Project proponent will ensure no interception on water runoff flow routes and drainage pattern of the area throughout the construction of the Industrial Estate at Barwala by providing adequate water channels.

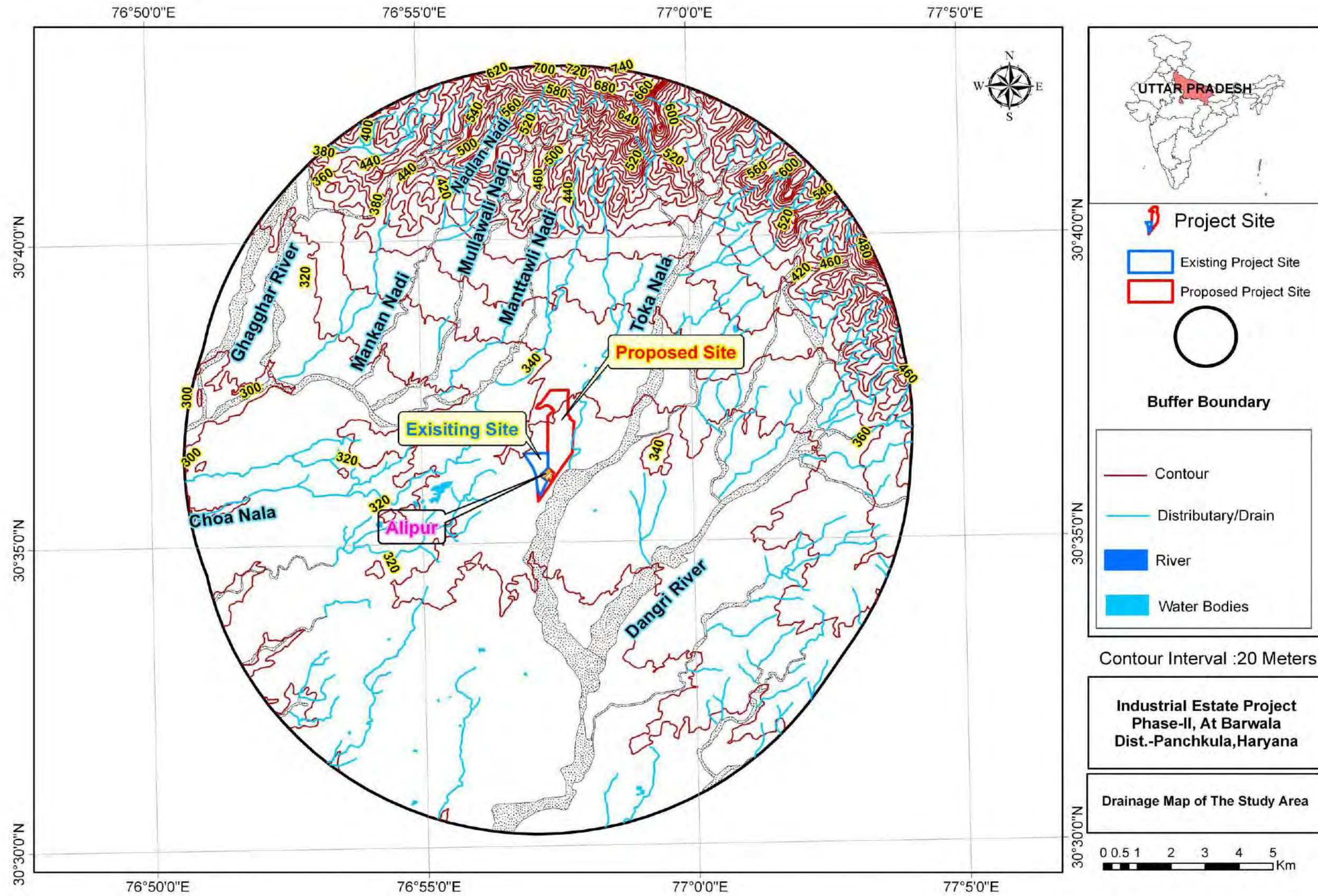


Figure-4.2 Drainage map of 10km from the project site

Ground Water Hydrology

Impact: Water requirement during construction phase will vary depending upon construction activities and will be met by existing tube wells at the site. Water will be required for site preparation activities, dust settlement, consolidation, compaction and curing as well as building construction and drinking water requirement. The requirement of construction water will not put sudden pressure on the available ground water resources of area as other source of water supply will be private water tankers. Therefore, impact on ground water resource will be insignificant during construction of Industrial Estate at Barwala.

Mitigation Measures: Although no significant impact is anticipated on the groundwater regime, it is proposed to carry out the following to further minimize the demand on freshwater resources:

- Curing water will be sprayed on concrete structures and free flow of water not allowed.
- After liberal curing on the first day, all concrete structures will be painted with curing chemicals to save water to stop daily water curing hence save water.
- Concrete structures will be covered with thick cloth/gunny bags and then water sprayed on them to avoid water rebound and ensure sustained and complete curing.
- Ponds will be made using cement and sand mortar to avoid water flowing away from the flat surface while curing.
- Water ponding will be done on all sunken slabs. This will also highlight the importance of having an impervious formwork.

4.4.5 Air Environment

Emissions Source: The potential sources of air emissions during the construction and development phase of the project will be as follows:

- Dust from earth works (during site clearance and preparation);
- Emissions from power generator at site;
- Emissions from the operation of construction equipment and machines;
- Fugitive emissions from vehicles running to site;
- Fugitive emissions during the unloading of material at the site;
- Fugitive emissions during mixing of cement with other building materials during development and construction activities;
- Air emissions other than dust arise from combustion of hydrocarbons. The pollutants of concerns are NO₂, SO₂, CO, particulate etc.
- Air emission by the various stacks of industries.

Potential Impacts: Ambient air quality effects are normally assessed in relation to their potential to cause;

- Health deterioration and nuisance in local communities
- Health deterioration amongst onsite workers
- Health deterioration amongst industrial workers

Assessment of the impacts from Dust Emissions: During the excavation of channels, foundations, unloading of construction material, cement bags and mixing of cement with other building materials such as brick and silica dust, wood dust, fugitive dust emissions may be emitted at construction site. During construction, dust suppression by water spraying will be done and curtaining floors from all sides will be done to prevent cement dust from becoming airborne. It may be noted that all the emissions will be in the form of coarse particulate matter and settle down ultimately in close vicinity of construction site. Therefore, no significant impact is anticipated due to dust emission during development and construction phase.

Assessment of the impact from Diesel Generators: Emissions from the D.G. Set during construction phase may cause some localized impact on ambient air quality for short duration, as it will be operated during power failure only. It may be noted that the D.G. Set power will be used to operate construction equipment only if required. Adequate height of stacks and acoustic erective will be provided to the D.G. Set as per guidelines of CPCB to facilitate the dispersion of flue gases into the atmosphere.

Mitigation Measures: It is proposed to provide adequate dust control systems in the form of installation of batch plants, and loose material handling in covered sheds. Dust suppression system is also to be provided where necessary. It is also proposed to cover scaffolding, hosing down road surfaces and cleaning of vehicles especially during the dry season. Avenue and curtain plantation on the internal roads and peripheral plantation around the site will be initiated from the beginning of construction activities.

4.46 NOISE ENVIRONMENT

During the construction phase of project, noise will be generated from the various sources. Some major sources of noise generation at project site are listed are under:

- Generation of noise during movement of vehicles carrying materials and loading & unloading activities.
- Generation of noise from excavation machines, concrete mixer and other construction machines,
- Generation of noise during the operation of D.G. Set,
- Generation of noise during concreting, hammering, etc.

All the above-mentioned sources of development and construction activities at Industrial Estate would be intermittent and experienced occasionally. It may also be noted that the most of the construction activities would be carried out only during the daytime.

The expected noise levels from various activities are given hereunder:

Table 4.3: Noise Levels During Construction Phase

Commercial Vehicles	85-91dB (A)
Air Compressor	81 dB
Back Hoe	80 dB
Compactor	82 dB (A)
Concrete Mixtures	85 dB (A)
Concrete Pump	82 dB (A)
Concrete Vibrator	76 dB (A)
Crane, Derrick	88 dB (A)
Crane, Mobile	83 dB (A)
Dozer	85 dB(A)
Generator	81 dB (A)
Grador	85 dB (A)
Impact Wrench	85 dB (A)
Jack Hammer	88 dB (A)
Loader	85 dB (A)
Paver	89 dB (A)
Pile Driver (Impact)	101 dB (A)
Pneumatic Tool	85 dB (A)
Pump	76 dB (A)
Roller	74 dB (A)
Saw	76 dB (A)
Scarifier	83 dB (A)
Scraper	89 dB (A)
Shovel	82 dB (A)
Tie Cutter	84 dB (A)
Truck	88 dB (A)

Resultant Noise Level:

The combined effect of above sources can be determined as per the following equation:

$$L_{p(\text{total})} = 10 \log (10^{(L_{p1}/10)} + 10^{(L_{p2}/10)} + 10^{(L_{p3}/10)} + \dots) \dots (1)$$

Where: L_{p1} , L_{p2} and L_{p3} are noise pressure level at a point due to different sources in dB (A).

For an approximate estimation of dispersion of noise in the ambient air from the sources point, a standard mathematical model for sound wave propagation is used. The sound level generated by noise source decrease with increasing distance from the source due to wave divergence. An additional decrease in sound pressure level from the source is expected due to atmospheric effect or its interaction with objects in the transmission path.

For hemispherical sound wave propagation through homogenous loss of free medium, noise levels at various locations can be calculated due to different sources using model based on the first principles as per the following, equation:

$$L_{p2} = L_{p1} - 20 \log (r2/r1) \dots (2)$$

Where: L_{p2} and L_{p1} – Sound Pressure Level (SPLs) at distance of $r2$ and $r1$ from the source respectively in dB (A).

Assuming no environmental attenuation factors, noise modeling has been done, which shows that additional noise level will not be much above the baseline noise level with in short distance.

The noise produced during, development and construction phase will have temporary impacts on the existing, ambient noise levels at project site but restricted to small distance and only during daytime. Therefore, the impact of noise levels on surrounding area will be insignificant during the development and construction phase.

Mitigation: To minimize impacts of noise generation from construction activities, the workers will be provided with ear muffs and other protection devices. D.G. Sets with proper acoustic enclosure for controlling noise would be installed. They rarely need DG set for construction phase as HSIIDC have their own power station by which all construction will take place. Avenue and curtain plantation on the internal roads and peripheral plantation around the site will serve as an attenuator and will be initiated from the beginning of construction activities

4.4.6 Biological Environment

Impact: There is no loss of forestland due to the construction of the Industrial Estate project at Barwala. No tree felling is involved, as the site is devoid of vegetation as site is agricultural land.

Birds and other domesticated biodiversity observed near the project site are common and already adapted to thrive in human - colonized habitats. The project will not have any significant negative ecological impact. There is no forest near the project site and therefore there will be no effect on the ecology of the area. Project site was an agricultural land before land acquired by HSIIDC. Compensation has already given to farmers for their land acquisition compensation has nothing to do with ecology it is purely an R & R issue.

Mitigation Measures: However, it is proposed to develop extensive green areas in the project site to improve the aesthetics of the area which will also help in reduction of air pollution, noise pollution and provide suitable habitat for local birds and animal species.

4.4.7 Economic Impacts

Impact: Relatively long-lived economic impacts of the development and construction phase are likely to be experienced in local area for the duration of construction phase of 5 years as workers will be hired every day from local traders in nearby areas. This is likely to give a short-lived stimulus to the traders that may disappear as soon as the construction is complete. Noticeable, flow-on economic impacts will be experienced in other sectors of economy as a result of purchase of construction materials and the payment of wages and salaries to the personnel engaged in the development and construction of project. Once the development and construction of Industrial Estate will complete, there will be long-term positive impact on the economic structure of the area. People in the area will get direct and indirect employment opportunities and other benefits from the Industrial Estate at Barwala. Therefore, overall positive impact is anticipated on economy of the area due to development and construction activity of the Industrial Estate.

4.4.8 Socio-Economic

During the construction phase of Industrial Estate project at Barwala, about 582 workers (194 skilled and 338 unskilled) will get direct employment opportunity, and during operational phase about 945 workers (120 skilled and 525 unskilled) will get direct employment which will have beneficial impact on the local people and improve socio-economic conditions of the area.

4.4.9 Construction Camp

Impact: During the development and construction phase, most of the laborers will be from local areas as Industrial Estate at Barwala will be developed gradually in the time span of about 5

years. Therefore, temporary laborer camps will be constructed to accommodate the laborers at the project site. This may lead to sanitation problems in the absence of adequate facilities.

Mitigation: Suitable measures will be taken at the construction camps to mitigate anticipated impacts due to temporary accommodation of laborers such as provision of clean drinking water, adequate toilet facilities, water and solid waste disposal system.

Other safety precautions to be maintained at work site including provision of PPEs, guarding of dangerous machine parts, maintenance of equipments as hoists and lifts etc, and adequate provision of different types of fire extinguishers will be made. All applicable rules and regulations pertaining to workplace health and welfare of workers will be adhered to.

4.4.10 Solid Waste Management

Impact: The construction waste includes debris, concrete (often recycled and reused at the site), steel and other metals, pallets, packaging and paper products, fluorescent tubes, wood beams, joists, studs, baseboards, cabinets and cupboards, railings, brick, doors and casings, interior windows, bathroom fixtures, light fixtures, ceiling grid and tile, furnishings, replant trees, shrubs. All wastes generated during the construction phase shall be collected and segregated for disposal as per the standard practice.

During the development and construction phase, some amount of debris, cuttings of construction materials may be observed at construction site. However, the quantity of these waste materials would be very small and limited up to the construction site only. There will be no contamination due to this waste as it will be collected time to time during construction phase and disposed accordingly.

Mitigation Measures: After due waste segregation, recyclable wastes will be sold off to scrap dealers and vendors. Hazardous wastes will be disposed off as per the provisions of the Hazardous Wastes (Management & Handling) Rules, 2011. There is Pali village in Haryana, where all hazardous waste will be disposed off.

4.4.11 Transport Linkage and Traffic

Impact: During development and construction phase, construction labour and construction materials bringing vehicles will approach the project site. The Industrial Estate at Barwala is well connected to neighborhood, where public transport facility, like, buses and minibuses are available in the area as transport linkage. During construction phase, some impact is anticipated

on the transport linkage of the area, however increase in traffic will not adversely affect the local traffic pattern since the site is well connected by road of adequate width

Mitigation: Through careful planning, the movement of the heavy vehicles will be scheduled to reduce incremental load on existing traffic such that the peak hours are avoided. It shall also be ensured that all the vehicles to the site will be provided with Parking space such that there is no waiting time along the access roads.

4.5 ASSESSMENT OF THE ENVIRONMENTAL IMPACTS DURING POST CONSTRUCTION PHASE

4.5.1 Land Environment

Impact: During the operation phase of the project, the soil may get polluted/ contaminated from littering of various kinds of wastes generated within the site such as food items, paper, wood pieces, paints, pesticides, oil & grease & other industrial waste etc. However, owing to the proposed solid waste management system, no significant impact is anticipated.

Mitigation Measures: To ensure against any chances of soil pollution, it is imperative to establish a well planned solid waste collection system covering all areas of the project site apart from door to door for the residential units . An identified area shall be designated for storage and segregation of the wastes from residential as well as industrial areas which will be treated/ disposed as per their characteristics.

4.5.2 Water environment

4.5.2.1 Surface water hydrology

Impact: The industrial effluents generated from the Industrial Estate will be collected through the lined network for treatment in the Common Effluent Treatment Plant (CETP). The treated wastewater will be reused and no discharge of polluted water will be made into any surface water body. Therefore, impact on the surface water hydrology will be insignificant during the post construction phase.

Mitigation: In absence of any storm water drainage, the rainfall often finds its way into the surface water bodies. To avoid the same, a well planned rain water harvesting plan is proposed that will collect the rain water from Industrial estate and conveys the same to Dangri river through proper channel, as ground water level is shallow at site and by doing this, it is possible to

recharge ground water as well as maintain water in river to meet demands of the people living near by the river.

4.5.2.2 Ground water hydrology

Impact: The water requirement of Industrial Estate at Barwala will be met by tube wells. The developer shall make internal distribution network of water in the Industrial Estate. Underground water tank of required capacity will be provided and over head tanks will be provided for water storage. Therefore, no significant impact is anticipated on ground water resources due to the project as it water level in the area is shallow.

Mitigation Measures: It is proposed that rain water from Industrial estate will be collected and conveys the same to recharge pits through proper drainage channel, as ground water level is shallow at site and by doing this, it is possible to recharge ground water as well as maintain water in river to meet demands of the people living near by the river. Treated wastewater from the site will be recycled for landscaping, flushing, DG set cooling etc.to further reduce demand on freshwater resources.

Water meters conforming to IS standards shall be installed at the inlet point of water uptake and at the discharge point to monitor the daily water consumption. To further lower the water consumption, options of Low Flow Flushing systems, sensor based fixtures, waterless urinals, and tap aerators etc will be explored.

4.5.2.3 Surface Water Quality

Impact: The industrial effluents generated from the Industrial Estate will be collected through the lined network provided in Industrial Estate, and treated in a Common Effluent Treatment Plant (CETP) of capacity 6.1 MLD will be provided in module wise. No discharges from the project site will be made to any surface water body.

Mitigation Measures: Effluent will be discharged after proper treatment.

4.5.2.4 Ground Water Quality

Impact: The storm water from the site will be channelized to recharge pits for the reason as explained above. The wastewater from the site is proposed to be used for landscaping only after adequate treatment in proposed Common Effluent Treatment Plant. Hence, no adverse impact is anticipated on the groundwater quality form the project.

Mitigation Measures: The Industrial Estate at Barwala will be well maintained. Solid waste management practices will be adopted and followed to prevent groundwater pollution through leaching.

4.5.3 Air Environment

AIR ENVIRONMENT

Prediction of Impacts

Vehicular emissions and DG set emissions will be the major sources of air pollution from industrial estate along with insignificant industry specific emissions as there are no category A or B industries as planned presently at Barwala project. During the post construction phase, cars, scooter/motorcycle will be owned by the population of such project. Ground Level Concentration of pollutants (as added by the project) will depend upon the following:

- Emission of pollutants from additional traffic on the roads due to the project.
- Meteorological conditions.
- Emission sources from D.G. Sets.
- Industry specific emissions

PM, NO₂, SO₂ and CO will be the main pollutants of primary concern released from traffic movement, DG sets and industrial emissions. The dispersion of vehicular emissions would be confined within limited distance from the road and concentration will decrease with the increase in distance from road as worked out by the line source model. It was anticipated that the contribution of vehicular emissions from the exhaust in ambient air quality will be marginal as Pollution Under Control (PUC) Certified vehicles and branded vehicles with low sulphur diesel will be used. Ground Level Concentration (GLC) of pollutants are found to be well within the stipulated National Ambient Air Quality Standards due to traffic movement and vehicles used inside the premises. Air modeling while considering all industrial sources is not possible as this stage, hence did DG sets air modeling using ISCST3 model.

CPCB/MoEF approved USEPA dispersion model-ISCST3 was used for prediction of impacts caused by DG sets. Stack & emission data was used as per design value provided by standard make and stipulated standards. Other primary data used as input for model were hourly meteorological data of Wind speed & direction, temperature, cloud amount and mixing height. Mixing height used in the model was taken from secondary data source "Atlas of Hourly Mixing Height Assimilative Capacity of Atmosphere in India published in 2008 by IMD, Delhi". Hourly

meteorological monitored at site during study period data was compared with long term data available from the nearest India Meteorological station.

In this project, for power requirement a 66 kV sub-station is proposed to supply power in the area. This will cause emission of PM, SO₂, NO₂ and CO in the ambient air quality. In the project, D.G. set will be used only during power failure and low sulphur diesel will be used as fuel to minimize SO₂ emission. Incremental load in the ambient air environment will be found to be very low as given in the report. An adequate stack height for D.G. sets will be provided as per the stipulated guidelines of Central Pollution Control Board (CPCB)/ National Building Code Manual to facilitate adequate dispersion of pollutants and to minimize the impact on Ambient Air Quality under the influence of local meteorology.

Meteorology - Hourly Meteorological data of wind speed & direction, temperature, cloud amount and rainfall were monitored at site for 3months for the dispersion model. Wind rose (**chp-3, figure 3.1**) was prepared in sixteen directions as per standards. It was observed that westerly and north-northwesterly wind was the prevalent wind direction during the study period. Average wind speed was 1.78 m/s and calm condition was 10.82 % during post-monsoon.

Model details and Frame work of Computation:

The predictions for air quality during operation phase was carried out using CPCB/MoEF approved “USEPA, Industrial Source Complex (Version - ISCST3)” Dispersion model developed by the US Environmental Protection Agency (USEPA) for prediction of pollutants dispersion from single or multiple point sources using emission and hourly meteorological data of the study period. Assumption used in the model was as follows:

The plume rise is limited to that of the mixing layer as published by IMD in the Catalogue of Atlas of Mixing Heights in India for the site

- Stack down-wash is not considered.
- Flat terrain is used for computations;
- It is assumed that the pollutants do not undergo any physico-chemical transformation.
- Chemical and scavenging process occurred in the atmosphere in the pollutants released at the stack exit is not considered.
- Prediction is based on single/multiple point sources, pollution released at stack exit and dispersed on the ground under influence of local meteorological conditions during the season.

ISCST3 dispersion model was used to predict GLC caused by a single point source (1 stack) at each receptor of 100 m x 100 m of grid network covering total area of 2000 m x 2000 m around the proposed source with stack & emission values and 1-hourly meteorological data. It was observed that SO₂, NO₂, Co and PM were significant pollutants released from the fuel of the D.G. sets. Emission of PM, CO and SO₂ were found insignificant with low values compared to NO₂. In this proposed project, NO₂ was the worst affected pollutant released into the atmosphere. 24-h GLC were predicted for SO₂, NO₂, CO and PM but isopleth of NO₂ is only presented in the report as GLC of other pollutants were lower under similar meteorological conditions.

Discussion of Results

ISCST3 - Dispersion model was used to predict GLC of all pollutants; SO₂, NO₂, CO and PM with stack & emission and hourly meteorological data. NO₂, being the predominant source, 24-hours average maximum incremental GLC of NO₂ was predicted to be **1.78 µg/m³** which will occur at X=300m, Y=200m from the DG sets fitted with 30 m chimney. It was found that GLC of NO₂ was less than the permissible limit of 100µg/m³ (as per CPCB guidelines) even under worst meteorological condition (Table 4.4).

Table 4.4 : Meteorological data for the 24-hour average maximum predicted Concentration under worst meteorological condition

Year	Month	Day	HOURS	Wind Direction (Degree)	Wind Speed (m/s)	Temperature (K)
2015	10	18	1	0	1	299
2015	10	18	2	0	1	298
2015	10	18	3	0	1	298
2015	10	18	4	0	1	297
2015	10	18	5	0	1	298
2015	10	18	6	0	1	298
2015	10	18	7	0	1	298
2015	10	18	8	0	1	296
2015	10	18	9	0	1	298
2015	10	18	10	0	1	301
2015	10	18	11	0	1	303
2015	10	18	12	0	1	306
2015	10	18	13	0	1	307
2015	10	18	14	0	1	307
2015	10	18	15	0	2.1	307
2015	10	18	16	0	2.6	307
2015	10	18	17	315	2.6	307
2015	10	18	18	0	3.1	307
2015	10	18	19	45	2.1	304
2015	10	18	20	45	2.1	303

2015	10	18	21	67.5	1.5	301
2015	10	18	22	90	1.5	301
2015	10	18	23	90	1.5	300
2015	10	18	24	90	1.5	299

Spatial distribution of NO₂ is shown in isopleth **Figure 4.3**. It was observed that GLC closed to the proposed source will be not significant. 24-h maximum value was 9.258 µg/m³ occurring at the distance 400 m East of the prediction point.

Conclusion

Incremental 24-h GLC of NO₂ was 9.258 µg/m³. High to moderate wind speed and minimum stack height of 30 m facilitates dispersion at the distance of 400 m East under the influence of local meteorology. Predicted GLC of all pollutants are given in **Table 4.5** as below:

Table 4.5: Predicted GLC (µg/m³) of all pollutants – Worst case scenario

S.No.	Pollutants	Maximum Base-line data	Maximum incremental GLC	Total resultant GLC (max)	Distance of occurrence	NAAQS (µg/m ³)
1	NO ₂	34.9	9.258	44.185	400 m, East	100
2	SO ₂	11.5	1.166	12.666	400 m, East	100
3	CO	1840	3.546	1843.546	400 m, East	4000

Max Conc. of NO₂ is 9.258 µg/m³ at 400 m East from the project site

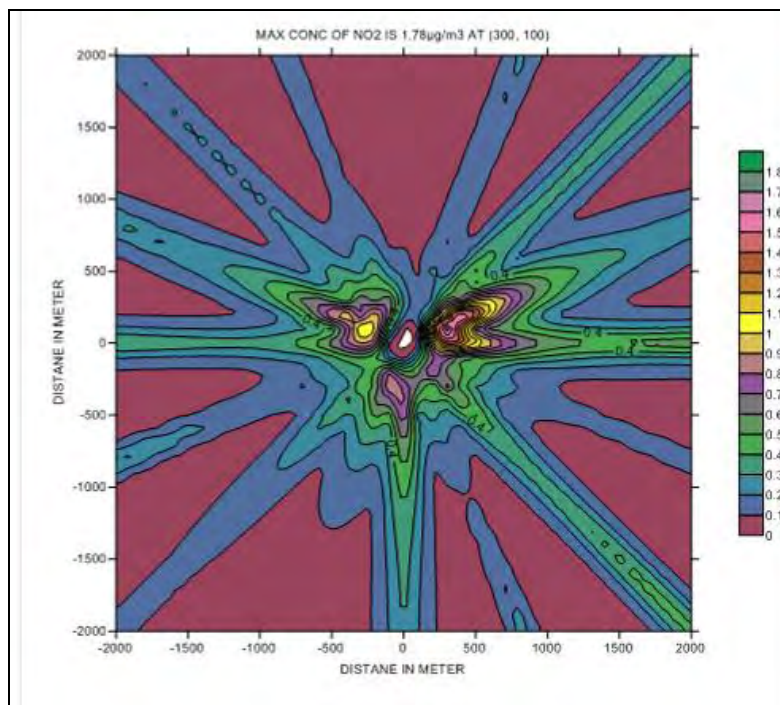


Figure 4.3: Spatial distribution of 24-hours average NO₂ concentrations (µg/m³). Moderate to high wind speed and stack height of 30 m facilitates dispersion at long distance of 300 m, East under the influence of local meteorology.

Mitigation Measures: The project proponent will develop a green belt inside the premises of the project site and along the internal road, which will work as barrier for the movement of pollutants and help in pollution control.

Different varieties of plants will be used as per requirements i.e. for parks, parking area, avenues etc. Common trees which are going to be planted are Neem, Amaltus, Pipal, Pilkhan and Maulsiri, Samel & Alstonia. Fine grassing & landscaping is proposed in all the parks. Side plantation will be carried out as per norms on foot paths.

S.NO	PARTICULARS	NUMBERS
1	TREES IN PHASE-II	7353
2	SHRUBS IN PHASE-II	18412

4.5.4 Noise Environment

Impact: The main sources of noise from the project are running of D.G. Set, industry specific machines vehicular traffic. D.G. Set installed and industry specific activities in the Industrial Estate will provide emergency electricity supply during power failure. This will be intermittent and for short durations. The PUC certified will be allowed to enter the site. However for industrial emissions each individual industry will take care off, their emissions.

Mitigation Measures: D.G. Sets will be fitted in suitable acoustic enclosures by individual industries owner depending upon their capacity and in machineries where ever possible. Adequate personnel protective equipment (PPE) will be provided to the personnel engaged in D.G. Set room and near machineries used in the industry. The traffic noise will diminish within a short distance from the source of origin. Honking within the site will be discouraged. Proposed rows of plantation will further restrict the noise on other side of the plantation i.e. outside the boundary.

4.5.5 Terrestrial Ecology

Impact: The project proposes 13.07 acres of green area that will be planted with local species with aesthetic appeal that will attract local bird and insect species.

Mitigation Measures: Various kinds of plantation such as curtain, avenue and ornamental plantation and lawns will be started during the construction phase itself and maintained during the operation phase. Open space and Parks will be fenced through the grasses and ornamental plants. Local and low water demanding plants that will also be effective as sinks for various pollutants and attract birds will be grown in the site that will contribute in positive to the local ecology.

4.5.6 Socio-economic Impact

Impact: During construction phase of Industrial estate at Barwala, more than 500 persons will get employment opportunities as labor, staff for management, maintenance and security. As an estimate, during post construction phase, approx 900 persons will get marginal employment opportunities from the project. This will help in improving the quality of life of economically weaker sections of the local area.

Mitigation Measures: To further improve the socio-economic conditions of the area, it may be proposed to employ mainly local people as workers. Much of the maintenance arrangements may also be made with local companies and purchase of new parts from the local market.

4.5.7 Transport Linkage and Traffic

Traffic density is a major development indicator and hence is a critical parameter of environmental impact assessment. More urbanization result in high traffic density. More population inflow has direct correlation with traffic density. Traffic density of an area is having direct impact on air & noise pollution and hence the need of management. Traffic is the predominant source of air and noise pollution in urban areas. The major air pollutants emitting out from vehicular traffic are Carbon monoxide, Sulphur dioxide, oxides of Nitrogen, Hydrocarbons etc, any development project activity essentially result in increase in vehicular traffic. Hence, it is important to collect data on existing status of traffic composition and volume in the vicinity of Proposed project site, so that the change in traffic composition and volume can be assessed. Traffic volume count is an important tool for decision maker's tom understands adequacy of prevailing road infrastructure to handle the increased vehicular movement after the proposed project comes up.

Table 4.6: Trip Generation

Area	No. of workers	No. of persons using cars		No. of persons using 2 wheelers		No. of person using Buses		No. of person using Bicycle	
		%	Nos.	%	Nos.	%	Nos.	%	Nos.
Industrial									
a. Unskilled	10500	Nil	Nil	20%	2100	30%	3150	30%	3150
b. Skilled	8400	20%	1680	50%	4200	20%	1680	10%	840
Construction workers	582	5%	229	30%	175	20%	116	30%	175
Commercial and Institutional Area	3337	25%	834	30%	1001	20%	667	15%	501
Public Utilities	190	10%	19	40%	76	20%	38	20%	38
Total	23009		2562		7552		5652		4703
Considering 33% population movement from adjoining areas	7593	20%	1519	40%	3037	20%	1519	15%	1139
Total	30602		4081		10590		7170		5842

Trip Generation for IE

- No. of trips of 2 wheelers: $10590/1.5 = 7060$
- No. of trips of Buses: $7170/30 = 239$
- No. of trips of cyclists: $5842/1 = 5842$

Trip Generation from surrounding area

- Assuming that 10% additional load will be generated from surrounding areas of main roads
- No. of trips of Cars: $2040/10 = 204$
- No. of trips of two wheelers: $7020/10 = 702$
- No. of trips of Buses: $239/10 = 24$
- No. of trips of Cyclists: $5842/10 = 584$

Table 4.7: Category wise trip of vehicles

Trip generation on Roads of IE	Category wise trips of vehicles						
	Car	2 Wheeler	Bus	Cycle	Truck	4 Wheeler	Total
Traffic due to IE	2040	7020	226	5842	0	0	15128
Traffic due to surrounding Area	204	702	23	584	0	0	1513
Traffic due to Industrial Production	0	0	0	0	293	1965	2358
Sub Total	2244	7722	249	6426	393	1965	18999
Total Vehicular Traffic (Excluding cyclist)	2244	7722	249	0	393	1965	12573
PCU	2244	3861	747	3212	1179	3930	15173
Peak Hour PCU (12%)	269	463	90	385	141	472	1821
Peak hour PCU assess road of 30 m @ 40% of the total	108	185	36	154	56	189	729
Peak Hour PCU assess road of 20 m @ 25% of total							

4.5.8 Energy Resources

Impact: HSIIDC has developed the electrical infrastructure so as to make available the source of electricity at the door step of industrial units of HSIIDC industrial estates. Being industrial estate demand for electrical supply is very high, hence, usage of more than 20% of non renewable resources has been planned.

Mitigation Measures: To promote energy conservation, HSIIDC Head Office, at Panchkula issued notice vide letter no. HSIIDC: IA: 2009:5533 to 49-dated 18.03.2009 to all field offices to strictly comply with the mandatory requirements of the renewable energy department, Haryana Govt, in context to the use of Energy Efficient Lighting (CFL & T5) energy efficient tube lights and energy efficient streetlights. The notification issued to field offices:

- To replace all the incandescent lamps and 40W tube lights with conventional choke with CFL & T5-28W tube lights respectively.
- To replace all the old tube light street light fixtures with energy efficient fixtures. Expenditure for replacement of CFL based light with T5-28W tube lights & old tube light street light fixtures with energy efficient fixtures will be recovered with in a period of 5 years through savings

Another notification of Govt. of Haryana regarding use of solar water heating system has come on 29th July, 2005 vides letter no. 22/52/05-5P.

The use of solar water heating systems will be mandatory in the following categories of building namely:

- Industries where hot water is required for processing
- Hospitals and Nursing homes including Govt. hospitals
- Hotels, Motels and Banquet halls
- Jai Barracks, Canteens
- Housing complexes set up by Group Housing Societies/Housing Boards
- All residential buildings built on a plot of size 500 square yards and above falling within the limits of municipal committees/corporations and HUDA sectors
- All Government buildings, residential schools, educational colleges, hostels, technical/vocational education institutes.
- HSIIDC will put condition in the building approval about provision of installation solar water heater systems.

4.5.9 Impact Assessment of Baseline Data:

In chapter 3rd analysis of different parameters like air, water, soil & noise has been carried out. If compared, ground water & surface water of the study area, both are found to be alkaline. pH of Ghaggar river between 7.31 to 7.56, which shows that water is a little alkaline in nature. Whereas pH of ground water varies between 7.51 to 7.96 this is also a little alkaline in nature. Total hardness of ground water of the study area founds in the range of 295-396 mg/l which indicates

that water is soft in nature. If we look at the surface water quality, it is found that values of water parameters are higher in December as compared to October & November. COD of Ghaggar river varies between 30 to 66 mg/l. BOD of Ghaggar River ranges between 9 to 23, hence is within the stipulated limits. Dissolved Oxygen is present in adequate quantity. Trace elements are also analyzed i.e. arsenic, mercury, zinc & iron which is present in very minute quantity and causes insignificant impact in the water quality.

Organic matter in the Soil of the project sites are found to be in the range of 0.26 to 0.37% it shows that soil is not very fertile NPK content is less in the soil. pH of the soil is found in the range of 6.86 – 7.63, which comes in the slightly alkaline range.

Air quality parameters have been monitored for the parameters like PM₁₀, PM_{2.5}, SO₂, NO₂, and Ozone and results shows that PM₁₀ and PM_{2.5} values are higher than the permissible limit at a few stations. The reasons behind such result are:

- Due to presence of national highway within the site
- Existence of industrial area near the site.
- Brick kilns are present upwind direction.

4.5.10 Impact Assessment on the nearest settlements

There are following terms which can affect positively in the nearest settlement –

- Project will create employment for local people so it will be beneficial for nearest settlement. During the construction phase, it is estimated that 582 persons comprising of 194 skilled workers and 338 unskilled workers would be required. Post construction, the employment generation potential is placed at 945 persons (420 skilled and 525 unskilled).
- The project will give much impetus to trade and business on construction materials in the nearby market places to the project area. construction materials namely coarse sand, fine sand, stone aggregate, cement, reinforcement steel, pipes, bricks, conduit pipes, PVC overhead tanks, glaze & floor tiles, hardware, stainless sinks etc.. Besides, service providing businesses like office & stationery, printing & binding, transport servicing, fabrication & welding, etc. are also expected to increase.
- Movement of vehicles to and from the project site is expected during the construction period. Hence, there is scope for further strengthening the road development in the area with adequate parking space so as not to disturb the traffic and allow smooth movement in and around the project area.

- Green belt development in the area increases the aesthetic value of the area, along with this help to attenuate noise and reduce pollution.
- Waste of one industry can use in other industry, this reduces traveling cost
- All the industries at one place will give opportunity for proper management of waste rather than scattered one, this not only reduces cost investment but from environment point of view supervision of industrial facility at one place will provide control pollution but prevent at source itself.

CHAPTER-5 ANALYSIS OF ALTERNATIVES

5.1 INTRODUCTION

HSIIDC has proposed to develop Industrial Estate project at Barwala. The Government of Haryana identified this site for developing an Industrial Estate land papers are given in **Annexure-II**. The present chapter discusses the various other alternatives considered in developing the project. It also compares the technical, financial and environmental feasibility of the project, where applicable.

An industrial estate at Barwala was developed by Haryana State to attract the industrial entrepreneur in the late seventies. There after there is a consistent demand of industrial plots. Haryana State Industrial and Infrastructure Development Corporation (HSIIDC) have acquired the proposed project land for developing the industrial plots with the modern environment friendly facilities.

SITE IDENTIFICATION:

The overall objective of industrial estate planning is to identify sites for industrial estates and plan industrial development in compatibility with the surrounding land uses. The various steps involved in the identification of a suitable site for industrial estate which includes:

- Identification of a search area where suitable sites for developing industrial estates for industries might be found
- Detailing environmental sensitivity of the search area and its surroundings;
- Avoiding areas which are attached with the sensitivity
- Assessing the siting potential of the search areas by identifying suitable sites for industrial estates (so called "candidate sites")
- Identification of types of industries that can be allowed in these industrial estates after assessing the pollution risks from those industries and the environmental impact risks by predicting the amount and spatial extent of adverse impacts.
- Recommending necessary effluent treatment, waste disposal facilities and other

commonly needed abatement infrastructure used by all industries of the industrial estate

- Providing appropriate buffer zones around the industrial estates
- Recommending land use controls around the industrial estates for controlling and minimizing adverse environmental impacts; and
- Identifying the social impacts of developing an industrial estate at an identified site and recommend methods of mitigation or compensation, if needed.

Site analysis

Identification of suitable site for industrial estate is based on various considerations. Approach for assessment of site suitability of identified candidate sites is shown in Figure 5.1 below.

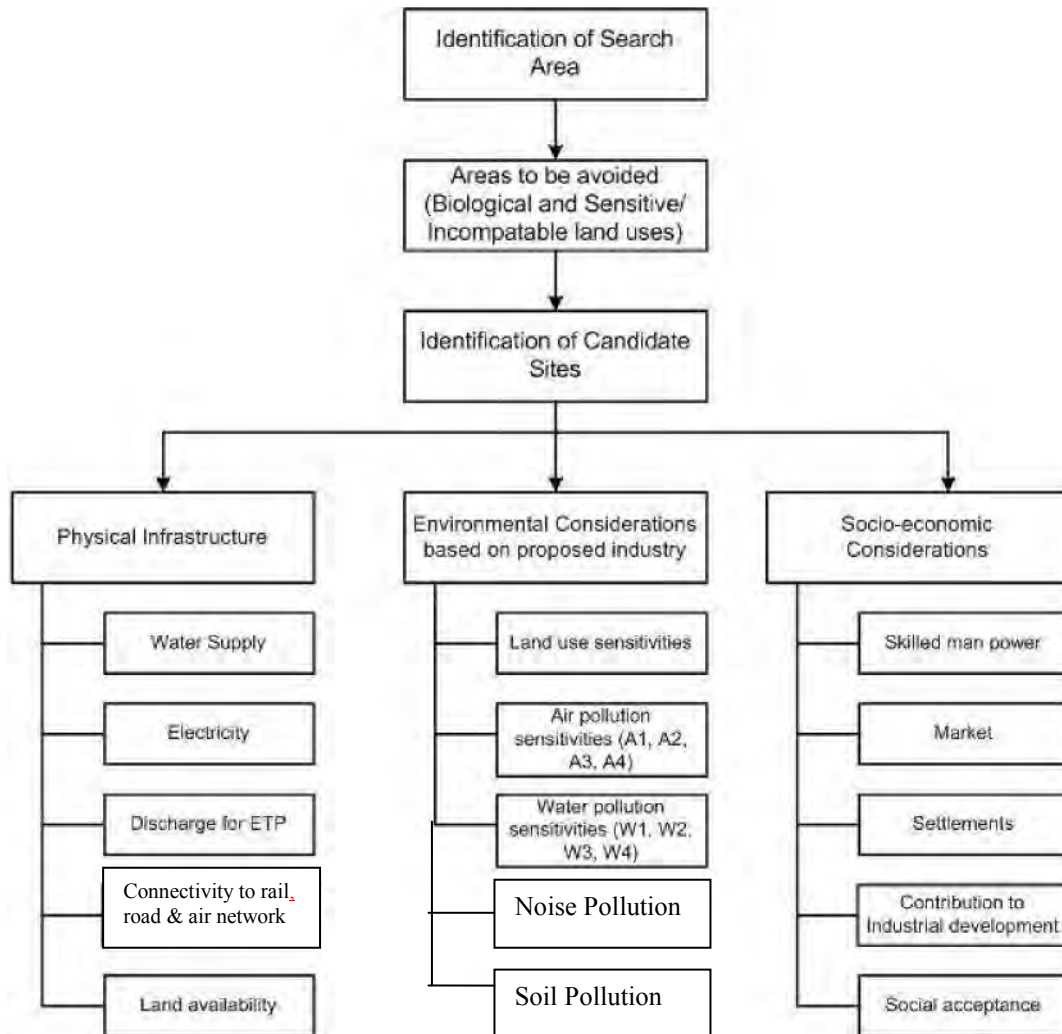


Figure 5.1: Site Suitability Approach for Candidate Sites

Site planning and development:

Site planning within the industrial estate demands a holistic approach for its sustainability, which includes the effective components of spatial planning, infrastructure planning, risk based planning and environmental management tools, resource utilization management and social infrastructure planning, *etc.* The master site plan for the industrial estates shall include the following important aspects.

- Long-term vision with focus on international competitiveness
- Focus on integrated infrastructure with emphasis on environmental management utilities
- Optimal utilization of available land
- Conservation of important natural features
- Optimal use of natural resources
- Explore synergies of co-existence
- Use of renewable energy sources
- Energy conservation measures
- Traffic management including public transport
- Disaster management
- Inclusion of social infrastructure like housing and allied requirements
- Integration of operation and management aspect

Site Master Planning

The development costs and the construction of an Industrial Estate at Barwala are heavily influenced by:

- Size of the site
- Shape of the site
- Its load-bearing capacity

Site specifications

The ideal site for an industrial estate for light and medium industry should have:

- Good access by main road to the city, port, and airport
- An adequate water supply
- Reliable electricity supply and telecommunications facilities
- Adequate storm water drainage network

5.2 SELECTION OF SITES FOR DETAILED INVESTIGATION

The algorithmic procedure to be followed for the selection of sites for industrial estates is as described below:

Step I - Mapping of Constraints

With increasing population the city boundaries are also increasing. The first step for site selection is mapping of constraints. Constraint mapping eliminates environmentally unsuitable sites and narrows down the number of sites for further consideration. Certain features termed as “exclusionary factors” such as restricted areas for play ground, gardens etc., are identified using map of appropriate scale. These factors will eliminate unsuitable sites from further analysis.

The factors to be considered while selections are as below:

1. Transport consideration

- The site should be as near as possible from a suitable main road with transport facilities.

2. Natural conditions

- Extreme morphology (steep or over steep, liable to land slips)

3. Land use pattern

- Incompatible future land use designations on or adjacent to the site, particularly hard (built) development or mineral extraction should be avoided.
- Should not be within a military exclusion zone.

4. Safety of Selected Site

- Ecologically and otherwise sensitive areas: Preferably 5 km; depending on the geo-climatic conditions the requisite distance may be decided appropriately by the agency.
- Coastal areas: Preferably ½ km away from the high tide line (HTL).
- Site should not be fallen in critically polluted area. Critically polluted areas are identified by MoEF & CC from time-to-time.

Step II- Identification of Comparable Potential Sites

As the project site is falls under the notified industrial area so there was no need to study the potential sites.

Step III- Preliminary Survey (Walk over survey)

The preliminary survey may sometimes require confirmation by other authorities. The objective of the walkover surveys is to identify sufficient constraints to reduce the number of possible sites. This was done by surveying the area and collecting data regarding:

- Existing zones of development
- Areas of mineral deposition
- Freshwater and wetland
- Natural vegetation
- Exposed geology

The data required from preliminary survey includes:

Is the site presently well drained?

Are there established watercourses within or adjacent to the site

Is there evidence of ephemeral streams, springs or sinkholes?

- From knowledge of the geology of the area does the morphology of the site suggest significant or minimum depths of soft material?
- Is there any evidence of geological features on or near the site?
- Are there any features, which will significantly limit the useful area of the site for land filling?
- Does the nearby well have high water table?
- Where are the nearest habitat dwelling?

Step IV- Site Investigation on Preferred Sites

Fourth step is site investigation, includes detail survey of hydrogeology, water, climatology, soil etc, of the sites which are scrutinized from step III. Subsurface exploration and a topographic survey should be carried out at the preferred site. These site investigations will be critical to the success of the site selection.

From the results of the site investigation program, the estimates of cost and capacity of the preferred site(s) may be firmed up and clearly preferred site identified.

General Site Selection Factors:

- Land acquired shall be sufficiently large to provide space for appropriate green cover including green belt, around the battery limit of that place.

- Land use of the area has been changed from agriculture to industrial estate as per developmental plan.
- Layout of the industry that may come up in the area must conform to the landscape of that area, without affecting the scenic features of that place.
- The site has source for fresh water requirement for the project which is 10.8 MLD;
- The site has source for power requirement for the project which is 66 kV.
- The site is well connected with NH-73 and SH-1 road which make site easily accessible.
- Labour during construction phase and workers during operational phase will be easily available around the area.
- Source of water supply will be tube well.

5.3 BUILDING MATERIALS

The choice of building materials plays an important role in terms of energy efficiency of the building. The manufacture of building materials should also be assessed to ensure the use of environment friendly and recycled/ recyclable construction materials.

5.3.1 Wall

Conventionally, clay bricks are cemented in the construction of walls. The strength of these construction materials cannot be compromised which will otherwise pose a threat to the life and property of the occupants. However, presently, materials with similar properties are easily available that are made of waste products, thereby reducing the waste burden and conserving natural resources. Thus, the project proposes the use of the following construction material for walls:

- Fal-G products – are manufactured by use of two waste products being fly ash, calcined gypsum (a byproduct of phosphogypsum or natural gypsum) along with lime.
- Perforated bricks
- Saw dust based doors and window frames
- Ferrocement shutters, PVC doors and windows, Rice husk boards, Natural fibre-reinforced
- Polymer composite door panels

5.3.2 Roof

The conventional material used for roofing is RCC, as it is suitable for longer spans. The constituents of RCC, i.e. cement, sand, aggregate and steel are energy intensive materials and high embodied energy content.

Alternately, it is proposed to use lightweight synthetic aggregates such as fly ash based aggregates, which is suitable for manufacture of brick, blocks, and is good substitute for clinker and natural aggregates. They have high rating to fire resistance and provide better insulation and thus improved energy efficiency. These are manufactured by the aerated cellular concrete manufacturing process.

5.3.3 Roads and open spaces

The Concept adopted for site grading described below.

- Sufficient natural slopes are available in the ground
- There is steep slope in 500 m distance from foothill.
- The level reduces to 320m near Bridge 1
- Village Alipur is surrounded by existing industrial area & proposed area with level variation from 321.32m to 317.85 m towards state high way.

In line with environment friendly design it is proposed to provide:

- **Non Permeable paving-** Non Permeable (porous) paving will be provided to control surface water runoff by allowing storm water to infiltrate the soil and return to the ground water. The traffic areas will however continue to be impermeable.
- **Gravel/crusher fines** - Loose aggregate materials from masonry wastes will be used to cover pedestrian surfaces.
- Use of steel in fencing, grills, tree covers, and benches and even in streetlights will be replaced by bamboo in the parks and green landscaped areas.

5.4 ENERGY CONSERVATION

To achieve conservation of energy, appropriate design of a building is of paramount importance. Accordingly, it is proposed to incorporate the guidelines of Energy Conservation Building Code, 2005 for the structures of the Industrial Estate project at Barwala.

The concept of passive solar design emphasizes architectural design approaches that minimize building energy consumption by integrating conventional energy-efficient devices, such as mechanical and electrical pumps, fans, lighting fixtures, and other equipment, with passive design elements, such as building siting, an efficient envelope, appropriate amounts of fenestration, increased day lighting design, and thermal mass. The basic idea of passive solar design is to allow daylight, heat, and airflow into a building only when beneficial.

The project layout has been finalized after careful siting consideration of various Industrial Estate components to optimize availability of natural sunlight.

- Glazed windows are located to face the south to receive maximum sunlight in winter. To reduce heat losses during the night these windows are double-glazed and have insulating curtains.
- Thermal storage wall is placed between the glazing and habitable space to prevent solar radiation from directly entering the living space.

Further, energy efficient lighting will be achieved through:

- To replace all the old tube light street light fixtures with energy efficient fixtures. Expenditure for replacement of CFL based light with T5-28W tube lights & old tube light street light fixtures with energy efficient fixtures will be recovered with in a period of 5 years through savings
- By providing solar provision in the following buildings:-
 - Industries where hot water is required for processing
 - Nursing homes
 - Canteens
 - Housing complexes

HSI IDC will put condition in the building approval about provision of installation solar water heater systems.

- After all phases become functional, there will be provision of biogas plant, gas generation will be used for lightening of street lights in the Industrial estate, hence saves energy.

5.5 ANALYSIS OF ALTERNATIVE SITE

No alternate site has been selected for development of project. This site is selected as per the land allotted to HSIIDC. As per developmental plan, the land use of this site is reserved for Industrial estate. There are important points which make the site completely feasible for establishing the Industrial Estate.

As this is an Industrial Estate project, identification of suitable site is based on various considerations.

- Physical Infrastructure
- Environment consideration (land use, air pollution, water pollution sensitivities)
- Socio economic consideration

The site has been acquired on the basis of its connectivity to the major cities through the National Highway-73 which is adjacent to the project site. Overall site selection criteria are summarized in **Table 5.1**

The entire area has been designated for the development of industrial estate as per Master plan approved by Department of Town and Country Planning, Haryana.

Table 5.1: Site Selection Criteria

Physical Infrastructure		
Water supply	Upto 5 Km	Good
Availability of electricity	Uninterrupted power supply	Good
Discharge from the ETP	Disposal within 5km	Good
Nearness to road	Up to 1 Km	Good
Availability of land	Government Ownership	Good
Biological diversity		
National Park, Wild life sanctuaries, Tiger reserves/ elephant reserves, biosphere reserves, Migratory bird habitat, wet land, reserve forest		> 15 km
Protected tribal settlement notified tribal areas		>15 km
Land use		
Double cropped		2-5 km

Water logged	0.5-2km
Industrial land	<0.5 km
Population	
Rural	Within2 Km
Urban	5-7 km
Environmental Quality	Good
Socio- Economic Parameters	
Skilled Manpower Availability	Good
Contribution of industrial estate to economic and Industrial development	Good

CHAPTER-6

ENVIRONMENTAL MONITORING PROGRAM

6.1 INTRODUCTION

The purpose of the environment monitoring programme is to ensure that the specified mitigative measures defined in the EMP are complied with and leads to the desired benefits for the target area and its population. To ensure the effective implementation of the EMP and gauge the efficiency of the mitigative measures, monitoring shall be undertaken both during the construction and operation period of the project.

6.2 PERFORMANCE INDICATORS (PIs)

The physical, biological and social components are of particular significance to the project is as listed below:

- Air quality
- Water quality
- Noise levels
- Solid Waste Management
- Replantation success / survival rate

Of these, the following are selected as the Performance Indicators (PIs) and shall be monitored, since these are well known and comparative data series exist:

- Air Quality
- Noise levels
- Water Quality
- Flora

To ensure the effective implementation of the mitigation measures and environmental management during construction and operation phase of project, the environmental monitoring plan proposed for Industrial Estate project at Barwala is given in **Table 6.1**.

6.2.1 Ambient Air Quality (AAQ) Monitoring

Ambient air quality parameters recommended for monitoring during construction activities are PM₁₀, PM_{2.5}, CO, SO₂, and NO₂. Monitoring shall be carried out twice a week for one month in

each season during construction phase in accordance with National Ambient Air Quantity Standards. The locations of pollution parameters to be monitored are detailed out in the Environmental Monitoring Plan (**Table 6.1**) as per wind rose of the study period/season and results of sites.

6.2.2 Noise Level Monitoring

The measurements of noise levels will be carried out at all designated locations in accordance to the ambient Noise Standards. Noise level will be monitored on hourly basis. Noise should be recorded at “A” weighted frequency using a slow time response mode of the measuring instrument. The measurement location, duration and the noise pollution parameters to be monitored are detailed in the Environmental Monitoring Plan (**Table 6.1**).

6.2.2.1 Success of Vegetation

To ensure the proper maintenance and monitoring of the proposed plantation activities, a regular survey of the survival rate of the planted trees is being proposed upto a period of 2 years from the start of operation of the project.

Table 6.1: : Environmental Monitoring Plan

Environment Component	Project stage	Parameter	Standards	Location	Duration / Frequency
Ground Water Quality	Construction Stage	Drinking water parameters	Drinking water standards (IS:10500)	Total 9 Locations including Project Site (C)	Twice in a year
	Operation Phase	Drinking water parameters	Drinking water standards (IS:10500)	Project Site	Twice in a year
Drinking water	Construction Stage	Drinking water parameters	Drinking water standards (IS:10500)	Supply water after treatment	Twice in a year
	Operation Phase	Drinking water parameters	Drinking water standards (IS:10500)	Ground Water	Twice in a year
Surface water body	Construction Phase	pH, BOD, COD, TDS , TSS, DO, Oil & Grease and the pesticide being used	CPCB standard for Category	Ghaggar River	Once in a month for summer season, post monsoon and winter season.
Treated wastewater	Operation Phase	pH, BOD, COD, TDS , TSS, DO,	General Standards for discharge of effluents	Outlet of individual ETPs, inlet and outlet of the CETP	Every three months during the project life cycle

Environment Component	Project stage	Parameter	Standards	Location	Duration / Frequency
Air	Construction Phase	PM ₁₀ , PM _{2.5} , SO ₂ , NO ₂ , CO	National Ambient Air Quality Standards	Project Site Alipur Sukhdarshanpur Batwal Raipur Rani Dhandaruru Kheri Haripur Rehawar	Continuous 24-hourly, twice a month.
	Operation Phase	PM ₁₀ , PM _{2.5} , SO ₂ , NO ₂ , CO, O ₃	National Ambient Air Quality Standards	Project Site	Continuous 24-hourly, once in a month. Ozone – 8 hourly, twice a week for one month, once in a year (summer).
Noise	Construction Phase	Noise Level in dB (A)	As per Ambient Noise Standards	Project Site Alipur Raipur Rani Balaji Medicentre Mt. Litera Zee School	One day hourly measurement, weekly
	Operation Phase	Noise Level in dB (A)	As per Ambient Noise Standards	Project Site	One day hourly measurement, Twice in a year
Rainwater harvesting	Operation Phase	Inspection of storm water drains and rainwater harvesting pits	Design parameters	Project site	Prior to monsoons

6.3 DATA MANAGEMENT

The monitoring will be carried out through MoEF & CC/ SPCB/NABL approved laboratory. All results will be maintained at the project site and submitted to the SPCB as per the reporting requirements in the Environmental Clearance.

6.4 Reporting Schedules

Monitoring activities and their regulation will be the responsibility of individual industry owners. It will be decided by them only whether they will set up the environment management cell or give the contract to some environment consultancy.

Alarming levels of pollutants in any of the monitored component may raise alarm in the **Industrial Estate Project Phase II, at Barwala**. However, such information should be made available to the residents/ occupants through notices. The latter may also be consulted on necessary steps to be taken on an immediate and long term basis to tide over the problem. The reporting schedule and monitoring parameters will be finalized as per conditions (general & specific) of Environment Clearance, CTE & CTO for individual industry.

6.5 OCCUPATIONAL HEALTH

In the construction phase, first-aid facility will be provided at the site for minor injuries & accidents. There will be difference in the risk level of workers of different industries. Individual Industry owner will have the facility of routine medical check-up for their workers. Routine medical examination of personnel shall be carried out as a systematic programme at plant. People working at the high potential areas will be rotated at low potential and vice-versa.

6.6 INTERACTION WITH POLLUTION CONTROL BOARDS

Owner of individual industries shall be in regular touch with SPCB and send them quarterly progress report on EMP and MoEF & CC, New Delhi and other statutory body as per EC conditions. Any new regulations considered by State/ CPCB for the Industry will be complied with.

CHAPTER-7
ADDITIONAL STUDIES

7.1 PREAMBLE

This chapter looks at studies that has been carried out for the purpose of better understanding of disaster during construction and operation of the project. It also highlights the in-advance preparation to face disaster with respect to both on site and off site emergencies. The chapter following issues are described and have been carried out

- Public consultation / Public Hearing
- Risk Assessment
- Social Impact Assessment

7.2 PUBLIC CONSULTATION

Public hearing is a very significant part of the process of public participation envisaged under guidelines issued by MoEF&CC, Government of India. It facilitates involvement of all the stake holders of the project which is essential for ensuring smooth running of project and benefitting all section of society in the process of economic development of the region. The public hearing for the proposed project has been organized by HSPCB at the project site at Village Alipur, Industrial Estate Phase-II, Barwala District Panchkula. Minutes of PH is attached as **Annexure-IX**.

7.3 PUBLIC HEARING ADVERTISEMENT

The Public notice for public hearing to be held on 07.10.2016 was advertised in news paper of The Tribune Chandigarh Edition dated 06.09.2016 by HSPCB for general information regarding environmental clearance of M/s Haryana State Industrial & Infrastructure Development Corporation Ltd., for the development of Industrial Estate, Phase-II, Barwaia, Panchkula.

The public hearing has been attended by:-

1. Sh. Satinder Pal, Regional Officer, HSPCB, Panchkula.
2. Sh. J.P, Khasa, DTP, Panchkula.
3. Sh. Mukesh Gupta, DGM, HSIIDC, Barwala.
4. Sh. Kamaljeet Singh, A.E.E, Regional Office, HSPCB, Panchkula.
5. Sh. Rohit Kanwar, Manager, HSIIDC, Barwala.
6. Sh. Jagdish Chand, Revenue, Department, Panchkula.
7. Sh. Sitender Kumar, AIPRO, Panchkula.
8. Sh. Suresh Kumar, Office of DIC, Panchkula.
9. Sh. Rakesh Kumar representative of Forest Department.

The public hearing has been organized by HSPCB at the project site.

The public hearing is chaired by Smt.Hema Sharma, HCS, Additional Deputy Commissioner, Panchkula on 07.10.2016

7.4 PUBLIC HEARING MINUTES



HSPCB

No. HSPCB/PKL/



332/

Haryana State Pollution Control Board
SCO-180, II ND FLOOR, SECTOR-5, PANCHKULA,
PHONE: 0172-2566286, 2587962

Dated: 24/10/2016

To

The Chairman,
Haryana State Pollution Control Board,
Panchkula.

Sub:- Minutes of the Public Hearing pertaining to Environmental Clearance for the project development of M/s Haryana State Industrial & Infrastructure Development Corporation Ltd., Industrial Estate, Phase-II, Barwala, Panchkula, having area of 557.75 acres at Alipur, Barwala, Panchkula.

Ref: H.O Letter No. HSPCB/2016/1268-70 dated 02.09.2016.

Please find enclosed herewith the Minutes of the Public Hearing pertaining to Environmental Clearance for the proposed project for development of Industrial Area at village Alipur, Barwala, Panchkula of **M/s Haryana State Industrial & Infrastructure Development Corporation Ltd., Industrial Estate, Phase-II, Barwala, Panchkula, having area of 557.75 acres** held on 07.10.2016 At 01:00 PM, along with attendance sheet of Public, Photographs, C.D of Public hearing & Executive Summary. The copy of statement of issues/questions asked during hearing is annexed as **annexure-C**.

Submitted for information & further necessary action please.


Regional Officer,
Panchkula Region.

D.A:-

1. Minutes of Public Hearing
2. Annexure 'A' (Attendance sheet of officers)
3. Annexure 'B' (Attendance sheet of Public)
4. Annexure 'C' (Copy of statements of issue/questions)
5. Videography of Public Hearing (02 CDs).
6. Photographs/Album of Public Hearing (02 sets).

**MINUTES OF PUBLIC HEARING CONDUCTED AS PER MOEF. (GOVT. OF
INDIA) NOTIFICATION DATED 14/09/2006.**

**PROJECT: DEVELOPMENT OF M/s Haryana State Industrial &
Infrastructure Development Corporation Ltd., Industrial Estate, Phase-II,
Barwala, Panchkula, having area of 557.75 acres.**

Date and Time : 07.10.2016 at 1:00 PM

Venue : Village Alipur, Industrial Estate Phase-II, Barwala District Panchkula.

The Public notice for public hearing to be held on 07.10.2016 was advertised in news paper of The Tribune Chandigarh Edition dated 06.09.2016 by HSPCB for general information regarding environmental clearance of M/s Haryana State Industrial & Infrastructure Development Corporation Ltd., for the development of Industrial Estate, Phase-II, Barwala, Panchkula.

The public hearing has been attended by:-

1. Sh. Satinder Pal, Regional Officer, HSPCB, Panchkula.
2. Sh. J.P, Khasa, DTP, Panchkula.
3. Sh. Mukesh Gupta, DGM, HSIIDC, Barwala.
4. Sh. Kamaljeet Singh, A.E.E, Regional Office, HSPCB, Panchkula.
5. Sh. Rohit Kanwar, Manager, HSIIDC, Barwala.
6. Sh. Jagdish Chand, Revenue, Department, Panchkula.
7. Sh. Sitender Kumar, AIPRO, Panchkula.
8. Sh. Suresh Kumar, Office of DIC, Panchkula.
9. Sh. Rakesh Kumar representative of Forest Department.

The public hearing has been organized by HSPCB at the project site. The public hearing is chaired by Smt.Hema Sharma, HCS, Additional Deputy Commissioner, Panchkula on 07.10.2016.

With the permission of Additional Deputy Commissioner-cum-Chairperson, Public Hearing, the Regional Officer, HSPCB started the public hearing and addressed the public present in hearing. He informed that the public hearing is regarding the development of HSIIDC, Industrial Estate, Phase-II, Barwala and M/s Haryana State Industrial & Infrastructure Development Corporation Ltd. Panchkula has acquired the land as per Haryana Govt. Land acquisition policy.

Ok

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It is further informed to public that M/s Haryana State Industrial & Infrastructure Development Corporation Ltd. Panchkula required Environment clearance from Ministry of Environment, Forest and Climate Change, Govt. of India as the project falls under activity 7(c) in schedule of EIA Notification under Category A. Therefore HSIIDC has applied for the Env. Clearance to MOEF & CC, New Delhi. As per procedure of Environmental Clearance, MOEF & CC has asked HSPCB to conduct the public hearing for this project. The Regional Officer, HSPCB further informed public about the impact of establishment of Industrial Estate on Environment and invited public to ask question related to the project verbally or in writing or to give suggestions or apprehensions regarding the said project.

The Regional officer, HSPCB further asked the Project Consultant of Haryana State Industrial & Infrastructure Development Corporation Ltd. Panchkula to give presentation and explain about the project in detail to the public in local language.

The Consultant Miss Akshara welcomed the officers and the participants present during the public hearing. The consultant of the project proponent distributed the copies of the executive summary to the public and given their presentation about the proposed project. During public hearing detailed presentation, introduction, salient features, benefits and environmental aspects of the proposed project were discussed.

After completion of the presentation by the consultant of the unit, the Regional Officer, HSPCB, with permission of worthy Additional Deputy Commissioner - cum - Chairperson has invited objection / questions / apprehensions in verbal as well as in writing from the public.

The questions / observations raised are as under:-

1. Question by Sh. Virender Singh , Village Khangesra, Tehsil Barwala , District Panchkula .

The acquired Land is a part of district Panchkula and there are Mango, Popular & Ashoka tree farms in this area. In my opinion HSIIDC should have taken prior permission before acquisition of land but after acquiring the land you are taking environmental clearance through public hearing and this is wrong. Moreover a river is flowing nearby the villages where our cattles goes for drinking of water. But after the establishment of Industrial Estate entire

OK

2

garbage and polluted water will be put in the river which might be dangerous for our cattles. The authorities have claimed to setup the common effluent treatment plant but lateron nobody pays attention, there is a bird sanctuary also near village Berwal which is just 3 miles (cross fly distance) away from the project site and no permission has been taken up by the HSIIDC in this regard.

Answer by - DGM HSIIDC, Barwala.

As per the master plan prepared by Director Town & Country Planning Department, Panchkula, the said area has been ear marked as Industrial zone and the land was acquired accordingly in year 2011-12. HSIIDC have just implemented the directions of the Government and regarding polluted water there is a provisions for establishment of CETP in Industrial Estate wherein the sewage as well as industrial effluent will be treated and reused for the plantation/horticulture purpose. If there will be a requirement to take clearance in context to the Bird Sanctuary, the same will be taken as per the Government norms.

**2. Question by Sh. Virender Singh, Village Khangesra, Tehsil Barwala ,
District Panchkula.**

As per the orders of Supreme court the fertile land cannot be acquired, however the land from the villages Khatauli, khangesra, Naggal, Alipur has been acquired which is very good & fertile land and we are objecting to this land acquisition because the most fertile land of the villages has been acquired. The then DRO also informed that Bheed Babupur and Bheed Firozpur is having unfertile land and can be used for this purpose where as on the said land residential zone has been planned by Govt. which is adjacent to the Industrial area of Punjab and garbage plant of the Punjab. Nobody pay attention to this and wrong planning has been done. We are not against the industrial setup, however the estate already developed in 1996 is still not occupied fully.

Answer by - DGM HSIIDC, Barwala.

The development plan of this area was finalized by the top officials of the Govt. and after final approval of the development plan by Director Town and Country Planning, Department, the land was acquired by HSIIDC.

**3. Question by Sh. Virender Singh , Village Khangesra, Tehsil Barwala ,
District Panchkula.**

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The Government has done planning but HSIIDC is the execution agency therefore it is duty of the concerned officer to examine the issue.

Answer by Sh. Satinder Pal, Regional Officer, HSPCB, Panchkula

We heard all your grievances and the same will be mentioned in proceedings of the public hearing and will be conveyed to the higher authorities for taking further necessary action.

4. Question by Sh. Gurdas, Village Alipur, Tehsil Barwala , District Panchkula.

He requested to the ADC, Panchkula to ensure that the work should be done in such a manner that there should not be any bad effect on the life of the nearby residents. Department should take all measures for all those peoples whose land has been acquired.

Answer by - DGM HSIIDC, Barwala

HSIIDC will adhere to the resettlement & rehabilitation policy for those whose land has been acquired and there is provisions of compensation and also plot will be given to the land owners whose 70% land has been acquired. Moreover, the question regarding impact on the environment, in this regard we will take all necessary precautionary measures for prevention of the environment from this project.

5. Question by Sh. Husan Lal , Village Shamtu, alongwith the residents of village Rattewali, Toka, Miyanpur, Shabilpur, Khetpurali Tehsil Barwala , District Panchkula ?.

We had a 12 Gatha wide very old link road of PWD from village Naggal to Shabilpur and the same has been broken/damaged due to the activities of HSIIDC in the nearby area. The villagers who wants to travel to Barwala have to take longer route. The temporary bridge constructed by the contractor has also been washed away during rains. We request HSIIDC to rejoin the link road so that the villagers would not face any problem.

Answer by - DGM HSIIDC, Barwala

For connectivity of Alipur-Toka road a 60 mt Sectoral road and also a diversion channel has been prepared, however after the completion of the project the wide connectivity of the roads will be provided. The old existing damaged road will also be repaired within 2-3 months for proper connectivity and facility of the villagers.

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**6. Question by Sh. Yaseen Khan, Village Khangesra, Tehsil Barwala ,
District Panchkula.**

He said that nobody pays attention to the problems related to pollution or Jamindars and for solution of any issue or regarding royalty etc we have to travel from Alipur to Panchkula. HSIIDC has also constructed boundary wall therefore the access of the villagers has been stopped. The Govt. is giving different compensation amount for the lands acquired earlier and now. Moreover the compensation amount also differ and varies from village to village.

Answer by - DGM HSIIDC, Barwala

HSIIDC is having a policy that boundary wall has to be constructed within the acquired area for the safety of the industrial units. However till proper connectivity is not provided to the affected villages, the excess shall be provided to the nearby residents. The matter regarding announcing compensation is related to the District Commissioner and was given by DRO, as per the potential of land or as per the circle rates defined by District Collector. There is no separate role of HSIIDC in the said matter. If anybody is not satisfied with the compensation amount he may proceed to the court for their claim.

7. Question by Sh. Padam Singh , Village Khatouli, Tehsil Barwala , District Panchkula.

He welcomed all the District Administration officers and requested that we are already suffering from various environmental pollution problems due to abundance of domestic flies and mosquitoes from poultry farms in our area despite of the Swatch Bharat Mission which is launched by the Hon'ble Prime Minister of India. We are not living in hygienic conditions due to fly menace from the nearby poultry farms and this issue has not been resolved till date. Whenever we talk about it to the higher authorities they said that the land was given by you for the concerned purpose & for the establishment of Poultry Farm/Industry etc. He further said that property/land was not given willingly. It is upto the government that they can acquire the land by giving the pre-decided value of the land and we cannot go against the Government. However after coming of the industries, our cattles would not be able to drink pure water from the nearby river or ponds as it would be polluted after coming of the

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industries. The underground drinking water will also get polluted after coming of industries in this area. We do not have any issue with the setting up of the industrial estate but we want proper arrangements should be done so that our river, ground water and land would not get polluted. We do not allow any compromise on Environmental issues therefore right now we are not in favour of the establishment of the industrial estate project of HSIIDC phase-II, in Barwala.

Beside this we have two grain markets in this area, one is in Barwala and another is in Raipur Rani. The Crops of the Landholders of this area are lying in the open areas whereas in the grain market the paddy is being procured by brokers from Punjab, as a result the farmers of this area are facing huge problem in selling their paddy in Anaj Mandi. We request the Additional Deputy Commissioner to solve the problem of crops too.

Answer by Satinder Pal, Regional Officer, Panchkula, It is the duty of the pollution control board and Government to control and prevent the environment and nobody will be allowed to pollute air and water. HSIIDC is duty bound to install CETP for proper treatment of the effluent being generated from the industrial units and HSIIDC would not be allowed to discharge any treated water into the drain/river. HSIIDC will have to make provisions for reuse/recycling of the treated effluent inside their premises as per the directions of CPCB.

8. Question by Sh. Sehjwinder Singh, village Alipur, Panchkula.

You said that proper CETP will be established for the project but for the old industries, HSIIDC has not installed any CETP in the industrial estate.

Answer by Sh. Satinder Pal, Regional Officer, HSPCB, Panchkula.

The CETP for the existing industries has already been established and the same can be checked alongwith the Officers of HSIIDC.

9. Question by Sh. Sehjwinder Singh, village Alipur, Panchkula.

He asked that the water is still discharged in to the river and no proper nallah system has been developed. The factories are putting waste material /garbage near the river bed and burn the waste resulting into the air pollution in nearby area.

Answer : by Sh. Satinder Pal, Regional Officer, HSPCB, Panchkula

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HSI IDC is responsible for management of the solid waste generated and has to ensure that no open dumping and burning of the waste of industry be allowed. If there is any specific complaint the same may be provided to the officer of Pollution Control Board and appropriate action will be taken if any violation is found on the part of industry. For this project 1.5 acre land has been earmarked by HSI IDC for solid waste disposal. HSI IDC should ensure that management of solid waste generated from the industrial estate be done properly and at the designated site.

10. Question by Sh. Sehjwinder singh, village Alipur, Panchkula

The plants/trees and houses on our land have not yet been compensated by HSI IDC and the land has been acquired earlier before giving any compensation associated with the loss.

Answer by -DGM HSI IDC, Barwala

The land acquisition matter is related to DRO and HSI IDC has deposited all the amount as per the demand received from DRO, however if any matter is left the same may be informed to HSI IDC in written and accordingly the matter will be taken up with DRO.

11. Question by Sh. Sehjwinder singh, village Alipur, Panchkula

One month has gone after submission of the affidavit and amount has been deposited on 26th, now farmers are asking for the interest.

Answer by - DGM HSI IDC, Barwala:-

As per the demand the disbursement of the fund has to be done by DRO, might be the scrutiny of the documents is going on. However the amount will be released by Monday or Tuesday as per the discussion held with DRO.

12. Question by Sh. Sehjwinder singh, village Alipur, Panchkula

It was promised that the lease rent will be enhanced @ of Rs. 750/- annum but you have only enhanced Rs. 500/ annum.

Answer by - DGM HSI IDC, Barwala

As per our record the increment of Rs. 750/- has been given and for the acquisition of land done before 2009 Rs. 500/- were given as increment. However if there is an doubt regarding calculation you can come to our office for clarification.

13. Question by Sh. Sehjwinder singh, village Alipur, Panchkula

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It was told to us that for the industrial plot which will be allotted to the jamindars in the industrial estate, for that they can give amount in the instalments and no interest will be charged. But now they are asking for the interest.

Answer by - DGM HSIIDC, Barwala

This matter is related to the Estate office of HSIIDC but still you can give in written your grievance with name and address. The reply will be given immediately plot wise.

14. Question by Sh. Sehjwinder singh, village Alipur, Panchkula

After establishment of industrial estate the facilities of Electricity and water are being affected. The supply of light is always available in the industrial estate whereas no proper electricity supply in the nearby villages.

Answer by - DGM HSIIDC, Barwala

For industrial Estate, Ph-II, the electrical wing of HSIIDC is going to setup 66 KVA power substation and power will also be provided to the villagers from this substation.

Sh. Baljit Singh R/o Village- Alipur, Barwala:-

No grievances and I am thankful for the kind hearing given to the public.

15. Question by Sh. Kamaljit Singh, A.E.E. HSPCB, Panchkula.

Is HSIIDC is having the Zero Liquid discharge provision for the CETP to be installed.

Answer by - DGM HSIIDC, Barwala

The CETP of 6.5 MLD will be having tertiary treatment but ZLD will not be achieved, however 70% water will be recycled and used for horticulture purpose.

16. Question by Sh. Kamaljit Singh, A.E.E. HSPCB, Panchkula.

Is Industrial as well as Domestic effluent of the industries will be treated in the CETP and what type of industries will be allowed in Industrial Estate.

Answer by - DGM HSIIDC, Barwala

The common treatment of the industrial as well as of domestic effluent will be done however at present there is no allotment of any plot to the industries as when there will be allotment it will be kept in the mind for finalizing the parameters for CETP and the matter will be taken accordingly. Mixed type of industries will be allowed in phase-II.

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17. Suggestions by Sh. Rajnish Garg, Industrialist of Phase-1, Barwala. 312

He suggested that in the upcoming industrial estate there should be provision for a crèche to facilitate female workers. The another observation is regarding providing proper parking space (Lay by area) for parking of the big trucks to avoid traffic problem.

Answer by - DGM HSIIDC, Barwala

Proper provision has already been taken of parking space for the vehicles in phase-II and there will not be any such traffic jam problem. He further replied that the proposal for crèche may kindly be provided in writing so that the same could be forwarded to the planning cell for earmarking a site for the crèche like other community development activities such as Police post, Fire station, ESI Dispensary etc in the Industrial Estate, Ph-II.

18. Suggestions by Sh. Rajnish Garg, Industrialist of Phase-1, Barwala.

He suggested that there should also be a provision for "Ran Basera" for the workers who got late or for stay in the severe conditions like rainy/winter season.

Answer by - DGM HSIIDC, Barwala

He replied that the demand for providing proper transport facility for the large number of workers may kindly be submitted in writing so that the matter in this regard be conveyed to the Transport Department through our Managing Director.

19. Suggestions by Sh. Rajnish Garg, Industrialist of Phase-1, Barwala.

After the establishment of the industrial estate there will be around 6000-10000 workers in the said industrial estate therefore there must be separate provisions for cycle & walking track for the convenience and safety of the workers.

Answer by - DGM HSIIDC, Barwala

The full development of Industrial Estate will take 5 to 10 years therefore the open space can be utilized till that time. However there is provision of 60 mt roads in Industrial Estate and in 60 mt road there is already provision for service road therefore that can be used by the workers. However the written suggestion may kindly be given for taking the said matter with higher authorities for providing the separate cycle and walking track.

OK

9.

20. Suggestions by Sh. Virender singh, village Khangesra, Barwala. 513

The local labour should be given employment in the Industrial Estate and Govt. has already given houses under Indra Awas Yogna to the labours.

21. Suggestion by - Sh. Rajnish Garg, Industrialist of Phase-1, Barwala.

There should be provision of labour housing in the Industrial Estate as in the nearby villages there are not sufficient provisions for the stay of Labourers.

Answer by - DGM HSIIDC, Barwala

In our R & R policy the provision has been mentioned for the residential complex for the workers but that is in bigger Industrial Estates i.e. around 2000 Acres, however if any such demand is there than the same could be considered as per the eligibility and requirement.

22. Suggestion by - Sh. Rajnish Garg, Industrialist of Phase-1, Barwala.

He further suggested that efforts should made for the benefit of the workers through CSIR policy and the industry will also help in doing the same for the development of workers.

23. Suggestion/Demand by Sh. Rajnish Garg, Industrialist of Phase-1, Barwala and Gurdas Ex-sarpanch of village Alipur, Barwala.

Proper provision should be carried out for turning, entry and exist of the big trucks from main road to the Industrial Estate internal roads. There should also be a cremation ground in the nearby area of Industrial Estate.

Answer by - DGM HSIIDC, Barwala

It will be ensured that proper structure should be provided for entry & exist of the vehicles from the main roads into the Industrial Estate. The matter regarding cremation ground shall be taken under village development scheme and can be earmarked subject to the resolution passed by the President, as this area now comes under Municipal Corporation, Panchkula.

24. Question by Sh. Satinder Pal, Regional Officer, HSPCB, Panchkula.

Whether any permission has been obtained from the Central Ground water Authority for withdrawal of ground water.

Answer by - DGM HSIIDC, Barwala

The permission in this regard is in process, whenever we get permission only than the tube wells will be installed.

25. Suggestions/Directions by Sh. Satinder Pal, Regional Officer, HSPCB, Panchkula.

Ok

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HSI IDC has to ensure compliance of fly ash notification 1999 and amendments thereafter in their project. HSI IDC should also adhere to the directions of Hon'ble NGT, New Delhi for taking all preventive measures to control dust and noise pollution during construction phase. The compliance of these directions has to be ensured by HSI IDC by making it mandatory in their allotment letters.

Answer by - DGM HSI IDC, Barwala.

HSI IDC will adhere to all such directions and try to get it implemented through Estate Division.

26. Sh. Satinder Pal, Regional Officer, HSPCB, Panchkula. asked for any other question/suggestion from the public before closing the public hearing.

27. Suggestions by Sh. Rajnish Garg, Industrialist of Phase-1, Barwala.

The ground water level in this area is quite high therefore there must be some provision for channelizing the water to be made in Industrial Estate even for the treated water.

Answer by Sh. Satinder Pal, Regional Officer, HSPCB, Panchkula.

HSI IDC shall make separate channels for transfer and reuse of the treated effluent of the CETP into the flushing system, horticulture and also in the process of the industrial units. No treated/untreated water will be allowed by HSPCB to be discharged on land therefore HSI IDC will make all such planning in their Industrial Estate. Proper green belt as per the requirement of the area shall be developed by HSI IDC for further controlling any water logging problem.

Answer by - DGM HSI IDC, Barwala

The directions of pollution control board will be adhered and implemented in the said project.

Smt. Hema Sharma, HCS, Additional Deputy Commissioner, Panchkula.

The Chairperson concludes the public hearing and informed to all participants that all questions/suggestion/discussion held in the hearing will be the part of the proceedings and will be sent to the Ministry of Environment and Forest, climate change for their consideration.

The attendance of officers present from various departments and the residents of nearby villages is annexed as **Annexure A & B**. The copy of the


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questions asked by the public is annexed as **Annexure-C**. 04 no letters were received during the public hearing are also annexed as **Annexure -D**. (The photographs and CD are also attached for reference).

At the end of public hearing Sh. Satinder Pal, Regional Officer, HSPCB thanked all the local residents presented in the public hearing for giving their valuable suggestions & time.

The Public hearing ended with the vote of thanks.


(Smt. Hema Sharma, HCS)
Additional Deputy Commissioner,
District- Panchkula, (Haryana)


(Satinder Pal)
Regional Officer
HSPCB, Panchkula.

ANNEXURE - 'A'

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ATTENDANCE SHEET OF OFFICERS

PUBLIC HEARING ON DATED 07.10.2016, 11:00 AM

M/S Haryana State Industrial & Infrastructure Development Corporation Ltd.,
for the development of Industrial Estate, Phase-II, Barwala, Panchkula having
area of 537.75 acre in District Panchkula.

Sr.No.	Name of the officer	Department	Signature
1	J. P. Khosla	D.T.P.	
2	Mohinder Singh	Deputy Commissioner Barwala	
3	Rohit Kanwar	Manager/Asst Barwala	
4	Jay Singh Chandel	Revenue	
5	Kamaljit Singh, AEC	HSPCB, PCL	
6	Satinder Pal, AEC	HSPCB, Barwala	
7	Sitender Kumar Singh	DIPRO/PHL	
8	Sandeep Kumar	DIC, PCL	
9	Rohit Kumar	Forest Dept	
10	Kamran	HSPCB, PCL	

ANNEXURE -B'

जनता Industrial Estate के विकास के
कातावली सम्बन्ध में है।

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ATTENDANCE SHEET (General Public)

PUBLIC HEARING ON DATED 07.10.2016. 1:00 AM

M/S Haryana State Industrial & Infrastructure Development Corporation Ltd.,
for the development of Industrial Estate, Phase-II, Barwala, Panchkula having area of
557.73 acre in District Panchkula.

Sl.No.	Name of the person	Village	Contact No.	Signature
1	Mamta Kaur	Kulpur	-	HEER Kaur
2	शक्ति कौर	Kulpur	-	
3	Raghubir Singh	Kulpur	91012	
4	Raminder Singh	Adhar	91012	
5	Rakesh	Adhar	91012	
	Ajay Singh	Adhar	91012	
	Sunil Kumar	Adhar	91012	
	रवि कुमार सिंह	अधर		
	D. R. Bhasin	Khetpur		
10	अमित सिंह	अधर	91012	
11	ROHITAS CHANDRA	PANCHKULA		
12	Somraj Mittal	P. K. C.	8295597910	

DATE: _____
PAGE NO: _____

S.No.	NAME	VILLAGE	CONTACT NO.	Signature
13	Rajneesh Garg	USINDA A.	98140220	Raj
14	Ramesh Kumar	H31102	9872815337	Ramesh
15	SHAMESH GOEL	H31102	9246251702	Shamesh
16	SACHIN GUPTA	H31102	89010 60602	Sachin
17	VED PARKASH	H31102	94671-35035	Ved
17	RAJESH GARG	H31102	9815777788	Rajesh
19	HITESH GUPTA	H31102	867991385	Hitesh
20	श्री 20/10/10/10	Shyam	98989 09874	Shyam
21	श्री 20/10/10/10	Shyam	9467486321	Shyam
22	श्री 20/10/10/10	-do-	97299(3099 50)2/	Shyam
23	श्री 20/10/10/10	-do-	9466363002	Shyam
24	श्री 20/10/10/10	-do-		Shyam
25	श्री 20/10/10/10	-do-	9813155351	Shyam
26	Nargan Singh	-do-	9416461150	Nargan
27	Ramesh Kumar	-do-	9813662200	Ramesh
28	Ramesh Kumar	-do-	9901189565	Ramesh
29	श्री 20/10/10/10	-do-		Shyam
30	श्री 20/10/10/10	Shyam	8901261357	Shyam
31	NIT Sharma	227 Anupur	9988704652	NIT
32	Kaldev Singh	227 Anupur	950172775	Kaldev
33	Shyam	227 Anupur	9881309172	Shyam
34	श्री 20/10/10/10	Shyam	981375257	Shyam
35	Ramesh Kumar	Shyam	9466363002	Ramesh
36	Ramesh Kumar	Shyam		Ramesh
37	Ramesh Kumar	Shyam	9896621102	Ramesh
38	Ramesh Kumar	Shyam		Ramesh
39	श्री 20/10/10/10	Shyam		Shyam
40	श्री 20/10/10/10	Shyam		Shyam

DATE: 3/19
PAGE NO.:

	NAME	Village	Cont	Signature
41	Ramesh Singh	Vij	8553303537	[Signature]
42	Megha Singh	Budh	8901332012	[Signature]
43	GURDAS SINGH	ALIPUR	9991845736	[Signature]
44	Mohan Singh	Koni	9867044000	[Signature]
45	Phaninder Singh	Bellari	9467932890	[Signature]
46	Hemraj Singh	Maliga	9418123395	[Signature]
47	Vijendra Singh	Rajpur	9515180000	[Signature]
48	Pankaj Singh	Takht	9126123456	[Signature]
49	Singh Singh	...	9897350000	[Signature]
50	Jatinder Singh	Balra	9418123395	[Signature]
51	Narinder Singh	Ali Pur	8053440426	[Signature]
52				
53	Krishan Singh	Alipur	9418123395	[Signature]
54	Singh Singh	Alipur	9418123395	[Signature]
55	Jatinder Singh	Alipur	9418123395	[Signature]
56	Manoj Singh	Alipur	9876543210	[Signature]
57	Balinder Singh	Alipur	9418123395	[Signature]
58	Sukhdev Singh	Mattara	9418123395	[Signature]
59	Rajinder Singh	Alipur	9418123395	[Signature]
60	Harinder Singh	Alipur	7083080981	[Signature]
61	Harinder Singh	Alipur	7083080981	[Signature]
62	Harinder Singh	Alipur	7083080981	[Signature]
63	Harinder Singh	Alipur	7083080981	[Signature]
64	Harinder Singh	Alipur	7083080981	[Signature]
65	Harinder Singh	Alipur	7083080981	[Signature]
66	Harinder Singh	Alipur	7083080981	[Signature]
67	Harinder Singh	Alipur	7083080981	[Signature]
68	Harinder Singh	Alipur	7083080981	[Signature]

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Sl. No.	Name	Village	Phone	Signature
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74		
75	981318806	
76	946671985	
77	972946160	
78	85029...	
79	999489259	
80		
81	916763645	
82		
83		
84		
85		
86	981318806	

7.5 PUBLIC HEARING ACTION PLAN

Name & Address	Question asked	Reply	Remark
<p>1-Sh. Virender Singh Village Khangesra, Tehsil Barwala, District Panchkula .</p>	<p>The acquired Land is a part of district Panchkula and there are Mango, Popular & Ashoka tree farms in this area. In my opinion HSIIDC should have taken, prior permission before acquisition of land but after acquiring the land you are taking environmental clearance through public hearing and this is wrong.</p> <p>Moreover a river is flowing nearby the villages where our cattles goes for drinking of water. But after the establishment of Industrial Estate entire garbage and polluted water will be put in the river which might by dangerous for our cattles.</p> <p>The authorities have claimed to setup the common effluent treatment plant but later on nobody pays attention, there is a bird sanctuary also near village Barwala which is just 3 miles (cross fly distance) away from the project site and no permission has been taken up by the HSIIDC in this regard.</p>	<p>Answer by - DGM HSUDC, Barwala.</p> <p>As per the master plan prepared by Director Town & Country Planning Department, Panchkula, the said area has been ear marked as Industrial zone and the land was acquired accordingly in year 2011-12. HSIIDC have just implemented the directions of the Government and regarding polluted water there is a provisions for establishment of CETP in Industrial Estate wherein the sewage as well as industrial effluent will be treated and reused for the plantation/ horticulture purpose. If there will be a requirement to take clearance in context to the Bird Sanctuary, the same will be taken as per the Government norms</p>	
<p>2- Sh. Virender Singh, Village Khangesra. Tehsil Barwala, District Panchkula.</p>	<p>As per the orders of Supreme court the fertile land cannot be acquired, however the land from the villages Khatauli, khangesra, Naggal, Alipur has been acquired which is very good & fertile land and we are objecting to this land acquisition because the most fertile land of the villages has been acquired.</p> <p>The then DRO also informed that Bheed Babupur and Bheed Firozpur is having unfertile land and can be used for this purpose where as on the said land residential zone has been planned by Govt. which is adjacent to the Industrial area of Punjab and garbage plant of the Punjab, Nobody pay attention to this and wrong planning has been done. We are not against the industrial setup, however the estate already developed in 1996 is still not Occupied fully.</p>	<p>Answer by - DGM HSIIDC, Barwala.</p> <p>The development plan of this area was finalized by the top officials of the Govt. and after approval of the development plan by Director Town and Country planning, Department, the land was acquired by HSIIDC.</p>	
<p>3- Sh. Virender Singh , Village Khangesra, Tehsil Barwala, District Panchkula.</p>	<p>The Government has done planning but HSIIDC IS the execution agency therefore it is duty of the concerned officer to examine the issue.</p>	<p>Answer by Sh. Satinder Pal, Regional Officer, HSPCB, Panchkula</p> <p>We heard all your grievances and the same will be mentioned in proceedings of the public hearing and will be conveyed to the higher authorities for taking further necessary action.</p>	

<p>4- Sh. Gurdas, Village Alipur, Tehsil Barwala, District Panchkula.</p>	<p>He requested to the ADC, Panchkula to ensure that the work should be done in such a manner that there should not be any bad effect on the life of the nearby residents Department should take all measures for all those peoples whose land has been acquired.</p>	<p>Answer by - DGM HSIIDC, Barwala HSIIDC will adhere to the resettlement & rehabilitation policy for those whose land has been acquired and there is provisions of compensation and also plot will be given to the land owners whose 70% land has been acquired. Moreover, the question regarding impact on the environment, in this regard we will take all necessary precautionary measures for prevention of the environment from this project.</p>	
<p>5- Sh. Husan Lal, Village Shamtu, along with the residents of village Rattewali, Toka, Miyanpur, Shabilpur, Khetpurali Tehsil Barwala, District Panchkula</p>	<p>We had a 12 Gatha wide very old link road of PWD from village Naggal to Shabilpur and the saine has been broken/ damaged due to the activities of HSIIDC in the nearby area. The villagers who want to travel to Barwala have to take longer route. The temporary bridge constructed by the contractor has also been washed away during rains. We request HSIIDC to rejoin the link road so that the villagers would not face any problem.</p>	<p>Answer by - DGM HSIIDC, Barwala For connectivity of Alipur-Toka road a 60 mt Sectoral road and also a diversion channel has been prepared, however after the completion of the project the vide connectivity of the roads will be provided. The old existing damaged road will also be repaired within 2-3 months for proper connectivity and facility of the villagers.</p>	
<p>6- Sh. Yaseen Khan, Village Khapgesra, Tehsil Barwala, District Panchkul</p>	<p>He said that nobody pays attention to the problems related to pollution or Jamindars and for solution of any issue or regarding royalty etc. we have to travel from Alipur to Panchkula. HSIIDC has also constructed boundary wall therefore the access of the villagers has been stopped. The Govt. is giving different compensation amount for the lands acquired earlier and now. Moreover the compensation amount also differs and varies from village to village.</p>	<p>Answer by - DGM .HSIIDC, Barwala HSIIDC is having a policy that boundary wall has to be constructed within the acquired area for the safety of the industrial units. However till proper connectivity is not provided to the affected villages, the excess shall be provided to the nearby residents. The matter regarding announcing compensation is related to the District Commissioner and was given by DRO, as per the potential of land or as per the circle rates defined by District Collector. There is no separate role of HSIIDC in the said matter. If anybody is not satisfied with the-compensation amount he may proceed to the court for their claim.</p>	
<p>7- Sh. Padam Singh, Village Khatouli, Tehsil Barwala , District Panchkula</p>	<p>He welcomed all the District Administration officers and requested that we are already suffering from various environmental pollution problems due to abundance of domestic flies and mosquitoes from poultry farms in our area despite of the Swatch Bharat Mission which is launched by the Hon'ble Prime Minister of India. We are not living in hygienic conditions due to fly menace from the nearby poultry farms and this issue has not been resolved till</p>	<p>Answer by Satinder Pal, RO, Panchkula It is the duty of the pollution control board and Government to control and prevent the environment and nobody will be allowed to pollute air and water. HSIIDC is duty bound to install CETP for proper treatment of the effluent being generated from the industrial units and HSIIDC would not be allowed to discharge any treated water into the</p>	

	<p>date.</p> <p>Whenever we talk about it to the higher authorities they said that the land was given by you for the concerned purpose & for the establishment of Poultry Farm/industry etc. He further said that property/land was not given willingly.</p> <p>It is upto the government that they can acquire the land by giving the predecided value of the land and we cannot go against the Government. However after coming of the industries, our cattles would not be able to drink pure water from the nearby river or ponds as it would be polluted after coming of the industries. The underground drinking water will also gets polluted after coming of industries in this area. We do not have, any issue with the setting up of the industrial estate but we want proper arrangements should be done so that our river, ground water and land would not get polluted. We do not allow any compromise on Environmental issues therefore right now we are not in favour of the establishment of the industrial estate project of HSIIDC phase-II, in Barwala.</p> <p>Beside this we have two grain markets in this area, one is in Barwala and another is in Raipur Rani. The Crops; of the Landholders of this area are lying in the open areas whereas in the grain market the paddy is being procured by brokers from Punjab, as a result the farmers of this area are facing huge problem in selling their paddy in Anaj Mandi. We request the ADC to solve the problem of crops too.</p>	<p>drain/ river. HSIIDC will have to make provisions for reuse/recycling of the treated effluent inside their premises as per the directions of CPCB.</p>	
<p>8- Sh. Sehjwinder Singh, village Alipur, Panchkula</p>	<p>You said that proper CETP will be established for the project but for the old industries, HSIIDC has not installed any CETP in the industrial estate.</p>	<p>Answer by Sh. Satinder Pal, R.O., HSPCB, Panchkula.</p> <p>The CETP for the existing industries has already been established and the same can be checked along with the Officers of HSIIDC</p>	
<p>9- Sh. Sehjwinder singh, village Alipur, Panchkula.</p>	<p>He asked that the water is still discharged in to the river and no proper nallah system has been developed. The factories are putting waste material / garbage near the river bed and burn the waste resulting into the air pollution in nearby area.</p>	<p>Answer by Sh. Satinder Pal, Regional Officer, HSPCB, Panchkula</p> <p>HSIIDC is responsible for management of the solid waste generated and has to ensure that no open dumping and burning of the waste of industry be allowed.</p> <p>If there is any specific complaint the same may be provided to the officer of Pollution Control Board and</p>	

		appropriate action will be taken if any violation is found on the part of industry. For this project 1.5 acre land has been ear marked by HSIIDC for solid waste disposal. HSIIDC should ensure that management of solid waste generated from the industrial estate be done properly and at the designated site.	
10- Sh. Sehjwinder singh, village Alipur, Panchkula	The plants/trees and houses on our land have not yet been compensated by HSIIDC and the land has been acquired earlier before giving any compensation associated with the loss.	Answer by -DGM HSIIDC, Barwala The land acquisition matter is related to DRO and HSIIDC has deposited all the amount as per the demand received from DRO, however if any matter is left the same may be informed to HSIIDC in written and accordingly the matter will be taken up with DRO.	
11- Sh. Sehjwinder singh, village Alipur, Panchkula	One month has gone after submission of the affidavit and amount has been deposited on 26th, now farmers are asking for the interest	Answer by - DGM HSIIDC, Barwala As per the demand the disbursement of the fund has to be done by DRO, might be the scrutiny of the documents is going on. However the amount will be released by Monday or Tuesday as per the discussion held with DRO.	
12- Sh. Sehiwinder singh, village Alipur, Panchkula	It was promised that the lease rent will be enhanced @ of Rs. 750/- annum but you have only enhanced Rs. 500/-annum.	Answer by - DGM HSIIDC, Barwala As per our record the increment of Rs. 750/- has been given and for the acquisition of land done before 2009 Rs. 500/- were given as increment. However if there is an doubt regarding calculation you can come to our office for clarification.	
13- Sh. Sehjwinder singh, village Alipur, Panchkula	It was told to us that for the industrial plot which will be allotted to the jamindars in the industrial estate, for that they can give amount in the instalments and no interest will be charged. But now they are asking for the interest.	Answer by - DGM HSIIDC, Barwala This matter is related to the Estate office of HSIIDC but still you can give in written your grievance with name and address. The reply will be given immediately plot wise.	
14- Sh. Sehjwinder singh, village Alipur, Panchkula	After establishment of industrial estate the facilities of Electricity and water are being affected. The supply of light is always available in the industrial estate whereas no proper electricity supply in the nearby villages.	Answer by - DGM HSIIDC, Barwala For industrial Estate, Ph-II, the electrical wing of HSIIDC is going to setup 66 kVA power sub-station and power will also be provided to the villagers from this substation.	
15- Sh. Kamaljit Singh, A.E.E. HSPCB, Panchkula.	Is HSIIDC is having the Zero Liquid discharge provision for the CETP to be installed.	Answer by - DGM HSIIDC, Barwala The CETP of 6.5 MLD will be having tertiary treatment but ZLD will not be achieved, however 70% water will be recycled and used for horticulture purpose.	Now HSIIDC is proposing ZLD system with CETP for capacity 6.1 MLD

<p>16- Sh. Kamaljit Singh. A.E.E. HSPCB, Panchkula.</p>	<p>Is Industrial as well as Domestic effluent of the industries will be treated in the CETP and what type of industries will be allowed in Industrial Estate.</p>	<p>Answer by - DGM HSIIDC, Barwala The common treatment of the industrial as well as of domestic effluent will be done however at present there is no allotment of any plot to the industries as when there will be allotment it will be kept in the mind for finalizing the parameters for CETP and the matter will be taken accordingly. Mixed type of industries will be allowed in phase-II.</p>	
<p>17- Sh. Rajnish Garg. Industrialist of Phase-1, Barwala</p>	<p>He suggested that in the upcoming industrial estate there should be provision for a crèche to facilitate female workers. The another observation is regarding providing proper parking space (Lay by area) for parking of the big truck to avoid traffic problem.</p>	<p>Answer by - DGM HSIIDC, Barwala Proper provision has already been taken of parking space for the vehicles in phase-II and there will not be any such traffic jam problem. He further replied that the proposal for crèche may kindly be provided in writing so that the same could be forwarded to the planning cell for earmarking a site for the crèche like other community development activities such as Police post, Fire station, ESI, Dispensary etc. in the Industrial Estate, PH-II.</p>	
<p>18- Sh. Rajnish Garg, Industrialist of Phase-1, Barwala.</p>	<p>He suggested that there should also be a provision for "Ran Basera" for the workers who got late or for stay in the severe conditions like rainy/winter season.</p>	<p>Answer by - DGM HSIIDC, Barwala He replied that the demand for providing proper transport facility for the large number of workers may kindly be submitted in writing so that the matter in this regard be conveyed to the Transport Department through our Managing Director</p>	
<p>19- Sh. Rajnish Garg, Industrialist of Phase-1, Barwala</p>	<p>After the establishment of the industrial estate there will be around 6000-10000 workers in the said industrial estate therefore there must be separate provisions for cycle & walking track for the convenience and safety of the workers.</p>	<p>Answer by - DGM HSIIDC, Barwala The full development of Industrial Estate will take 5 to 10 years therefore the open space can be utilized till that time. However there is provision of 60 mt roads in industrial Estate and in 60 mt road there is already provision for service road therefore that can be used by the workers. However the written suggestion may kindly be given for taking the said matter with higher authorities for providing the separate cycle and walking track.</p>	
<p>20- Sh. Virender singh, village Khangesra, Barwala.</p>	<p>Suggestion The local labour should be given employment in the Industrial Estate and Govt. has already given houses under Indra Awas Yojna to the labours</p>	<p>Noted</p>	

<p>21- Sh. Rajnish Garg, Industrialist of Phase-I, Barwala.</p>	<p>Suggestion There should be provision of labour housing in the Industrial Estate as in the nearby villages there are not sufficient provisions for the stay of Labourers.</p>	<p>Answer by - DGM HSIIDC, Barwala In our R&R policy the provision has been mentioned for the residential complex for the workers but that is in bigger Industrial Estates i.e. around 2000 Acres, however if any such demand is there than the same could be considered as per the eligibility and requirement.</p>	
<p>22- Sh. Rajnish aarg. Industrialist of Phase-I, Barwala.</p>	<p>Suggestion He further suggested that efforts should made for the benefit of the workers through CSIR policy and the industry will also help in doing the same for the development of workers</p>	<p>Noted</p>	<p>CER & CSR details are incorporated in EIA</p>
<p>23- Sh. Rajnish Garg, Industrialist of Phase-I, Barwala and Gurdas Ex-sarpanch of village Alipur, Barwala.</p>	<p>Suggestion/Demand Proper provision should be carried out for turning, entry and exist of the big trucks from main road to the Industrial Estate internal roads. There should also be a cremation ground in the nearby area of Industrial Estate.</p>	<p>Answer by - DGM HSIIDC, Barwala It will be ensured that proper structure should be provided for entry & exit of the vehicles from the main roads into the Industrial Estate. The matter regarding cremation ground shall be taken under village development scheme and can be earmarked subject to the resolution passed by the President, as this area now comes under Municipal Corporation, Panchkula.</p>	
<p>24- Sh. Satinder Pal, Regional Officer, HSPCB, Panchkula.</p>	<p>Suggestion Whether any permission has been obtained from the Central Ground water Authority for withdrawal of ground water.</p>	<p>Answer by - DGM HSIIDC, Barwala The permission in this regard is in process, whenever we get permission only than the tube wells will be installed.</p>	<p>Ground water is the only source for water consumption. NOC from CGWB has been obtained vide NOC no. CGWA/ NOC/INF/ORI G/2019/4844 dated-12th March 2019</p>
<p>25- Sh. Satinder Pal, Regional Officer, HSPCB, Panchkula.</p>	<p>Suggestion/Direction HSIIDC has to ensure compliance of fly ash notification 1999 and amendments thereafter in their project. HSIIDC should also adhere to the directions of Hon'ble NGT, New Delhi for taking all-preventive measures to control dust and noise pollution during construction phase. The compliance of these directions has to ensured by HSIIDC by making it mandatory in their allotment letters.</p>	<p>Answer by - DGM HSIIDC, Barwala HSIIDC will adhere to all such directions and try to get it implemented through Estate Division.</p>	

<p>26- Sh.Satinder Pal, Regional Officer, HSPCB, Panchkula</p>	<p>Asked for any other question/ suggestion from the public before closing the public hearing.</p>		
<p>27- Sh. Rajnish Garg. Industrialist of Phase-I, Barwala.</p>	<p>Suggestion The ground water level in this area is quite high therefore there must be some provision for channelizing the water to be made in Industrial Estate even for the treated water.</p>	<p>Answer by She Satinder Pal, Regional Officer, HSPCB, Panchkula. HSIIDC shall made separate channels for transfer and reuse of the treated effluent of the CETP into the flushing system, horticulture and also in the process of the industrial units. No treated/untreated water will be allowed by HSPCB to be discharged on land therefore HSIIDC will make all such planning in their Industrial Estate. Proper green belt as per the requirement of the area shall be developed by HSIIDC for further controlling any water logging problem. Answer by - DGM HSIIDC, Barwala The directions of pollution control board will be adhered and implemented in the said project.</p>	<p>CETP of 6.1 MLD will be having tertiary treatment facility. All the treated water shall be utilized to achieve the ZLD</p>

7.6 RISK ASSESSMENT AND DISASTER MANAGEMENT PLAN

Industrial accidents results in great personal and financial loss. Managing this accidental risk in today’s environment is the concern of every industry including Industrial Estates, because either real or perceived incidents can quickly jeopardize the financial viability of a business. Many facilities involve various manufacturing processes that have the potential for accidents which may be catastrophic to the plant, work force and environment or public.

OBJECTIVE: The main objective of risk assessment study is to propose a comprehensive but simple approach to carry out risk analysis and conducting feasibility studies for industries, planning and management of industrial prototype hazard analysis study in Indian context.

7.2.1 RISK HAZARD AND ITS CONTROL MEASURES

7.2.1.1 ON SITE MANAGEMENT PLAN

The on- site management plan will be circulated to all concerned member of emergency team. It is essential that all concerned person are familiar with the overall on- site emergency plan and their respective roles and responsibilities during emergency. They should also participate

regularly in the mock drills to keep in a state of perpetual preparedness at all times to meet any emergency.

7.2.1.2. Action Plan of on-site Emergency Plan

The parameters considered are given as follows:

- To constitute Disaster Management Committee under senior officer not below the rank of General Manager.
- To identify potential hazards areas in the layout map of industrial estate
- To use model to predict hazards impact in the surrounding areas in form of pool-fire or gas leakage.
- To predict degree of burns and distance of the risk zone by using model.
- To evacuate the area within risk zone.
- To localize the emergency and if possible eliminate it.
- To minimize the effects of accidents on people and property.
- To take remedial measures in the quickest possible time to contain the incident and control it with minimum damage.
- To mobilize the internal resource and utilize them in the most effective way.
- To get help from the local community and government official to supplement internal manpower and resources.
- To minimize the damage in other sections.
- To keep the required emergency equipment in stock at right places and ensure that they are in working condition.
- To keep the concerned personnel fully trained in the use of emergency equipment.
- To give immediate warning to the surrounding localities in case of emergency situation arising.
- To mobilize transport and medical treatment of the injured.
- To educate the public in the surrounding village regarding hazards.
- To arrange treatment of casualties.
- To safe guard the people.
- To identify the casualties and communicate to persons known to them.
- To render necessary help to concerned.
- To rehabilitate area affected.
- To provide information to media and government agencies.

7.2.1.3 Scope of on-site Emergency Plan

The plan covers information regarding the properties of the industry, type of disasters and disaster/accident prone zones. The important elements considered in this plan are:

- Statutory requirement
- Emergency organization
- Roles and responsibility
- Communications during emergency
- Emergency facilities
- Important information

The primary purpose of the on- site emergency plan is to control and contain the incident and so to prevent it from spreading. To cover eventuality in the plan and the successful handling of the emergency will depend on appropriate action and decision being taken on the spot.

It is proposed to plan and construct the buildings following all safety norms. However, it is not always possible to totally eliminate such eventualities and random failures of equipment or human errors. An essential part of major hazard control has therefore, to be concerned with mitigating the effects of such emergency and restoration of normalcy at the earliest. A detailed table showing activities during construction and operation phase along with mitigation measures are given in **Table 7.1**

Table 7.1: Activities during construction and operation along with mitigation measures

HAZARDS ASSOCIATED WITH ACTIVITIES (During Construction & Operation)	CONTROL/MITIGATION MEASURES
Manual Handling - Strains and sprains incorrect lifting - too heavy loads - twisting - bending - repetitive movement - body vibration.	Exercise/warm up - get help when needed - control loads - rest breaks/no exhaustion - no rapid movement/twisting/ bending/repetitive movement - good housekeeping.
Falls - Slips – Trips Falls on same level - falls to surfaces below - poor housekeeping - slippery surfaces Uneven surfaces -poor access to work areas climbing on and off plant -unloading materials into excavations wind - falling objects.	Housekeeping - tidy workplace - guardrails, handholds, harnesses, hole cover, hoarding, no slippery floors/trip hazards - clear/ safe access to work areas - egress from work areas - dust/water controlled - PPE.
Fire Flammable liquids/Gases like LPG, Diesel Storage area and combustible building materials - poor housekeeping - grinding sparks - open flames, absence of Fire hydrant net work.	Combustible/flammable materials properly stored/used - good housekeeping - fire extinguishers made available & Fire hydrant Network with reserve Fire water (As per NFPA Code) - Emergency Plan in case of Fire or collapse of structure.
Absence of Personal Protective Equipment Lack of adequate footwear - head protection - hearing/eye protection - respiratory protection - gloves - goggles.	Head/face - footwear - hearing/eye - skin – respiratory protection provided - training - maintenance.

HAZARDS ASSOCIATED WITH ACTIVITIES (During Construction & Operation)	CONTROL/MITIGATION MEASURES
Defective or wrong Hand Tools Wrong tool - defective tool - struck by flying debris - caught in or on - missing guards - carbon monoxide - strains and sprains - dust.	Right tool for the job - used properly - good condition/ maintenance guards - isolation - eye/face protection - flying debris controlled.
Electricity Electrocution - overhead/underground services- any leads damaged or poorly insulated - temporary repairs -no testing and tagging - circuits overloaded - non use of protective devices.	Leads good condition and earthed - no temporary repairs - no exposed wires - good insulation - no overloading - use of protective devices - testing and tagging -no overhead/ underground services
Scaffolding Poor foundation - lack of ladder access insufficient planking - lack of guardrails and toe boards - insufficient ties or other means - all scaffolds incorrectly braced or stabilized to prevent overturning.	All scaffolds correctly braced and stabilized - 3:1 height to base ratio - firm foundation, plumb and level - ladder access provided and used - proper platform (3 planks/675 mm) - planks secured - guardrails and toe boards - 900mm to 1100mm high, within 200mm of working face, mid-rail.
Ladders Carrying loads - not secured against dislodgement - defective ladders - not sufficient length - wrong positions - incorrectly placed (angles, in access ways, vehicle movements.	Secured against movement or footed - ladders in good condition - regularly inspected - extend 1m above platform - 4:1 angle - out of access ways, vehicle movements - climbing - no carrying loads - 3 points of contact - no higher than 3 rd step down - use for access only, not working platforms.
Excavations Trench collapse - material falling in undetected underground services - falls - hazardous atmosphere struck by traffic and mobile plant.	Soil stability known - no water accumulation - existing services known - material 600mm from edge - clear of suspended loads - hardhats/PPE - ladders - public protection – atmospheric testing - traffic controls - Emergency Plan.
Gas Cutting and Welding Fire - welding flash, burns, fumes, electrocution in wet conditions - flashback in oxygen set, leaking cylinders, acetylene cylinders lying down - poorly maintained leads.	Welding flash and burns controlled with PPE and shields -fumes controlled with ventilation and PPE (in good condition and properly positioned), Gas cylinders be kept upright & secured position (properly tied) - combustible materials to be kept at secured place to avoid fire & Fire Extinguishers to be kept in fire prone area with training to people for its use.
Noise known noise levels over 85 decibels	Levels below 85 decibels - proper protection.
Falling Material Fall during carrying/Lifting materials- dislodged tools and materials from overhead work areas.	Materials to be secured – kept away from edge - toe boards –Use of hard hats.
Craneage & Lifts Display of carrying capacity i.e. load (No. of person), incorrectly slung, defective lifting equipment, unsecured loads, craning in close proximity to building people and plant - falls - falling materials.	Periodic testing by competent authority - correctly slung/secured loads, lifting equipment good condition - use of proper hand signals - falls while unloading controlled.
• Visitors Presence at site Falls - struck by - dropped materials - roading accidents - insufficient hoarding or fencing - pedestrian access past site - mechanical plant movement on and off site.	Sufficient hoarding - fencing and barricades - safe pedestrian access past site traffic management for loading and delivery - construction separated from occupied areas of projects.

7.2.1.4. Objective of on-site Emergency Plan

Risk analysis and risk assessment should provide details on risk posed to people who work inside or live near hazardous facilities, and to aid in preparing effective emergency response plans by delineating a Disaster Management Plan (DMP) to handle on-site and off-site emergencies. Hence, Risk analysis and risk assessment is an invaluable method for making informed risk-specific for any plant is complex and needs extensive study that involves process understanding, hazard identification, consequences probability data, vulnerability models/data, local weather and terrain conditions and local population data. Risk analysis and risk assessment will be carried out to serve the following objectives:

- Identification of safety areas
- Identification of hazard sources
- Generation of accidental release scenarios for escape of hazardous materials from the facility
- Identification of vulnerable units with recourse to hazard indices
- Assessment of risk on the basis of above evaluation against the risk acceptability criteria relevant to the situation
- Suggest risk mitigation measures based on engineering judgment, reliability and risk analysis approaches
- Delineation/upgradation of DMP
- Safety reports: with external safety report/occupational safety report

The risk assessment report may cover the following in terms of the extent of damage with analysis and delineation of risk mitigations measures with an approach to DMP.

- Hazard Identification- identification of hazardous activities, hazardous materials, past accident records, etc.
- Hazard quantification- consequence analysis to assess the impacts
- Risk Presentation
- Risk Mitigation Measures
- DMPs

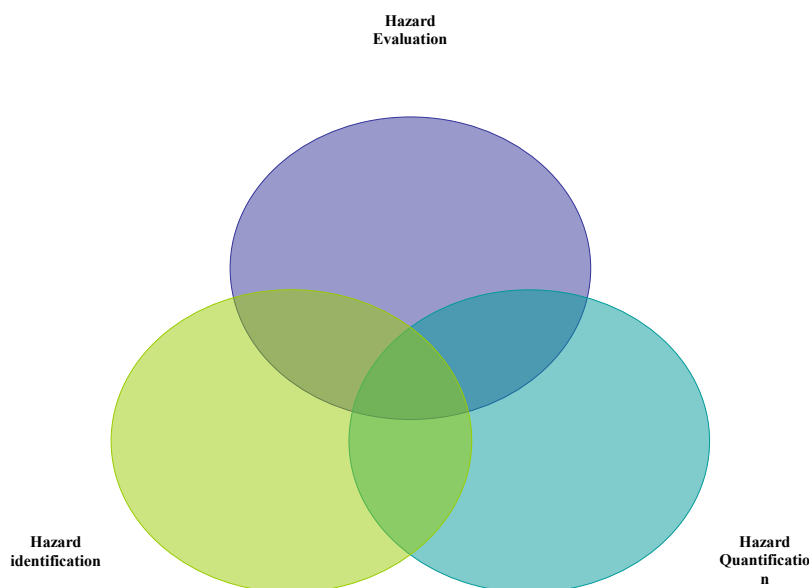


Figure 7.1: Risk Assessment-Conceptual Framework

Table 7.2: Choice of Models for Impact Predictions: Risk Assessment

Name	Application	Remarks
EFFECT	Consequence analysis for Visualization of accidental chemical release scenarios & its consequence	Heat load, press wave & toxic release exposure neutral gas dispersion
WHAZAN	Consequence of analysis for visualization of accidental chemical release scenarios & its consequence	
DEGADIS	Consequence of analysis for visualization of accidental chemical release scenarios & its consequence	Dense gas dispersion
HAZOP & fault tree assessment	For estimating top event probability	Failure frequency data is required
Pathways reliability and protective system hazard analysis	For estimating reliability of equipments and protective systems	Markov Models
Vulnerability Exposure models	Estimation of population exposure	Uses probit equation for population exposure
F-X and F-N curves	Individual/Societal risks	Graphical Representation

Depending on the manufacturing process and technology adopted, risk associate with the project can be decided.

7.6.1 Emergency

A major emergency in any situation is one, which has the potential to cause serious injury or loss of life, which may cause extensive damage to the structure in vicinity and environment and could result in serious disruption to normal operation both inside and outside the industry premises. Depending on the magnitude the emergency, service of the outside agencies may also be damage.

The management has to take effective steps to assess, minimize and wherever feasible eliminate the risk to large extent. Accident may still occur and it is necessary to be fully prepared to tackle all such emergencies if and when they occur.

It is likely that the consequences of such emergencies will be confined to the units concerned or may affect outside. If the consequences are confined within the plant boundary, it will be controlled by **Chief Emergency Controller**. The most widely used techniques in practice will be based on experience accumulated over many year and safety audits.

7.2.1 STORAGE & HANDLING OF HAZARDOUS MATERIALS: Both the hazardous & non hazardous material generated within the Industrial Estates shall be temporarily accommodated in necessary units placed within the Industrial Estate in line with the Safety, Health and Environmental standards.

The size of these temporary units will depend on the quantity and the type of Hazardous waste materials like asbestos, PCB, oils, fuels etc. with appropriate storage capacities are placed in the Estate following Hazardous Waste Management and Handling Rules (1989). Also, if gas cylinders will be stored in the Estate, the Gas Cylinders Rules under explosives Act will be followed. Later, these materials will be disposed off at a centralized disposal facility with utmost care following safety norms. Each unit in the Industrial Estates will be facilitated with fire hydrant system to handle fire hazards.

7.2.2 HAZARD IDENTIFICATION: Hazard is the characteristic of any system or process which has the potential for accident. Identification of hazards, in the presence of any hazardous waste generating industries within the Industrial Estates is of primary significance in the analysis, quantification and cost effective control of accidents involving chemicals and process.

The typical methods for hazard identification employed are:

- Identification of major hazardous units based on Manufacture, Storage and Import of Hazardous Chemical Rules, 1989 of Government of India (amended in 2000)
- Identification of hazardous wastes based on Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2008, as its amendments.

- Hazardous substances may be classified into three main classes namely flammable substances, unstable substances and Toxic substances.

7.2.3 HAZARD ASSESSMENT & EVALUATION: A preliminary hazard analysis shall be carried out to identify the major hazards associated with storages in the facility. This is followed by consequence analysis to quantify these hazards. Following are the vulnerable zones of accident:

Frequent causes of accidents:

- Fire and explosion: explosives, flammable materials
- Being struck by falling objects
- Caught in or compressed
- Snapping of cables, ropes, chains, slings
- Handling heavy objects
- Electricity
- Poor illumination
- Falls from height inside industrial units or on the ground
- Struck by moving objects
- Slipping on wet surfaces
- Sharp objects
- Oxygen deficiency in confined spaces

Hazardous substances and wastes:

- Heavy and toxic metals (lead, mercury, cadmium, copper, zinc, etc.)
- Organometallic substances (tributyltin, etc.)
- Lack of hazard communication (storage, labelling, material safety data sheets)
- Batteries, fire-fighting liquids
- PCBs and PVC
- Welding fumes
- Volatile organic compounds (solvents)
- Inhalation in confined and enclosed spaces

Physical hazards:

- Noise
- Extreme temperatures
- Vibration
- Radiation (UV, radioactive materials)

Mechanical Hazards:

- Trucks and transport vehicles
- Scaffolding, fixed and portable ladders
- Impact by tools, sharp-edged tools

- Power-driven hand tools, saws, grinders and abrasive cutting wheels
- Failure of machinery and equipment
- Poor maintenance of machinery and equipment
- Lack of safety guards in machines
- Structural failure

Biological hazards:

- Risk of communicable diseases transmitted by pests, vermin, rodents, insects and
- Other animals that may infest in the IEs.
- Animal bites
- Vectors of infectious diseases (TB, malaria, dengue fever, hepatitis, respiratory
- Infection)

Ergonomic and psychosocial hazards:

- Repetitive strain injuries, awkward postures, repetitive and monotonous work,
- Excessive workload
- Long working hours, shift work, night work, temporary employment
- Mental stress, human relations (aggressive behaviour, alcohol and drug abuse,
- violence)
- Poverty, low wages, minimum age, lack of education and social environment

General concerns:

- Lack of safety and health training
- Poor work organization
- Inadequate housing and sanitation
- Inadequate accident prevention and inspection
- Inadequate emergency, first-aid and rescue facilities
- Lack of medical facilities and social protection

7.2.4 Hazard Seasonality Map

Catastrophe like floods, cold wave, drought, hailstorms etc. are climatic hazards and therefore have seasonal probability of occurrence. Mishaps like fires and chemical accidents can occur any season. Similarly, occurrence of earthquake is highly unpredictable and can occur in any season of the year, so its probability is throughout the year.

Hazards like road accidents and rail accidents have high probability in the months of December and January as during these months there is dense fog all over the district may result into accidents. Similarly, hazardous chemicals transporting also have similar risk. The above mentioned list of hazards in Panchkula, show a pattern depending upon the probability and severity of occurrence during various months of the year. The following table shows probability and seasonality of hazards.

7.3 DISASTER MANAGEMENT PLAN

A disaster is a catastrophic situation in which suddenly, people are plunged into helplessness and suffering and, as a result, need protection, clothing, shelter, medical and social care and other necessities of life. The Disaster Management Plan is aimed to ensure safety of life, protection of Environment, protection of installation, restoration of production and salvage operations in this same order of priorities. For effective implementation of the Disaster Management Plan, it should be widely circulated and a personnel training is to be provided through rehearsals/drills. To tackle the consequences of a major emergency inside the plant or immediate vicinity of the plant, a Disaster Management Plan has to be formulated and this planned emergency document is called "Disaster Management Plan".

The objective of the Industrial Disaster Management Plan is to make use of the combined resources of the plant and the outside services to achieve the following:

- Effect the rescue and medical treatment of casualties;
- Safeguard other people;
- Minimize damage to property and the environment;
- Initially contain and ultimately bring the incident under control;
- Identify any dead;
- Provide for the needs of relatives;
- Provide authoritative information to the news media;
- Secure the safe rehabilitation of affected area;
- Preserve relevant records and equipment for the subsequent inquiry into the cause and circumstances of the Emergency.

In effect, it is to optimize operational efficiency to rescue rehabilitation and render medical help and to restore normalcy.

Disaster Management Plan should include Emergency Preparedness Plan, Emergency Response Team, Emergency Communication, Emergency Responsibilities, Emergency Facilities and Emergency Actions

7.4 EMERGENCY RESPONSE PLAN (ERP)

The overall objective of an Emergency Response Plan (ERP) is to make use of the combined resources at the site and outside services to achieve the following:

1. To localize the emergency and if possible eliminate it;
2. To minimize the effects of the accident on people and property;
3. Effect the rescue and medical treatment of casualties;

4. Safeguard other people;
5. Evacuate people to safe areas;
6. Informing and collaborating with statutory authorities;
7. Initially contain and ultimately bring the incident under control;
8. Preserve relevant records and equipment for the subsequent enquiry into the cause and circumstances of the emergency;
9. Investigating and taking steps to prevent reoccurrence

The ERP is therefore related to identification of sources from which hazards can arise and the maximum credible loss scenario that can take place in the concerned area. The plan takes into account the maximum credible loss scenario - actions that can successfully mitigate the effects of losses/ emergency need to be well planned so that they would require less effort and resources to control and terminate emergencies.

Main hazards identified for the project include hazards pertaining to fires in buildings and fire in diesel storage areas, earthquake and LPG leakage and an ERP pertaining to these is described in the following section.

7.5 RESPONSE IN CASE OF EARTHQUAKE

7.5.1 Response Procedures for Occupants

If indoors:

1. Take cover under a piece of heavy furniture or against an inside wall and hold on.
2. Stay inside: The most dangerous thing to do during the shaking of an earthquake is to try to leave the building because objects can fall on you.

If outdoors:

Move into the open, away from buildings, streetlights, and utility wires. Once in the open, stay there until the shaking stops.

If in a moving vehicle:

Stop quickly and stay in the vehicle. Move to a clear area away from buildings, trees, overpasses, or utility wires. Once the shaking has stopped, proceed with caution. Avoid bridges or ramps that might have been damaged by the quake.

After the quake

1. After the quake be prepared for aftershocks.
2. Although smaller than the main shock, aftershocks cause additional damage and may bring weakened structures down. Aftershocks can occur in the first hours, days, weeks, or even months after the quake.

Help injured or trapped persons.

1. Give first aid where appropriate. Do not move seriously injured persons unless they are in immediate danger of further injury. Call for help.
2. Remember to help those who may require special assistance--infants, the elderly, and people with disabilities.
3. Stay out of damaged buildings.
4. Use the telephone only for emergency calls.

7.5.2 Response Procedure for Emergency Team

1. Formulate an Emergency Response Team for earthquake response.
Using the public address system, inform residents of response procedures discussed above.
2. Inform the necessary authorities for aid.
3. Ensure no person is stuck beneath any debris, in case of a structural failure.
4. Ensure that all occupants standing outside near the buildings are taken to open areas.
5. Ensure that the first aid ambulance and fire tender vehicles are summoned if necessary.
6. Inform the nearby hospitals if there are any injuries.
7. Check the utilities and storage tanks for any damage.

7.6 Response for LPG Leakage

1. The affected area should be evacuated and cordoned off immediately
2. Initiate an Emergency Response Team for LPG leakage.
3. Shut down the main valves in the gas bank.
4. Ensure that only concerned personnel are present in the affected area and all other personnel and visitors are moved to the nearest assembly points.
5. Rescue trapped personnel, also check if any personnel are unconscious in the area and immediately move them outside and provide first aid. Ambulance should be summoned to take injured personnel to the nearest hospital.
6. Personnel in the nearby buildings to close all doors and windows to prevent entry of the leaked gas.
7. Source of leakage to be traced and isolated from all the other areas. And if required use pedestal fans to bring down the gas concentration.
8. In case of a fire follow the instructions in case of fire.

7.7 RESPONSE IN CASE OF FIRE

1. Required response during in the event of a fire should be described in signs located in the lobby.
2. On sighting a fire, it should be immediately informed to the environment manager giving the exact location and type of fire in detail.
3. Initiate the Emergency Response Team for fires.
4. If the fire is small, engage in extinguishing the fire using the nearest fire extinguisher.
5. Guide the Emergency Response Team staff to the emergency assembly point.
6. The Emergency Response Team should immediately inform the nearest dispensary and security force. If required a fire tender should be summoned.
7. The response team should immediately move to the point of fire and take all necessary steps to stop the fire. If the fire is not controllable and spreads then the manager in charge should inform the district authorities and call for external help.
8. The Emergency Response Team will provide immediate relief to the injured residents at the scene of incident. Any injured persons should be evacuated on priority to the dispensary or one of the nearest hospitals based on their condition.

Instructions for occupants

1. Get out of buildings as quickly and as safely as possible.
2. Use the stairs to escape. When evacuating, stay low to the ground.
3. If possible, cover mouth with a cloth to avoid inhaling smoke and gases.
4. Close doors in each room after escaping to delay the spread of the fire.
5. If in a room with a closed door.
6. If smoke is pouring in around the bottom of the door or if it feels hot, keep the door closed.
7. Open a window to escape or for fresh air while awaiting rescue.
8. If there is no smoke at the bottom or top and the door is not hot, then open the door slowly.
9. If there is too much smoke or fire in the hall, slam the door shut.
10. Stay out of damaged buildings.
11. Check that all wiring and utilities are safe.

A state of the art fire fighting system is proposed for the project to prevent and control fire outbreaks. The fire fighting system will consist of portable fire extinguishers, hose reel, wet riser, yard hydrant, automatic sprinkler system, and manual fire alarm system. The buildings will also be provided with automatic fire detection and alarm system.

Table-7.3: Brief of Hazard-specific Structural & Non-Structural Measures

Hazard	Structural Measures	Non-Structural Measures
Flood	<ul style="list-style-type: none"> • Strengthening/ construction of embankments, flood walls • Proper regulation of water storage reservoirs • Drainage improvement in order to avoid congestion • Inspection, rehabilitation and maintenance programme to ensure that the design capabilities are maintained 	<ul style="list-style-type: none"> • Flood plain zoning to regulate land use in the flood plains. • Integrated Water Resource Management such as water resources assessment, socio-economic assessment, water resources planning, implementation of action plans, day-today water resources management (adjustments of the plans) and water resources protection and conservation. • Medical preparedness in terms of after-effects of floods requiring medical attention.
Earthquake	<ul style="list-style-type: none"> • Seismic strengthening of existing structures. • Structural safety audit of critical lifeline structure. • Earthquake-resistant construction 	<ul style="list-style-type: none"> • Development of Rapid Visual Screening procedures and Detailed Vulnerability Assessment. • Regular conduction of Fire Safety Audits and Electrical Safety Audits. • Public Awareness campaigns. • Techno-legal regime for ensuring compliance of earthquake-resistant design and construction practices in all new constructions.
Drought	<ul style="list-style-type: none"> • Water management including water harvesting and conservation. • Micro-irrigation including drip and sprinkler irrigation 	<ul style="list-style-type: none"> • Study ground water availability map in area.
Fire	<ul style="list-style-type: none"> • Implementation of all applicable fire safety norms. 	<ul style="list-style-type: none"> • Training of community members in fire-fighting techniques. • Putting in place audit system. • Compulsory fire hazard evaluation of all types of buildings old and new • Planning and calendar of evacuation drills/ mock drills in vital installations/ industrial plants/ government buildings / schools and critical infrastructure like hospitals, etc. • Enforcement of fire approvals as per the provisions contained in National. • Building Code (NBC) 2005 for new constructions.

Chemical & Industrial Accidents	Creation of appropriate infrastructure as mentioned in Off-site and On-site plans including Public Address system.	<ul style="list-style-type: none"> • Enforcement of code of practices, procedures and standards. • Audits of On-site & Off-site • Emergency plans at regular intervals • Statutory inspection, safety audit and testing of emergency plans • Safety Auditing • Hotline telephone connection with nearby emergency services • Awareness generation among community regarding HAZMAT • Training of specialized Medical First Aid Responders
Biological Disasters	Enforcement of bio-safety measures in labs	<ul style="list-style-type: none"> • Regular survey and proper maintenance of water supply and sewage pipeline. • Creation of awareness about personal hygiene. • Vector control programmes.

7.8 RESOURCE CONSERVATION

The project will lead to utilization of various natural resources. As an environmentally responsible corporate, the developers endeavor to conserve these resources by judicious management and recycling and strive to build up these resources where possible.

Water Resources: The project will have private water from tanker during the construction phase & tube wells during operation phases of the project. The national water scenario, where availability of fresh water is fast dwindling, judicious use of the same cannot be over emphasized. Following means are proposed to be adopted for conservation of this life sustaining resource:

Reduced use of water: To further minimize the use of available freshwater, various low flow fixtures may be provided such as Low flow flushing systems, sensor based fixtures, waterless urinals, tap aerators. Awareness will also be spread amongst the employees and residents on the following lines:

- Timely detection and repair of all leakages;
- Avoiding/minimizing use of shower/bath tub in bathroom;
- Turning off faucets while soaping and rinsing clothes;
- Avoiding use of running water while hand-washing;
- Turning off the main valve of water while going outdoor;
- Avoiding use of hose for washing floors; Use of broom may be preferred;

- Watering of lawn or garden during the coolest part of the day (early morning or late evening, hours) when temperature and wind speed are lowest. This reduces losses due to evaporation.
- Planting of native and/or drought tolerant grasses, ground covers, shrubs and trees. Once fully grown, they need not to be watered frequently.
- Avoiding over watering of lawns. Good rains eliminate the need for watering for more than a week.
- Setting sprinklers to water the lawn or garden only, not the street or sidewalk;
- Avoiding installation or use of ornamental water features unless they recycle the water and avoiding running them during drought or hot weather;
- Installation of high-pressure, low-volume nozzles on spray washers;
- Replacement of high-volume hoses with high-pressure, low-volume cleaning systems;
- Equipping spring loaded shutoff nozzles on hoses;
- Installation of float-controlled valve on the make-up line, closing filling line during operation, provision of surge tanks for each system avoid overflow;

Treatment and Recycling: The wastewater generated from the site will be treated in an on-site Common Effluent Treatment Plant (CETP). This will enable the treated wastewater to be used for landscaping, DG cooling etc, thereby reducing the requirement of freshwater for these purposes. Net fresh water demand for the project is 6.15 MLD.

Rainwater harvesting: It is proposed that rain water from Industrial estate will be collected and conveys the same to RWH pits through proper drainage channel.

Construction materials: As a large Industrial Estate, the project will require various kinds of natural construction materials such as sand, gravel etc. It is proposed for prior estimation of required quantities of these materials and procurement only as per requirement. This will also result in cost-efficiency. Excavated soil from the project site will be used within the site to the extent feasible. Excess soil will be made available to the construction sites, as per need.

Energy: To conserve the energy resources, good practices will be followed during the construction phase such as turning off lights and equipments when not in use, ensuring fuel efficiency of motors and vehicles through proper maintenance and minimal work at night.

Use of LED lightening in common areas etc. HSIIDC will put condition in the building approval about provision of installation solar water heater systems.

7.9 EMERGENCY PREPAREDNESS PLAN

Incidents, accidents and contingency preparedness should be accounted during ship recycling process. This will be a part of EMS. Emergency Preparedness Plan (EPP) should be prepared following the national environmental Emergency plan and OSHA guidelines. According to these guidelines, an environmental emergency plan would essentially provide the following information:

- Assignment of the duties and responsibilities among the authorities, participating
- Agencies, the response team and coordinators and/or those responsible for the pollution incident;
- Relationship with other emergency plans;
- A reporting system that ensures rapid notification in the event of a pollution incident;
- The establishment of a focal point for co-ordination and directions connected to the implementation of the plan;
- Response operations; should always cover these four phases:
 - Discovery and alarm
 - Evaluation, notification and plan invocation
 - Containment and countermeasures
 - Cleanup and disposal
- Identification of expertise and response resources available for assistance for the implementation of the plan;
- Directions on the necessary emergency provisions applicable to the handling, treatment or disposal of certain pollutants;
- Link to the local community for assistance, if necessary;
- Support measures, such as procedures for providing public information, carrying out surveillance, issuing post incident reports, review and updating of the plan, and periodic exercising of the plan.

Emergency response:

Various industrial activities within the Industrial Estates are always subjected to accidents and incidents of many kind. Therefore, a survey of potential incidents and accidents is to be carried out. Based on this, a plan for response to incidents, injuries and emergencies should be prepared. Response to emergencies should ensure that:

- The exposure of workers should be limited as much as possible during the operation
- Contaminated areas should be cleaned and if necessary disinfected
- Limited impact on the environment at the extent possible.

Written procedures for different types of emergencies should be prepared and the entire workforce should be trained in emergency response. All relevant emergency response equipment should also be readily available. With regard to dangerous spills, associated clean-up and fire-fighting operations should be carried out by specially allocated and trained personnel.

Response team:

It is important to setup an Emergency Organization. A senior executive who has control over the affairs of the plant would be heading the Emergency Organization. He would be designated as Site Controller. Manager (Safety) would be designated as the Incident Controller. In the case of stores, utilities, open areas, which are not under the control of the Production Heads, Senior Executive responsible for maintenance of utilities would be designated as Incident Controller. All the Incident Controllers would be reporting to the

Site Controller.

Each Incident Controller organizes a team responsible for controlling the incidence with the personnel under his control. Shift In-charge will be the reporting officer, who will bring the incidence to the notice of the Incident Controller and Site Controller.

Emergency Coordinators will be appointed who will undertake the responsibilities like fire fighting, rescue, rehabilitation, transport and provide essential and support services. For this purposes, Security In-charge, Personnel Department, Essential services personnel would be engaged. All these personnel would be designated as Key personnel.

In each shift, electrical supervisor, electrical fitters, pump house in-charge, and other maintenance staff would be drafted for emergency operations. In the event of power or communication system failure, some of staff members in the office/facility would be drafted and their services would be utilized as messengers for quick passing of communications. All these personnel would be declared as essential personnel.

Response to injuries

Based on a survey of possible injuries, a procedure for response to injuries or exposure to hazardous substances should be established. All staff should have minimum training to such response and the procedure ought to include the following:

- Immediate first aid, such as eye splashing, cleansing of wounds and skin, and bandaging
- Immediate reporting to a responsible designated person
- If possible, retention of the item and details of its source for identification of possible hazards
- Rapid additional medical care from medical personnel

- Medical surveillance
- Recording of the incident
- Investigation, determination and implementation of remedial action
- It is vital that incident reporting is straightforward so that reporting is actually carried out.

Emergency communication:

Whoever notices an emergency situation such as fire, growth of fire, leakage etc. would inform his immediate superior and Emergency Control Center. The person on duty in the Emergency Control Center, would appraise the Site Controller. Site Controller verifies the situation from the Incident Controller of that area or the Shift In-charge and takes a decision about an impending On Site Emergency. This would be communicated to all the Incident Controllers, Emergency Coordinators. Simultaneously, the emergency warning system would be activated on the instructions of the Site Controller.

Emergency responsibilities

The responsibilities of the key personnel will be defined for the following:

- Site controller
- Incident controller
- Emergency coordinator - rescue, fire fighting
- Emergency coordinator-medical, mutual aid, rehabilitation, transport and communication
- Emergency coordinator - essential services
- Employers responsibility

Emergency facilities:

- Emergency Control Center – with access to important personnel, telephone, fax, telex facility, safe contained breathing apparatus, hand tools, emergency shutdown procedures, duties and contact details of key personnel and government agencies, emergency equipments, etc.
- Assembly Point – with minimum facilities for safety and rescue
- Emergency Power Supply – connected with diesel generator, flame proof emergency lamps, etc.
- Fire Fighting Facilities – first aid for firefighting equipments, fire alarms, etc.
- Location of wind – located at appropriate location to indicate the direction of wind for emergency escape
- Emergency Medical Facilities – Stretchers, gas masks, general first aid, emergency control room, breathing apparatus, other emergency medical equipment, ambulance

Emergency actions:

- Emergency Warning
- Evacuation of Personnel
- All Clear Signal
- Public information and warning
- Coordination with local authorities
- Mutual aid
- Mock drills

7.10 Hierarchy of elements of mitigation plan

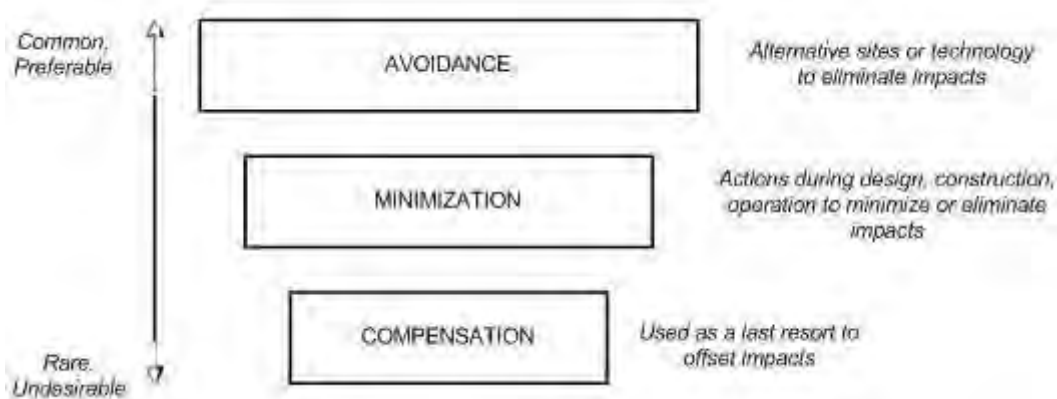


Figure 7.2: Elements of Mitigation

A good EIA practice requires technical understanding of relevant issues and measures that work in such given circumstances. The priority of selection of mitigation measures should be in the order:

Step One: Impact avoidance:

This step is most effective when applied at an early stage of project planning. It can be achieved by:

- not undertaking certain projects or elements that could result in adverse impacts
- avoiding areas that are environmentally sensitive; and

Step Two: Impact minimization

This step is usually taken during impact identification and prediction to limit or reduce the degree, extent, magnitude, or duration of adverse impacts. It can be achieved by:

- scaling down or relocating the proposal
- redesigning elements of the project
- taking supplementary measures to manage the impacts

Step Three: Impact compensation:

This step is usually applied to remedy unavoidable residual adverse impacts. It can be achieved by:

- rehabilitation of the affected site or environment,
- replacement of the same resource values at another location. For example, by wetland engineering to provide an equivalent area to that lost to drainage or infill.

Table 7.4: Typical Mitigation Measures

Impacts	Typical Mitigation Measures
Soil	Windscreens, maintenance, and installation of ground cover. Installation of drainage ditches. Minimize disturbances and scarification of the surface Usage of appropriate monitoring and control facilities for construction equipments deployed Methods to reuse earth material generated during excavation
Resources – fuel/construction material, etc.	<ul style="list-style-type: none"> • Availing the resources which could be replenished by natural systems, etc.
Deforestation	<ul style="list-style-type: none"> • Plant or create similar areas • Initiate a tree planning program in other areas • Donate land to conversationalist groups
Water pollution (Ground water/ Surface water)	<ul style="list-style-type: none"> • Conjunctive use of ground/surface water, to prevent flooding/waterlogging/depletion of water resources. Included are Land use pattern, land filling, lagoon/reservoir/garland canal construction, and rainwater harvesting and pumping rate. • Storm water drainage system to collect surface runoff • Minimize flow variation from the mean flow. Storing of oil wastes in lagoons should be minimized in order to avoid possible contamination of the ground water system. • All effluents containing acid/alkali/organic/toxic wastes should be properly treated. • Monitoring of ground waters • Use of biodegradable or otherwise readily treatable • Neutralization and sedimentation of wastewaters, where applicable • Dewatering of sludges and appropriate disposal of solids

	<ul style="list-style-type: none"> • In case of oil waste, oil separation before treatment and discharge into the environment By avoiding the activities that increases erosion or that contributes nutrients to water (thus stimulating alga growth) For wastes containing high TDS, treatment methods include removal of liquid and disposal of residue by controlled landfilling to avoid any possible leaching of the fills • All surface runoffs around mines or quarries should be collected treated and disposed. • Wastewater carrying radioactive elements should be treated separately by means of de-watering procedures, and solids or brine should be disposed of with special care. • Develop spill prevention plans in case of chemical discharges and spills. • Develop traps and containment system and chemically treat discharges on site
Air Pollution	<ul style="list-style-type: none"> • Periodic checking of vehicles and construction machinery to ensure compliance to emission standards • Attenuation of pollution/protection of receptor through green belts /green cover • Dilution of odourant (dilution can change the nature as well as strength of an odour), odour counteraction or neutralize (certain pairs of odours in appropriate concentrations may neutralize each other), odour masking or blanketing (certain weaker malodours may be suppressed by a considerably stronger good odour). • Regular monitoring of air polluting concentrations
Dust pollution	<ul style="list-style-type: none"> • Adopt sprinkling of water • Wetting of roadways to reduce traffic dust and re entrained particles. • Control vehicle speed on sight. • Ensure periodical washing of construction equipment and transport vehicles to prevent accumulated dust. • Ensure that vehicles should be covered during Installation of windscreens to break up the wind flow. • Burning of refuse on days when meteorological conditions provide for good mixing and dispersion • Providing dust collection equipment at all possible points. • Maintaining dust levels within permissible limits. • Provision for masks when dust level exceeds

Noise pollution	<ul style="list-style-type: none"> • Use of suitable muffler systems/enclosures/sound-proof glass panelling on heavy equipment/pumps/blowers • Pumps and blowers may be mounted on rubber pads or any other noise absorbing materials • Limiting certain activities • Proper scheduling of high noise generating activities to minimize noise impacts. • Usage of well maintained construction equipment meeting the regulatory standards. • Placement of equipments emitting high noise in an orientation that directs the noise away from sensitive receptors. • Periodic maintenance of equipment/ replacing whenever necessary/lubrication of rotating parts, <i>etc.</i> • By using damping, absorption, dissipation, and deflection methods. • By using common techniques such as constructing sound enclosures, applying mufflers, mounting noise sources on isolators, and/or using materials with damping. • Performance specifications for noise represent a way to insure the procured item is controlled. • Use of ear protective devices. • In case of steady noise levels above 85-dB (A), initiation of hearing conservation measures <p>Implementation of greenbelt for noise attenuation</p>
Biological	<ul style="list-style-type: none"> • Installation of systems to discourage nesting or perching of birds in dangerous environments • Increased employee awareness to sensitive areas.
Social	<ul style="list-style-type: none"> • Health and safety measures for workers • Provision of alternate jobs in unskilled and skilled categories • Development of traffic plan that minimizes road use by workers • Provide sufficient counselling and time to the affected population for relocation • Upgrade of roads and intersections. • Discuss and finalize alternate arrangements and associated infrastructure in places of religious importance. • Exploration of alternative approach routes in consultation with local community and other stakeholders • Provision of alternate jobs in unskilled and skilled categories
Marine	<ul style="list-style-type: none"> • Water quality monitoring program • Limit construction activities to day time to provide recuperation time at night and reduce turbidity

	<ul style="list-style-type: none"> • Prevention of spillage of diesel, oil, lubes, <i>etc.</i> • Usage of appropriate system to barges/workboats for collection of liquid/solid waste generated onboard. • Avoid discharge of construction/dredging waste (lose silt) into sea. It may be disposed at the identified disposal point. • Ensure usage of suitable/proper equipment for dredging in order to minimize the turbidity and suspensions at the dredging site. • Checking with the compliance conditions before discharging wastes into the sea water • Have a post-dredging monitoring programme in place • Have a post-dredging monitoring programme in place • Take up periodic maintenance dredging including inspection of sub-sea conditions, <i>etc.</i>
Occupational health and safety	<ul style="list-style-type: none"> • Provision of worker camps with proper sanitation and medical facilities, as well as making the worker camps self- sufficient with resources like water supply, power supply, <i>etc.</i> • Arrangement of periodic health check-ups for early detection and control of communicable diseases. • Arrangement to dispose off the wastes at approved disposal sites. • Provide preventive measures for potential fire hazards with requisite fire detection, fire-fighting facilities and adequate water storage.
Construction	<ul style="list-style-type: none"> • Have a Transport Management Plan in place in order to prevent/minimize the disturbance on surrounding habitats • Initiate traffic density studies
Solid/Hazardous waste	<ul style="list-style-type: none"> • Proper handling of excavated soil • Proper plan to collect and dispose off the solid waste generated onsite. • Identify an authorized waste handler for segregation of construction and hazardous waste • and its removal on a regular basis to minimize odour, pest and litter impacts • Prohibit burning of refuse onsite.

7.11 SOCIO-ECONOMIC IMPACT ASSESSMENT, RESETTLEMENT AND REHABILITATION

INTRODUCTION

Socio-Economic Impact Assessment (SEIA) refers to the systematic analysis of various social and economic characteristics of the human beings living in the geographical area/study area around the project location. SEIA is carried out separately but concurrently with Environment Impact Assessment (EIA). The study area consists of core and buffer area around the project site. The SEIA focuses on the likely effects of the project on social and economic well-being of the community. The impact(s) may be direct or indirect, positive or negative.

In this part of the EIA report an attempt has been made to assess the Socio-Economic Impact of construction of '**BARWALA INDUSTRIAL ESTATE (PHASE – II)**' located in Barwala Block of Panchkula Tehsil in the district Panchkula of Haryana State.

OBJECTIVES OF SEIA

The prime objective of the current study is to assess the likely impact of the project on socio-economic characteristics of people living in the study area. Further, it is to be established whether the impact would be direct or indirect. Furthermore, it is to be examined whether the said impact would be positive or negative. Lastly, it is to be comprehended if the impact is positive how long it would sustain or if it is negative how soon the same could be eased.

SCOPE

The Scope of the study is as follows:

- a) To collect baseline data of the study area
- b) To comprehend socio-economic status of the people living in the study area.
- c) To assess the probable impact of the project on social and economic aspects in the study area.
- d) To evaluate the likely impact of the project on Quality of Life of the people living in the study area.
- e) To ensure sustainability of the positive impact.
- f) To suggest mitigation measures and agency responsible for taking action in case of adverse impact.

METHODOLOGY

For Socio-Economic Impact Assessment of the project, GRC India carries out systematic analysis of the various socio-economic characteristics, both in terms of quality and quantity. Accordingly, both qualitative and quantitative data was collected from secondary sources. The secondary data was collected from the published data/information of the Census Authority. Records of the state and district administration were also referred to.

For collection of primary data, a sample survey was conducted in the study area. In each selected habitation, a specified number of representative households were selected scientifically for collection of information through face to face interview with head of the household or any responsible member of the family.

➤ Census-cum Sample Survey in the Core Area

As the likely project impact(s) will traverse a domino alley with greatest impacts in the core area which diminish progressively when moving away from the core to the buffer of the study area, a Census-cum-Sample Survey was conducted in the core and buffer area for the collection of socio-economic data. Further, in each village a household survey was conducted by drawing representative samples from a list of households prepared. Since, collection of information from all the households in a village is time consuming and expensive, the sample survey approach was adopted for collection of information from the selected households.

➤ Sample Survey in the Core & Buffer Area

In the core & buffer areas of the project, the following structured framework was followed for the collection of information.

➤ Sample Design & Size

Two-Stage Sampling Design was adopted in the study area. The First Stage Units were Census villages and the Ultimate Stage Units were households in the selected villages.

The sample size at each level (village and household) was decided by using the formula $n = \sqrt{\{(1.96 * \sigma) / \Delta\}^2}$; where n = Sample size, 1.96 is the Table Value of Confidence Limit, σ = Standard Deviation and Δ = Degree of Precision.

➤ Selection of First Stage Units (Villages/Towns)

In the study area the sample villages were selected from the list of Census villages/towns by adopting the method of Probability Proportional to Size (PPS), the size being number of households in a given village/town.

➤ **Selection of Ultimate Stage Units (Households)**

The sample households were selected from the list of households by adopting the method of Circular Systematic Sampling. This method was adopted since the sampling frame i.e. the complete list of households was readily available.

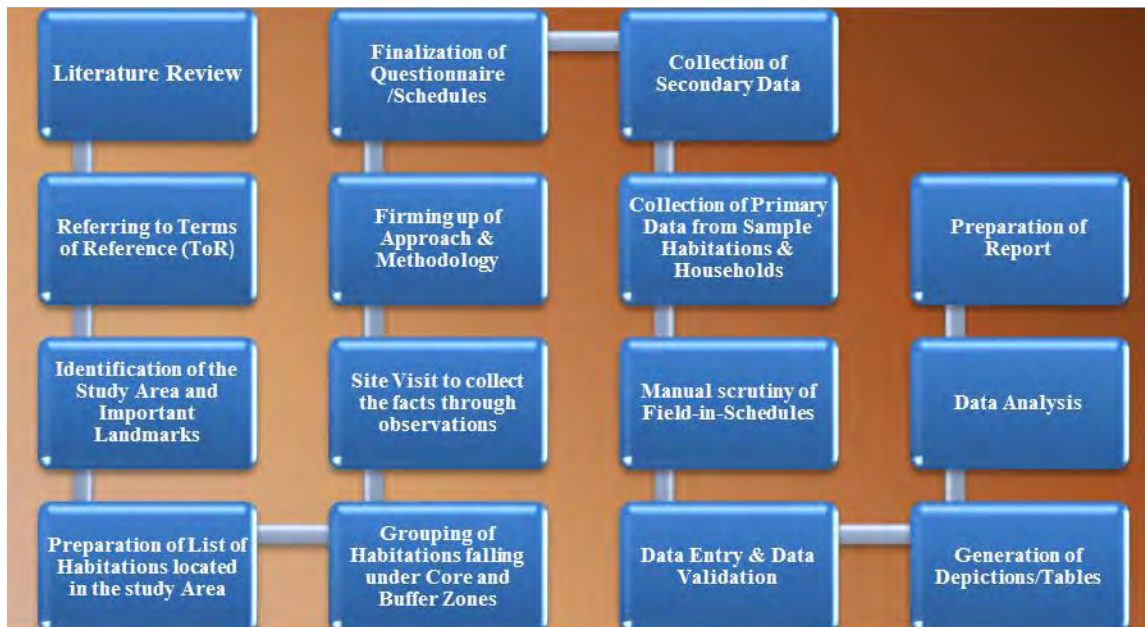
SURVEY INSTRUMENTS

The following Schedules/Questionnaires were developed for collection of data – primary from the households and secondary for the villages:

- Schedule/format for Village/Town Particulars
- Questionnaire for Household Details and project perception

Each of these data/information instruments has segment blocks and there are both open-ended and closed-ended questions.

CRONOLOGY OF VARIOUS STEPS TO PREPARE THE SEIA REPORT IS AS UNDER:



Project Location

The industrial estate is located in Barwala Block of District Panchkula in the State of Haryana. The Phase II of this industrial estate, covering an area of 225.71 ha, adjoins the existing developed Phase I area. Land for the Phase II has been acquired from six villages, namely, Alipur, Toka, Khangesra, Khatauli, Sukhdarshanpur and Naggal.

Study Area

The study area for the project is spread across a 10 km radius around the project having an area of 39,588.23 ha. The habitation in this area is largely agricultural. The land use pattern of this area shows area under settlements of only 6.8% with the major segment being agriculture land with a share of 59.5%. The segment-wise land use pattern of the study area is detailed below:

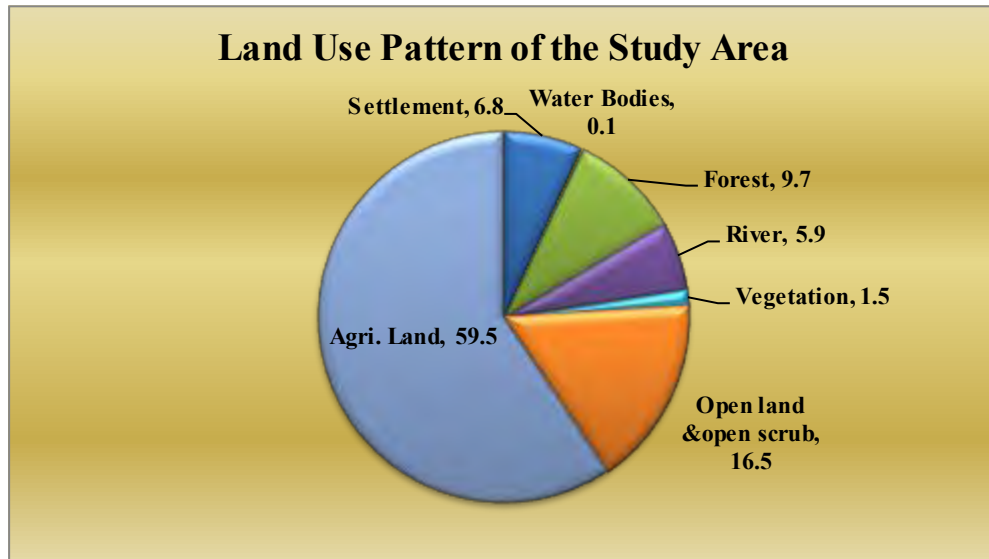


Fig. 7.3 Land use Pattern of Study Area

Source: HSIIDC Project Pre-feasibility Report

BASELINE DATA

The baseline data as a whole with respect to population and basic amenities is as under:

I. Demographic Details

The population of about 7.72 lakhs is housed in 1.47 lakh households, giving an average household size of 5. The male-female population of 4.15 lakhs and 3.57 lakhs respectively gives a sex ratio of 860 females per 1000 males. The overall literacy rate in the study area is 78.4% with male literacy at 86.0% and female literacy at 69.6%. Rural population and households predominate in the blocks.

Table 7.5: Demographic Particulars/Population Details of the Study Area

S. No.	Description	Number	Percentage to Respective Total
1	Gender wise Total Population	7,71,899	100.0
	Male	4,14,916	53.8
	Female	3,56,983	46.2
	Sex Ratio	860	
2	Gender wise Total Population (0-6 age group)	90,932	100.0
	Male	49,900	54.9
	Female	41,032	45.1
	Sex Ratio	822	
3	Total Number of Households	1,47,141	
	Average Household Size	5	
4	Total Literates	5,33,879	100.0
	Male	3,14,061	58.8
	Female	2,19,818	41.2
	Overall Literacy Rate	78.4	
	Male	86.0	
	Female	69.6	
	Gender Gap in Literacy Rate	16.4	
5	Total Workers	3,05,656	100.0
	Male	2,34,036	76.6
	Female	71,620	23.4
	Gender Gap in Work Participation Rate	53.2	
5.1	Total Main Workers	2,45,826	80.4
5.2	Total Marginal Workers	59,830	19.6
5.3	Total Household Industrial Workers	11,806	3.9
5.4	Total Agricultural Workers	1,28,959	42.2 (100.0)
5.4.1	Total Cultivators	88,056	(68.3)
5.4.2	Total Agricultural Labour	40,903	(31.7)
5.5	Total 'Other Workers'	1,64,891	53.9

Source: Census 2011.

Table 7.6 Amenities & Social Infrastructure

EDUCATION	
Educational Institutions (Including Professional Institutions)	Primary School
	Middle School
	Secondary School
	Senior Secondary School
	Higher Education Institutions
	Government College
	Polytechnic & Engineering Colleges
	Longowal Polytechnic College
	FRIHM Institute of Hotel Management
	Haryana Institute of Technology
	BLS Institute of Technology & Management
	BRS Dental College & Hospital
HEALTH	
Health Institutions (Anganwadi/ASHA in villages)	Primary Health Centre
	Family Welfare Centre
	Anganwadi Centers/ASHA
	Allopathic Dispensary
	Registered Medical Practitioners (RMP)
	Nursing Home
	BRS Dental College & Hospital
WATER	
Drinking Water Sources (Tap water is the major source with 94% having source within or near premises)	Tap
	Covered Wells
	Hand pump
	Tube well
	Spring/River /Canal
	Tank/Pond/Other Sources
SANITATION	
Sewer System (71% households have latrine facility with their premises)	Facility
	Piped sewer system
	Septic Tank
	Pit latrine
	Other facility
Bathing & Waste Water Outlet (77% households have bathrooms and 90% have WW Outlet facility)	Facility
	Bathroom
	Enclosure w/o roof
	Waste Water Outlets

ELECTRICITY	
Electricity Supply (93% have electricity as main source of lighting)	Type of Electricity Available
	Power for Domestic Uses
	Power for Agriculture Uses
TRANSPORT & CONNECTIVITY	
Roads (National Highway – is in close proximity [$< 0.5\text{km}$] of the Industrial Estate)	Types of Road (s) Available
	Black Topped
	Gravel Roads
	Footpaths
Railways	Chandi Mandir Cantt Railway Station (15.2 km)
Air	Chandigarh Airport (17.2 km)
COMMUNICATION	
(Television ownership is over 80% while that of mobiles is around 60%)	Radio/Transistor
	Television
	Computer/Laptop
	Telephone/Mobile
BANKING & POST	
(Banking services are availed by around 80%)	Post Office
	Commercial/Cooperative Bank
	Agricultural Credit Society

Source: Study Research

7.12 SOCIO-ECONOMIC IMPACT OF THE PROJECT

Impact on Demographic Composition

The project is intended to encourage and support the creation, expansion and modernization of small scale industries through the provision of factory accommodation, common service facilities and assistance and servicing thorough all stages of establishment and operations of industrial activity in the area in an environmental friendly manner. The project is therefore envisaged to increase the working population in the study area both during the construction and operation phases with possibility of in-migration of people. This will make some changes in the demographic composition of the population in the area. The occupation structure of the working population is also projected to shift further in favor of household industry and other industrial/business establishments when the project completed. The sex ratio may also get impacted.

Employment Opportunities

The project will provide employment opportunities both during the construction and operational phases. During the construction phase, it is estimated that 582 persons comprising of 194 skilled workers and 338 unskilled workers would be required. Post construction, the employment generation potential is placed at 945 persons (420 skilled and 525 unskilled). Besides, the industrial units in the industrial state will offer employment opportunities and also generate business opportunities to cater to the demand of people working in these units in the industrial estate. The local people will therefore have both employment and business opportunities. The socio-economic standard of the local people will increase due to these enhanced employment and business opportunities. This will lead to better quality of life, improvement in the living conditions and will also set a standard for future developments in the area. It is a positive impact of the project.

Impetus to Trade & Business in Construction Materials

The project will give much impetus to trade and business on construction materials in the nearby market places to the project area. It is expected that trading and business will flourish on various construction materials namely coarse sand, fine sand, stone aggregate, cement, reinforcement steel, pipes, bricks, conduit pipes, PVC overhead tanks, glaze & floor tiles, hardware, stainless sinks etc.. Besides, service providing businesses like office & stationery, printing & binding, transport servicing, fabrication & welding, etc. are also expected to increase.

Impact on Agriculture

The area under agriculture is expected to show a marginal decline as land that is being acquired for the project is agricultural land. However, this decline is not envisaged to reduce the agricultural income of the people in the area. Further, with Barwala being developed as an industrial hub it is envisaged that the increase in industry and business activities in the area would increase income levels which would outweigh the decline in agricultural income of the area. The short term negative impact, if any, would be outweighed in the medium and long term.

Impact on Road Development

Movement of vehicles to and from the project site is expected during the construction period. This movement is expected to further increase when the industrial estate becomes functional.

Hence, there is scope for further strengthening the road development in the area with adequate parking space so as not to disturb the traffic and allow smooth movement in and around the project area.

Impact on Law & Order

As workers to be employed in the project is expected to increase both during the construction and operation phases, law & order /administrative institution may be further upgraded/strengthen close to the project site.

Impact on Health

In the operational phase, the industrial estate has provisioned for area for an ESI Dispensary under the utilities segment of the land use plan. There are no chances of any major diseases due to the construction work.

However, to meet any emergency few safety measures are outlined below:

- a) **Safe Working Environment:** The project proponent shall ensure health and safety of all the employees at work. All efforts will be made to provide and maintain a safe work environment and ensure that the machinery and equipment in use is safe for employees.
- b) **Provision of First Aid:** In case of any accidents arising out of the construction works, timely and prompt first aid treatment is, often, the most important tool. Suitable first aid arrangements shall be made at the site for rendering immediate first aid in case of any injury. The first-aiders will be well trained in handling patients working in the project.
- c) **Regular Medical Examination:** For all workers, medical examination will be made on regular basis.
- d) **Health Education:** Adequate health education & information related to the work will be provided to the workers so that their health & safety can be ensured.
- e) **Tie-up with the nearest Hospital for Medical Assistance:** To meet the medical needs of the workers in case of accidents, tie-up with nearest hospitals will be made. Efforts will be made to reserve a few beds in the said hospitals for the workers to meet any emergency. This will ensure timely medical aid to the affected persons.

- f) **Supply of Mask & Gloves:** The workers exposed to dust will be provided with dust masks to prevent them from getting affected by respiratory diseases. Gloves will be provided to workers working with hand tools to ensure safety of their hands.
- g) **Special Telephone Number:** A special telephone number will be made available to the workers in case of emergency so that they can dial the same in case of any accident.

7.13 CORPORATE ENVIRONMENT RESPONSIBILITY (CER)

As per the Ministry's Office Memorandum F. No. 22-65/2017-IA.III dated 1st May 2018, an amount of Rs. 8.31 Crores of the total project cost i.e. 531 Crores (Land-278Cr. + Development Cost-253Cr.) shall be earmarked under Corporate Environment Responsibility (CER) for the following activities:

Break up of cost estimation

@ 2.0 % for ≤100 Crores (i.e. 100 Crores = 2.0 Crores)

@ 1.5 % for >100 to ≤500 Crores (i.e. 400 Crores = 6.0 Crores)

@ 1.0 % for >500 to ≤1000 Crores (i.e. 31 Crores = 0.31 Crores)

S. No.	ACTIVITY	YEAR-WISE IMPLEMENTATION BUDGET (INR)			TOTAL BUDGET (INR)
		1 st Year (2020-21)	2 nd Year (2021-22)	3 rd Year (2022-23)	
1	Infrastructure Creation for Drinking Water Supply	-	280000	280000	560000
2	Sanitation Facility	250000	250000	250000	750000
3	Skill Development	600000	600000	600000	1800000
4	Construction of Roads	500000	500000	500000	1500000
5	Cross Drains	100000	100000	100000	300000
6	Electrification including Solar Power	550000	550000	550000	1650000
7	Rain Water Harvesting	150000	150000	150000	450000
8	Solid Waste Management Facilities	300000	300000	300000	900000
9	Plantation in Community Area	-	200000	200000	400000
TOTAL BUDGET PROPOSED FOR CER					8310000

The CER budget shall be utilized & spend under the supervision of local authority

7.13 CORPORATE SOCIAL RESPONSIBILITY:

As per the section 135 of the Companies Act, 2013 Corporate Social Responsibility (CSR) is mandatory part of any development project.

As per the guidelines issued on dated 27th Feb, 2014 (Schedule-VII) by the Ministry of Corporate Affairs, Government of India the suggested ten major CSR activities by giving importance to the corporate philosophy with the objective to improve the quality of life and socio-economic scenario with special attention to the people residing in the study area are given below:

- I. Hunger, Poverty and Malnutrition, Promoting Preventive Health Care and Sanitation and making available Safe Drinking Water
- II. Promoting Education, including Special Education and Employment Enhancing Vocation Skills Especially among Children, Women, Elderly, and the Differently-Able and Livelihood Enhancement Projects
- III. Promoting Gender Equality, Empowering Women, setting up Homes and Hostels for Women and Orphans, setting up Old Age Homes, Day Care Centers and such other Facilities for Senior Citizens and measures for Reducing Inequalities faced by Socially and Economically Backward Groups
- IV. Ensuring Environmental Sustainability, Ecological Balance, Protection of Flora and Fauna, Animal Welfare, Agro-forestry, Conservation of Natural Resources and Maintaining Quality of Soil, Air and Water
- V. Protection of National Heritage, Art and Culture Including Restoration of Buildings and sites of Historical Importance and Works of Art, setting up Public Libraries, Promotion and development of Traditional Arts and Handicrafts
- VI. Measures for the benefit of Armed Forces Veterans, War Widows and their Dependents
- VII. Training to Promote Rural Sports, Nationally Recognized Sports, Paralympics sports and Olympic sports
- VIII. Contribution to the Prime Minister's National Relief Fund or any other fund set up by the Central Government for socio-economic development and relief and welfare of the Scheduled Castes, the Scheduled Tribes, other backward classes, minorities and women
- IX. Contributions or funds provided to technology incubators located within academic institutions which are approved by the Central Government
- X. Rural Development Projects.

Based on the above suggested activities by the Government of India, the project proponent may set out to do the following CSR activities by giving importance to their corporate philosophy in order to achieve the objective to improve the quality of life and socio-economic scenario with special attention to the people residing in the study area:

1. In support of Health-

- Health Checkups and Medical Camps once in every quarter of a year in the villages around the project site.
- Sanitation & Hygiene Awareness Camps once in every quarter of a year in the villages around the project site.
- Providing financial assistance to building sanitation facilities in the villages around the project site.

2. In support of Education-

- Spreading the light of education by providing scholarship or financial assistance to underprivileged children and meritorious students for their higher & technical education.
- Providing uniforms and books to the school children.
- Upgrading education infrastructure in schools.

3. In support of Agriculture & Agro-based Activities-

- Promotion of Agro-based activities by providing financial backing to the farmers of the study area for purchasing seeds, fertilizers and pesticides.

4. In support of Skill Development-

- Providing training to the students and unemployed youths in technical institutions like ITIs etc. for up gradation of computer based technical skills.
- Providing training to the women for self-help to be self-dependent and to improve their skill and economic condition.
- Setting up Computer Literacy Centers.

5. In support of Sports, Art & Culture-

- Providing financial aid for distributing sports goods and musical instruments to the local clubs located in the study area.
- Organizing sports events & tournaments and providing financial aid to the eligible candidates for coaching and proper training.

6. In support of Other Development Activities-

- Providing maintenance & development of the public park(s) situated in the study area.
- Development of Community Centre equipped with library & internet connected computer facilities.

In compliance to the CSR Policy and as a responsible corporate citizen, a budgetary amount (2% of the project cost) i.e., approximately Rs. 1032 Lakh has been decided to be spent during next five years after commencement of the project in support of the above mentioned CSR activities. The budgetary allocation of the said amount among five years of span is indexed below:

Table: 7.7 Budgetary allocation of the fund

S. No.	Activities	Budgetary Allocation of the Fund (Rs. Lakhs)					
		Year-I	Year-II	Year-III	Year-IV	Year-V	Total
1	In support of Health	60	60	60	60	60	300
2	In support of Education	50	50	50	50	50	250
3	In support of Agriculture & Agro-based Activities	15	15	15	15	15	75
4	In support of Skill Development	45	45	45	45	45	225
5	In support of Sports, Art & Culture	16.4	16.4	16.4	16.4	16.4	82
6	In support of Other Development Activities	20	20	20	20	20	100
Total		206.4	206.4	206.4	206.4	206.4	1032.00

7.14 LIST OF ENVIRONMENTAL SENSITIVE LOCATIONS

List of environmental sensitive locations around the project site is given in table

Table 7.8 : Environmental sensitive locations

S. No.	Particular	Distance from project site
A	Forest & WLS	
1	Kholhai Raitan Reserved Forest	12.39km
2	Bird Sanctuary at Morni Hills	10.22km
B	Water bodies	
1	Tangri River	8.16km
2	Tikkar Tal	13.64km
C	National/International Boundary	

S. No.	Particular	Distance from project site
1	Haryana-Punjab Border	4.08km
D	Sensitive man-made structures	
1.	Hospital Primary Health Center (Kot)	2.73 km
2.	Gupta Nursing Home-	4.82 km
3.	BRS Dental College & Hospital	5.91 km
4.	School Mount Litera Zee School	2.24 km
5.	Government College	6.14 km
6.	Panchkula Engineering College	7.68 km
7.	FRIHM Institute of Hotel Management	8.26 km
E	Densely populated area	
1.	Alipur	0.20 km
2.	Nagal	0.98 km
3.	Khangesra	1.74km
4.	Khatauli	2.3 km
5.	Kot	2.73km
6.	Barwala	5.07 km
7.	Panchkula	13.54 km

7.15 RESETTLEMENT AND REHABILITATION

Land acquisition details of the project are given below:-

Table 7.9: Detail of Land Acquisition

S. No.	Name of village	Area acquired
1.	Village Alipur	141.487
2.	Village Toka	24.605
3.	Village Khangesra	345.705
4.	khatauli	33.518
5.	Sukhdarshanpur	2.953
6.	Naggal	4.458

Affected persons are likely to be affected on account of acquisition of land in Barwala (Phase-II). Govt., of Haryana vide notification dated 7.12.2007 has formulated a policy for rehabilitation and resettlement of land owners –land acquisition oustees. The silent feature of the policy is given as under:-

I. Annuity:

- i) The land owners will be paid annuity for 33 years over and above the usual land compensation. The amount of annuity will be Rs. 15,000/- per acre per annum.
- ii) Annuity of Rs. 15,000/- will be increased by a fixed sum of Rs. 500/- every year.
- iii) In respect of land acquired in terms of land acquisition policy for settling up of Special Economic Zone/Technology cities, Technology Parks in addition to rehabilitation and resettlement package notified by Industries and commerce Department vide No.49/48/2006-41BL dated 4th May, 2006, a sum of Rs. 30,000/- per acre annual will be paid for a period of 33 years by private developers and this annuity will be increased by Rs. 1,000/- every year.
- iv) The policy by paying annuity will be applicable to all cases of land acquisition by Govt., except land acquired for defense purpose.

II. Allotment of plots by Haryana Urban Development Authority and Haryana State Industrial Infrastructure Development Corporation Limited.

- i) The allotment will be made to each co-sharer depending upon his share in the land acquired for Haryana Urban Development Authority and Haryana State Industrial Infrastructure Development Corporation Limited as per scale mentioned in the entitlement.
- ii) Plots under this policy would be offered if the land proposed to be acquired is under the ownership of oustees on the date of publication under section-4 of Land Acquisition Act and if 75% or more of the total land owned by the owner in that urban estate is acquired. Only one time benefit of this policy will be given to the land owners whose land is acquired in pocket at different times. In case, the land owner becomes entitled for a bigger size plot due to subsequent acquisition of his land then differential of the plot already allotted to him shall be allowed to him.
- iii) This benefit will not be allowed to the applicant whose land has been released and he will not make such request to the Government for release of his land.
- iv) No litigation should be pending except that of enhanced compensation in any Court.
- v) The maximum size of the plot to be allotted will be restricted to 350 sq. yards. Since livelihood of the farmers predominantly depends upon his agriculture income and shops, in order to provide the affected land owners/farmers a long term sustainable source of income, In addition to the residential plot, commercial sites, measuring 2.75 x 2.75 mtr., may be allotted in Haryana Urban Development Authority sectors. Such allotment shall be made to each co-sharer provided his share exceeds 2.5 acres. Otherwise all the co-shares will be allotted a

single site. Director, Town & Country Planning, Haryana will allow additional component of commercial use in the Sector if the booths are separately provided. In respect of Haryana State Industrial Infrastructure Development Corporation Limited, mixed land use of residential and commercial will be allowed for which detailed scheme shall be worked out by Haryana State Industrial Infrastructure Development Corporation Limited.

- vi) In case the land is acquired for purposes other than residential sector, the plots as mentioned in para above will be allotted in the residential sector to be developed in that urban estate.
- vii) The land required for social infrastructure could either be exchanged with the land if village Panchayat or the land acquired in continuity of the village can be transferred to village Panchayat together with the infrastructure development thereon for its day to day management.
- viii) The sale price of residential plots will be kept as the issue price of the respective plot. In the case of commercial area of kiosks i.e. 2.75 mtr. x 2.75 mtr., the sale price will be 3 times of the nodal price of the residential plot.
- ix) The Rehabilitation Policy will also be applicable to those land owners whose residential structures/houses/dwelling units fall within alignment of essential Infrastructure services and is acquired under urgency clause.
- x) The plot sizes for allotment are given as under:-

(a) In case where only land is acquired:-

Land/are acquired (each allotment)	Size of residential plot to be allotted
100 to 500 sq.yd.	3 marla
501 to 1000 sq.yd.	4 marla
1001 sq. yd. to ½ acre	6 marla
Above ½ acre to ¾ acre	8 marla
Above ¾ acre to 1 acre	10 marla
One acre and above	14 marla

(b) In case of constructed residential structures acquired the plots sizes will be as under:-

Size of the residential house acquired	Size of residential plot to be allotted
Up-to 100 sq.yd.	50 sq.yd.
Above 100 sq.yd and upto 200 sq.yd	100 sq.yd
Above 200 sq.yd and upto 300 sq.yd	150 sq.yd.
Above 300 sq.yd. and upto 400 sq.yd.	200 sq.yd
Above 400 sq.yd. and upto 500 sq.yd.	250 sq.yd.
Above 500 sq.yd.	350 sq.yd.

Oustees will have choice to opt for either (a) or (b) above which he will have to communicate to concerned Land Acquisition Officer 30 days of the announcement of award otherwise it will be decided by the concerned agency.

- III.** Haryana State Industrial Infrastructure Development Corporation Limited and Haryana Urban Development Authority would take steps for creation of social infrastructure and /or employment in the villages falling within the acquired land under their policy.
- IV.** The policy for allotment of plots will be applicable only for lands acquired for-Haryana Urban Development Authority and Haryana State Industrial Infrastructure Development Corporation.

This policy will be applicable with effect from 5th March, 2005 and cover all those cases of acquisition in which awards of compensation were announced on or after 5th March, 2005

7.16 CONCLUSION

The socio-economic standard of people living in the area will improve due to employment opportunities created by the project. This will lead to better quality of life and will also set a standard for future development in the study area. Due to the project, the infrastructure of the area will improve including development of roads, parks, play grounds etc. This will give a boost in the quality of life of people of the area. However, there is still scope of improving health and educational facilities besides improving the skill sets of the people in the area. CER budget shall be utilized/spend under the supervision of local administration for the development of the region. It is expected that same will improve with the project & associated business activities becoming operational and the CSR activities planned by HSIIDC in the area.

The overall impact of the project is expected to be positive for the habitants of the area and the persons associated with the project.

CHAPTER-8 **PROJECT BENEFITS**

8.1 GENERAL

Industrial estate are usually located on the edges of, or outside the main residential area of a city, and normally provided with good transportation access, including road and rail.

This idea of setting land aside through this type of zoning is based on several concepts:

- To be able to provide dedicated infrastructure facilities for Industrial Estate Project at Barwala, road-rail networks, access to airport & high-power electric supplies (often including three-phase power), high-end communications cables, water supplies, and high-volume gas lines are made available to each industry.
- Infrastructure developed due to Industrial Estates will facilitate in employment generation, business development and economy improvement. This will encourage other developers to set up industry in the area.

Industrial Development in an area plays significant role in improvement of economical condition and potential of employment generation

Key factors in industrial development are:

- Government
- R&D Institution
- Industry

8.2 ADVANTAGES OF INDUSTRIAL ESTATES:

Constructing Industrial Estates has lots of advantages, as it will be easy to handle all the issues of industries present at one location rather than disperse at different locations:-

1. Getting rid of health hazards and damages of buildings which may be caused by accidents occurring in factories and workshops.
2. Reducing noise pollution caused by factories and workshops.
3. Industrial Estates contribute to maintain cities clean. In the absence of well organized industrial areas lots of wadis (so called Saila), streets and footpaths suffer from pollution with

oils, lubricants and industrial rubbish. Reducing noise and clean cities have positive effects on tourism. Collection, transport, and disposal of normal and hazardous waste in the Industrial Estate (solid waste management) take place according to laws issued by the government and under the supervision of the responsible authority.

4. The development of Industrial Estates aims also at limiting environmental pollution caused by factories, workshops especially the pollution of groundwater.

5. Industrial Estates enable the responsible authorities to better supervise factories, workshops.

6. Industrial Estates will have among other things their own water supply, water networks, sanitation networks, electric power connection and distribution system and standby generator, thereby decreasing noteworthy the load for the cities supply, distribution and disposal networks.

7. Due to the high population growth rate in developing countries CETPs are often overloaded. The extension of these plants is hardly possible because there is no additional area or because of the high cost for the extension. Constructing Industrial Estates that have their own common effluent treatment plant decrease the load for the cities sewage treatment plant and ease the operation. As factories and workshops in developing countries usually don't have pretreatment plants, oils and lubricants used for repair and maintenance of transportation vehicles, industrial waste water complicate the operation of CETP. Each tenant at the Industrial Estate is required to pre-treat his industrial waste water to agreed standards prior to conveying it to the Industrial Estate's common effluent treatment plant. Treated waste water can then more easily meet standards for reuse.

8. Constructing Industrial Estates encourages local investors and foreign companies to invest in this country. The existence of Industrial Estates means, investors are not forced to go through a complicated process that can last years in developing countries (searching a suitable land, getting the necessary permissions from the concerning authorities, constructing infrastructure and get necessary services).

9. Encouraging investors through the construction of Industrial Estates contributes to create sustainable jobs, decrease unemployment and reduce poverty. In addition to the direct employment at the industrial estate, big number of indirect jobs is created. Workers' skills enhancement is also a noteworthy advantage.

10. Investors contribute to the development of the national economy through paying rent for the lot or buying the lot, taxes paid by themselves and by their employees, producing goods not existing at the local market and as such reducing the import rate, production of products at competitive costs which can be exported to foreign markets.

8.3 PHYSICAL INFRASTRUCTURE

Industrial Project will have campuses for industries, Industrial plots, commercial and institutional areas, area reserved for R&R policy etc. While it will help in meeting the growing industrial need for nation, it also provides the commercial & residential facilities to the people. Care has been taken to provide the staff, occupants and visitors with necessary facilities as power, water supply, parking spaces, and broad roads that are safe and secure.

Total power requirement of the project a 66 kV sub-station is proposed.

8.4 SOCIAL INFRASTRUCTURE

An Industrial Estate project of this scale sets in an overall development of the region, with construction of new or maintenance and widening of existing roads, power supply and water supply, since a large Industrial Estate project generally brings the focus of the development authorities in the locality.

8.5 ECONOMIC BENEFITS

The project will entail positive impact on the local as well as state economy in a convenient way. The construction phase of the project will engage a large number of construction workers, whether skilled, semi-skilled or unskilled. The workers will also be ensured welfare facilities such as drinking water, sheds for resting, medical aids, and aid in children's education.

In meeting the day-to-day and recreational demands of the residents of the site, the region is also likely to develop a number of shopping and commercial facilities, thereby, further stimulating the local economy.

The project will provide employment to skilled and unskilled laborers at various levels directly or indirectly. In operation phase also due to industrial development, ample number of employment will be generated. It will provide various business opportunities for entrepreneurs for setting up the different types of industries. The project will help in infrastructure

development in the villages and others people of weaker sections. Need based survey will be conducted and people under this category will be provided assistance as per requirement. HSIIDC also provides the R&R policy for the farmers, whose land is acquired for the industrial development. Detailing of land acquisition is attached as **Annexure II (b)**. Project will provide infrastructural development in the area that will improve local economy. More educational, medical and commercial centers will be developed in the area. An industrial estate will make structural change in the area.

CHAPTER 9

ENVIRONMENTAL COST BENEFIT ANALYSIS

Proper evaluation of the environmental impacts requires a number of conceptual issues which is carefully considered. These include the correct understanding of the environmental cost, choice of evaluation technique, setting the time horizon, assessing distributional impacts and inter-temporal issues and evaluating risks. Environmental externalities costs from a productive or consumptive process can be identified as the cost resulting from the provision of a resource, which can be passed on to a third party. These costs are not incorporated into the price of the productive or consumptive resource, and can cause damage to human health, human life, materials and ecosystems. Environmental externality costs can occur despite complying with all national rules and regulations. Therefore, meeting environmental standards does not mean that there is no unaccounted environmental cost. The cost of compliance is likely to be included as part of the base cost- hence is treated as a financial cost.

Industrial Estate project has been proposed in Barwala will also take few values and commitments into consideration. At this early stage of the project, it will not be possible to give exact benefited amount. However government designated this place for industrial estate after considering many aspects including environment cost benefit too, as industrial development will bring foreign direct investment to the country. However in case of an environment it will be very difficult to give proper cost evaluation. Thus from environment point of view, Industrial Estate project, components that might be evaluated in terms of cost will be:-

- Socioeconomic
- Human health
- Air
- Land
- Water

Out of the five components that have been mentioned, human health is the most important, however it is the hardest to quantify. This value is also controversial as it is often confused with values of human life, not risks to human life. Valuation of human life is controversial because for some, it is unethical. During this study, it has been noted that the valuation of human life is

different from the value of human health risks, and the latter should be estimated. Human health is directly related with our environment i.e. surroundings in which we live. Surrounding includes everything, air, water & land etc. Pollutions of air, water and land directly and indirectly causes health issues. Example contamination of ground water, surface water causes many issues and in the situation when we have non renewable resources, it will more important to prevent excess use and contamination of these resources. As all the storm water will disposed off in RWH pits, RWH tank and will be dispose in Dangri river, this reduces the loss due to evaporation and hopefully help to sustain the water in for greater duration of time, this even recharges ground water in natural way.. Green belt development in the area increases the aesthetic value of the area, along with this help to attenuate noise and reduce pollution. Socioeconomic conditions of the area will increase which provide employment, as one direct employment will provide four indirect employments in chain. Increase in surplus salary will increase demand of non-food items hence increases overall economy. Waste of one industry can be used in other industry, this reduces traveling cost. All the industries at one place will give opportunity for proper management of waste rather than scattered one, this not only reduces cost investment but from environment point of view supervision of industrial facility at one place will provide control pollution but prevent at source itself.

Therefore, we can say that prevention cost is always much less than control cost or “Prevention is better than cure”. Our study confirms that the economic value that has been assigned with the Industrial Estate project in Barwala to health risk is not the value of certain death; it is the value of a risk shared by members of an exposed population. The value is based on everyone sharing the risk, without knowing the specific individuals who will suffer mortality or morbidity.

9.2 Conclusion

Taking the above mentioned points into consideration, we would like to affirm that the environmental costs for this project is beneficial, as all the storm water will disposed off in RWH tanks, RWH pits and Dangri river. This will reduces the loss due to evaporation and hopefully help to sustain the water for greater duration of time, this even recharges ground water in natural way. Green belt development in the area increases the aesthetic value of the area, along with this help to attenuate noise and reduce pollution. Socioeconomic conditions c of the area will

increase which provide employment, as one direct employment will provide four indirect employments in chain. Increase in surplus salary will increase demand of non-food items hence increases overall economy. Waste of one industry can use in other industry, this reduces traveling cost. All the industries at one place will give opportunity for proper management of waste rather than scattered one, this not only reduces cost investment but from environment point of view supervision of industrial facility at one place will provide control pollution but prevent at source itself. Hence provide better and sustainable development for the society. No environmental damage cost is anticipated from the project as the national standards for emissions, effluents, and solid waste will be maintained. However calculation cost in term of money is very difficult and not possible at this point of time.

CHAPTER-10

ENVIRONMENTAL MANAGEMENT PLAN

10.1 INTRODUCTION

Identification and prediction of impacts further needs to suggest the mitigation measures which would play a vital role in prevention of environmental degradation during construction and operational phase of the Industrial Estate. This leads to preparation of Environmental Management Plan (EMP). Environmental Management Plan therefore forms an imperative part of EIA process.

Preparation of Environmental Management Plan is required for formulation, implementation and monitoring of Environmental protection measures during and after commissioning of projects. The Environmental Management plan is a site specific plan developed to ensure that the project is implemented in an environmentally sustainable manner where all contractors and subcontractors, including consultants if any, understand the potential environmental risks arising from the project and take appropriate actions to minimize those risks. EMP also ensures that the project implementation is carried out in accordance with the planned design and by taking appropriate mitigation actions to reduce adverse environmental impacts during project's life cycle.

The aims of EMP are:

- ✓ Overall conservation of environment.
- ✓ Minimization of waste generation and pollution.
- ✓ Judicious use of natural resources and water.
- ✓ Safety, welfare and good health of the work force.
- ✓ Ensure effective operation of all control measures.
- ✓ Vigilance against probable disasters and accidents.
- ✓ Monitoring of cumulative and long time impacts.
- ✓ Ensure effective operation of all control measures.

The project will create certain inevitable impacts, during construction and operational phase, although within permissible limits as mentioned in Chapter 4 and can be reduced significantly with the help of effective implementation of a well-designed EMP. The parameters which need to be regulated are mentioned below:

- Air pollution due to the emission of particulate matter and gaseous pollutants from operation of D.G. Sets during power failure and vehicular movement;
- Noise pollution due to various noise generating equipment as well as vehicular movement;
- Water resource management to ensure continuous water supply.
- Wastewater generation from industries, sanitary/domestic activities; and
- Generation of solid wastes from industries, residences, maintenance of roads, parks, common areas including constructional, electrical and plumbing wastes.
- Energy conservation methods
- Maintenance of Building Management Systems and emergency aids.

To ensure better environment in & around the project site, effective EMP is developed separately for construction and operational phase.

10.1.1 ENVIRONMENT MANAGEMENT PLAN FOR PROPOSED PROJECT

The project proponent to manage the key environmental issues associated with the construction and operation of the project will initiate the Environment Management Plan for the project activities envisage to outlines the key environmental management and safeguards that. The major concerns for the EMP of the proposed project activities would be:

- Delineation of mitigation and compensation measures for all the identified significant impacts.
- Delineation of unmitigated impacts
- Physical planning including work programme, time schedule and locations for putting mitigation and compensation system in place.

EMP is the process to ensure that environmental considerations are integrated into the project scope. These are tools for mitigating or offsetting the potential adverse environmental impacts resulting from various activities of the project. The EMP would, therefore, consists of following main components:

- To integrate potential impacts (positive or negative), environmental mitigation measures implementation schedule, and monitoring plans.
- To describe the potential environmental impacts and proposed management associated with each stage of the project development.
- To control environmental impacts to levels within acceptable standards, and to minimize possible impact on the community and the workforce of foreseeable risks during the construction and subsequent operational phases of the project.
- To highlight that the environmental mitigation measures will be used in consonance with good management practices and good engineering design, construction and operation practices.

The EMP would, hence, be a working document that concerned stakeholders need to both understand environmental concerns and to address associated issues to facilitate environmental management.

10.2 ENVIRONMENTAL MANAGEMENT STRATEGIES

Strategy for environmental management in construction work should be based on three-pronged approach comprising of:

- Pollution prevention.
- Pollution control.
- Protection of pollution recipients.

10.2.1 Topography and Physiography

During the development, construction and post construction phase of the Industrial Estate, no significant impact is anticipated on local or regional topography and physiography, hence exhaustive management plan is not required. It is however proposed to carry out extensive turfing with local species apart from proposed plantations and greens.

10.2.2 Soil

10.2.2.1 Development & Construction Phase

During the construction phase, various kinds of wastes are generated that will be disposed in varied ways. The following measures will be taken to prevent soil contamination at site and ensure waste management:

Vegetation and top soil management:

- Remove vegetative cover only from the specific site on which construction will take place.
- Plantation as proposed shall be started at the earliest.
- The top soil will be stripped from constructional areas and stockpiled for later reuse in landscaping.
- Promote use of organic fertilizers.
- Construction of erosion prevention troughs, as deemed necessary.
- To prevent the erosion of excavated loose soil produced as a result of excavation, site preparation activities and excavation work would be undertaken during dry season after monsoon is over.

Construction Debris:

- Fuel and oil would be stored in cement lined storage yard and handled carefully to prevent soil contamination through leakage or spillage.
- All metal, paper, plastic wastes, debris and cuttings would be collected from site as soon as particular construction activity is over.
- During construction of flexible pavement, bitumen wastes will be collected (if any) and disposed in environmentally sound manner.
- The number, frequency and area of movement of heavy machinery will also be restricted.
- Recycling of construction wastes into aggregates for use in the project site.
- Used oil from DG Sets will be stored in HDPE drums in isolated covered facility and disposed off as per the Hazardous wastes (Management & Handling Rule) 1989 and its amendments & Transboundary Movement Rules, 2008.
- Working in a small area at a point of time (phase wise construction)

10.2.2.2 Post Construction Phase

To prevent soil contamination at site, the most important aspect is to manage the solid wastes that will be generated during the operation phase. The Environmental Management Plan for the solid waste focuses on three major components during the life cycle of the waste management system i.e. collection and transportation, treatment or disposal.

Collection and segregation of wastes

- Solid waste generated from different industries will be managed by the themselves. Vendors will be hired by the industry owners; they will collect the solid waste from different industries.
- For residential & commercial area there will be separate provision for the solid waste collection.
- Decomposable wastes will be decomposed and converted to manure to be used for horticulture.
- Recyclable waste would be sold to govt. approved vendors.
- Inert waste which comprises a very small amount of the total solid waste generated would be temporarily stored within the project premises and will be sent to MSW site.
- Waste bins would be placed at the strategic locations such as inter section of internal roads, parks, common places, etc.
- To minimize littering and odors, waste will be stored in well-designed containers/ bins that will be located at strategic locations to minimize disturbance in traffic flow
- Care would be taken such that the collection vehicles are well maintained and generate minimum noise and emissions. During transportation of the waste, it will be covered to avoid littering.

Transportation:

The segregation, transportation and disposal of wastes will be done by the authorized agency that will take care of the waste management of the project during the operational phase of the project.

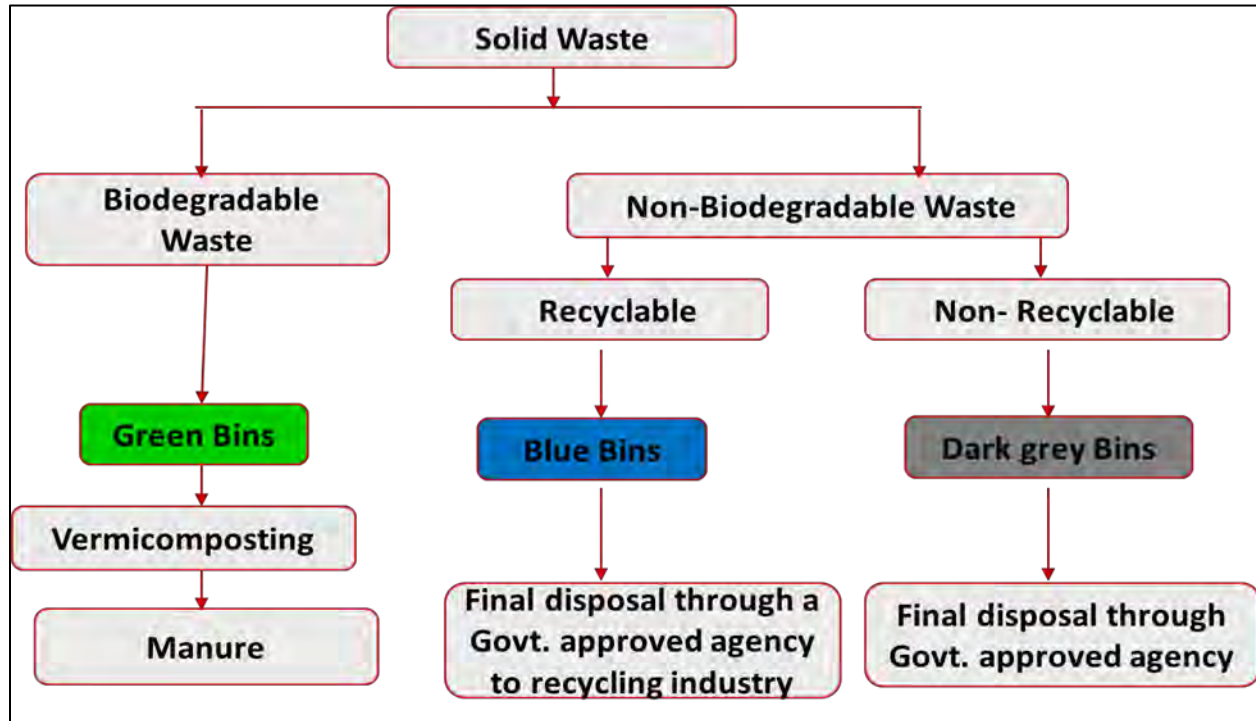


Figure 10.1: Waste Management Flow Diagram

Disposal

With regards to the disposal/ treatment of waste, the management will take the services of the authorized agency for waste management and disposal of the same on the project site during its operational phase. Hazardous waste will be disposed off in hazardous waste designated site at Pali.

10.2.3 Hydrology

10.2.3.1 Surface water Hydrology

Development & Construction Phase

To ensure adequate passage of the storm water as per the regional drainage pattern, water channels will be provided. It is also suggested to avoid excavation during monsoons. Community toilets with septic tanks shall be constructed on the site during construction phase to prevent wastewater from entering the water bodies. Chemicals such as paints and varnishes and oil/ grease will be stored under covered and cemented areas. Wash offs containing these chemicals will be drained into impervious drain for disposal as hazardous wastes.

Post Construction Phase

It is proposed to provide rainwater drainage channel to take water into RWH pits. This will help to recharge ground water. This will reduce the pressure of storm water management system of the city.

10.2.3.2 Ground water Hydrology

Development & Construction Phase

The water requirement during the construction period will be met by private water tankers. The following are also proposed to further reduce the demand of freshwater:

- Curing water will be sprayed on concrete structures and free flow of water not allowed.
- After liberal curing on the first day, all concrete structures will be painted with curing chemical to save water to stop daily water curing hence save water.
- Concrete structures will be covered with thick cloth/gunny bags and then water sprayed on them to avoid water rebound and ensure sustained and complete curing.
- Ponds will be made using cement and sand mortar to avoid water flowing away from the flat surface while curing.
- Water ponding will be done on all sunken slabs. This will also highlight the importance of having an impervious formwork.

Post Construction Phase

It is proposed to conserve groundwater resources through the combined means of water resource development, minimized water consumption and reuse of treated wastewater to reduce freshwater demand.

10.2.4 Water Resource Development

Storm water management system

The storm water will be pumped into carrier channel leading to RWH pits for final disposal.

Minimal Water Consumption

To reduce the water consumption, awareness along the following lines will be spread amongst the management and maintenance team:

- Installation of water meters conforming to IS standards at inlet and outlet point of water supply.
- To further lower the water consumption, options of Low flow flushing systems, sensor based fixtures, waterless urinals, and tap aerators etc. will be explored.
- Leak detection
- Irrigation through use of sprinklers.
- Use of low-volume, low-angle sprinklers for lawn areas

The message of water conservation will be spread through awareness campaigns and pamphlets. Following tips shall be provided to the residents for conserving water.

- Timely detection and repair of all leakages;
- Using automatic washing machine only when it is fully loaded;
- Turning off the main valve of water while going outdoor;
- Watering of lawn or garden during the coolest part of the day (early morning or late evening, hours) when temperature and wind speed are lowest. This reduces losses due to evaporation.
- Planting of native and/or drought tolerant grasses, ground covers, shrubs and trees. Once fully grown, they need not to be watered frequently.
- Avoiding over watering of lawns. Good rains eliminate the need for watering for more than a week.
- Setting sprinklers to water the lawn or garden only, not the street or sidewalk;
- Avoiding installation or use of ornamental water features unless they recycle the water and avoiding running them during drought or hot weather;
- Installation of high-pressure, low-volume nozzles on spray washers;
- Replacement of high-volume hoses with high-pressure, low-volume cleaning systems;
- Equipping spring loaded shutoff nozzles on hoses;
- Installation of float-controlled valve on the make-up line, closing filling line during operation, provision of surge tanks for each system avoid overflow;

Re-use of treated wastewater

Treated wastewater from the site will be recycled for horticulture, roadside plantation, and industrial demand to further reduce demand on freshwater resources. This will be achieved by treating the wastewater from the site in a proposed CETP of capacity 6.5 MLD. The detail of the CETP is given in Chapter 2. The treated wastewater conforming to standards for effluent discharge on land will be reused.

10.2.5 Surface water Quality

Development & Construction Phase

To mitigate the impacts of soil erosion during first rain and generation of wastewater from construction labour camps, the following measures are proposed;

- Excavation during dry season and proper management of excavated soils,
- Clearing all debris from site as soon as construction is over,
- Provision of proper hutment and toilet facilities for construction labour,
- Proper disposal of waste water generated at site.

10.2.6 Ground water Quality

Development and Construction Phase

To ensure against any groundwater pollution through leaching of waste into the soil, solid waste management plan ensuring timely collection of wastes will be followed. The collected wastes will be stored at designated area and disposed as per the standard procedures in line with the statutory requirements.

Post Construction Phase

The ground water pollution can arise from improper waste handling or by recharge to groundwater through contaminated storm water. A well planned solid waste management as discussed in chapter 2 is proposed for the operation phase that will ensure against any chances of soil or groundwater pollution on this account.

Landscaping water enters the soil and finally the groundwater. It is thus of utmost importance that only clean water is used for horticulture purposes. Regular monitoring of treated wastewater shall be carried out to ensure that all parameters are within acceptable levels.

10.2.7 Air Quality

10.2.7.1 Development and Construction Phase

The construction phase for the Industrial Estate project at Barwala is about 5 years, causing only marginal impact on ambient air quality from constructional activities, unloading of construction materials, cement, soil and vehicular movement etc. The main pollutant of concern is PM_{2.5} PM₁₀ (dust). Likewise, following mitigation measures will be adopted during this phase to mitigate the impacts on ambient air:

- Installation of batch plant at isolated place and providing cover shed around plants.
- Loading and unloading of cement and other material in covered shed.
- Providing dust suppression system in unloading area (as per requirement).
- Developing avenue and curtain plantation on the internal roads and peripheral plantation around the site to protect the movement of dust and other pollutants.
- Cover scaffolding, hosing down road surfaces and cleaning of vehicles.
- On-Road- Inspection for black smoke generating machinery.
- Vehicles having pollution under control certificate will only be allowed.
- Use of covering sheets for trucks to prevent dust dispersion from the trucks.
- All material storages will be adequately covered and contained.
- Training to the workers to reduce idling time of machines that otherwise tends to produce hydrocarbons and carbon monoxide.
- Best practices for maintenance and repair of all machineries and equipments.

10.2.7.2 Post Construction Phase

During the post construction phase, following measures will be adopted for pollution control in the Industrial Estate:

- Adequate stack height for DG Sets & Individual industries

- Traffic pollution management
- Green belt development/ plantation

DG Set & Industrial Emissions: The running of DG sets will result in emission of various pollutants. To achieve adequate natural dispersion, stack height will be provided to DG sets respectively in accordance with the guidelines of Central Pollution Control Board (CPCB) and same will be provided for industries too.

Traffic pollution management: Internal roads would be maintained in good conditions to control the dust emissions. Awareness will be raised amongst the people of industrial estate for use of low sulphur fuel.

Green belt/plantation: Vegetation is an effective means for controlling air pollution due its dual action of acting as a barrier between the source of emission and receptors and also as a sink for various pollutants. It is proposed to develop plantation of species effective in absorption of expected pollutants at site, along the internal roads and on the periphery of the Industrial Project at Barwala. Suggested species for plantation are:

Table 10.1: List of trees

S. No.	Local Names	Botanical Names
1.	Neem	<i>Azadirachta indica</i>
2.	Safeda	<i>Eucalyptus</i>
3.	Dhatura	<i>Datura sp.</i>
4.	Amaltas	<i>Cassia fistula</i>
5.	Carrot grass	<i>Parthenium sp.</i>
6.	Gulmohar	<i>Delonix regia</i>
7.	Bargad	<i>Ficus benghalensis</i>
8.	Pipal	<i>Ficus religiosa</i> (Linn)
9.	Mango	<i>Mangifera indica</i>

10.2.8 Noise Levels

10.2.8.1 Development and Construction Phase

During the construction phase, some noise will be generated through the operation of construction machines, excavators, etc. Wherever possible entire machinery will be enclosed with acoustic enclosures. DG set of enclosed will be installed on firm steel base to reduce noise & vibration at source. Following measures would be taken; into consideration to mitigate the noise at construction site:

- Use of well-maintained equipment fitted with silencers and providing noise shields near the heavy construction operations
- Earmuff and other protection devices shall be provided to laborers working in high noise generating machines.
- High noise activities shall be carried out during daytime.

10.2.8.2 Post Construction Phase

The main sources of noise during this phase are the intermittent use of DG Sets, machines & equipments used in individual industries and traffic movement in the industrial estate. The principles of noise emission control and screening are proposed for the two different scenarios of noise generation.

10.2.8.3 Noise emission control

All the D.G. Sets will be provided with acoustic enclosures ensuring 25 dB (A) insertion loss or for meeting the ambient noise standards whichever is higher as per CPCB norms. It will be ensured that the manufacturer provides acoustic enclosures as an integral part of Diesel Generator Sets. Machines & Equipments will be the other noise polluting source in industrial estate. All noise generating sources in the industrial area will be equipped with appropriate noise control measures. Sound levels will be consistent with local government regulations. Ambient noise levels will be periodically monitored to determine compliance with the norms. By these measures, it is anticipated that noise levels in the vicinity would be maintained as per the Noise Pollution (Regulation & Control) rules 2000, wide s.no. 123(E) dt 14.2.2000 and its amendments.

Barriers:

Trees having thick and fleshy leaves with flexible petioles having capacity to withstand vibration are suitable. Heavier branches and trunk of the trees also deflect or refract the sound waves. The following species are proposed to be used in a greenbelt especially surrounding industrial groups and along the periphery of the project site.

- Bargad- *Ficus benghalensis*
- Pipal- *Ficus religiosa*
- Mango- *Mangifera indica*
- Gulmohar- *Delonix regia*

10.2.9 Biological Environment

10.2.9.1 Development and construction phase

During the construction and post construction phase, no tree will be cut and therefore no impact is anticipated on terrestrial ecology. Site clearing shall be carried out strictly as per plan. Workers shall be advised against cutting, uprooting, coppicing of trees or small trees present in and around the project site for cooking. Workers shall also be discouraged from wandering in nearby areas with plantation or dense vegetation.

Further, green belt will be developed on the periphery and along the internal roads of site during the construction phase itself that will act as a curtain to restrict the movement of pollutants from either side of the project and improve site aesthetics.

10.2.9.2 Post construction phase

During the post construction phase, green belt will be developed and maintained. Ornamental plant species and grasses will be planted in open space within the premises 13.07 acres of area is proposed to be maintained green in the project site.

Plantation Design

The pattern of plantation around the Industrial Estate is discussed under curtain, avenue, field and ornamental plantations.

A. Curtain Plantation

The curtain plantation is developed all around the industrial estate. The plants would be of tall trees and small trees with mono-axial habit and shrubs. The plants in curtain plantation should be planted at a distance of 2.5 m in between them and between the rows. The large trees are spaced at large distance with small trees and shrubs in between them to form a dense green curtain around the complex. The following species may be planted from outside to inside of the curtain belt:

- Bargad- *Ficus benghalensis*
- Pipal- *Ficus religiosa*
- Mango- *Mangifera indica*
- Gulmohar- *Delonix regia*

B. Avenue Plantation

To combine aesthetic beauty and pollution abatement needs, two parallel rows of trees (inner and outer row) would be planted on the either side of the roads. The tree species for the purpose, as given below, shall be planted 1.5 m apart.

<i>Alstonia scholaria</i>	(Chitwan)
<i>Lagerstroemia flos-reginae</i>	(Sawani)
<i>Saraca indica</i>	(Ashok)
<i>Nerium odorum</i>	(Kaner)

C. Field Plantation

Plantation on open stretches of land helps to improve the general ecological conditions of the habitat by adding greenery to the landscape and by providing a vast canopy of foliage for sinking of pollutants generated in the area. The vacant area around the terminal will be developed as woodland. The area thus developed will provide a perennial biological system for pollution abatement. The plant species to be used as a community of mixed species, at a spacing 2 m apart.

D. Ornamental Plantation

The available area, according to the demand would be used for planning lawns, hedges, flowering trees and shrubs and seasonal flowers. In some strategic corners flowering climbers will be used to create the visual effect. The following species will be used:

1) **Foliage and Flowering trees.**

Nerium odorum (kaner)

Habiscus rosasinesis (godhal)

Plumria rubra (champa)

2) **Flowering Shrubs**

Bougainvilles spectabilis (baganwilas)

Thespesia populnea (sthel padma)

Poinsettia pulcherrima (lalpata)

Ixora coccinea (lal Rangoon)

3) **Flowering Climbers**

Quisqualis indica (Rangoon creeper)

Gloriosa superba (Malabar glory lilli)

Tecoma staus (Yellow bells)

Bignonia venusta (Golden showers)

Flowering climber species above can also be planted close to chain link fencing for developing into a flowering green screen.

10.2.10 Vehicle Parking and Traffic Management

10.2.10.1 Development and Construction Phase

To ensure that the heavy vehicles transporting construction material to the site does not burden the local traffic, it is proposed to:

- Plan the movement of the heavy vehicles avoiding the peak hours (day time).
- All the vehicles to the site will be provided with parking space such that there is no waiting time along the access roads.

10.2.10.2 Post Construction Phase

- Movement of the vehicle will also be scheduled such that the peak hours are avoided.
- In operation phase entry and exit will be from separate gates to minimize the disturbance to the approach road.
- Adequate parking is proposed to ensure there is no parking along the road.
- A well planned road network is proposed within the industrial estate premises

10.2.11. ENERGY CONSERVATION

The project will be designed in such a way that natural light and air will be enhanced in the industries, residences, and other facilities in the Industrial project at Barwala will be energy efficient through use of low energy consuming fixtures. Energy conservation will be achieved through various means as given below.

Site Plan and building design:

- Maximum utilization of solar light will be done
- Public areas will be cooled by natural ventilation as opposed to air-conditioning
- Maximize the use of natural lighting through design
- The orientation of the buildings will be done in such a way that maximum daylight is available
- The water bodies and green areas will be spaced, so that a significant reduction in the temperature can take place.

Energy saving:

- Energy efficient lamps will be provided within the complex.
- Constant monitoring of energy consumption and defining targets for energy conservation
- Adjusting the settings and illumination levels to ensure minimum energy used for desired comfort levels.
- Use of solar energy will save lot of non-renewable energy.

Awareness:

- Promoting awareness on energy conservation

- Training staff on methods of energy conservation and to be vigilant to such opportunities.

10.2.12 MANAGEMENT AND MAINTENANCE SYSTEM

Management and maintenance system is an important issue for the industrial estate project at Barwala. During the construction phase HSIIDC will take care for the implementation of environmental management plan for the IEs project. They will review the effectiveness of implemented mitigation measures adopted by contractors and sub-contractors from time to time. The houses will be provided with water sprinklers and fire alarms and there will be provision of adequate number of fire extinguishers. Back up service will be provided for all emergency equipments and machineries.

Post construction, management and maintenance of the internal services laid in Industrial Estate will be done by HSIIDC and by the individual Industry Owners.

- a. Reporting:** For effective implementation of any system/ plan, a systematic reporting system is essential. An Environmental Management Cell shall be set up for implementation of the Management Plan. Reporting of the results of all the management and monitoring plan shall be submitted to the designated Project Head. The reports shall be reviewed and
- parameters exceeding their limits should be identified and the reason for the same investigated. Any requisite mitigation plan shall be taken up accordingly.

The Environment Management Cell will be a permanent organizational set up charged with the task of ensuring its effective implementation of mitigation measures and conduct environmental monitoring. The major duties and responsibilities of Environmental Management Cell shall be as given below:

- To implement the environmental management plan
 - To assure regulatory compliance with all relevant rules and regulations
 - To ensure regular operation and maintenance of pollution control devices
 - To minimize environmental impact of operations as by strict adherence to the EMP
 - To initiate environmental monitoring as per approved schedule
- b. Review and interpretation** of monitored results and corrective measures in case monitored results are above the specified limit.

- c. **Maintain documentation** of good environmental practices and applicable environmental laws for a ready reference
- d. **Maintain environmental related records**
- e. **Coordination** with regulatory agencies, external consultants, monitoring laboratories
- f. **Maintenance of log of public complaints and the action taken.**

10.2.13 Hierarchical Structure of Environmental Management Cell

Normal activities of the EMP cell would be supervised by a dedicated person who will report to the project Head.

10.2.13.1 Awareness and Training

Training and human resource development is an important link to achieve sustainable operation of the facility and environment management. For successful functioning of the project, relevant EMP would be communicated to employees, residents and contractors.

Occupants must be made aware of the importance of waste segregation and disposal, water and energy conservation. The awareness can be provided by periodic Integrated Society meetings in residential areas. They would be informed of their duties.

10.2.13.2 Environmental Audits and Corrective Action Plans

To assess whether the implemented EMP is adequate, periodic environmental audits will be conducted by the project proponent's Environmental division. These audits will be followed by Correction Action Plan (CAP) to correct various issues identified during the audits.

10.2.14 ESTIMATED COST FOR ENVIRONMENTAL MITIGATION

Monthly monitoring of Ambient Air and Water will be conducted at Nine (9) and six locations (Ground water – 5 & Surface -1) respectively except monsoon. Soil and noise monitoring will be conducted once in season. There will be no monitoring during monsoon season as it is assumed that pollutants will be settled during monsoon, however online monitoring of meteorological data will be conducted at the site. Cost of environment monitoring is calculated as follows:

Table 10.2: Environment Monitoring Cost

Monitoring months		Cost of Monitoring of Environment Parameters in Lakhs				
		Ambient Air	Water	Soil	Noise	Meteorological Parameters
Summer Season	March	3.6	0.48			Wind speed, wind direction, Temperature, Rainfall and as in EC/CTE
	April	3.6	0.48	0.4	0.27	
	May	3.6	0.48			
Monsoon	June	No Monitoring		No Monitoring	No Monitoring	
	July					
	August					
	September					
Post-monsoon	October	3.6	0.48			
	November	3.6	0.48	0.4	0.27	
	December	3.6	0.48			
Winter	January	3.6	0.48	0.4	0.27	
	February	3.6	0.48			
Total		28.8	3.84	1.20	0.81	1.5

10.2.15 OVERALL MITIGATION MEASURES AND ENVIRONMENTAL MANAGEMENT PLAN

Overall impact assessment of anticipated environmental impacts and mitigation measures & environmental management plan to mitigate the potential impacts during the construction and operation phase are summarized in **Table 10.3**.

10.2. 16 ENVIRONMENT FRIENDLY TECHNOLOGIES

HSI IDC firmly believes that industrial development and associated growth should be based on the principles of sustainable development. HSI IDC is thus committed towards its responsibility

in promoting a clean and green environment. HSIIDC has taken a number of initiatives in this direction HSIIDC aims to encourage Environment Management by rational use of resources, environment audit and taking measures to reduce pollution load, waste recovery, recycling and waste recharge besides focusing on adoption of clean process technology.

HSIIDC would guide the local entrepreneurs to adopt the relevant technology to earn carbon credits.

10.2.17 ORGANIZATIONAL STRUCTURE FOR EMP

Normal activities of the EMP cell would be supervised by a dedicated person who will report to the site manager/coordinator of the Institution. The hierarchical structure of suggested Environmental Management Cell is given in following Figure 10.2:

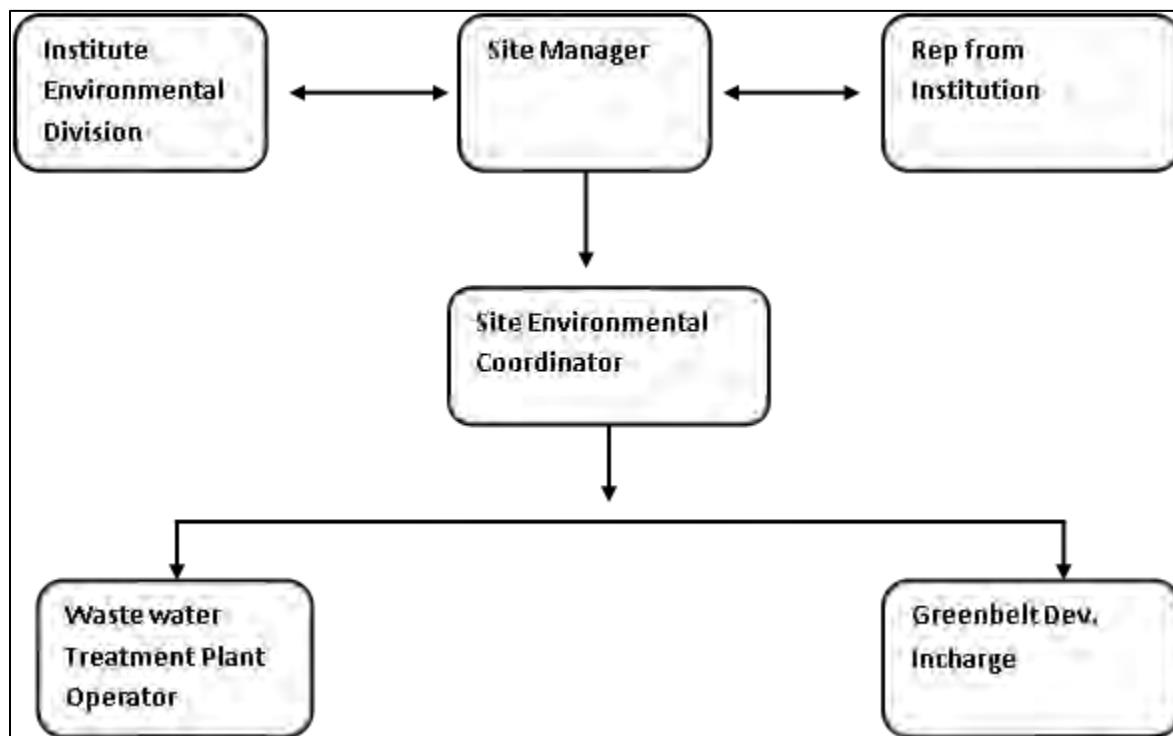


Figure 10.2: Environment Management Cell Structure

Table 10.3: Environmental Management Plan during construction and operation phases of the project.

Sl. No.	Environmental Components	Potential Impacts	Potential Source of Impact	Controls through EMP & Design	Impact evaluation	Remedial Measures
1.	Groundwater Quality	Ground water contamination	<u>Construction Phase</u> <ul style="list-style-type: none"> ▪ Wastewater generated from Labor tents. 	<ul style="list-style-type: none"> • Treated in the modular STP. 	No significant impact as majority of laborers would be locally deployed.	Modular STP will be used to manage waste water.
			<u>Operation Phase</u> <ul style="list-style-type: none"> ▪ Sewage treatment, sludge disposal on land. 	<ul style="list-style-type: none"> • Sewage will be treated in Common effluent Treatment Plant. Sludge will be disposed with municipal wastes. 	No significant negative impact on ground water quality envisaged.	In an unlikely event of soil and ground water contamination, remediation measures shall be implemented.

Sl. No.	Environmental Components	Potential Impacts	Potential Source of Impact	Controls through EMP & Design	Impact evaluation	Remedial Measures
2.	Groundwater Quantity	Ground Water Depletion	<u>Construction Phase</u> Private water tanker will supply the water in construction phase.	<ul style="list-style-type: none"> • NA 	No significant impact on ground water quantity envisaged.	No use of ground water will be used during construction phase.
			<u>Operation Phase</u> <ul style="list-style-type: none"> ▪ Ground water augmented with tube well supply during operation phase. 	<ul style="list-style-type: none"> • Recycling of treated wastewater to reduce freshwater requirement • Awareness Campaign for reduced water use by occupants. 	No significant impact on ground water quantity envisaged.	Controlled withdrawal from tube

Sl. No.	Environmental Components	Potential Impacts	Potential Source of Impact	Controls through EMP & Design	Impact evaluation	Remedial Measures
3.	Air Quality	Dust Emissions	<u>Construction Phase</u> <ul style="list-style-type: none"> ▪ All heavy construction activities. 	<ul style="list-style-type: none"> • Dust suppression through water sprinkling using water trucks, handheld sprays and automatic sprinkler systems. • Vehicles transporting loose construction material should be covered. • Contractors will be advised to provide dust masks for the employed labour. 	Not significant because dust generation will be temporary and will settle fast due to dust suppression techniques used.	Use of sprinklers will reduce dust particles in the atmosphere.
		Emissions of PM, SO ₂ , NO ₂ and CO	<u>Construction Phase</u> <ul style="list-style-type: none"> ▪ Operation of construction equipment and vehicles during site development. 	<ul style="list-style-type: none"> • Rapid on site construction • Improved maintenance of equipments. 	Not significant	Regular monitoring of emissions and control measures to reduce the emission levels.

Sl. No.	Environmental Components	Potential Impacts	Potential Source of Impact	Controls through EMP & Design	Impact evaluation	Remedial Measures
			<p><u>Operation Phase</u></p> <ul style="list-style-type: none"> ▪ Power generation through D.G. Set Operation. ▪ Emissions from vehicular traffic ▪ Emission from specific industries 	<ul style="list-style-type: none"> • Use of ultra-low Sulphur diesel, if available. • Stacks will be provided of adequate height. ▪ Green belt to be provided with specified species to help reduce PM levels. ▪ Based on the type of process involved each industry will provide proper stack height for emissions other than DG set along with control measures like electrostatic precipitator and bag filters 	<p>Not significant as D.G. Set would be used as power back-up only.</p>	

Sl. No.	Environmental Components	Potential Impacts	Potential Source of Impact	Controls through EMP & Design	Impact evaluation	Remedial Measures
4.	Noise Environment	Noise emissions	<p><u>Construction Phase</u></p> <ul style="list-style-type: none"> ▪ Operation of construction equipment and vehicles during site development. 	<ul style="list-style-type: none"> • Equipments should be fitted with silencers, where applicable and maintained well. • Providing noise shields near heavy construction operations. • Construction activity will be limited mostly to daytime hours only. • Use of Personal Protective Equipment (PPE) like earmuffs and earplugs during construction activities. 		

Sl. No.	Environmental Components	Potential Impacts	Potential Source of Impact	Controls through EMP & Design	Impact evaluation	Remedial Measures
			<p><u>Operation Phase</u></p> <ul style="list-style-type: none"> ▪ Noise from vehicular movement. ▪ Noise from D.G. sets operation. ▪ From Industry specific machineries 	<ul style="list-style-type: none"> • Peripheral plantations. • Providing Acoustic Enclosures on D.G. Sets. <p>Acoustic enclosures will be provided, where ever possible to control noise.</p> <p>Along with acoustic enclosures ear muffs will be provided for the workers, working at high noise generating areas.</p>	<p>Not significant</p> <p>Short-term exposure within permissible limit.</p> <p>Short-term exposure during working hours</p>	

Sl. No.	Environmental Components	Potential Impacts	Potential Source of Impact	Controls through EMP & Design	Impact evaluation	Remedial Measures
5.	Land Environment	Soil contamination	<u>Construction Phase</u> <ul style="list-style-type: none"> ▪ Disposal of construction debris. 	<ul style="list-style-type: none"> • Construction debris will be collected and suitably used on site as per construction waste management plan. 	Impact will be local, as any waste generated will be reused for construction activities. Not significant.	
			<u>Operation Phase</u> <ul style="list-style-type: none"> ▪ Dumping of municipal solid waste on land. ▪ Handling of used oil from D.G. Sets. 	<ul style="list-style-type: none"> • Solid waste from site will be collected on a daily. The segregation, transportation and disposal of wastes will be handled by a private agency. • Waste will be handled as per The Hazardous Wastes (Management & Handling) Rules, 1989. All hazardous will be disposed off in hazardous waste dumping site at Pali. 	Not Significant Negligible impact	

Sl. No.	Environmental Components	Potential Impacts	Potential Source of Impact	Controls through EMP & Design	Impact evaluation	Remedial Measures
6.	Biological Environment (Flora and Fauna)	Removal of Flora and Fauna on site.	<u>Construction Phase</u> <ul style="list-style-type: none"> ▪ Site development during construction. 	<ul style="list-style-type: none"> • The site comprises of abandoned agriculture land. 	No negative impact	--
		Increase of Green Cover	<u>Operation Phase</u> <ul style="list-style-type: none"> ▪ Plantations along the periphery of the complex. 	<ul style="list-style-type: none"> • Plantations of species that are native to the area, fast growing and with good canopy cover. 	Beneficial impact	
7.	Socio - Economic Environment	Population displacement and economic impact	<u>Construction Phase</u> <ul style="list-style-type: none"> ▪ No relocation is involved. ▪ Constructional activities 	<ul style="list-style-type: none"> • Compensation has been provided to the land owners by HSIIDC • Employment for labourers 	No negative impact Beneficial impact	--

CHAPTER-11

SUMMARY AND CONCLUSION

11.1 PROJECT BACKGROUND

Industrial Estate project is proposed to be developed over an area of 557.74 acres (22.56 hectare) as Phases II at Barwala, Haryana. The industrial estate was developed by Haryana State to attract the industrial entrepreneur in the late seventies. Since then, there has been consistent demand of industrial plots. In line with the development plan of the district, Haryana State Industrial and Infrastructure Development Corporation (HSIIDC) have acquired land for developing a new industrial area at, Barwala, Haryana, with modern and environment-friendly infrastructure facilities.

Industrial Estates come under the schedule 7 (c) according to EIA notification 2006 & its amendments. There are two categories under schedule 7 (c), category “A” & category “B”. Category “A” project required clearance from MoEF while category “B” projects required clearance from their respective Authorities (SEIAA). Industrial Estate project at Barwala, Haryana comes under “A” category as the project area is less than the 500 ha but Haryana-Punjab Interstate boundary lies within 4.08 km (west) from project site. Application form for 7 (c) projects included Form 1 & Pre Feasibility Report on the basis of which, TOR has been granted by MoEF & CC. Based on the TOR, this report is the EIA Report for EC presentation.

The EIA has been carried out by Grass Roots Research & Creation India (P) Ltd., a QCI/NABET accredited EIA Consultancy organization having a MoEF and NABL Accredited Laboratory. For this study, the impact zone will confine within an angular radius of 10 km from the project boundary.

The EIA is conducted to establish the baseline environmental setting in the study area, assessment of potential impacts on different environmental components, design of mitigation measures so as to keep impacts within acceptable limits and strengthen the positive impacts.

The Executive Summary summarizes the findings of the EIA study to aid in decision making and provides project related information and environmental impacts to non-technical sections of society. The summary highlights the baseline environmental status, key environmental issues and their likely impacts and also lists the major recommended mitigation measures to attenuate the impacts.

11.2 PROJECT SITE

The Industrial Estate project will be located in Barwala, Haryana. Geo-graphical coordinates are 30°36'5.00"N76°57'10.00"E. The nearest airport to the site is Chandigarh International Airport which is 17.42 km away in WNW direction and the nearest railway station is Chandigarh Railway Station about 15.22 km in NNW direction. The site can be approached by NH-73 which lies at a distance of about 0.8 km (west) from the site.

The state highways like SH-1 lies at a distance of about 6.3 km (ESE) from the project site.

11.3 PROJECT FEATURES

Salient features of the project are:

Table 11.1: Salient Features of the project

S. No.	Facility	Value
1.	Power Demand	66 kV
2.	Source of Power	Sub station
3.	D.G. Set	
4.	Water Supply Source	Tube wells
5.	Total Water Demand	Fresh water- 10.8 MLD Treated water- 4.65 MLD
6.	Wastewater generation	6.31 MLD
7.	CETP Capacity	6.5 MLD
8.	Solid waste generation	40 MT/day
9.	Manpower requirement	Construction phase- 582 Workers Operational phase- 945 Workers
10.	Project cost <ul style="list-style-type: none"> • Land cost • Development cost 	277.59 cr. 238.23 cr.
11.	Connectivity	NH-73 is 0.8 km (W) passes through the site. The state highways like SH-1 lies at a distance of about 6.3 (ESE) from the project site.

The project will be implemented over a span of 5 years, the commencement of construction.

11.4 ENVIRONMENTAL SETTING OF THE STUDY AREA

The baseline environmental status was assessed based on primary and secondary data collected either through in-site field observation or obtained from agencies such as Irrigation Department, India Meteorological Department (IMD), Central Ground Water Board, Geological Survey of India, State Ground Water Department, State Pollution Control Board, Census of India and Local Forest Department, Non -Governmental Agencies. The baseline status established from analysis of secondary and primary data and predicted impacts are discussed below. The proposed mitigation measures are also provided along with.

11.4.1 Land Environment

The land use pattern of the study area (10 km) is mainly residential, agricultural and open scrub, open land, forest, vegetation & River with dry channel. The site falls under Industrial use as per the development plan of Barwala. When awarded by the project proponent, the land was agricultural land. Compensation has been given to the farmers for acquiring their lands.

The construction phase of any construction project poses the threat of soil contamination and soil erosion, mainly during the construction phase. Inadequate solid waste management & waste from industries may also cause soil contamination during operation phase. The estimated waste generation during operation phase will be 40 MT.

During construction phase, excavation related work will be avoided during the monsoons and site clearing will be carried out for specific areas being developed. All wastes from site will be regularly removed and disposed/sold. An efficient solid waste management is proposed comprising waste collection, segregation at solid waste management facility within the site, and their disposal. Solid waste will be disposed by sale of recyclable wastes to vendors, composting of bio-degradable wastes, land filling of inert wastes to municipal dump sites and hazardous wastes to TSDF.

11.4.2 Water environment

The water requirement during construction phase will be met by private water tanker.

A combination of efficient water management to reduce water consumption, reuse of treated wastewater to reduce freshwater demand and rainwater harvesting to replenish groundwater is proposed to have a positive bearing on the water environment of the region.

A Common Effluent Treatment Plant of total capacity 6.1 MLD is proposed for treating of waste water.

11.4.3 Air Environment

During construction phase, the major air pollutant of prime concern is PM_{2.5}, PM₁₀ as impacts of other emissions such as SO₂, NO₂, and CO will not be significant because the nature of sources is such that the emissions are distributed spatially as well as temporal. Industrial emissions will also be taking place during operation phase. The levels of PM_{2.5}, PM₁₀, are higher than the standards prescribed by NAAQS at all stations because agricultural land and project site is at 0.8 km from NH -73. Thus dust emissions from construction activities shall require comprehensive mitigation measures and best construction practices.

Adequate stack heights will be proposed for D.G. Sets & for every individual industry above the ground to provide for sufficient dispersion of pollutants. Water sprinklers will be used to suppress dust during construction. During the operation phase, green belt and green area development is proposed to restrict and absorb air pollutants. Each industry will provide mitigation measure based on the type of industry.

11.4.4 Noise Environment

Noise levels were observed at five locations within the study area. Levels of background noise monitored in exceed the limits at 55 dB (A) and 45dB (A) for daytime and night time respectively.

The noise emitted from heavy-duty construction equipments during construction period being high shall require occupational preventive measures and temporary noise barriers for noise attenuation. The construction period being about 4 to 5 year duration approx., will require significant mitigation measures such as restricted loud noise activities to daytime, provision of PPEs and acoustic enclosures for D.G. Set.

In the operation phase, noise pollution will be checked through acoustic enclosures of DG Sets and green belt plantation. Noise will also be generated from different industries which are going to be set up in industrial area. It will be the responsibility of each industrial owner to provide suitable noise control measures (noise control barriers/acoustic enclosures) within the industrial area.

11.4.5 Biological environment

There is no protected area, reserved forest or sanctuary in the study area. The project will have 13.07 acres of green area. The proposed landscaping will include native species that will attract local birds and insects, reduce pollution and improve aesthetics and micro-climate of the region.

11.4.6 Socio-economic environment

The population of the project site will be approx. 9787 which include Residential, Industrial, Institutional and floating population. The study area has access to clean drinking water and adequate transportation facilities.

The project will add to the infrastructure facilities will also have a positive bearing on the local economy by increased demand of daily needs items, increased business opportunities in meeting fancy and recreational means for the population of the residents. It is also proposed to engage local people after imparting adequate training and local companies for maintenance of the Industrial Estate during operation phase.

11.4.7 Energy efficiency

For power requirement a 66 kV sub-station is proposed to supply power in the area. Various provisions are made to reduce the energy efficiency of the building such as use of solar energy, provision of low energy fixtures, design features to maximise sunlight and use of materials to improve energy efficiency.

11.4.8 Other

Resource Conservation: A concerted effort is made towards resource conservation by way of using recycled building materials, fly-ash bricks, reduced water consumption and improving energy efficiency of the building.

Indoor Air Quality: Special attention will be given to maintaining indoor air quality through use of low VOC paints, provision of adequate ventilation, proper storage of chemical and cleaning materials.

Safety: A network of manned security gates, security men, closed circuit TV and intercom facilities are proposed to ensure safety of the occupant. The buildings will also be provided with adequate fire tenders, fire alarms and water sprinklers.

11.5 ENVIRONMENTAL MANAGEMENT PLAN

Adequate environmental management measures will be incorporated during the entire planning, construction and operating stages of the project to minimize any adverse environmental impact and assure sustainable development of the area.

For the effective and consistent functioning of the campus, an Environmental Management System (EMS) will be established at the site including an Environmental Management cell for implementation of the EMP and monitoring plan, training and awareness, audits and maintenance of records.

Based on the environmental assessment, the associated potential adverse environmental impacts can be mitigated to an acceptable level by adequate implementation of the measures as stated in the EIA and the EMP. Some of the benefits from the project are:

- Use of solar energy by industries.
- Provision of green walls
- Use of fly ash bricks.
- Use of steel manufactured from recycled content
- Provide permeable paving to control surface water runoff
- Meet all requirements for buildings in moderate earthquake prone areas.
- Provision of fire alarms and water sprinklers
- Provision of welfare schemes to workers
- Extending educational and healthcare facilities to the local people
- Commitment to engaging local people and businessmen for maintenance and repair work

Hence, it may be concluded that the project will have significant positive economic and social impact on the local community apart from meeting the housing needs of the occupants, without bearing any significant adverse environmental impacts.

Table 11.2: Summary matrix of predicted impacts and mitigation measures

Sl. No.	Environmental Components	Potential Impacts	Potential Source of Impact	Controls through EMP & Design	Impact evaluation	Remedial Measures
1.	Groundwater Quality	Ground water contamination	<u>Construction Phase</u> <ul style="list-style-type: none"> ▪ Wastewater generated from Labor tents. 	<ul style="list-style-type: none"> • Treated in the modular STP. 	No significant impact as majority of laborers would be locally deployed.	Modular STP will be used to manage waste water.
			<u>Operation Phase</u> <ul style="list-style-type: none"> ▪ Sewage treatment, sludge disposal on land. 	<ul style="list-style-type: none"> • Sewage will be treated in Common effluent Treatment Plant. Sludge will be disposed with municipal wastes. When all phases get completed biodegradable sludge might use for biogas generation 	No significant negative impact on ground water quality envisaged.	In an unlikely event of soil and ground water contamination, remediation measures shall be implemented.

Sl. No.	Environmental Components	Potential Impacts	Potential Source of Impact	Controls through EMP & Design	Impact evaluation	Remedial Measures
2.	Groundwater Quantity	Ground Water Depletion	<u>Construction Phase</u> Private water tanker will supply the water in construction phase.	<ul style="list-style-type: none"> • NA 	No significant impact on ground water quantity envisaged.	No use of ground water will be used during construction phase.
			<u>Operation Phase</u> <ul style="list-style-type: none"> ▪ Ground water augmented with tube wells supply during operation phase. 	<ul style="list-style-type: none"> • Recycling of treated wastewater to reduce freshwater requirement • Awareness Campaign for reduced water use by occupants. 	No significant impact on ground water quantity envisaged.	Controlled withdrawal from tube as well

Sl. No.	Environmental Components	Potential Impacts	Potential Source of Impact	Controls through EMP & Design	Impact evaluation	Remedial Measures
3.	Air Quality	Dust Emissions	<u>Construction Phase</u> <ul style="list-style-type: none"> ▪ All heavy construction activities. 	<ul style="list-style-type: none"> • Dust suppression through water sprinkling using water trucks, handheld sprays and automatic sprinkler systems. • Vehicles transporting loose construction material should be covered. • Contractors will be advised to provide dust masks for the employed labour. 	Not significant because dust generation will be temporary and will settle fast due to dust suppression techniques used.	Use of sprinklers will reduce dust particles in the atmosphere.
		Emissions of PM, SO ₂ , NO ₂ and CO	<u>Construction Phase</u> <ul style="list-style-type: none"> ▪ Operation of construction equipment and vehicles during site development. 	<ul style="list-style-type: none"> • Rapid on site construction • Improved maintenance of equipments. 	Not significant	Regular monitoring of emissions and control measures to reduce the emission levels.

Sl. No.	Environmental Components	Potential Impacts	Potential Source of Impact	Controls through EMP & Design	Impact evaluation	Remedial Measures
			<p><u>Operation Phase</u></p> <ul style="list-style-type: none"> ▪ Power generation through D.G. Set Operation. ▪ Emissions from vehicular traffic. ▪ Emission from specific industries 	<ul style="list-style-type: none"> • Use of ultra-low Sulphur diesel, if available. • Stacks will be provided of adequate height. ▪ Green belt to be provided with specified species to help reduce PM levels. ▪ Based on the type of process involved each industry will provide proper stack height for emissions other than DG set along with control measures like electrostatic precipitator and bag filters 	<p>Not significant as D.G. Set would be used as power back-up only.</p>	

Sl. No.	Environmental Components	Potential Impacts	Potential Source of Impact	Controls through EMP & Design	Impact evaluation	Remedial Measures
4.	Noise Environment	Noise emissions	<p><u>Construction Phase</u></p> <ul style="list-style-type: none"> ▪ Operation of construction equipment and vehicles during site development. 	<ul style="list-style-type: none"> • Equipments should be fitted with silencers, where applicable and maintained well. • Providing noise shields near heavy construction operations. • Construction activity will be limited mostly to daytime hours only. • Use of Personal Protective Equipment (PPE) like earmuffs and earplugs during construction activities. 		

Sl. No.	Environmental Components	Potential Impacts	Potential Source of Impact	Controls through EMP & Design	Impact evaluation	Remedial Measures
			<p><u>Operation Phase</u></p> <ul style="list-style-type: none"> ▪ Noise from vehicular movement. ▪ Noise from D.G. sets operation. ▪ From Industry specific machineries 	<ul style="list-style-type: none"> • Peripheral plantations. • Providing Acoustic Enclosures on D.G. Sets. <p>Acoustic enclosures will be provided, where ever possible to control noise.</p> <p>Along with acoustic enclosures ear muffs will be provided for the workers, working at high noise generating areas.</p>	<p>Not significant</p> <p>Short-term exposure within permissible limit.</p> <p>Short-term exposure during working hours</p>	

Sl. No.	Environmental Components	Potential Impacts	Potential Source of Impact	Controls through EMP & Design	Impact evaluation	Remedial Measures
5.	Land Environment	Soil contamination	<u>Construction Phase</u> <ul style="list-style-type: none"> ▪ Disposal of construction debris. 	<ul style="list-style-type: none"> • Construction debris will be collected and suitably used on site as per construction waste management plan. 	Impact will be local, as any waste generated will be reused for construction activities. Not significant.	
			<u>Operation Phase</u> <ul style="list-style-type: none"> ▪ Dumping of municipal solid waste on land. ▪ Handling of used oil from D.G. Sets. 	<ul style="list-style-type: none"> • Solid waste from site will be collected on a daily. The segregation, transportation and disposal of wastes will be handled by a private agency. • Waste will be handled as per The Hazardous Wastes (Management & Handling) Rules, 1989. All hazardous will be disposed off in hazardous waste dumping site at Pali 	Not Significant Negligible impact	

Sl. No.	Environmental Components	Potential Impacts	Potential Source of Impact	Controls through EMP & Design	Impact evaluation	Remedial Measures
6.	Biological Environment (Flora and Fauna)	Removal of Flora and Fauna on site.	<u>Construction Phase</u> <ul style="list-style-type: none"> ▪ Site development during construction. 	<ul style="list-style-type: none"> • The site comprises of abandoned agriculture land. 	No negative impact	--
		Increase of Green Cover	<u>Operation Phase</u> <ul style="list-style-type: none"> ▪ Plantations along the periphery of the complex. 	<ul style="list-style-type: none"> • Plantations of species that are native to the area, fast growing and with good canopy cover. 	Beneficial impact	
7.	Socio - Economic Environment	Population displacement and economic impact	<u>Construction Phase</u> <ul style="list-style-type: none"> ▪ No relocation is involved. 	<ul style="list-style-type: none"> • Compensation has been provided to the land owners by HSIIDC 	No negative impact	--
			<ul style="list-style-type: none"> ▪ Constructional activities 	<ul style="list-style-type: none"> • Employment for labourers 	Beneficial impact	

Sl. No.	Environmental Components	Potential Impacts	Potential Source of Impact	Controls through EMP & Design	Impact evaluation	Remedial Measures
			<u>Operation Phase</u> <ul style="list-style-type: none"> ▪ Site operation. 	<ul style="list-style-type: none"> • Project will provide employment opportunities. • Boost to local market for increased demand in goods of daily need. 	Beneficial impact	--
9.	Traffic Pattern	Increase of Vehicular traffic	<u>Construction Phase</u> <ul style="list-style-type: none"> ▪ Heavy vehicular movement during construction. 	<ul style="list-style-type: none"> • Heavy vehicular movement will be restricted to daytime only and adequate parking facility will be provided. 	No negative impact	Adequate parking facility will be provided within the site to regulate heavy vehicular movement.

Sl. No.	Environmental Components	Potential Impacts	Potential Source of Impact	Controls through EMP & Design	Impact evaluation	Remedial Measures
			<u>Operation Phase</u> <ul style="list-style-type: none"> ▪ Increased traffic from the project. 	<ul style="list-style-type: none"> • Vehicular movement will be regulated inside the site • Adequate parking space provided. 	Moderate negative impact	Adequate parking facility will be provided within the site to regulate vehicular movement.

CHAPTER-12

DISCLOSURE OF CONSULTANTS ENGAGED

Project Name: Industrial Estate Project Phase II, Barwala, Panchkula, Haryana		
Name and address of the Consultant	GRC India (P) Ltd. F-374 & 375, Sector: 63, Noida, India	ISO 9001:2008 Certified, QCI-NABET Accredited.
Personnel involved in preparation of EIA/EMP report	Mr. Sonu Prajapati (PA)	
Base line data	GRC India Training and Analytical Laboratory Sector: 63, F- 375, Noida, India	NABL Accredited Laboratory, Recognized by MoEF&CC under Environment (Protection) Act, 1986. A unit of GRC India (P) Ltd.

12.1 Under the guidance of following Coordinators & Functional Area Experts:

EIA Coordinator	Dr. Dhiraj Kr. Singh
F AE-AP	Dr. Dhiraj Kr. Singh/Ms. Sadhna Singh-Cat. B
F AE-WP	Dr. Dhiraj Kr. Singh/ Ms. Sadhna Singh-Cat. B
F AE-SHW	Dr. Dhiraj Kr. Singh
F AE-SE	Mr. B.N Chaudhari
F AE-EB	Dr. Dhiraj Kr. Singh
F AE-HG	Mr. Tapan Majumdar
F AE-GEO	Mr. Tapan Majumdar
F AE-SC	Mr. N.P.S Varde
F AE-AQ	Ms. Mudita Singh Tomar
F AE- NV	Mr. Sanjay Shevkar
F AE – LU	Mr. N.P.S Varde/Mr. B.N Chaudhari
F AE – RH	Mr. S. K.Bandopadhyay

12.1 ACCREDITATION/ FROM QUALITY COUNCIL OF INDIA, QCI

Grass Roots Research & Creation India (P) Ltd., Noida is an EIA Consultant organization accredited by Quality Council of India, NABET. GRC India is accredited vide NABET **Certificate No. - NABET/EIA/1619/RA 0064** and validity of accreditation is till December 04, 2019. Certificate of Accreditation is attached for reference.

As per QCI NABET 'List of Accredited Consultant Organizations Rev. 88, June 10, 2020, under LIST '1', Category 'A' Sl. No. 87. The list of accredited consultants is published on QCI NABET and MoEF&CC websites as well.

For reference, a snapshot of the list where GRC India's name is listed is pasted below:



Quality Council of India

National Accreditation Board for
Education & Training



CERTIFICATE OF ACCREDITATION

Grass Roots Research and Creation India (P) Ltd.
F-375, Sector -63, Noida - 201301

are accredited as Category - A organization under the QCI-NABET Scheme for Accreditation of EIA Consultant Organizations: Version 3 for preparing EIA/EMP reports in the following sectors:

Sl. No.	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals including opencast/ underground mining	1	1 (a) (i)	A
2	Offshore and onshore oil and gas exploration, development & production	2	1 (b)	A
3	River Valley projects	3	1 (c)	A
4	Thermal power plants	4	1 (d)	A
5	Coal washeries	6	2 (a)	A
6	Mineral beneficiation including pelletisation	7	2 (b)	A
7	Metallurgical industries (ferrous & non-ferrous)	8	3 (a)	A
8	Cement plants	9	3 (b)	A
9	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/coral reefs /ecologically sensitive Areas including LNG terminal	27	6 (a)	A
10	Industrial estates/ parks/ complexes/ Areas, export processing zones(EPZs), Special economic zones (SEZs), Biotech parks, Leather complexes	31	7 (c)	A
11	Common Municipal Solid Waste Management Facility (CMSWMF)	37	7 (i)	B
12	Building and construction projects	38	8 (a)	B
13	Townships and Area development projects	39	8 (b)	B

Note: Name of approved EIA Coordinators and Functional Area Experts are mentioned in RA AC minutes dated July 07, 2017 posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in NABET's letter of accreditation bearing no. QCI/NABET/ENV/ACO/17/0365 dated Aug. 02, 2017. The accreditation needs to be renewed before the expiry date by Grass Roots Research and Creation India (P) Ltd., Noida, following due process of assessment.



Sr. Director |NABET
Dated: Aug. 02, 2017

Certificate No.
NABET/ EIA/1619/ RA 0064

Valid till Date
04.12.2019

For the updated List of Accredited Consultants with approved sectors please refer QCI-NABET website.



**National Accreditation Board
for Education and Training**

(Member - International Accreditation Forum & Pacific Accreditation Cooperation)



QCI/NABET/ENV/ACO/20/1328

May 19, 2020

To

Grass Roots Research & Creation India (P) Ltd.

F: 374 & 375, Sec-63, Noida-201301

Uttar Pradesh

(Kind Attention- Dr. Dhiraj Kr. Singh)

Sub.: Extension of Validity of Accreditation till 18th August, 2020 - regarding

Dear Sir/Madam

In view of the outbreak of Corona Virus (COVID-19) and subsequent lockdown declared for its control vide order dated 24th March 2020, issued by Ministry of Home Affairs, Govt. of India, NABET hereby extends the Validity of your Accreditation till 18th August 2020.

As soon as, NABET office opens/resumes its operation necessary action regarding issuance of certificate/extension of validity letters / other may be initiated, therefore, ACO to ensure their complete application with NABET, if applicable.

Meanwhile, you may enclose this with your EIA reports along with the certificate/validity letter. The EAC/SEIAA/SEAC/Other are hereby requested to consider the same as a valid document for the preparation of EIA/EMP report.

With best regards.

Sd/-

(A K Jha)

Sr. Director, NABET

NABET

Scheme for Accreditation of EIA Consultant Organizations		Scheme for Accreditation of EIA Consultant Organizations			
List '1' – Accredited EIA Consultant Organizations (ACOs) - as on June 2020*					
S. No.	Consultant Organization	Scope of Accreditation			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
1	Aadhi Boomi Mining and Enviro Tech Private Limited (formerly known as Suriya Mining Services) Address:3/216, K.S.V.Nagar, Narasothiparti, Salem-636004 Email:suriyakumarsemban@gmail.com Tel.:09842729655, 09443290855 Conditions apply	1	Mining of minerals – opencast only	A	1 (a) (i)
		3	River Valley Projects	A	1 (c)
		7	Mineral beneficiation	A	2 (b)
		9	Cement Plants	A	3 (b)
		34	Highways	B	7 (f)
		38	Building and construction projects	B	8(a)
2	Aakhivi Consultants Address:57 C, Block E5, Shatabdi Vihar, Sector 52, Noida, UP - 201 308 Email:aakhivi.2016@gmail.com Tel.:08409580043; 07210434847	1	Mining of minerals - opencast only	A**	1 (a) (i)
		4	Thermal power plants	A**	1 (d)
		34	Highway	A**	7 (f)

List of Accredited Consultant Organizations (Alphabetically) Rev. 88, June 10, 2020

Page 1

Scheme for Accreditation of EIA Consultant Organizations		Scheme for Accreditation of EIA Consultant Organizations			
List of Accredited Consultant Organizations (Alphabetically) Rev. 88, June 10, 2020					
S. No.	Consultant Organization	Scope of Accreditation			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
			dredging		
		36	Common effluent treatment plants (CETPs)	B	7 (h)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)
87	Grass Roots Research and Creation India (P) Ltd. Address: F- 375, Sec – 63, Noida – 201301 Email: md@grc-india.com, info@grc-india.com Tel.: 0120 – 4044630, 4044660, 09811554031, 09818184005 Conditions apply	1	Mining of minerals including open cast/ underground mining	A	1 (a) (i)
		2	Offshore and onshore oil and gas exploration, development & production	A	1 (b)
		3	River Valley projects	A	1 (c)
		4	Thermal power plants	A	1 (d)
		6	Coal washeries	A	2 (a)
		7	Mineral beneficiation including pelletisation	A	2 (b)
		8	Metallurgical industries(ferrous and non-ferrous) - both primary & secondary	A	3 (a)
		9	Cement plants	A	3 (b)

List of Accredited Consultant Organizations (Alphabetically) Rev. 88, June 10, 2020

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Scheme for Accreditation of EIA Consultant Organizations		Scope of Accreditation			
S. No.	Consultant Organization	As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals; other synthetic organic chemicals and chemical intermediates)	A	5 (f)
		24	Pulp & paper industry excluding manufacturing of paper from wastepaper and manufacture of paper from ready pulp without bleaching	A	5 (i)
		27	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/coral reefs /ecologically sensitive Areas including LNG terminal	A	6 (a)
		31	Industrial estates/ parks/ complexes/ Areas, export processing zones (EPZs), Special economic zones	A	7 (c)

List of Accredited Consultant Organizations (Alphabetically) Rev. 88, June 10, 2020 Page 95

Scheme for Accreditation of EIA Consultant Organizations		Scope of Accreditation			
S. No.	Consultant Organization	As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
			(SEZs), Biotech parks, Leather complexes		
		33	Ports, harbours, break waters and dredging	A	7 (e)
		34	Highways	A	7 (f)
		36	Common Effluent Treatment Plants (CETPs)	B	7 (h)
		37	Common municipal solid waste management facility (CMSWMF)	B	7 (i)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)
88	Gujarat Environment Management Institute Address: 3 rd floor, Block No. 13 Dr. Jivraj Mehta Bhavan, Old Sachivalaya, Sector 10B, Gandhinagar, Gujarat 382010 Email: paresh.gemi@gmail.com , nitashkhatri1983@gmail.com	9	Cement plants	B	3 (b)
		18	Petro-chemical complexes (industries based on processing of petroleum fractions & natural gas and/or reforming to aromatics)	A	5 (c)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding	A	5 (f)

List of Accredited Consultant Organizations (Alphabetically) Rev. 88, June 10, 2020 Page 96

F.No.21-36/2015-IA.III

Government of India
Ministry of Environment, Forest & Climate Change
(IA.III Section)

Indira Paryavaran Bhawan,
Jor Bagh Road,
New Delhi - 110 003.

Dated: 18th June, 2015

To
**M/s Haryana State Industrial and
Infrastructure Development Corp. Ltd. (HSIIDC),**
Industrial Estate, C 13-14, Sector-6,
Panchkula - 134 109, Haryana

**Subject: Development of Industrial Estate (Phase-II), Barwala, Haryana by
M/s Haryana State Industrial & Infrastructure Development Co.
Ltd. (HSIIDC) -Terms of Reference (ToR) - Reg.**

Sir,

This has reference to your letter No. HSIIDC:IA:BRW:2015 dated 20.02.2015 forwarding along with application seeking for Terms of Reference for the aforesaid project.

2. The proposal was considered by the Expert Appraisal Committee (EAC) in its 148th meeting held on 19th - 21st May, 2015 and the proponent has informed that:

- i. The project "Industrial Estate (Barwala)" is located at village Barwala, District Panchkula, Haryana by Haryana State Industrial and Infrastructure Development Corporation.
- ii. This industrial estate will be developed over total land area of 660.74 acres.
- iii. The existing phase (Phase I) has total area of 102.99 acres. Phase II of the project will be developed on 557.75 acres.
- iv. The industrial estate will have Industrial plots, commercial and institutional areas, CETP, ESI Dispensary, Fire Station and other amenities. The development will be of required standards with provision of power, water supply, roads, sewerage, and effluents disposal system with treatment, storm water disposal and solid waste management to enable enterprises to function in a state of development environment. The project envisages the establishment of mainly pollution free industries based on advanced technologies. Mainly automobiles industries, mechanical industries, general manufacturing industries will be coming in the HSIIDC Barwala Phase-II.
- v. The area under road, green area and open space will be 218.81 acres.
- vi. The total water demand of the project will be 10.80 MLD that will be provided through the tubewells.
- vii. Total wastewater generated from the project will be 6.31 MLD. Wastewater will be treated in the CETP of 6.5 MLD capacity.
- viii. Total power requirement for the project is 66 KVA that will be provided by Uttar Haryana Bidhut Vitran Nigam (UHBVN).



- ix. Total solid waste generated from the project will be 40.05 MT.
- x. The land cost of the scheme is Rs. 277.59 Crores and development cost is 238.23 Crores.

3. The project was examined by the EAC in its 148th meeting held on 19th – 21st May, 2015 and recommended the project for the TOR with the following specific TOR with general conditions for preparation of the Environment Impact Assessment (EIA) Report and Environment Management Plan (EMP) in respect of the **Development of Industrial Estate (Phase-II), Barwala, Haryana by M/s Haryana State Industrial & Infrastructure Development Co. Ltd. (HSIIDC):**

- (i) Declaration regarding no archaeological site falling in project area.
- (ii) No ground water extraction would be allowed.
- (iii) A detailed clarification from HUDA regarding availability of water in the area and corresponding summation of commitments made to various projects to be obtained by the PP.
- (iv) Reasons for selecting the site with details of alternate sites examined/rejected/selected on merit with comparative statement and reason/basis for selection. The examination should justify site suitability in terms of environmental damage, resources sustainability associated with selected site as compared to rejected sites. The analysis should include parameters considered along with weightage criteria for short-listing selected site.
- (v) Submit details of the land use break-up for the proposed project. Details of land use around 10 km radius of the project site. Analysis should be made based on latest satellite imagery for land use with raw images.
- (vi) Submit details of environmentally sensitive places, land acquisition status, rehabilitation of communities/ villages and present status of such activities.
- (vii) Examine the impact of proposed project on the nearest settlements.
- (viii) Examine baseline environmental quality along with projected incremental load due to the project taking into account of the existing developments nearby.
- (ix) Environmental data to be considered in relation to the project development would be (a) land, (b) groundwater, (c) surface water, (d) air, (e) bio-diversity, (f) noise and vibrations, (g) socio economic and health.
- (x) Submit a copy of the contour plan with slopes, drainage pattern of the site and surrounding area.
- (xi) Details regarding project boundary passing through any eco-sensitive area and within 10 km from eco- sensitive area.

- (xii) Green buffer in the form of green belt to a width of 15 meters should be provided all along the periphery of the industrial area. The individual units should keep 33% of the allotted area as a green area.
- (xiii) Submit details of the trees to be felled for the project.
- (xiv) Submit details of the infrastructure to be developed.
- (xv) Submit the present land use and permission required for any conversion such as forest, agriculture etc.
- (xvi) Submit details regarding R&R involved in the project
- (xvii) Zoning of the area in terms of 'type of industries' coming-up in the industrial area based on the resource requirement along with likely pollutants with quantity from the various industries.
- (xviii) The project boundary area and study area for which the base line data is generated should be indicated through a suitable map. Justification of the parameters, frequency and locations shall be discussed in the EIA.
- (xix) Submit Legal frame work for implementation of the Environmental Clearance conditions - to be clearly spelt out in the EIA report.
- (xx) Submit roles and responsibility of the developer for compliance of environmental regulations under the provisions of EP Act.
- (xxi) Site justification of the identified industry sectors from environmental angle and details of the studies conducted if any.
- (xxii) Ground water classification as per the Central Ground Water Authority.
- (xxiii) Submit the source of water, requirement vis-à-vis waste water to be generated along with treatment facilities, use of treated waste water along with water balance chart taking into account all forms of water use and management.
- (xxiv) Rain water harvesting proposals should be made with due safeguards for ground water quality. Maximize recycling of water and utilization of rain water.
- (xxv) Examine soil characteristics and depth of ground water table for rainwater harvesting.
- (xxvi) Examine details of solid waste generation treatment and its disposal.
- (xxvii) Examine and submit details of use of solar energy and alternative source of energy to reduce the fossil energy consumption.
- (xxviii) In case DG sets are likely to be used during construction and operational phase of the project, emissions from DG sets must be taken into consideration while estimating the impacts on air environment.



- (xxix) Examine road/rail connectivity to the project site and impact on the traffic due to the proposed project. Present and future traffic and transport facilities for the region should be analysed with measures for preventing traffic congestion and providing faster trouble free system to reach different destinations in the city.
- (xxx) A detailed traffic and transportation study should be made for existing and projected passenger and cargo traffic.
- (xxxii) Examine details of transport of materials for construction which should include source and availability.
- (xxxiii) Examine details of National Highways/State Highways/ expressways falling along the corridor and the impact of the development on them.
- (xxxiv) Examine noise levels - present and future with noise abatement measures.
- (xxxv) Identify, predict and assess the environmental and sociological impacts on account of the project. A detailed description with costs estimates of CSR should be incorporated in the EIA/EMP report.
- (xxxvi) Examine separately the details for construction and operation phases both for Environmental Management Plan and Environmental Monitoring Plan with cost and parameters.
- (xxxvii) Submit details of a comprehensive Disaster Management Plan including emergency evacuation during natural and man-made disaster.
- (xxxviii) Any further clarification on carrying out the above studies including anticipated impacts due to the project and mitigative measure, Project Proponent can refer to the model ToR available on Ministry website "<http://moef.nic.in/Manual/Industrial Estate>".

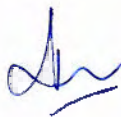
General Guidelines

- (i) The EIA document shall be printed on both sides, as far as possible.
- (ii) All documents should be properly indexed, page numbered.
- (iii) Period/date of data collection should be clearly indicated.
- (iv) Authenticated English translation of all material provided in Regional languages.
- (v) The letter/application for EC should quote the MoEF&CC File No. and also attach a copy of the letter prescribing the TOR.
- (vi) The copy of the letter received from the Ministry on the TOR prescribed for the project should be attached as an annexure to the final EIA-EMP Report.



- (vii) The final EIA-EMP report submitted to the Ministry must incorporate the issues in TOR and that raised in Public Hearing. The index of the final EIA-EMP report, must indicate the specific chapter and page no. of the EIA-EMP Report where the specific TOR prescribed by Ministry and the issue raised in the P.H. have been incorporated. Questionnaire related to the project (posted on MoEF&CC website) with all sections duly filled in shall also be submitted at the time of applying for EC.
- (viii) Grant of TOR does not mean grant of EC.
- (ix) Grant of TOR/EC to the present project does not mean grant of approvals in other regulations such as the Forest (Conservation) Act 1980 or the Wildlife (Protection) Act, 1972.
- (x) Grant of EC is also subject to Circulars issued under the EIA Notification 2006, which are available on the MoEF&CC website: www.envfor.nic.in.
- (xi) The status of accreditation of the EIA consultant with NABET/QCI shall be specifically mentioned. The consultant shall certify that his accreditation is for the sector for which this EIA is prepared.
- (xii) On the front page of EIA/EMP reports, the name of the consultant/consultancy firm along with their complete details including their accreditation, if any shall be indicated. The consultant while submitting the EIA/EMP report shall give an undertaking to the effect that the prescribed TORs (TOR proposed by the project proponent and additional TOR given by the MoEF) have been complied with and the data submitted is factually correct (Refer MoEF office memorandum dated 4th August, 2009).
- (xiii) While submitting the EIA/EMP reports, the name of the experts associated with/involved in the preparation of these reports and the laboratories through which the samples have been got analysed should be stated in the report. It shall clearly be indicated whether these laboratories are approved under the Environment (Protection) Act, 1986 and the rules made there under (Please refer MoEF office memorandum dated 4th August, 2009). The project leader of the EIA study shall also be mentioned.
- (xiv) All the TOR points as presented before the Expert Appraisal Committee (EAC) shall be covered.

4. A detailed draft EIA/EMP report should be prepared in terms of the above additional ToRs and should be submitted to the State Pollution Control Board for conduct of Public Hearing. Public Hearing to be conducted for the project in accordance with the provisions of Environmental Impact Assessment Notification, 2006 and the issues raised by the public should be addressed in the Environmental Management Plan. The Public Hearing should be conducted based on the ToR letter issued by the Ministry and not on the basis of Minutes of the Meeting available on the web-site.



5. You are required to submit the detailed final EIA/EMP prepared as per ToRs including issues raised during Public Hearing to the Ministry for considering the proposal for environmental clearance within 3 years as per the MoEF&CC O.M. No.J-11013/41/2006-IA-II(I) (P) dated 08.10.2014.

6. The consultants involved in the preparation of EIA/EMP report after accreditation with Quality Council of India/National Accreditation Board of Education and Training (QCI/NABET) would need to include a certificate in this regard in the EIA/EMP reports prepared by them and data provided by other Organization(s)/Laboratories including their status of approvals etc. vide notification of the MoEF dated 19.07.2013.

7. The prescribed ToRs would be valid for a period of three years for submission of the EIA/EMP Reports.


(Dr. Ranjini Warriar)
Director

Copy to:
Member Secretary, Haryana State Pollution Control Board, C-11, Sector-6,
Panchkula.

AWARD NO. 4 FOR THE YEAR 2011-12

Award announced by Sh. G.S. Virk District Revenue Officer-cum-Land Acquisition Collector, Panchkula.

Villages:- Alipur H.B.No. 237, Toka H.B.No. 1, Khangesra H.B.No. 240, Naggal H.B.No. 238, Sukhdarshanpur H.B.No. 2 and Khatauli H.B.No. 3 Tehsil & District Panchkula

Acquisition of land in the revenue estates Alipur H.B.No. 237, Toka H.B.No. 1, Khangesra H.B.No. 240, Naggal H.B.No. 238, Sukhdarshanpur H.B.No. 2 and Khatauli H.B.No. 3 Tehsil & District Panchkula for the public purpose namely for the development of Industrial Estate in the above villages by Haryana Government, Industries and Commerce Department vide notification detailed below.

AWARD

In pursuance of Haryana Government Industries and Commerce Department vide notification no. 2/6/20-I-IB-II-08 dated 15.12.2008 published in Haryana Government, gazette dated 15.12.2008 u/s 4 of the Land Acquisition Act 1894 (Act 1 of 1894) and subsequent Notification no. 2-6-20-I-IB-II-08 dated 18.12.2009 published in Haryana Government, Industries and Commerce Department gazette dated 18.12.2009 u/s 6 of the Act of 1894. It was declared that the land was needed for the aforesaid purpose. The Land Acquisition Collector, Panchkula was directed u/s 7 of the Land Acquisition Act for announcement of the award of acquired land.

LAND

The area given in the notification u/s 6 of the Land Acquisition Act 1894 (Act 1 of 1894) of 6 villages was 568 Acres 3 kanal 12 marla but on actual measurement of land it was found as under:-

1. Alipur H.B.No. 237, 143 Acre 1 Kanal 13 Marla

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2.	Toka H.B.No. 1	24 Acre 4 Kanal 17 Marla
3.	Khangesra H.B.No. 240	352 Acre 6 Kanal 6 Marla
4.	Naggal H.B.No. 238	4 Acre 3 Kanal 15 Marla
5.	Sukhdarshanpur H.B.No. 2	2 Acre 7 Kanal 14 Marla
6.	Khatauli H.B.No. 3	38 Acre 4 Kanal 3 Marla

The land measuring 56 Kanal 13 Marla of village Khangesra and 13 Kanal 15 Marla of village Alipur has been released u/s 48 of Land Acquisition Act vide notification no. 2/6/20-I-II-08 dated 07.12.2011 issued by the Financial Commissioner & Secretary to Government of Haryana, Industries and Commerce Department Chandigarh.

CLASSIFICATIONS OF THE LAND

Classification of the area under acquisition in the latest jamabandi for the Year 2007-08 of village Alipur, 2008-09 of village Toka, 2010-11 of village Khangesra, 2007-08 of village Naggal, 2008-09 of village Sukhdarshanpur and 2006-07 of village Khatauli is given as under:-

1. Alipur H.B.No. 237

<u>Kind of land</u>	<u>Kanal</u>	<u>Marla</u>
Chahi	716	- 17
Barani	25	- 1
Banjar Kadim	30	- 0
Gair Mumkin	360	- 0

2. Toka H.B.No. 1

<u>Kind of land</u>	<u>Kanal</u>	<u>Marla</u>
Chahi	93	- 5
Barani	48	- 16
Banjar Kadim	17	- 13
Gair Mumkin	37	- 3

3. Khangesra H.B.No. 240

<u>Kind of land</u>	<u>Kanal</u>	<u>Marla</u>
Chahi	2225	- 6
Bag Chahi	146	- 9
Barani	317	- 7

Banjar Kadim	17 - 3
Gair Mumkin	59 - 8

4. Naggal H.B.No. 238

<u>Kind of land</u>	<u>Kanal</u>	<u>Marla</u>
Chahi	30	8
Barani	4	5
Banjar Kadim	0	3
Gair Mumkin	0	19

5. Sukhdarshanpur H.B.No. 2

<u>Kind of land</u>	<u>Kanal</u>	<u>Marla</u>
Chahi	23	14

6. Khatauli H.B.No. 3

<u>Kind of land</u>	<u>Kanal</u>	<u>Marla</u>
Chahi	212	14
Barani	3	5
Gair Mumkin	92	4

The above said classification of the land as per revenue record was intimated to the right holders/interested persons through notices issued under section 9 of the act and also read over to them on 4th October 2011 when they appeared before me. None of the interested persons raised any objection regarding classification of the land. The classification of the land as per latest revenue record will be accepted for determination of compensation.

DEMAND OF THE LAND OWNERS AND INTERESTED PERSONS

The right holders/persons of village Alipur, Toka, Naggal and Sukhdarshanpur were called on 4th October 2011 in the office of Market Committee Barwala to appear before me personally or through their duly authorized agent to state the nature of their respective interest and claim regarding measurement/rates of the land.

The interested persons of these villages appeared before me and they submitted claims regarding compensation of their acquired land. The interested persons demanded compensation @ Rs. 10,000/-

per Sq. yard to Rs. 5 crore per acre of their acquired land. But they did not produce any documentary proof in sport of their claims.

Further, the right holders/persons of village Khangesra and Khatauli were called on 2nd December 2011 in the office of Market Committee Barwala to appear before me personally or through their duly authorized agent to state the nature of their respective interest and claim regarding measurement/rates of the land.

The interested persons appeared before me and they submitted claims regarding compensation of their acquired land. The interested persons of village Khangesra demanded compensation @ Rs. 10,000/- per Sq. yard to Rs. 5 crore per acre and of village Khatauli @ Rs. 10,000/- per Sq. yard to Rs. 1.5 crore per acre of their acquired land. But they did not produce any documentary proof in sport of their claims.

MARKET VALUE

In order to determine the market value of acquired land, the date of notification u/s 4 of the Land Acquisition Act, which is material date, is to be kept in view, of which is 15.12.2008. The District Collector (Deputy Commissioner) Panchkula was requested vide letter no. 1875/DRO/LA dated 10.12.2010 to supply the Collector's rate of land under acquisition which is required under para 12 of the Financial Commissioner's Standing Order no. 28. I have considered the Collector's rates supplied by the District Collector, Panchkula vide his memo no. 1135/DRA dated 12.07.2011 which is Rs. 30,00,000/- per acre for All kinds of land of village Alipur, Toka, Khangesra, Naggal, Sukhdarshanpur and Khatauli. I have inspected the site. All relevant facts as well as site potentiality of land under acquisition have been considered for assessing the amount of compensation of the said land.

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On balanced consideration of all the above facts the above rates supplied by the District Collector, Panchkula are found to be quite genuine, fare, accurate and allow the same accordingly.

STRUCTURES, TREES, TUBEWELLS and CROPS etc.

There are some structures, trees and tubewells existing on the acquired land. The assessment report of the same is still awaited from the concerned department. The supplementary Award will be announced later on as and when the report is received from the department.

Crops

The land is under Rabi crops for the time being. The farmers has requested for compensation to harvest their crops after ripping or allow them compensation for the same. In view of the above, instead of any compensation for the standing crops, I allow the farmers for harvesting their crops, the possession and ownership of the acquired land shall vest with Industries and Commerce Department, Haryana in all interest and purposes.

COMPULSORY ACQUISITION CHARGES AND ADDITIONAL AMOUNT U/S 23 (1-A) & 23 (2)

The additional amount of 12% per annum from the date of notification u/s 4 of Land Acquisition Act 1894 till the date of award and compulsory acquisition charges @ 30% of the market value as provided u/s 23(1-A) & 23(2) of the Act respectively are also allowed.

MODE OF PAYMENT

The payment will be made to the land owners and other interested persons according to their shares as entered in the latest record of rights (Jamabandi) amended to the extent of sanctioned mutations thereafter. The details of apportionment are given in Award Statement attached with file.

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Annuity Scheme

Annuity is to be paid to the landowners, whose land has been acquired, as per notification issued by Haryana Government, Revenue & Disaster Management Department vide Memo no. 3212-R-5-2010/12140 dated 9th November 2010. The rate of annuity will be paid as per instructions issued by Government from time to time in this regard.

POSSESSION OF THE LAND

The Award has been announced today and possession of the acquired land is taken over after offering the compensation to the land owners and interested persons and possession handed over to the beneficiary department i.e. Industries and Commerce Department, Haryana except the land involved in CWP Nos. 1008, 1026, 1035, 1047, 1122, 1446, 1447, 1478, 1479, 2087, 2089, 2090, 2091, 2173, 2174, 2176, 2190, 2581, 2603, 2694, 3040 of 2010 and CWP Nos. 14160, 14168, 18540, 18822 & 19942 of 2011 in which status quo regarding dispossession of acquired land has been directed/ordered.

The land thus acquired except involved in above mentioned CWPs here after, vests fully in the ownership of Haryana Government, Industries and Commerce Department free from all encumbrances.

CONCLUSION

Subject to the above remarks this Award is made as under:-
Village:- Alipur H.B.No. 237

1. Compensation for land	42,44,62,500.00
2. CAC @ 30%	12,73,38,750.00
3. Addl. amount @ 12% p.a on item no. 1 (from date of notification u/s 4 to Award)	15,23,87,853.00
TOTAL	70,41,89,103.00

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Village:- Toka H.B.No. 1

1. Compensation for land	7,38,18,750.00
2. CAC @ 30%	2,21,45,625.00
3. Addl. amount @ 12% p.a on item no. 1 (from date of notification u/s 4 to Award)	2,65,01,943.00
TOTAL	12,24,66,318.00

Village:- Khangesra 240

1. Compensation for land	1,03,71,18,750.00
2. CAC @ 30%	31,11,35,625.00
3. Addl. amount @ 12% p.a on item no. 1 (from date of notification u/s 4 to Award)	37,23,39,841.00
TOTAL	1,72,05,94,216.00

Village:- Naggal H.B.No. 238

1. Compensation for land	1,34,06,250.00
2. CAC @ 30%	40,21,875.00
3. Addl. amount @ 12% p.a on item no. 1 (from date of notification u/s 4 to Award)	48,13,028.00
TOTAL	2,22,41,153.00

Village:- Sukhdarshanpur H.B.No. 2

1. Compensation for land	88,87,500.00
2. CAC @ 30%	26,66,250.00
3. Addl. amount @ 12% p.a on item no. 1 (from date of notification u/s 4 to Award)	31,90,735.00
TOTAL	1,47,44,485.00

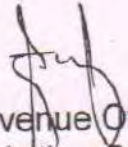
Village:- Khatuali H.B.No. 3

1. Compensation for land	11,55,56,250.00
2. CAC @ 30%	3,46,66,875.00
3. Addl. amount @ 12% p.a on item no. 1 (from date of notification u/s 4 to Award)	4,14,86,277.00
TOTAL	19,17,09,402.00

TOTAL amount of the Award 2,77,59,44,677.00


(Rs. Two hundred seventy seven crore fifty nine lacs forty four thousands six hundred and seventy seven only)

Dated: - 12.12.2011.
Place: - Market Committee
Barwala


District Revenue Officer-cum
Land Acquisition Collector,
Panchkula

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Award announced in the presence of those interested persons who appeared before me in the Mini Secretariat, Panchkula. The Award is now filed in my office.

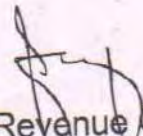
Dated: - 12.12.2011.
Place: - Market Committee
Barwala

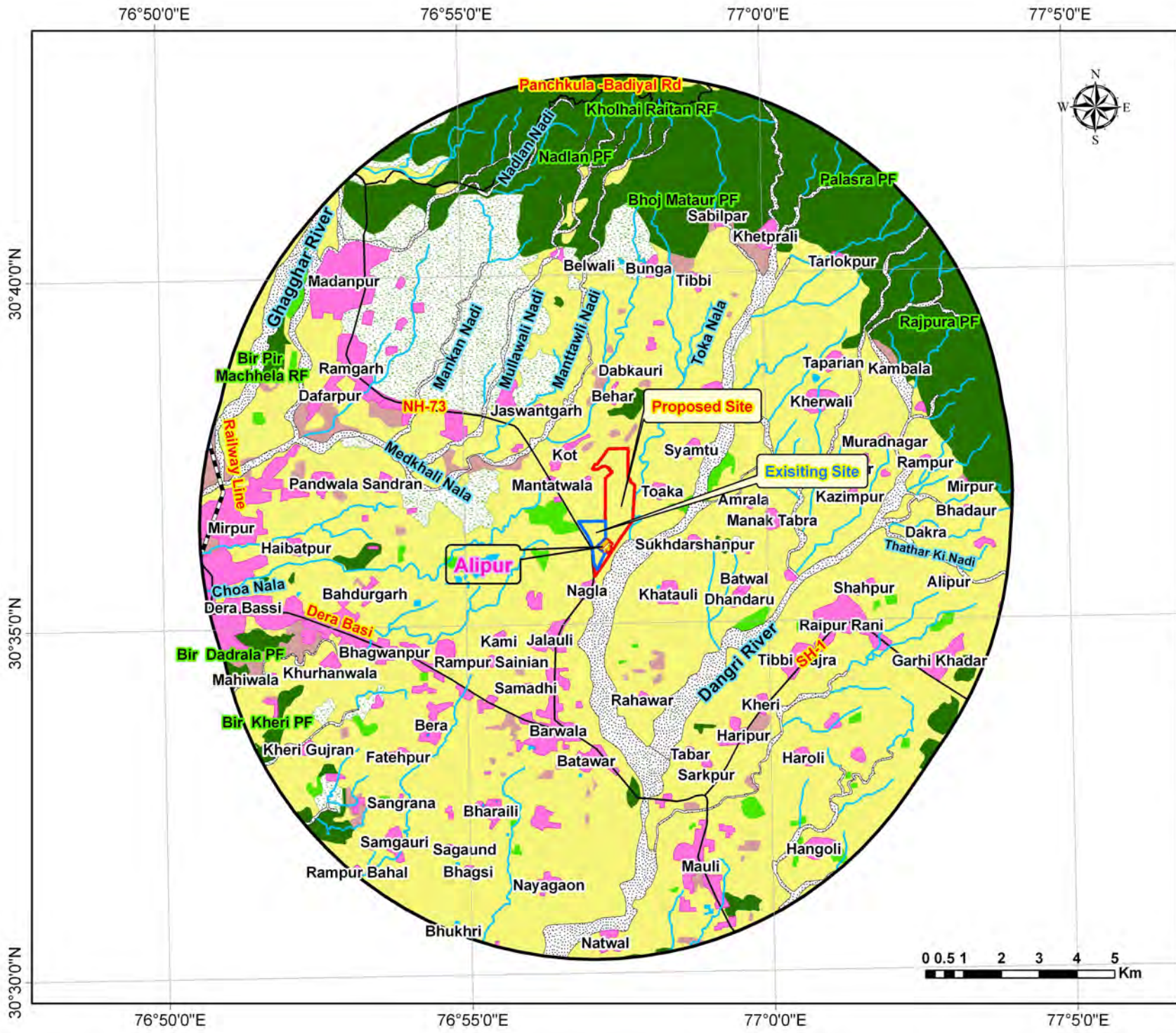

District Revenue Officer-cum
Land Acquisition Collector,
Panchkula

Endst. No. 503 - 07 /DRO/LA/2011 dated 12.12.2011

A copy is forwarded to the following for information please:-

1. Financial Commissioner & Principal Secretary to Government Haryana, Industries and Commerce Department Chandigarh
2. Commissioner. Ambala Division, Ambala Cantt.
3. Director, Industries and Commerce Department, Haryana 30-Bays Sector 17, Chandigarh
4. Collector, Panchkula (DRA Br.)
- 5 MD, HSIIDC, Panchkula.


District Revenue Officer-cum
Land Acquisition Collector,
Panchkula.



Legend

- Project Site
- Existing Project Site
- Proposed Project Site
- Buffer Boundary
- Road
- Railway Line
- Distributary
- Settlement
- Water Bodies
- Forest
- River With Dry Channel
- Vegetation
- Open Land
- Open Scrub
- Agricultural Land

LU Class	Area (Ha)
Settlement	3154.32
Water Bodies	52.23
River With Dry Channel	2779.26
Vegetation	437.11
Forest	6453.22
Open Scrub	2896.59
Open Land	836.89
Agricultural Land	22978.31
Total	39587.93

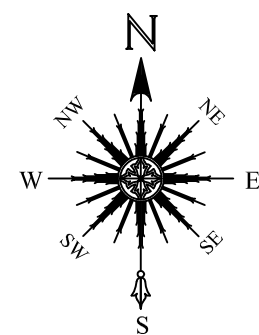
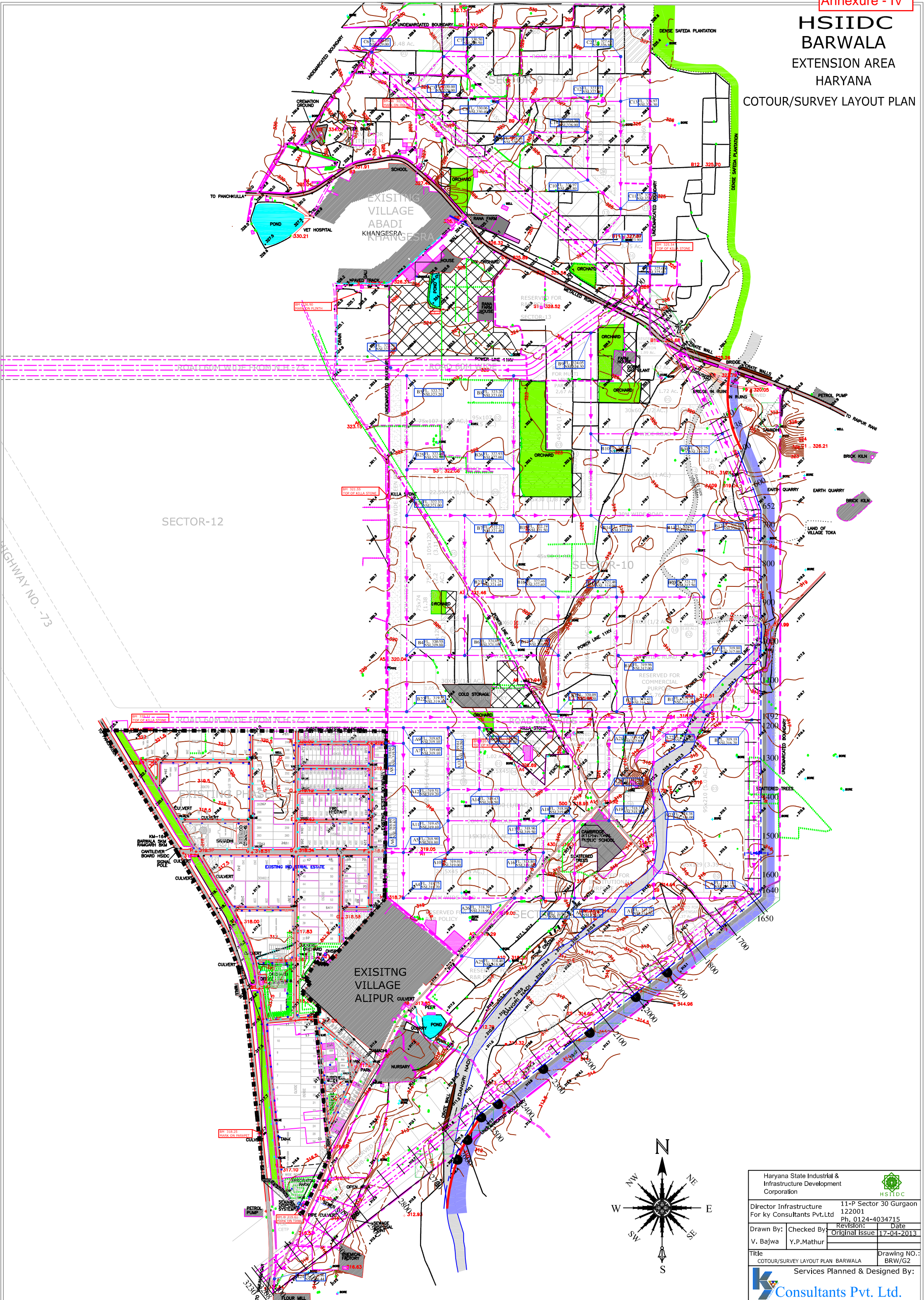
**Industrial Estate Project
Phase-II, At Barwala
Dist.-Panchkula,Haryana**


**Landuse/Landcover Map of the
Study Area**



HSIIDC BARWALA EXTENSION AREA HARYANA

COTOUR/SURVEY LAYOUT PLAN



Haryana State Industrial & Infrastructure Development Corporation		HSIIDC	
Director Infrastructure		11-P Sector 30 Gurgaon	
For ky Consultants Pvt.Ltd		122001	
Drawn By:		Checked By:	
V. Bajwa		Y.P.Mathur	
Revision:		Date	
Original Issue		17-04-2013	
Title		Drawing NO.:	
COTOUR/SURVEY LAYOUT PLAN BARWALA		BRW/G2	
Services Planned & Designed By:			
 Consultants Pvt. Ltd.			



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NABL Accredited Laboratory (Dept. of Science & Technology, GoI) Chemical: T-2195, Biological: T-2196

Head Office: F-375, Sec-63, NOIDA - 201 301,

Ph. No.: 0120 - 4044630, 4044660, 4323 120, Fax: 0120 - 2406519

Website: <http://www.grc-india.com>, E-mail: info@grc-india.com, lab@grc-india.com

GRC India

Test Report

Report Code: A20151031-081

Issue Date: 31.10.2015

Issued To: Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Analysis Duration: 03.10.2015 to 30.10.2015

Sample Description: Ambient Air

RESULTS**Ambient Air Quality Analysis****SAMPLING DETAILS**

Sampling Location	: Project Site
Sample Collected by	: Mr. Narendra & Mr. Mohit Gupta
Sampling Protocol	: GRC/LAB/STP/AIR/01
Weather Condition	: Clear Sky
Sampling Duration	: 24 Hours
Sampling Duration for CO	: 1 Hour
Sampler Location w.r.t. Height	: 4.0 Meter above Ground Level
Sample Packing & Marking	: Plastic Bottle / Zip Polybag & IE/OCT/A001-008

S. No.	Date	Test Parameter				
		Particulate Matter (PM2.5); $\mu\text{g}/\text{m}^3$	Particulate Matter (PM10); $\mu\text{g}/\text{m}^3$	Sulphur Dioxide (SO_2); $\mu\text{g}/\text{m}^3$	Nitrogen Dioxide (NO_2); $\mu\text{g}/\text{m}^3$	Carbon Monoxide, (CO) $\mu\text{g}/\text{m}^3$
		GRC/LAB/STP/AIR/03, Gravimetric Method	IS 5182 (Part 23):2006	IS 5182 (Part 2) :2001, Reaff.2006	IS 5182 (Part 6) :2006	IS 5182 (Part 10):1999, Reaff. 2003
1	02.10.2015	97.3	219.4	9.7	27.1	1590
2	06.10.2015	95.4	220.3	9.1	24.9	1500
3	09.10.2015	92.3	212.6	8.8	23.8	1550
4	14.10.2015	101.9	225.1	9.9	28.7	1620
5	17.10.2015	104.3	229.6	10.1	30.5	1740
6	22.10.2015	94.7	215.4	9.4	27.8	1570
7	25.10.2015	91.2	208.9	8.9	25.7	1490
8	28.10.2015	100.6	222.2	9.6	27.6	1580

End of Report



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Head Office: F-375, Sec-63, NOIDA - 201 301,
Ph. No.: 0120 - 4044630, 4044660, 4323120, Fax: 0120 - 2406519
Website: <http://www.grc-india.com>, E-mail : info@grc-india.com, lab@grc-india.com

Test Report

Report Code: A20151031-082

Issue Date: 31.10.2015

Issued To: Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Analysis Duration: 03.10.2015 to 30.10.2015

Sample Description: Ambient Air

RESULTS

Ambient Air Quality Analysis

SAMPLING DETAILS

Sampling Location	: Alipur
Sample Collected by	: Mr. Narendra & Mr. Mohit Gupta
Sampling Protocol	: GRC/LAB/STP/AIR/01
Weather Condition	: Clear Sky
Sampling Duration	: 24 Hours
Sampling Duration for CO	: 1 Hour
Sampler Location w.r.t. Height	: 4.0 Meter above Ground Level
Sample Packing & Marking	: Plastic Bottle / Zip Polybag & IE/OCT/A001-008

S. No.	Date	Test Parameter				Carbon Monoxide, (CO) $\mu\text{g}/\text{m}^3$
		Particulate Matter (PM _{2.5}); $\mu\text{g}/\text{m}^3$	Particulate Matter (PM ₁₀); $\mu\text{g}/\text{m}^3$	Sulphur Dioxide (SO ₂); $\mu\text{g}/\text{m}^3$	Nitrogen Dioxide (NO ₂); $\mu\text{g}/\text{m}^3$	
		GRC/LAB/STP/AIR/03, Gravimetric Method	IS 5182 (Part 23):2006	IS 5182 (Part 2) :2001, Reaff.2006	IS 5182 (Part 6) :2006	IS 5182 (Part 10):1999, Reaff. 2003
1	02.10.2015	97.6	191.6	8.3	24.5	1410
2	06.10.2015	99.3	188.2	8.1	22.8	1360
3	09.10.2015	92.4	183.4	8.2	23.4	1420
4	14.10.2015	102.7	197.3	8.7	25.6	1400
5	17.10.2015	106.3	202.7	9.3	27.5	1590
6	22.10.2015	94.8	185.4	8.2	26.0	1440
7	25.10.2015	89.9	181.8	8.0	21.7	1360
8	28.10.2015	100.2	195.4	8.7	25.6	1440

****End of Report****



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Ph. No.: 0120 - 4044630, 4044660, 4323120, Fax: 0120 - 2406519

Website: <http://www.grc-india.com>, E-mail : info@grc-india.com, lab@grc-india.com

Test Report

Report Code: A20151031-083

Issue Date: 31.10.2015

Issued To: Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Analysis Duration: 03.10.2015 to 30.10.2015

Sample Description: Ambient Air

RESULTS

Ambient Air Quality Analysis

SAMPLING DETAILS

Sampling Location	: Sukhdarshanpur
Sample Collected by	: Mr. Narendra & Mr. Mohit Gupta
Sampling Protocol	: GRC/LAB/STP/AIR/01
Weather Condition	: Clear Sky
Sampling Duration	: 24 Hours
Sampling Duration for CO	: 1 Hour
Sampler Location w.r.t. Height	: 4.0 Meter above Ground Level
Sample Packing & Marking	: Plastic Bottle / Zip Polybag & IE/OCT/A001-008

S. No.	Date	Test Parameter				
		Particulate Matter (PM2.5); $\mu\text{g}/\text{m}^3$ GRC/LAB/STP/AIR/03, Gravimetric Method	Particulate Matter (PM10); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 23):2006	Sulphur Dioxide (SO ₂); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 2) :2001, Reaff.2006	Nitrogen Dioxide (NO ₂); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 6) :2006	Carbon Monoxide, (CO) $\mu\text{g}/\text{m}^3$ IS 5182 (Part 10):1999, Reaff. 2003
1	02.10.2015	78.1	170.3	7.1	21.6	1110
2	06.10.2015	73.9	166.4	6.5	20.2	1070
3	09.10.2015	71.3	161.8	6.1	19.1	1050
4	14.10.2015	87.6	179.2	7.7	22.5	1160
5	17.10.2015	88.2	184.3	8.1	26.5	1230
6	22.10.2015	73.3	164.4	7.0	23.8	1130
7	25.10.2015	67.4	159.6	6.8	21.0	1050
8	28.10.2015	89.1	181.4	7.6	22.1	1130

****End of Report****



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Website: <http://www.grc-india.com>, E-mail: info@grc-india.com, lab@grc-india.com

Test Report

Report Code: A20151031-084

Issue Date: 31.10.2015

Issued To: Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Analysis Duration: 03.10.2015 to 30.10.2015

Sample Description: Ambient Air

RESULTS

Ambient Air Quality Analysis

SAMPLING DETAILS

Sampling Location : Batwal
Sample Collected by : Mr. Narendra & Mr. Mohit Gupta
Sampling Protocol : GRC/LAB/STP/AIR/01
Weather Condition : Clear Sky
Sampling Duration : 24 Hours
Sampling Duration for CO : 1 Hour
Sampler Location w.r.t. Height : 4.0 Meter above Ground Level
Sample Packing & Marking : Plastic Bottle / Zip Polybag & IE/OCT/A001-008

S. No.	Date	Test Parameter				
		Particulate Matter (PM _{2.5}); µg/m ³ GRC/LAB/STP/AIR/03, Gravimetric Method	Particulate Matter (PM ₁₀); µg/m ³ IS 5182 (Part 23):2006	Sulphur Dioxide (SO ₂); µg/m ³ IS 5182 (Part 2):2001, Reaff.2006	Nitrogen Dioxide (NO ₂); µg/m ³ IS 5182 (Part 6):2006	Carbon Monoxide, (CO) µg/m ³ IS 5182 (Part 10):1999, Reaff. 2003
1	02.10.2015	73.3	157.0	6.5	21.7	970
2	06.10.2015	69.3	149.5	5.8	19.5	930
3	09.10.2015	65.9	145.9	6.1	20.4	940
4	14.10.2015	78.5	167.5	7.2	23.7	1070
5	17.10.2015	81.9	172.7	7.4	25.2	1190
6	22.10.2015	74.4	155.7	6.5	22.0	920
7	25.10.2015	70.3	148.1	6.1	21.3	850
8	28.10.2015	83.3	172.8	7.1	24.2	950

End of Report

Authorized Signatory
(Seal & Signature)

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Ph. No.: 0120 - 4044630, 4044660, 4323120, Fax: 0120 - 2406519

Website: <http://www.grc-india.com>, E-mail: info@grc-india.com, lab@grc-india.com

Test Report

Report Code: A20151031-085

Issue Date: 31.10.2015

**Issued To: Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana**

Analysis Duration: 03.10.2015 to 30.10.2015

Sample Description: Ambient Air

RESULTS

Ambient Air Quality Analysis

SAMPLING DETAILS

Sampling Location	: Raipur Rani
Sample Collected by	: Mr. Narendra & Mr. Mohit Gupta
Sampling Protocol	: GRC/LAB/STP/AIR/01
Weather Condition	: Clear Sky
Sampling Duration	: 24 Hours
Sampling Duration for CO	: 1 Hour
Sampler Location w.r.t. Height	: 4.0 Meter above Ground Level
Sample Packing & Marking	: Plastic Bottle / Zip Polybag & IE/OCT/A001-008

S. No.	Date	Test Parameter				
		Particulate Matter (PM2.5); $\mu\text{g}/\text{m}^3$	Particulate Matter (PM10); $\mu\text{g}/\text{m}^3$	Sulphur Dioxide (SO ₂); $\mu\text{g}/\text{m}^3$	Nitrogen Dioxide (NO ₂); $\mu\text{g}/\text{m}^3$	Carbon Monoxide, (CO) $\mu\text{g}/\text{m}^3$
		GRC/LAB/STP/AIR/03, Gravimetric Method	IS 5182 (Part 23):2006	IS 5182 (Part 2):2001, Reaff.2006	IS 5182 (Part 6):2006	IS 5182 (Part 10):1999, Reaff. 2003
1	02.10.2015	74.6	200.6	7.4	25.5	1110
2	06.10.2015	71.2	193.4	6.7	24.1	1050
3	09.10.2015	69.6	186.7	6.3	23.6	1080
4	14.10.2015	81.8	208.2	7.6	26.7	1190
5	17.10.2015	84.4	212.4	8.2	28.4	1250
6	22.10.2015	77.6	199.6	7.3	26.6	1060
7	25.10.2015	73.6	195.2	7.2	24.1	1010
8	28.10.2015	84.4	215.3	8.4	27.9	1060

End of Report



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Website: <http://www.grc-india.com>, E-mail: info@grc-india.com, lab@grc-india.com

Test Report

Report Code: A20151031-086

Issue Date: 31.10.2015

Issued To: Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Analysis Duration: 03.10.2015 to 30.10.2015

Sample Description: Ambient Air

RESULTS

Ambient Air Quality Analysis

SAMPLING DETAILS

Sampling Location	: Dhandaruru
Sample Collected by	: Mr. Narendra & Mr. Mohit Gupta
Sampling Protocol	: GRC/LAB/STP/AIR/01
Weather Condition	: Clear Sky
Sampling Duration	: 24 Hours
Sampling Duration for CO	: 1 Hour
Sampler Location w.r.t. Height	: 4.0 Meter above Ground Level
Sample Packing & Marking	: Plastic Bottle / Zip Polybag & IE/OCT/A001-008

S _n No.	Date	Test Parameter				
		Particulate Matter (PM _{2.5}); $\mu\text{g}/\text{m}^3$ GRC/LAB/STP/AIR/03, Gravimetric Method	Particulate Matter (PM ₁₀); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 23):2006	Sulphur Dioxide (SO ₂); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 2):2001, Reaff.2006	Nitrogen Dioxide (NO ₂); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 6):2006	Carbon Monoxide, (CO) $\mu\text{g}/\text{m}^3$ IS 5182 (Part 10):1999, Reaff. 2003
1	02.10.2015	61.9	148.5	6.7	24.4	920
2	06.10.2015	58.5	141.4	6.1	23	860
3	09.10.2015	56.9	134.6	5.6	21.9	890
4	14.10.2015	69.1	156.3	6.9	25.6	1000
5	17.10.2015	71.7	160.3	7.5	27.3	1060
6	22.10.2015	64.9	147.7	6.6	25.5	870
7	25.10.2015	61.1	143.1	6.3	23.0	820
8	28.10.2015	71.7	163.4	7.7	26.8	870

End of Report



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Website: <http://www.grc-india.com>, E-mail: info@grc-india.com, lab@grc-india.com

Test Report

Report Code: A20151031-087

Issue Date: 31.10.2015

Issued To: Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Analysis Duration: 03.10.2015 to 30.10.2015

Sample Description: Ambient Air

RESULTS

Ambient Air Quality Analysis

SAMPLING DETAILS

Sampling Location	: Kheri
Sample Collected by	: Mr. Narendra & Mr. Mohit Gupta
Sampling Protocol	: GRC/LAB/STP/AIR/01
Weather Condition	: Clear Sky
Sampling Duration	: 24 Hours
Sampling Duration for CO	: 1 Hour
Sampler Location w.r.t. Height	: 4.0 Meter above Ground Level
Sample Packing & Marking	: Plastic Bottle / Zip Polybag & IE/OCT/A001-008

S. No.	Date	Test Parameter				
		Particulate Matter (PM2.5); $\mu\text{g}/\text{m}^3$ GRC/LAB/STP/AIR/03, Gravimetric Method	Particulate Matter (PM10); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 23):2006	Sulphur Dioxide (SO_2); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 2) :2001, Reaff.2006	Nitrogen Dioxide (NO_2); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 6) :2006	Carbon Monoxide, (CO) $\mu\text{g}/\text{m}^3$ IS 5182 (Part 10):1999, Reaff. 2003
1	02.10.2015	64.3	144.0	6.3	24.4	940
2	06.10.2015	60.3	136.5	5.6	22.2	900
3	09.10.2015	56.9	132.9	5.8	23.1	910
4	14.10.2015	69.5	154.5	6.8	26.4	1040
5	17.10.2015	72.9	161.6	7.2	27.9	1160
6	22.10.2015	65.4	142.7	6.3	24.7	890
7	25.10.2015	61.3	135.1	5.9	24.0	820
8	28.10.2015	74.9	159.8	6.9	26.9	920

****End of Report****



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Test Report

Report Code: A20151031-088

Issue Date: 31.10.2015

Issued To: Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Analysis Duration: 03.10.2015 to 30.10.2015

Sample Description: Ambient Air

RESULTS

Ambient Air Quality Analysis

SAMPLING DETAILS

Sampling Location	: Haripur
Sample Collected by	: Mr. Narendra & Mr. Mohit Gupta
Sampling Protocol	: GRC/LAB/STP/AIR/01
Weather Condition	: Clear Sky
Sampling Duration	: 24 Hours
Sampling Duration for CO	: 1 Hour
Sampler Location w.r.t. Height	: 4.0 Meter above Ground Level
Sample Packing & Marking	: Plastic Bottle / Zip Polybag & IE/OCT/A001-008

S. No.	Date	Test Parameter				
		Particulate Matter (PM2.5); $\mu\text{g}/\text{m}^3$	Particulate Matter (PM10); $\mu\text{g}/\text{m}^3$	Sulphur Dioxide (SO_2); $\mu\text{g}/\text{m}^3$	Nitrogen Dioxide (NO_2); $\mu\text{g}/\text{m}^3$	Carbon Monoxide (CO) $\mu\text{g}/\text{m}^3$
		GRC/LAB/STP/AIR/03, Gravimetric Method	IS 5182 (Part 23):2006	IS 5182 (Part 2) :2001, Reaff.2006	IS 5182 (Part 6) :2006	IS 5182 (Part 10):1999, Reaff. 2003
1	02.10.2015	88.6	188.6	7.5	24.3	1110
2	06.10.2015	84.8	185.2	7.3	22.6	1060
3	09.10.2015	83.4	180.4	6.8	23.2	1120
4	14.10.2015	93.7	194.3	7.6	25.4	1100
5	17.10.2015	97.3	199.7	8.4	27.3	1290
6	22.10.2015	85.8	182.4	7.1	25.8	1140
7	25.10.2015	80.9	178.9	6.9	21.5	1060
8	28.10.2015	91.2	192.4	7.6	25.4	1140

End of Report

Authorized Signatory
(Seal & Signature)

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Ph. No.: 0120 - 4044630, 4044660, 4323120, Fax: 0120 - 2406519

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Test Report

Report Code: A20151031-089

Issue Date: 31.10.2015

Issued To: Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Analysis Duration: 03.10.2015 to 30.10.2015

Sample Description: Ambient Air

RESULTS

Ambient Air Quality Analysis

SAMPLING DETAILS

Sampling Location : Rehawar
Sample Collected by : Mr. Narendra & Mr. Mohit Gupta
Sampling Protocol : GRC/LAB/STP/AIR/01
Weather Condition : Clear Sky
Sampling Duration : 24 Hours
Sampling Duration for CO : 1 Hour
Sampler Location w.r.t. Height : 4.0 Meter above Ground Level
Sample Packing & Marking : Plastic Bottle / Zip Polybag & IE/OCT/A001-008

S. No.	Date	Test Parameter				
		Particulate Matter (PM2.5); $\mu\text{g}/\text{m}^3$ GRC/LAB/STP/AIR/03, Gravimetric Method	Particulate Matter (PM10); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 23):2006	Sulphur Dioxide (SO ₂); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 2) :2001, Reaff.2006	Nitrogen Dioxide (NO ₂); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 6) :2006	Carbon Monoxide, (CO) $\mu\text{g}/\text{m}^3$ IS 5182 (Part 10):1999, Reaff. 2003
1	02.10.2015	60.6	144.3	6.1	18.2	910
2	06.10.2015	56.6	140.4	5.4	17.2	870
3	09.10.2015	54.6	135.8	5.1	16.1	810
4	14.10.2015	67.3	153.2	6.7	20.4	960
5	17.10.2015	71.3	158.3	7.1	23.8	1030
6	22.10.2015	56.3	138.4	6.0	20.8	930
7	25.10.2015	50.7	133.6	5.8	18.0	850
8	28.10.2015	72.4	155.4	6.6	19.1	930

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Test Report

Report Code: A20151202-082

Issue Date: 02.12.2015

Issued To: Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Analysis Duration: 04.11.2015 to 01.12.2015

Sample Description: Ambient Air

RESULTS

Ambient Air Quality Analysis

SAMPLING DETAILS

Sampling Location	: Alipur
Sample Collected by	: Mr. Narendra & Mr. Mohit Gupta
Sampling Protocol	: GRC/LAB/STP/AIR/01
Weather Condition	: Clear Sky
Sampling Duration	: 24 Hours
Sampling Duration for CO	: 1 Hour
Sampler Location w.r.t Height	: 4.0 Meter above Ground Level
Sample Packing & Marking	: Plastic Bottle / Zip Polybag & IE/NOV/A001-008

S. No.	Date	Test Parameter				
		Particulate Matter (PM2.5); $\mu\text{g}/\text{m}^3$ GRC/LAB/STP/AIR/03, Gravimetric Method	Particulate Matter (PM10); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 23):2006	Sulphur Dioxide (SO_2); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 2) :2001, Reaff.2006	Nitrogen Dioxide (NO_2); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 6) :2006	Carbon Monoxide, (CO) $\mu\text{g}/\text{m}^3$ IS 5182 (Part 10):1999, Reaff. 2003
1	03.11.2015	104.7	199.3	10.2	30.7	1530
2	07.11.2015	98.1	191.1	9.3	27.4	1490
3	11.11.2015	107.8	205.4	8.3	33.8	1600
4	14.11.2015	103.4	202.3	9.3	28.1	1450
5	18.11.2015	96.2	188.5	8.4	25.9	1390
6	21.11.2015	98.2	192.2	9.2	26.6	1490
7	25.11.2015	100.5	195.3	9.5	29.7	1630
8	29.11.2015	94.3	184.4	8.4	25.6	1550

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Test Report

Report Code: A20151202-083

Issue Date: 02.12.2015

Issued To: Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Analysis Duration: 04.11.2015 to 01.12.2015

Sample Description: Ambient Air

RESULTS

Ambient Air Quality Analysis

SAMPLING DETAILS

Sampling Location	: Sukhdarshanpur
Sample Collected by	: Mr. Narendra & Mr. Mohit Gupta
Sampling Protocol	: GRC/LAB/STP/AIR/01
Weather Condition	: Clear Sky
Sampling Duration	: 24 Hours
Sampling Duration for CO	: 1 Hour
Sampler Location w.r.t. Height	: 4.0 Meter above Ground Level
Sample Packing & Marking	: Plastic Bottle / Zip Polybag & IE/NOV/A001-008

S. No.	Date	Test Parameter				
		Particulate Matter (PM2.5); $\mu\text{g}/\text{m}^3$ GRC/LAB/STP/AIR/03, Gravimetric Method	Particulate Matter (PM10); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 23):2006	Sulphur Dioxide (SO_2); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 2):2001, Reaff.2006	Nitrogen Dioxide (NO_2); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 6):2006	Carbon Monoxide, (CO) $\mu\text{g}/\text{m}^3$ IS 5182 (Part 10):1999, Reaff. 2003
1	03.11.2015	83.9	176.3	8.7	27.6	1240
2	07.11.2015	76.9	165.5	7.9	25.0	1170
3	11.11.2015	91.6	186.3	9.1	26.9	1110
4	14.11.2015	83.1	174.2	7.6	23.8	1130
5	18.11.2015	78.4	167.4	7.0	22.0	1090
6	21.11.2015	83.1	173.3	7.9	24.7	1160
7	25.11.2015	79.9	171.2	8.3	28.8	1290
8	29.11.2015	78.2	163.7	7.0	21.5	1140

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Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: A20151202-083

Issue Date: 02.12.2015

Issued To: Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Analysis Duration: 04.11.2015 to 01.12.2015

Sample Description: Ambient Air

RESULTS

Ambient Air Quality Analysis

SAMPLING DETAILS

Sampling Location	: Sukhdarshanpur
Sample Collected by	: Mr. Narendra & Mr. Mohit Gupta
Sampling Protocol	: GRC/LAB/STP/AIR/01
Weather Condition	: Clear Sky
Sampling Duration	: 24 Hours
Sampling Duration for CO	: 1 Hour
Sampler Location w.r.t. Height	: 4.0 Meter above Ground Level
Sample Packing & Marking	: Plastic Bottle / Zip Polybag & IE/NOV/A001-008

S. No.	Date	Test Parameter				
		Particulate Matter (PM2.5); $\mu\text{g}/\text{m}^3$	Particulate Matter (PM10); $\mu\text{g}/\text{m}^3$	Sulphur Dioxide (SO_2); $\mu\text{g}/\text{m}^3$	Nitrogen Dioxide (NO_2); $\mu\text{g}/\text{m}^3$	Carbon Monoxide, (CO) $\mu\text{g}/\text{m}^3$
		GRC/LAB/STP/AIR/03, Gravimetric Method	IS 5182 (Part 23):2006	IS 5182 (Part 2) :2001, Reaff.2006	IS 5182 (Part 6) :2006	IS 5182 (Part 10):1999, Reaff. 2003
1	03.11.2015	83.9	176.3	8.7	27.6	1240
2	07.11.2015	76.9	165.5	7.9	25.0	1170
3	11.11.2015	91.6	186.3	9.1	26.9	1110
4	14.11.2015	83.1	174.2	7.6	23.8	1130
5	18.11.2015	78.4	167.4	7.0	22.0	1090
6	21.11.2015	83.1	173.3	7.9	24.7	1160
7	25.11.2015	79.9	171.2	8.3	28.8	1290
8	29.11.2015	78.2	163.7	7.0	21.5	1140

End of Report



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Test Report

Report Code: A20151202-084

Issue Date: 02.12.2015

Issued To: Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Analysis Duration: 04.11.2015 to 01.12.2015

Sample Description: Ambient Air

RESULTS

Ambient Air Quality Analysis

SAMPLING DETAILS

Sampling Location : Batwal
Sample Collected by : Mr. Narendra & Mr. Mohit Gupta
Sampling Protocol : GRC/LAB/STP/AIR/01
Weather Condition : Clear Sky
Sampling Duration : 24 Hours
Sampling Duration for CO : 1 Hour
Sampler Location w.r.t. Height : 4.0 Meter above Ground Level
Sample Packing & Marking : Plastic Bottle / Zip Polybag & IE/NOV/A001-008

S. No.	Date	Test Parameter				
		Particulate Matter (PM2.5); $\mu\text{g}/\text{m}^3$ GRC/LAB/STP/AIR/03, Gravimetric Method	Particulate Matter (PM10); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 23):2006	Sulphur Dioxide (SO_2); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 2) :2001, Reaff.2006	Nitrogen Dioxide (NO_2); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 6) :2006	Carbon Monoxide, (CO) $\mu\text{g}/\text{m}^3$ IS 5182 (Part 10):1999, Reaff. 2003
1	03.11.2015	77.3	164.1	6.7	29.1	1030
2	07.11.2015	72.5	152.8	7.3	26.1	1080
3	11.11.2015	67.9	149.6	6.3	23.5	930
4	14.11.2015	76.5	162.8	7.1	25.5	970
5	18.11.2015	73.7	155.9	6.2	22.6	940
6	21.11.2015	79.2	162.0	7.4	26.4	1020
7	25.11.2015	71.6	156.5	7.5	29.4	1140
8	29.11.2015	76.3	166.0	6.2	23.5	980

****End of Report****

Authorizing Signatory
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Test Report

Report Code: A20151202-085

Issue Date: 02.12.2015

Issued To: Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Analysis Duration: 04.11.2015 to 01.12.2015

Sample Description: Ambient Air

RESULTS

Ambient Air Quality Analysis

SAMPLING DETAILS

Sampling Location	: Raipur Rani
Sample Collected by	: Mr. Narendra & Mr. Mohit Gupta
Sampling Protocol	: GRC/LAB/STP/AIR/01
Weather Condition	: Clear Sky
Sampling Duration	: 24 Hours
Sampling Duration for CO	: 1 Hour
Sampler Location w.r.t. Height	: 4.0 Meter above Ground Level
Sample Packing & Marking	: Plastic Bottle / Zip Polybag & IE/NOV/A001-008

S. No.	Date	Test Parameter				
		Particulate Matter (PM2.5); $\mu\text{g}/\text{m}^3$ GRC/LAB/STP/AIR/03, Gravimetric Method	Particulate Matter (PM10); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 23):2006	Sulphur Dioxide (SO_2); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 2):2001, Reaff.2006	Nitrogen Dioxide (NO_2); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 6):2006	Carbon Monoxide, (CO) $\mu\text{g}/\text{m}^3$ IS 5182 (Part 10):1999, Reaff. 2003
1	03.11.2015	80.2	208.6	8.6	29.9	1190
2	07.11.2015	75.7	196.2	7.9	27.5	1130
3	11.11.2015	71.6	193.2	7.2	26.1	1030
4	14.11.2015	82.2	211.7	7.8	27.3	1150
5	18.11.2015	76.5	198.6	6.9	25.1	1100
6	21.11.2015	84.7	209.8	8.1	27.2	1200
7	25.11.2015	76.9	200.8	8.7	29.4	1300
8	29.11.2015	83.5	203.6	7.6	26.1	1090

End of Report



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Test Report

Report Code: A20151202-086

Issue Date: 02.12.2015

Issued To: Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Analysis Duration: 04.11.2015 to 01.12.2015

Sample Description: Ambient Air

RESULTS

Ambient Air Quality Analysis

SAMPLING DETAILS

Sampling Location	: Dhandaruru
Sample Collected by	: Mr. Narendra & Mr. Mohit Gupta
Sampling Protocol	: GRC/LAB/STP/AIR/01
Weather Condition	: Clear Sky
Sampling Duration	: 24 Hours
Sampling Duration for CO	: 1 Hour
Sampler Location w.r.t. Height	: 4.0 Meter above Ground Level
Sample Packing & Marking	: Plastic Bottle / Zip Polybag & IE/NOV/A001-008

S. No.	Date	Test Parameter				
		Particulate Matter (PM2.5); $\mu\text{g}/\text{m}^3$	Particulate Matter (PM10); $\mu\text{g}/\text{m}^3$	Sulphur Dioxide (SO_2); $\mu\text{g}/\text{m}^3$	Nitrogen Dioxide (NO_2); $\mu\text{g}/\text{m}^3$	Carbon Monoxide; (CO) $\mu\text{g}/\text{m}^3$
		GRC/LAB/STP/AIR/03, Gravimetric Method	IS 5182 (Part 23):2006	IS 5182 (Part 2) :2001, Reaff.2006	IS 5182 (Part 6) :2006	IS 5182 (Part 10):1999, Reaff. 2003
1	03.11.2015	67.5	156.5	7.9	28.8	1000
2	07.11.2015	63.0	144.3	7.3	26.4	940
3	11.11.2015	58.9	141.1	6.5	24.9	840
4	14.11.2015	69.5	159.8	7.1	26.2	960
5	18.11.2015	63.8	146.5	6.5	24.0	910
6	21.11.2015	72.0	157.9	7.4	26.1	1010
7	25.11.2015	64.2	148.7	8.0	28.3	1170
8	29.11.2015	70.8	151.7	6.9	25.0	900

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Test Report

Report Code: A20151202-087

Issue Date: 02.12.2015

Issued To: Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Analysis Duration: 04.11.2015 to 01.12.2015

Sample Description: Ambient Air

RESULTS

Ambient Air Quality Analysis

SAMPLING DETAILS

Sampling Location : Kheri
Sample Collected by : Mr. Narendra & Mr. Mohit Gupta
Sampling Protocol : GRC/LAB/STP/AIR/01
Weather Condition : Clear Sky
Sampling Duration : 24 Hours
Sampling Duration for CO : 1 Hour
Sampler Location w.r.t. Height : 4.0 Meter above Ground Level
Sample Packing & Marking : Plastic Bottle / Zip Polybag & IE/NOV/A001-008

S. No.	Date	Test Parameter				
		Particulate Matter (PM2.5); $\mu\text{g}/\text{m}^3$ GRC/LAB/STP/AIR/03, Gravimetric Method	Particulate Matter (PM10); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 23):2006	Sulphur Dioxide (SO_2); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 2) :2001, Reaff.2006	Nitrogen Dioxide (NO_2); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 6) :2006	Carbon Monoxide, (CO) $\mu\text{g}/\text{m}^3$ IS 5182 (Part 10):1999, Reaff. 2003
1	03.11.2015	68.3	151.1	6.7	31.8	1000
2	07.11.2015	63.5	139.8	7.1	28.8	1050
3	11.11.2015	58.9	136.6	6.1	26.2	900
4	14.11.2015	67.5	149.8	6.9	28.2	940
5	18.11.2015	64.7	142.9	6.0	25.3	910
6	21.11.2015	70.2	149.0	7.2	29.1	990
7	25.11.2015	62.6	143.5	7.3	32.1	1110
8	29.11.2015	67.3	153.0	5.8	26.2	950

****End of Report****



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Head Office: F-375, Sec-63, NOIDA - 201 301,
Ph. No.: 0120 - 4044630, 4044660, 4323120, Fax: 0120 - 2406519
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Test Report

Report Code: A20151202-088

Issue Date: 02.12.2015

Issued To: Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Analysis Duration: 04.11.2015 to 01.12.2015

Sample Description: Ambient Air

RESULTS

Ambient Air Quality Analysis

SAMPLING DETAILS

Sampling Location : Haripur
Sample Collected by : Mr. Narendra & Mr. Mohit Gupta
Sampling Protocol : GRC/LAB/STP/AIR/01
Weather Condition : Clear Sky
Sampling Duration : 24 Hours
Sampling Duration for CO : 1 Hour
Sampler Location w.r.t. Height : 4.0 Meter above Ground Level
Sample Packing & Marking : Plastic Bottle / Zip Polybag & IE/NOV/A001-008

Table with 7 columns: S. No., Date, Particulate Matter (PM2.5), Particulate Matter (PM10), Sulphur Dioxide (SO2), Nitrogen Dioxide (NO2), Carbon Monoxide (CO). It contains 8 rows of sampling data from 03.11.2015 to 29.11.2015.

End of Report



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Test Report

Report Code: A20151202-089

Issue Date: 02.12.2015

Issued To: Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Analysis Duration: 04.11.2015 to 01.12.2015

Sample Description: Ambient Air

RESULTS

Ambient Air Quality Analysis

SAMPLING DETAILS

Sampling Location : Rehawar
Sample Collected by : Mr. Narendra & Mr. Mohit Gupta
Sampling Protocol : GRC/LAB/STP/AIR/01
Weather Condition : Clear Sky
Sampling Duration : 24 Hours
Sampling Duration for CO : 1 Hour
Sampler Location w.r.t. Height : 4.0 Meter above Ground Level
Sample Packing & Marking : Plastic Bottle / Zip Polybag & IE/NOV/A001-008

S. No.	Date	Test Parameter				Carbon Monoxide; (CO) µg/m ³ IS 5182 (Part 10):1999, - Reaff. 2003
		Particulate Matter (PM _{2.5}); µg/m ³ GRC/LAB/STP/AIR/03, Gravimetric Method	Particulate Matter (PM ₁₀); µg/m ³ IS 5182 (Part 23):2006	Sulphur Dioxide (SO ₂); µg/m ³ IS 5182 (Part 2) :2001, Reaff.2006	Nitrogen Dioxide (NO ₂); µg/m ³ IS 5182 (Part 6) :2006	
1	03.11.2015	67.2	150.3	7.7	24.6	1040
2	07.11.2015	60.2	139.5	6.9	22.0	970
3	11.11.2015	74.9	160.3	8.1	23.9	910
4	14.11.2015	66.4	148.2	6.6	20.8	930
5	18.11.2015	61.4	141.4	6.0	19.0	890
6	21.11.2015	66.4	147.3	6.9	21.7	960
7	25.11.2015	63.2	145.2	7.3	25.8	1090
8	29.11.2015	61.3	137.7	6.0	18.8	940

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Test Report

Report Code: A20151228-081

Issue Date: 28.12.2015

Issued To: Industrial Estate at Barwala(HSIIDC),

Analysis Duration: 05.12.2015 to 27.12.2015

Distt:- Panchkula, Haryana

Sample Description: Ambient Air

RESULTS

Ambient Air Quality Analysis

SAMPLING DETAILS

Sampling Location	: Project Site
Sample Collected by	: Mr. Narendra & Mr. Mohit Gupta
Sampling Protocol	: GRC/LAB/STP/AIR/01
Weather Condition	: Clear Sky
Sampling Duration	: 24 Hours
Sampling Duration for CO	: 1 Hour
Sampler Location w.r.t. Height	: 4.0 Meter above Ground Level
Sample Packing & Marking	: Plastic Bottle / Zip Polybag & IE/OCT/A001-008

S. No.	Date	Test Parameter				
		Particulate Matter (PM2.5); $\mu\text{g}/\text{m}^3$ GRC/LAB/STP/AIR/03, Gravimetric Method	Particulate Matter (PM10); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 23):2006	Sulphur Dioxide (SO_2); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 2) :2001, Reaff.2006	Nitrogen Dioxide (NO_2); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 6) :2006	Carbon Monoxide, (CO) $\mu\text{g}/\text{m}^3$ IS 5182 (Part 10):1999, Reaff. 2003
1	04.12.2015	99.8	219.8	10.6	31.7	1730
2	07.12.2015	92.5	213.3	8.9	25.3	1460
3	10.12.2015	101.3	221.1	9.6	28.6	1620
4	13.12.2015	106.7	229.4	10.1	30.8	1540
5	16.12.2015	98.6	223.7	9.7	29.7	1500
6	19.12.2015	110.4	239.3	10.6	32.4	1590
7	22.12.2015	113.2	243.2	11.5	34.9	1840
8	25.12.2015	104.7	224.4	9.9	27.4	1590

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Test Report

Report Code: A20151228-082

Issue Date: 28.12.2015

Issued To: Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Analysis Duration: 05.12.2015 to 27.12.2015

Sample Description: Ambient Air

RESULTS

Ambient Air Quality Analysis

SAMPLING DETAILS

Sampling Location : Alipur
Sample Collected by : Mr. Narendra & Mr. Mohit Gupta
Sampling Protocol : GRC/LAB/STP/AIR/01
Weather Condition : Clear Sky
Sampling Duration : 24 Hours
Sampling Duration for CO : 1 Hour
Sampler Location w.r.t. Height : 4.0 Meter above Ground Level
Sample Packing & Marking : Plastic Bottle / Zip Polybag & IE/OCT/A001-008

S. No.	Date	Test Parameter				
		Particulate Matter (PM2.5); $\mu\text{g}/\text{m}^3$ GRC/LAB/STP/AIR/03, Gravimetric Method	Particulate Matter (PM10); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 23):2006	Sulphur Dioxide (SO_2); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 2) :2001, Reaff.2006	Nitrogen Dioxide (NO_2); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 6) :2006	Carbon Monoxide; (CO) $\mu\text{g}/\text{m}^3$ IS 5182 (Part 10):1999, Reaff. 2003
1	04.12.2015	97.1	190.4	9.6	30.6	1470
2	07.12.2015	90.4	182.6	7.9	23.9	1360
3	10.12.2015	102.5	197.2	8.7	27.5	1580
4	13.12.2015	107.1	203.3	9.2	29.7	1430
5	16.12.2015	100.1	199.8	8.8	28.6	1390
6	19.12.2015	96.3	209.2	9.7	31.3	1470
7	22.12.2015	106.8	219.3	9.4	33.8	1550
8	25.12.2015	102.7	200.5	9	26.3	1400

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Test Report

Report Code: A20151228-083

Issue Date: 28.12.2015

Issued To: Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Analysis Duration: 05.12.2015 to 27.12.2015

Sample Description: Ambient Air

RESULTS

Ambient Air Quality Analysis

SAMPLING DETAILS

Sampling Location	: Sukhdarshanpur
Sample Collected by	: Mr. Narendra & Mr. Mohit Gupta
Sampling Protocol	: GRC/LAB/STP/AIR/01
Weather Condition	: Clear Sky
Sampling Duration	: 24 Hours
Sampling Duration for CO	: 1 Hour
Sampler Location w.r.t. Height	: 4.0 Meter above Ground Level
Sample Packing & Marking	: Plastic Bottle / Zip Polybag & IE/OCT/A001-008

S. No.	Date	Test Parameter				
		Particulate Matter (PM2.5); $\mu\text{g}/\text{m}^3$ GRC/LAB/STP/AIR/03, Gravimetric Method	Particulate Matter (PM10); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 23):2006	Sulphur Dioxide (SO_2); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 2):2001, Reaff.2006	Nitrogen Dioxide (NO_2); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 6):2006	Carbon Monoxide, (CO) $\mu\text{g}/\text{m}^3$ IS 5182 (Part 10):1999, Reaff. 2003
1	04.12.2015	78.9	168.3	8.1	26.3	1110
2	07.12.2015	72.8	160.2	7.2	21.3	1040
3	10.12.2015	84.1	180.4	7.9	24.1	1240
4	13.12.2015	89.5	187.6	8.5	27.2	1130
5	16.12.2015	78.1	178.6	7.6	24.7	1060
6	19.12.2015	86.9	185.2	8.8	28.8	1190
7	22.12.2015	91.3	190.3	9.3	30.8	1310
8	25.12.2015	79.9	170.3	7.5	23.7	1090

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Test Report

Report Code: A20151228-084

Issue Date: 28.12.2015

Issued To: Industrial Estate at Barwala(HSIIDC),

Analysis Duration: 05.12.2015 to 27.12.2015

Distt:- Panchkula, Haryana

Sample Description: Ambient Air

RESULTS

Ambient Air Quality Analysis

SAMPLING DETAILS

Sampling Location	: Batwal
Sample Collected by	: Mr. Narendra & Mr. Mohit Gupta
Sampling Protocol	: GRC/LAB/STP/AIR/01
Weather Condition	: Clear Sky
Sampling Duration	: 24 Hours
Sampling Duration for CO	: 1 Hour
Sampler Location w.r.t. Height	: 4.0 Meter above Ground Level
Sample Packing & Marking	: Plastic Bottle / Zip Polybag & IE/OCT/A001-008

S. No.	Date	Test Parameter				
		Particulate Matter (PM2.5); $\mu\text{g}/\text{m}^3$ GRC/LAB/STP/AIR/03, Gravimetric Method	Particulate Matter (PM10); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 23):2006	Sulphur Dioxide (SO_2); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 2) :2001, Reaff.2006	Nitrogen Dioxide (NO_2); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 6) :2006	Carbon Monoxide, (CO) $\mu\text{g}/\text{m}^3$ IS 5182 (Part 10):1999, Reaff. 2003
1	04.12.2015	80.9	169.5	7.2	25.7	920
2	07.12.2015	84.4	174.0	7.4	27.3	1070
3	10.12.2015	80.4	166.6	6.3	22.8	980
4	13.12.2015	84.4	176.0	7.8	28.3	1070
5	16.12.2015	70.9	163.9	6.8	23.1	910
6	19.12.2015	82.3	172.0	7.4	30.5	1180
7	22.12.2015	79.6	167.6	8.1	27.3	1050
8	25.12.2015	75.8	158.0	6.5	23.5	1020

****End of Report****

Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: A20151228-085

Issue Date: 28.12.2015

Issued To: Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Analysis Duration: 05.12.2015 to 27.12.2015

Sample Description: Ambient Air

RESULTS

Ambient Air Quality Analysis

SAMPLING DETAILS

Sampling Location	: Raipur Rani
Sample Collected by	: Mr. Narendra & Mr. Mohit Gupta
Sampling Protocol	: GRC/LAB/STP/AIR/01
Weather Condition	: Clear Sky
Sampling Duration	: 24 Hours
Sampling Duration for CO	: 1 Hour
Sampler Location w.r.t. Height	: 4.0 Meter above Ground Level
Sample Packing & Marking	: Plastic Bottle / Zip Polybag & IE/OCT/A001-008

S. No.	Date	Test Parameter				
		Particulate Matter (PM2.5); $\mu\text{g}/\text{m}^3$	Particulate Matter (PM10); $\mu\text{g}/\text{m}^3$	Sulphur Dioxide (SO_2); $\mu\text{g}/\text{m}^3$	Nitrogen Dioxide (NO_2); $\mu\text{g}/\text{m}^3$	Carbon Monoxide, (CO) $\mu\text{g}/\text{m}^3$
		GRC/LAB/STP/AIR/03, Gravimetric Method	IS 5182 (Part 23):2006	IS 5182 (Part 2) :2001, Reaff.2006	IS 5182 (Part 6) :2006	IS 5182 (Part 10):1999, Reaff. 2003
1	04.12.2015	86.3	217.3	8.3	28.6	1020
2	07.12.2015	88.1	221.8	8.9	30.2	1170
3	10.12.2015	82.5	210.8	7.4	25.8	1060
4	13.12.2015	87.2	212.6	9.1	29.9	1260
5	16.12.2015	76.6	200.2	8.1	26.2	1020
6	19.12.2015	74.7	192.4	8.7	29.7	1230
7	22.12.2015	81.5	204.2	8.3	27.9	1100
8	25.12.2015	78.5	197.7	7.3	26.4	1190

End of Report



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Test Report

Report Code: A20151228-086

Issue Date: 28.12.2015

Issued To: Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Analysis Duration: 05.12.2015 to 27.12.2015

Sample Description: Ambient Air

RESULTS

Ambient Air Quality Analysis

SAMPLING DETAILS

Sampling Location	: Dhandaruru
Sample Collected by	: Mr. Narendra & Mr. Mohit Gupta
Sampling Protocol	: GRC/LAB/STP/AIR/01
Weather Condition	: Clear Sky
Sampling Duration	: 24 Hours
Sampling Duration for CO	: 1 Hour
Sampler Location w.r.t. Height	: 4.0 Meter above Ground Level
Sample Packing & Marking	: Plastic Bottle / Zip Polybag & IE/OCT/A001-008

S. No.	Date	Test Parameter				
		Particulate Matter (PM2.5); $\mu\text{g}/\text{m}^3$ GRC/LAB/STP/AIR/03, Gravimetric Method	Particulate Matter (PM10); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 23):2006	Sulphur Dioxide (SO ₂); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 2):2001, Reaff.2006	Nitrogen Dioxide (NO ₂); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 6):2006	Carbon Monoxide, (CO) $\mu\text{g}/\text{m}^3$ IS 5182 (Part 10):1999, Reaff. 2003
1	04.12.2015	73.6	165.2	7.6	26.9	830
2	07.12.2015	76.7	169.9	8.4	29.1	980
3	10.12.2015	69.8	158.7	6.7	24.8	870
4	13.12.2015	74.5	160.7	8.4	28.8	1070
5	16.12.2015	63.9	148.1	7.4	25.1	830
6	19.12.2015	62.0	140.5	8.2	28.6	1040
7	22.12.2015	68.8	152.1	7.6	26.8	910
8	25.12.2015	65.8	145.8	6.6	25.3	1000

****End of Report****



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Test Report

Report Code: A20151228-087

Issue Date: 28.12.2015

Issued To: Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Analysis Duration: 05.12.2015 to 27.12.2015

Sample Description: Ambient Air

RESULTS

Ambient Air Quality Analysis

SAMPLING DETAILS

Sampling Location	: Kheri
Sample Collected by	: Mr. Narendra & Mr. Mohit Gupta
Sampling Protocol	: GRC/LAB/STP/AIR/01
Weather Condition	: Clear Sky
Sampling Duration	: 24 Hours
Sampling Duration for CO	: 1 Hour
Sampler Location w.r.t. Height	: 4.0 Meter above Ground Level
Sample Packing & Marking	: Plastic Bottle / Zip Polybag & IE/OCT/A001-008

S. No.	Date	Test Parameter				
		Particulate Matter (PM2.5); $\mu\text{g}/\text{m}^3$ GRC/LAB/STP/AIR/03, Gravimetric Method	Particulate Matter (PM10); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 23):2006	Sulphur Dioxide (SO_2); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 2):2001, Reaff.2006	Nitrogen Dioxide (NO_2); $\mu\text{g}/\text{m}^3$ IS 5182 (Part 6):2006	Carbon Monoxide, (CO) $\mu\text{g}/\text{m}^3$ IS 5182 (Part 10):1999, Reaff. 2003
1	04.12.2015	71.9	156.5	7.0	28.4	890
2	07.12.2015	75.4	161.0	7.2	30.2	1040
3	10.12.2015	71.5	153.6	6.1	25.5	950
4	13.12.2015	75.4	163.0	7.6	31.1	1040
5	16.12.2015	61.9	150.9	6.6	25.8	880
6	19.12.2015	73.3	159.0	7.2	33.2	1150
7	22.12.2015	70.8	154.6	7.6	30.9	1060
8	25.12.2015	66.8	145.0	6.3	26.2	990

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Website: <http://www.grc-india.com>, E-mail : info@grc-india.com, lab@grc-india.com

Test Report

Report Code: A20151228-088

Issue Date: 28.12.2015

Issued To: Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Analysis Duration: 05.12.2015 to 27.12.2015

Sample Description: Ambient Air

RESULTS

Ambient Air Quality Analysis

SAMPLING DETAILS

Sampling Location	: Haripur
Sample Collected by	: Mr. Narendra & Mr. Mohit Gupta
Sampling Protocol	: GRC/LAB/STP/AIR/01
Weather Condition	: Clear Sky
Sampling Duration	: 24 Hours
Sampling Duration for CO	: 1 Hour
Sampler Location w.r.t. Height	: 4.0 Meter above Ground Level
Sample Packing & Marking	: Plastic Bottle / Zip Polybag & IE/OCT/A001-008

Test Parameter

S. No.	Date	Particulate Matter (PM2.5); $\mu\text{g}/\text{m}^3$	Particulate Matter (PM10); $\mu\text{g}/\text{m}^3$	Sulphur Dioxide (SO ₂); $\mu\text{g}/\text{m}^3$	Nitrogen Dioxide (NO ₂); $\mu\text{g}/\text{m}^3$	Carbon Monoxide, (CO) $\mu\text{g}/\text{m}^3$
		GRC/LAB/STP/AIR/03, Gravimetric Method	IS 5182 (Part 23):2006	IS 5182 (Part 2) :2001, Reaff.2006	IS 5182 (Part 6) :2006	IS 5182 (Part 10):1999, Reaff. 2003
1	04.12.2015	88.1	187.4	8.5	30.4	1170
2	07.12.2015	81.4	179.6	6.9	23.7	1060
3	10.12.2015	93.5	194.2	7.6	27.3	1280
4	13.12.2015	98.1	200.3	8.1	29.5	1130
5	16.12.2015	91.1	196.8	7.7	28.4	1090
6	19.12.2015	99.7	206.2	8.6	31.1	1170
7	22.12.2015	97.6	216.3	8.3	31.8	1250
8	25.12.2015	93.7	197.5	7.9	26.1	1100

****End of Report****

Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: A20151228-089

Issue Date: 28.12.2015

Issued To: Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Analysis Duration: 05.12.2015 to 27.12.2015

Sample Description: Ambient Air

RESULTS

Ambient Air Quality Analysis

SAMPLING DETAILS

Sampling Location	: Rehawar
Sample Collected by	: Mr. Narendra & Mr. Mohit Gupta
Sampling Protocol	: GRC/LAB/STP/AIR/01
Weather Condition	: Clear Sky
Sampling Duration	: 24 Hours
Sampling Duration for CO	: 1 Hour
Sampler Location w.r.t. Height	: 4.0 Meter above Ground Level
Sample Packing & Marking	: Plastic Bottle / Zip Polybag & 1E/OCT/A001-008

S. No.	Date	Test Parameter				Carbon Monoxide, (CO) $\mu\text{g}/\text{m}^3$
		Particulate Matter (PM2.5); $\mu\text{g}/\text{m}^3$	Particulate Matter (PM10); $\mu\text{g}/\text{m}^3$	Sulphur Dioxide (SO_2); $\mu\text{g}/\text{m}^3$	Nitrogen Dioxide (NO_2); $\mu\text{g}/\text{m}^3$	
		GRC/LAB/STP/AIR/03, Gravimetric Method	IS 5182 (Part 23):2006	IS 5182 (Part 2) :2001, Reaff.2006	IS 5182 (Part 6) :2006	IS 5182 (Part 10):1999, Reaff. 2003
1	04.12.2015	62.2	142.3	7.2	23.4	910
2	07.12.2015	56.1	134.2	6.1	18.3	840
3	10.12.2015	67.4	154.4	6.8	21.1	1040
4	13.12.2015	72.8	161.6	7.4	24.2	930
5	16.12.2015	61.4	152.6	6.4	21.7	860
6	19.12.2015	70.2	159.2	7.8	25.8	990
7	22.12.2015	74.3	164.3	6.3	27.6	1110
8	25.12.2015	63.2	144.3	6.7	20.7	890

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Test Report

Report Code: N20151104-001

Issue Date: 04.11.2015

Issued To : Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Data Received on: 03.11.2015

Sample Description: Ambient Noise

RESULTS

Ambient Noise Level

MONITORING DETAILS

Date of Monitoring : 02.11.2015
Monitoring Done by : Mr. Mohit Gupta
Monitoring Protocol : GRC/LAB/STP/NOISE/01
Weather Condition : Clear Sky
Monitoring Duration : 24 Hours

S. No.	LOCATION	ZONE	Limit for As Per E(P)A,1986 ;Leq, dB (A)		Observed Value Leq, dB (A)	
			Day Time*	Night Time**	Day Time*	Night Time**
1	Project Site	Industrial Area	75	70	63.4	51.2
2	Alipur	Residential Area	55	45	56.8	46.7
3	Raipur Rani	Residential Area	55	45	53.3	36.5
4	Balaji Medicentre	Silence zone	50	40	52.9	39.6
5	Mt.Litera Zee School	Silence zone	50	40	51.3	38.6
	* Day Time	6.00 a.m. to 10.00 p.m				
	**Night Time	10.00 p.m. to 6.00 a.m.				

End of Report

Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: W20151014-081

Issue Date: 14.10.2015

Issued To : Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Sample Received on: 06.10.2015
Analysis Duration: 07.10.2015 to 13.10.2015

Sample Description: Ground Water

RESULTS

Water Quality Analysis

SAMPLING DETAILS

Date of Sampling	: 06.10.2015
Sampling Location	: Project Site
Sample Collected by	: Mr. Narendra
Sampling Protocol	: IS-3025(Pt-1)-1987 Reaff : 2003 & IS-1622- 1981(Reaff.2003)
Weather Condition	: Clear Sky
Sample Quantity	: 5 L+500 ml
Sample Packing & Mark	: Plastic/ Glass Bottle & IE/OCT/GW1

S. No.	Parameters	Units	Limits (as per IS:10500-2012)		Results	Test Method
			Desirable Limit	Permissible Limit		
1	Color	Hazen	5	15	<5	IS : 3025(Pt-4) 1983, Reaff. 2003
2	Odour	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-5) 1983, Reaff. 2002
3	Taste	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-8)-1984, Reaff. 2006
4	Turbidity	NTU	1	5	1	IS: 3025(Pt-10)-1984,Reaff. 2006
5	pH	-	6.5-8.5	No Relaxation	7.59	IS : 3025(Pt-11)1983, Reaff. 2002
6	Total Hardness (as CaCO ₃)	mg/l	200	600	370	IS : 3025(Pt-21)1983, Reaff. 2009
7	Iron (as Fe)	mg/l	0.3	No Relaxation	0.6	APHA 22 nd Ed., 3120B (ICP-OES)/ 3111B (AAS),
8	Chlorides (as Cl)	mg/l	250	1000	196	IS : 3025(Pt-32)1988, Reaff. 2003
9	Fluoride (as F)	mg/l	1	1.5	0.8	APHA 22 nd Ed., 4500F(D)
10	TDS	mg/l	500	2000	855	IS: 3025(Pt-16)1984, Reaff. 2006
11	Calcium (as Ca ²⁺)	mg/l	75	200	89	IS : 3025(Pt-40)1991, Reaff. 2003
12	Magnesium (as Mg ²⁺)	mg/l	30	100	35	APHA 22 nd Ed., 3500-Mg (B)
13	Copper (as Cu)	mg/l	0.05	1.5	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B (AAS)
14	Manganese(as Mn)	mg/l	0.1	0.3	0.05	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B(AAS)
15	Sulphate (as SO ₄)	mg/l	200	400	85	IS : 3025(Pt-24)1986, Reaff. 2003
16	Nitrate(as NO ₃)	mg/l	45	No Relaxation	6	IS : 3025(Pt-34)1988, Reaff. 2003

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Test Report

Report Code: W20151014-081

Issue Date: 14.10.2015

17	Phenolic Compounds (as C ₆ H ₅ OH)	mg/l	0.001	0.002	<0.001	APHA 22 nd Ed., 5530 (c)
18	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	APHA 22 nd Ed. 3120 B (ICP-OES-VGA), 3112 (AAS-VGA)
19	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.001	APHA 22 nd Ed., 3120 B (ICP-OES) / 3111B (AAS)
20	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES) / 3114, AAS-VGA
21	Arsenic (as As)	mg/l	0.01	0.05	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES) / 3114, AAS-VGA
22	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.01	APHA 22 nd Ed., 4500 CN
23	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES) / 3111B AAS
24	Zinc (as Zn)	mg/l	5	15	0.18	APHA 22 nd Ed., 3120 B (ICP-OES) / 3111 B (AAS)
25	Anionic Detergent (as MBAS)	mg/l	0.2	1	<0.01	APHA 22 nd Ed., 5540 (c)
26	Chromium (as Cr ⁶⁺)	mg/l	0.05	No Relaxation	<0.01	IS : 3025(Pt-52)-2003
27	Mineral oil	mg/l	0.5	No Relaxation	<0.1	IS: 3025(Pt-39)1991, Reaff. 2003
28	Alkalinity (as CaCO ₃)	mg/l	200	600	336	IS: 3025(Pt-23)1986, Reaff. 2003
29	Aluminum (as Al)	mg/l	0.03	0.2	<0.02	APHA 22 nd Ed. 3120 B (ICP-OES) / 3111 B (AAS) / IS 3025 (pt-55) 2003
30	Boron (as B)	mg/l	0.5	1	0.2	IS: 3025(Pt-57):2005, APHA 22 nd Ed., 3120 B (ICP-OES)
Bacteriological Parameters						
1	Total Coli form	MPN/100ml	Shall Not Be Detectable		Not Detected (<2)	IS : 1622-1981 (Reaff.2003)
2	E.coli	E.coli/100ml	Shall Not Be Detectable		Absent	IS : 1622-1981 (Reaff.2003)

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Test Report

Report Code: W20151014-082

Issue Date: 14.10.2015

**Issued To : Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana**

**Sample Received on: 06.10.2015
Analysis Duration: 07.10.2015 to 13.10.2015**

Sample Description: Ground Water

RESULTS

Water Quality Analysis

SAMPLING DETAILS

Date of Sampling	: 06.10.2015
Sampling Location	: Alipur
Sample Collected by	: Mr. Narendra
Sampling Protocol	: IS-3025(Pt-1)-1987 Reaff : 2003 & IS-1622- 1981(Reaff.:2003)
Weather Condition	: Clear Sky
Sample Quantity	: 5 L+500 ml
Sample Packing & Mark	: Plastic/ Glass Bottle & IE/OCT/GW2

S. No.	Parameters	Units	Limits (as per IS:10500-2012)		Results	Test Method
			Desirable Limit	Permissible Limit		
1	Color	Hazen	5	15	<5	IS : 3025(Pt-4) 1983, Reaff. 2003
2	Odour	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-5) 1983, Reaff. 2002
3	Taste	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-8)-1984, Reaff. 2006
4	Turbidity	NTU	1	5	1	IS : 3025(Pt-10)-1984, Reaff. 2006
5	pH	-	6.5-8.5	No Relaxation	7.74	IS : 3025(Pt-11)1983, Reaff. 2002
6	Total Hardness (as CaCO ₃)	mg/l	200	600	340	IS : 3025(Pt-21)1983, Reaff. 2009
7	Iron (as Fe)	mg/l	0.3	No Relaxation	0.7	APHA 22 nd Ed., 3120B (ICP-OES)/ 3111B (AAS),
8	Chlorides (as Cl)	mg/l	250	1000	155	IS : 3025(Pt-32)1988, Reaff. 2003
9	Fluoride (as F)	mg/l	1	1.5	0.6	APHA 22 nd Ed., 4500F(D)
10	TDS	mg/l	500	2000	809	IS : 3025(Pt-16)1984, Reaff. 2006
11	Calcium (as Ca ²⁺)	mg/l	75	200	82	IS : 3025(Pt-40)1991, Reaff. 2003
12	Magnesium (as Mg ²⁺)	mg/l	30	100	33	APHA 22 nd Ed., 3500-Mg (B)
13	Copper (as Cu)	mg/l	0.05	1.5	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B (AAS)
14	Manganese(as Mn)	mg/l	0.1	0.3	0.02	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B(AAS)
15	Sulphate (as SO ₄)	mg/l	200	400	92	IS : 3025(Pt-24)1986, Reaff. 2003
16	Nitrate(as NO ₃)	mg/l	45	No Relaxation	7	IS : 3025(Pt-34)1988, Reaff. 2003

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Test Report

Report Code: W20151014-082

Issue Date: 14.10.2015

17	Phenolic Compounds (as C ₆ H ₅ OH)	mg/l	0.001	0.002	<0.001	APHA 22 nd Ed., 5530 (c)
18	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	APHA 22 nd Ed. 3120 B (ICP-OES-VGA), 3112 (AAS-VGA)
19	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.001	APHA 22 nd Ed., 3120 B (ICP-OES) / 3111B (AAS)
20	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES) / 3114, AAS-VGA
21	Arsenic (as As)	mg/l	0.01	0.05	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES) / 3114, AAS-VGA
22	Cyanide (as CN ⁻)	mg/l	0.05	No Relaxation	<0.01	APHA 22 nd Ed., 4500 CN
23	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES) / 3111B AAS
24	Zinc (as Zn)	mg/l	5	15	0.15	APHA 22 nd Ed., 3120 B (ICP-OES) / 3111 B (AAS)
25	Anionic Detergent (as MBAS)	mg/l	0.2	1	<0.1	APHA 22 nd Ed., 5540 (c)
26	Chromium (as Cr ⁶⁺)	mg/l	0.05	No Relaxation	<0.01	IS : 3025(Pt-52)-2003
27	Mineral oil	mg/l	0.5	No Relaxation	<0.1	IS: 3025(Pt-39)1991, Reaff. 2003
28	Alkalinity (as CaCO ₃)	mg/l	200	600	350	IS: 3025(Pt-23)1986, Reaff. 2003
29	Aluminum (as Al)	mg/l	0.03	0.2	<0.02	APHA 22 nd Ed. 3120 B (ICP-OES) / 3111 B (AAS) / IS 3025 (pt-55) 2003
30	Boron (as B)	mg/l	0.5	1	0.2	IS: 3025(Pt-57):2005, APHA 22 nd Ed., 3120 B (ICP-OES)
Bacteriological Parameters						
1	Total Coli form	MPN/100ml	Shall Not Be Detectable	Not Detected (<2)	IS : 1622-1981 (Reaff.2003)	
2	E.coli	E.coli/100ml	Shall Not Be Detectable	Absent	IS : 1622-1981 (Reaff.2003)	

** End of Report **



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GRC India

Test Report

Report Code: W20151014-083

Issue Date: 14.10.2015

Issued To : Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Sample Received on: 06.10.2015

Sample Description: Ground Water

Analysis Duration: 07.10.2015 to 13.10.2015

RESULTS

Water Quality Analysis

SAMPLING DETAILS

Date of Sampling	: 06.10.2015
Sampling Location	: Sukhdarshanpur
Sample Collected by	: Mr. Narendra
Sampling Protocol	: IS-3025(Pt-1)-1987 Reaff : 2003 & IS-1622- 1981(Reaff.2003)
Weather Condition	: Clear Sky
Sample Quantity	: 5 L+500 ml
Sample Packing & Mark	: Plastic/ Glass Bottle & IE/OCT/GW3

S. No.	Parameters	Units	Limits (as per IS:10500-2012)		Results	Test Method
			Desirable Limit	Permissible Limit		
1	Color	Hazen	5	15	<5	IS : 3025(Pt-4) 1983, Reaff. 2003
2	Odour	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-5) 1983, Reaff. 2002
3	Taste	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-8)-1984, Reaff. 2006
4	Turbidity	NTU	1	5	1	IS: 3025(Pt-10)-1984, Reaff. 2006
5	pH	-	6.5-8.5	No Relaxation	7.56	IS : 3025(Pt-11)1983, Reaff. 2002
6	Total Hardness (as CaCO ₃)	mg/l	200	600	310	IS : 3025(Pt-21)1983, Reaff. 2009
7	Iron (as Fe)	mg/l	0.3	No Relaxation	0.6	APHA 22 nd Ed., 3120B (ICP-OES)/ 3111B (AAS),
8	Chlorides (as Cl)	mg/l	250	1000	185	IS : 3025(Pt-32)1988, Reaff. 2003
9	Fluoride (as F)	mg/l	1	1.5	0.6	APHA 22 nd Ed., 4500F(D)
10	TDS	mg/l	500	2000	763	IS: 3025(Pt-16)1984, Reaff. 2006
11	Calcium (as Ca ²⁺)	mg/l	75	200	74	IS : 3025(Pt-40)1991, Reaff. 2003
12	Magnesium (as Mg ²⁺)	mg/l	30	100	30	APHA 22 nd Ed., 3500-Mg (B)
13	Copper (as Cu)	mg/l	0.05	1.5	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B (AAS)
14	Manganese(as Mn)	mg/l	0.1	0.3	0.03	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B(AAS)
15	Sulphate (as SO ₄)	mg/l	200	400	75	IS : 3025(Pt-24)1986, Reaff. 2003
16	Nitrate(as NO ₃)	mg/l	45	No Relaxation	5	IS : 3025(Pt-34)1988, Reaff. 2003

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(Seal & Signature)

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Head Office: F-375, Sec-63, NOIDA - 201 301,
 Ph. No.: 0120-4044630, 4044660, 4323120, Fax: 0120-2406519
 Website: <http://www.grc-india.com>, E-mail: info@grc-india.com, lab@grc-india.com

Test Report

Report Code: W20151014-083

Issue Date: 14.10.2015

17	Phenolic Compounds (as C ₆ H ₅ OH)	mg/l	0.001	0.002	<0.001	APHA 22 nd Ed., 5530 (c)
18	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	APHA 22 nd Ed. 3120 B (ICP-OES-VGA), 3112 (AAS-VGA)
19	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.001	APHA 22 nd Ed. 3120 B (ICP-OES)/3111B (AAS)
20	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3114, AAS-VGA
21	Arsenic (as As)	mg/l	0.01	0.05	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3114, AAS-VGA
22	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.01	APHA 22 nd Ed., 4500 CN
23	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/3111B AAS
24	Zinc (as Zn)	mg/l	5	15	0.12	APHA 22 nd Ed., 3120 B (ICP-OES) / 3111 B (AAS)
25	Anionic Detergent (as MBAS)	mg/l	0.2	1	<0.01	APHA 22 nd Ed., 5540 (c)
26	Chromium (as Cr ⁶⁺)	mg/l	0.05	No Relaxation	<0.01	IS : 3025(Pt-52)-2003
27	Mineral oil	mg/l	0.5	No Relaxation	<0.1	IS: 3025(Pt-39)1991, Reaff. 2003
28	Alkalinity (as CaCO ₃)	mg/l	200	600	285	IS: 3025(Pt-23)1986, Reaff. 2003
29	Aluminum (as Al)	mg/l	0.03	0.2	<0.02	APHA 22 nd Ed. 3120 B (ICP-OES)/ 3111 B (AAS)/IS 3025 (pt-55)2003
30	Boron (as B)	mg/l	0.5	1	0.1	IS: 3025(Pt-57):2005, APHA 22 nd Ed., 3120 B (ICP-OES)
Bacteriological Parameters						
1	Total Coli form	MPN/100ml	Shall Not Be Detectable	Not Detected (<2)	IS : 1622-1981 (Reaff.2003)	
2	E.coli	E.coli/100ml	Shall Not Be Detectable	Absent	IS : 1622-1981 (Reaff.2003)	

** End of Report **

Authorized Signatory
 (Seal & Signature)

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Ph. No.: 0120 - 4044630, 4044660, 4323120, Fax: 0120 - 2406519
Website: <http://www.grc-india.com>, E-mail: info@grc-india.com, lab@grc-india.com

Test Report

Report Code: W20151014-084

Issue Date: 14.10.2015

Issued To : Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Sample Received on: 06.10.2015
Analysis Duration: 07.10.2015 to 13.10.2015

Sample Description: Ground Water

RESULTS

Water Quality Analysis

SAMPLING DETAILS

Date of Sampling : 06.10.2015
 Sampling Location : Batwal
 Sample Collected by : Mr. Narendra
 Sampling Protocol : IS-3025(Pt-1)-1987 Reaff: 2003 & IS-1622- 1981(Reaff.2003)
 Weather Condition : Clear Sky
 Sample Quantity : 5 L+500 ml
 Sample Packing & Mark : Plastic/ Glass Bottle & IE/OCT/GW4

S. No.	Parameters	Units	Limits (as per IS:10500-2012)		Results	Test Method
			Desirable Limit	Permissible Limit		
1	Color	Hazen	5	15	<5	IS : 3025(Pt-4)-1983, Reaff. 2003
2	Odour	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-5) 1983, Reaff. 2002
3	Taste	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-8)-1984, Reaff. 2006
4	Turbidity	NTU	1	5	1	IS : 3025(Pt-10)-1984, Reaff. 2006
5	pH	-	6.5-8.5	No Relaxation	7.52	IS : 3025(Pt-11)1983, Reaff. 2002
6	Total Hardness (as CaCO ₃)	mg/l	200	600	327	IS : 3025(Pt-21)1983, Reaff. 2009
7	Iron (as Fe)	mg/l	0.3	No Relaxation	0.4	APHA 22 nd Ed., 3120B (ICP-OES)/ 3111B (AAS),
8	Chlorides (as Cl)	mg/l	250	1000	196	IS : 3025(Pt-32)1988, Reaff. 2003
9	Fluoride (as F)	mg/l	1	1.5	0.9	APHA 22 nd Ed., 4500F(D)
10	TDS	mg/l	500	2000	828	IS : 3025(Pt-16)1984, Reaff. 2006
11	Calcium (as Ca ²⁺)	mg/l	75	200	79	IS : 3025(Pt-40)1991, Reaff. 2003
12	Magnesium (as Mg ²⁺)	mg/l	30	100	31	APHA 22 nd Ed., 3500-Mg (B)
13	Copper (as Cu)	mg/l	0.05	1.5	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B (AAS)
14	Manganese(as Mn)	mg/l	0.1	0.3	0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B(AAS)
15	Sulphate (as SO ₄)	mg/l	200	400	86	IS : 3025(Pt-24)1986, Reaff. 2003
16	Nitrate(as NO ₃)	mg/l	45	No Relaxation	5	IS : 3025(Pt-34)1988, Reaff. 2003

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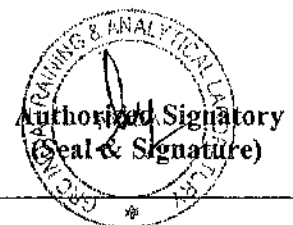
Test Report

Report Code: W20151014-084

Issue Date: 14.10.2015

17	Phenolic Compounds (as C ₆ H ₅ OH)	mg/l	0.001	0.002	<0.001	APHA 22 nd Ed., 5530 (c)
18	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	APHA 22 nd Ed. 3120 B (ICP-OES-VGA), 3112 (AAS-VGA)
19	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.001	APHA 22 nd Ed., 3120 B (ICP-OES) / 3111B (AAS)
20	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES) / 3114, AAS-VGA
21	Arsenic (as As)	mg/l	0.01	0.05	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES) / 3114, AAS-VGA
22	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.01	APHA 22 nd Ed., 4500 CN
23	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES) / 3111B AAS
24	Zinc (as Zn)	mg/l	5	15	0.09	APHA 22 nd Ed., 3120 B (ICP-OES) / 3111 B (AAS)
25	Anionic Detergent (as MBAS)	mg/l	0.2	1	<0.01	APHA 22 nd Ed., 5540 (c)
26	Chromium (as Cr ⁶⁺)	mg/l	0.05	No Relaxation	<0.01	IS : 3025(Pt-52)-2003
27	Mineral oil	mg/l	0.5	No Relaxation	<0.1	IS: 3025(Pt-39)1991, Reaff. 2003
28	Alkalinity (as CaCO ₃)	mg/l	200	600	310	IS: 3025(Pt-23)1986, Reaff. 2003
29	Aluminium (as Al)	mg/l	0.03	0.2	<0.02	APHA 22 nd Ed. 3120 B (ICP-OES) / 3111 B (AAS) / IS 3025 (pt-55) 2003
30	Boron (as B)	mg/l	0.5	1	0.1	IS: 3025(Pt-57):2005, APHA 22 nd Ed., 3120 B (ICP-OES)
Bacteriological Parameters						
1	Total Coli form	MPN/100ml	Shall Not Be Detectable	Not Detected (<2)	IS : 1622-1981 (Reaff.2003)	
2	E.coli	E.coli/100ml	Shall Not Be Detectable	Absent	IS : 1622-1981 (Reaff.2003)	

** End of Report **



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Test Report

Report Code: W20151014-085

Issue Date: 14.10.2015

Issued To : Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Sample Received on: 06.10.2015

Analysis Duration: 07.10.2015 to 13.10.2015

Sample Description: Ground Water

RESULTS

Water Quality Analysis

SAMPLING DETAILS

Date of Sampling	: 06.10.2015
Sampling Location	: Raipur Rani
Sample Collected by	: Mr. Narendra
Sampling Protocol	: IS-3025(Pt-1)-1987 Reaff: 2003 & IS-1622- 1981(Reaff.:2003)
Weather Condition	: Clear Sky
Sample Quantity	: 5 L+500 ml
Sample Packing & Mark	: Plastic/ Glass Bottle & IE/OCT/GW5

S. No.	Parameters	Units	Limits (as per IS:10500-2012)		Results	Test Method
			Desirable Limit	Permissible Limit		
1	Color	Hazen	5	15	<5	IS : 3025(Pt-4)-1983, Reaff. 2003
2	Odour	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-5) 1983, Reaff. 2002
3	Taste	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-8)-1984, Reaff. 2006
4	Turbidity	NTU	1	5	1	IS : 3025(Pt-10)-1984, Reaff. 2006
5	pH	-	6.5-8.5	No Relaxation	7.61	IS : 3025(Pt-11)1983, Reaff. 2002
6	Total Hardness (as CaCO ₃)	mg/l	200	600	295	IS : 3025(Pt-21)1983, Reaff. 2009
7	Iron (as Fe)	mg/l	0.3	No Relaxation	0.5	APHA 22 nd Ed., 3120B (ICP-OES)/ 3111B (AAS),
8	Chlorides (as Cl)	mg/l	250	1000	163	IS : 3025(Pt-32)1988, Reaff. 2003
9	Fluoride (as F)	mg/l	1	1.5	0.6	APHA 22 nd Ed., 4500F(D)
10	TDS	mg/l	500	2000	785	IS : 3025(Pt-16)1984, Reaff. 2006
11	Calcium (as Ca ²⁺)	mg/l	75	200	71	IS : 3025(Pt-40)1991, Reaff. 2003
12	Magnesium (as Mg ²⁺)	mg/l	30	100	28	APHA 22 nd Ed., 3500-Mg (B)
13	Copper (as Cu)	mg/l	0.05	1.5	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B (AAS)
14	Manganese(as Mn)	mg/l	0.1	0.3	0.02	APHA-22 nd Ed., 3120 B (ICP-OES)/ 3111B(AAS)
15	Sulphate (as SO ₄)	mg/l	200	400	91	IS : 3025(Pt-24)1986, Reaff. 2003
16	Nitrate(as NO ₃)	mg/l	45	No Relaxation	4	IS : 3025(Pt-34)1988, Reaff. 2003


 Authorized Signatory
 (Seal & Signature)

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Test Report

Report Code: W20151014-085

Issue Date: 14.10.2015

17	Phenolic Compounds (as C ₆ H ₅ OH)	mg/l	0.001	0.002	<0.001	APHA 22 nd Ed., 5530 (c)
18	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	APHA 22 nd Ed. 3120 B (ICP-OES-VGA), 3112 (AAS-VGA)
19	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.001	APHA 22 nd Ed., 3120 B (ICP-OES)/3111B (AAS)
20	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3114, AAS-VGA
21	Arsenic (as As)	mg/l	0.01	0.05	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3114, AAS-VGA
22	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.01	APHA 22 nd Ed., 4500 CN
23	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/3111B AAS
24	Zinc (as Zn)	mg/l	5	15	0.15	APHA 22 nd Ed., 3120 B (ICP-OES) / 3111 B (AAS)
25	Anionic Detergent (as MBAS)	mg/l	0.2	1	<0.01	APHA 22 nd Ed., 5540 (c)
26	Chromium (as Cr ⁶⁺)	mg/l	0.05	No Relaxation	<0.01	IS : 3025(Pt-52)-2003
27	Mineral oil	mg/l	0.5	No Relaxation	<0.1	IS: 3025(Pt-39)1991, Reaff. 2003
28	Alkalinity (as CaCO ₃)	mg/l	200	600	316	IS: 3025(Pt-23)1986, Reaff. 2003
29	Aluminum (as Al)	mg/l	0.03	0.2	<0.02	APHA 22 nd Ed. 3120 B (ICP-OES)/ 3111 B (AAS)/IS 3025 (pt-55)2003
30	Boron (as B)	mg/l	0.5	1	0.1	IS: 3025(Pt-57)-2005, APHA 22 nd Ed., 3120 B (ICP-OES)
Bacteriological Parameters						
1	Total Coli form	MPN/100ml	Shall Not Be Detectable	Not Detected (<2)		IS : 1622-1981 (Reaff.2003)
2	<u>E.coli</u>	<u>E.coli</u> /100ml	Shall Not Be Detectable	Absent		IS : 1622-1981 (Reaff.2003)

** End of Report **



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Website: <http://www.grc-india.com>, E-mail: info@grc-india.com, lab@grc-india.com

Test Report

Report Code: W20151014-086

Issue Date: 14.10.2015

Issued To : Industrial Estate at Barwala(HSIIDC),

Distt:- Panchkula, Haryana

Sample Description: Ground Water

Sample Received on: 06.10.2015

Analysis Duration: 07.10.2015 to 13.10.2015

RESULTS

Water Quality Analysis

SAMPLING DETAILS

Date of Sampling	: 06.10.2015
Sampling Location	: Dhandaruru
Sample Collected by	: Mr. Narendra
Sampling Protocol	: IS-3025(Pt-1)-1987 Reaff: 2003 & IS-1622- 1981(Reaff.2003)
Weather Condition	: Clear Sky
Sample Quantity	: 5 L+500 ml
Sample Packing & Mark	: Plastic/ Glass Bottle & IB/OCT/GW6

S. No.	Parameters	Units	Limits (as per IS:10500-2012)		Results	Test Method
			Desirable Limit	Permissible Limit		
1	Color	Hazen	5	15	<5	IS : 3025(Pt-4) 1983, Reaff. 2003
2	Odour	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-5) 1983, Reaff. 2002
3	Taste	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-8)-1984, Reaff. 2006
4	Turbidity	NTU	1	5	1	IS : 3025(Pt-10)-1984, Reaff. 2006
5	pH	-	6.5-8.5	No Relaxation	7.51	IS : 3025(Pt-11)1983, Reaff. 2002
6	Total Hardness (as CaCO ₃)	mg/l	200	600	312	IS : 3025(Pt-21)1983, Reaff. 2009
7	Iron (as Fe)	mg/l	0.3	No Relaxation	0.6	APHA 22 nd Ed., 3120B (ICP-OES)/ 3111B (AAS),
8	Chlorides (as Cl)	mg/l	250	1000	141	IS : 3025(Pt-32)1988, Reaff. 2003
9	Fluoride (as F)	mg/l	1	1.5	0.3	APHA 22 nd Ed., 4500F(D)
10	TDS	mg/l	500	2000	738	IS : 3025(Pt-16)1984, Reaff. 2006
11	Calcium (as Ca ²⁺)	mg/l	75	200	75	IS : 3025(Pt-40)1991, Reaff. 2003
12	Magnesium (as Mg ²⁺)	mg/l	30	100	30	APHA 22 nd Ed., 3500-Mg (B)
13	Copper (as Cu)	mg/l	0.05	1.5	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B (AAS)
14	Manganese(as Mn)	mg/l	0.1	0.3	0.02	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B(AAS)
15	Sulphate (as SO ₄)	mg/l	200	400	69	IS : 3025(Pt-24)1986, Reaff. 2003
16	Nitrate(as NO ₃)	mg/l	45	No Relaxation	3	IS : 3025(Pt-34)1988, Reaff. 2003

Authorized Signatory
(Seal & Signature)



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GRC India

Test Report

Report Code: W20151014-086

Issue Date: 14.10.2015

17	Phenolic Compounds (as C ₆ H ₅ OH)	mg/l	0.001	0.002	<0.001	APHA 22 nd Ed., 5530 (c)
18	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	APHA 22 nd Ed. 3120 B (ICP-OES-VGA), 3112 (AAS-VGA)
19	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.001	APHA 22 nd Ed., 3120 B (ICP-OES) / 3111B (AAS)
20	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES) / 3114, AAS-VGA
21	Arsenic (as As)	mg/l	0.01	0.05	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES) / 3114, AAS-VGA
22	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.01	APHA 22 nd Ed., 4500 CN
23	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES) / 3111B AAS
24	Zinc (as Zn)	mg/l	5	15	0.08	APHA 22 nd Ed., 3120 B (ICP-OES) / 3111 B (AAS)
25	Anionic Detergent (as MBAS)	mg/l	0.2	1	<0.01	APHA 22 nd Ed., 5540 (c)
26	Chromium (as Cr ⁶⁺)	mg/l	0.05	No Relaxation	<0.01	IS : 3025(Pt-52)-2003
27	Mineral oil	mg/l	0.5	No Relaxation	<0.1	IS: 3025(Pt-39)1991, Reaff. 2003
28	Alkalinity (as CaCO ₃)	mg/l	200	600	342	IS: 3025(Pt-23)1986, Reaff. 2003
29	Aluminum (as Al)	mg/l	0.03	0.2	<0.02	APHA 22 nd Ed 3120 B (ICP-OES) / 3111 B (AAS) IS 3025 (pt-55) 2003
30	Boron (as B)	mg/l	0.5	1	0.1	IS: 3025(Pt-57):2005, APHA 22 nd Ed., 3120 B (ICP-OES)
Bacteriological Parameters						
1	Total Coli form	MPN/100ml	Shall Not Be Detectable	Not Detected (<2)	IS : 1622-1981 (Reaff.2003)	
2	<u>E.coli</u>	<u>E.coli</u> /100ml	Shall Not Be Detectable	Absent	IS : 1622-1981 (Reaff.2003)	

**** End of Report ****

Authorized Signatory
(Seal & Signature)

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Head Office: F-375, Sec-63, NOIDA - 201 301,
Ph. No.: 0120 - 4044630, 4044660, 4323120, Fax: 0120 - 2406519
Website: <http://www.grc-india.com>, E-mail: info@grc-india.com, lab@grc-india.com

Test Report

Report Code: W20151014-087

Issue Date: 14.10.2015

Issued To : Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana
Sample Description: Ground Water

Sample Received on: 06.10.2015
Analysis Duration: 07.10.2015 to 13.10.2015

RESULTS

Water Quality Analysis

SAMPLING DETAILS

Date of Sampling : 06.10.2015
Sampling Location : Kheri
Sample Collected by : Mr. Narendra
Sampling Protocol : IS-3025(Pt-1)-1987 Reaff: 2003 & IS-1622- 1981(Reaff:2003)
Weather Condition : Clear Sky
Sample Quantity : 5 L+500 ml
Sample Packing & Mark : Plastic/ Glass Bottle & IE/OCT/GW7

S. No.	Parameters	Units	Limits (as per IS:10500-2012)		Results	Test Method
			Desirable Limit	Permissible Limit		
1	Color	Hazen	5	15	<5	IS : 3025(Pt-4) 1983, Reaff. 2003
2	Odour	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-5) 1983, Reaff. 2002
3	Taste	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-8)-1984, Reaff. 2006
4	Turbidity	NTU	1	5	1	IS: 3025(Pt-10)-1984, Reaff. 2006
5	pH	-	6.5-8.5	No Relaxation	7.63	IS : 3025(Pt-11)1983, Reaff. 2002
6	Total Hardness (as CaCO ₃)	mg/l	200	600	327	IS : 3025(Pt-21)1983, Reaff. 2009
7	Iron (as Fe)	mg/l	0.3	No Relaxation	0.3	APHA 22 nd Ed., 3120B (ICP-OES)/ 3111B (AAS),
8	Chlorides (as Cl)	mg/l	250	1000	132	IS : 3025(Pt-32)1988, Reaff. 2003
9	Fluoride (as F)	mg/l	1	1.5	0.9	APHA 22 nd Ed., 4500F(D)
10	TDS	mg/l	500	2000	682	IS: 3025(Pt-16)1984, Reaff. 2006
11	Calcium (as Ca ²⁺)	mg/l	75	200	78	IS : 3025(Pt-40)1991, Reaff. 2003
12	Magnesium (as Mg ²⁺)	mg/l	30	100	32	APHA 22 nd Ed., 3500-Mg (B)
13	Copper (as Cu)	mg/l	0.05	1.5	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B (AAS)
14	Manganese(as Mn)	mg/l	0.1	0.3	0.02	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B(AAS)
15	Sulphate (as SO ₄)	mg/l	200	400	74	IS : 3025(Pt-24)1986, Reaff. 2003
16	Nitrate(as NO ₃)	mg/l	45	No Relaxation	4	IS : 3025(Pt-34)1988, Reaff. 2003

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Test Report

Report Code: W20151014-087

Issue Date: 14.10.2015

17	Phenolic Compounds (as C ₆ H ₅ OH)	mg/l	0.001	0.002	<0.001	APHA 22 nd Ed., 5530 (c)
18	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	APHA 22 nd Ed. 3120 B (ICP-OES-VGA), 3112 (AAS-VGA)
19	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.001	APHA 22 nd Ed. 3120 B (ICP-OES)/3111B (AAS)
20	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed. 3120 B (ICP-OES)/3114, AAS-VGA
21	Arsenic (as As)	mg/l	0.01	0.05	<0.01	APHA 22 nd Ed. 3120 B (ICP-OES)/3114, AAS-VGA
22	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.01	APHA 22 nd Ed., 4500 CN
23	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/3111B AAS
24	Zinc (as Zn)	mg/l	5	15	0.11	APHA 22 nd Ed., 3120 B (ICP-OES) / 3111 B (AAS)
25	Anionic Detergent (as MBAS)	mg/l	0.2	1	<0.01	APHA 22 nd Ed., 5540 (c)
26	Chromium (as Cr ⁶⁺)	mg/l	0.05	No Relaxation	<0.01	IS : 3025(Pt-52)-2003
27	Mineral oil	mg/l	0.5	No Relaxation	<0.1	IS: 3025(Pt-39)1991, Reaff. 2003
28	Alkalinity (as CaCO ₃)	mg/l	200	600	298	IS: 3025(Pt-23)1986, Reaff. 2003
29	Aluminium (as Al)	mg/l	0.03	0.2	<0.02	APHA 22 nd Ed. 3120 B (ICP-OES)/3111 B (AAS)/IS-3025 (pt-55)2003
30	Boron (as B)	mg/l	0.5	1	0.2	IS: 3025(Pt-57):2005, APHA 22 nd Ed. 3120 B (ICP-OES)
Bacteriological Parameters						
1	Total Coli form	MPN/100ml	Shall Not Be Detectable	Not Detected (<2)	IS : 1622-1981 (Reaff.2003)	
2	E.coli	E.coli/100ml	Shall Not Be Detectable	Absent	IS : 1622-1981 (Reaff.2003)	

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Test Report

Report Code: W20151014-088

Issue Date: 14.10.2015

Issued To : Industrial Estate at Barwala(HSIDC),

Distt:- Panchkula, Haryana

Sample Received on: 06.10.2015

Analysis Duration: 07.10.2015 to 13.10.2015

Sample Description: Ground Water

RESULTS

Water Quality Analysis

SAMPLING DETAILS

Date of Sampling	: 06.10.2015
Sampling Location	: Haripur
Sample Collected by	: Mr. Narendra
Sampling Protocol	: IS-3025(Pt-1)-1987 Reaff : 2003 & IS-1622- 1981(Reaff..2003)
Weather Condition	: Clear Sky
Sample Quantity	: 5 L+500 ml
Sample Packing & Mark	: Plastic/ Glass Bottle & IE/OCT/GW8

S. No.	Parameters	Units	Limits (as per IS:10500-2012)		Results	Test Method
			Desirable Limit	Permissible Limit		
1	Color	Hazen	5	15	<5	IS : 3025(Pt-4) 1983, Reaff. 2003
2	Odour	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-5) 1983, Reaff. 2002
3	Taste	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-8)-1984, Reaff. 2006
4	Turbidity	NTU	1	5	1	IS: 3025(Pt-10)-1984, Reaff. 2006
5	pH	-	6.5-8.5	No Relaxation	7.76	IS : 3025(Pt-11)1983, Reaff. 2002
6	Total Hardness (as CaCO ₃)	mg/l	200	600	339	IS : 3025(Pt-21)1983, Reaff. 2009
7	Iron (as Fe)	mg/l	0.3	No Relaxation	0.9	APHA 22 nd Ed., 3120B (ICP-OES)/ 3111B (AAS),
8	Chlorides (as Cl)	mg/l	250	1000	162	IS : 3025(Pt-32)1988, Reaff. 2003
9	Fluoride (as F)	mg/l	1	1.5	0.4	APHA 22 nd Ed., 4500F(D)
10	TDS	mg/l	500	2000	766	IS: 3025(Pt-16)1984, Reaff. 2006
11	Calcium (as Ca ²⁺)	mg/l	75	200	81	IS : 3025(Pt-40)1991, Reaff. 2003
12	Magnesium (as Mg ²⁺)	mg/l	30	100	33	APHA 22 nd Ed., 3500-Mg (B)
13	Copper (as Cu)	mg/l	0.05	1.5	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B (AAS)
14	Manganese(as Mn)	mg/l	0.1	0.3	0.03	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B(AAS)
15	Sulphate (as SO ₄)	mg/l	200	400	83	IS : 3025(Pt-24)1986, Reaff. 2003
16	Nitrate(as NO ₃)	mg/l	45	No Relaxation	6	IS : 3025(Pt-34)1988, Reaff. 2003

Authorized Signatory
(Seal & Signature)



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Test Report

Report Code: W20151014-088

Issue Date: 14.10.2015

17	Phenolic Compounds (as C ₆ H ₅ OH)	mg/l	0.001	0.002	<0.001	APHA 22 nd Ed., 5530 (c)
18	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	APHA 22 nd Ed. 3120 B (ICP-OES-VGA), 3112 (AAS-VGA)
19	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.001	APHA 22 nd Ed., 3120 B (ICP-OES)/3111B (AAS)
20	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/3114, AAS-VGA
21	Arsenic (as As)	mg/l	0.01	0.05	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/3114, AAS-VGA
22	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.01	APHA 22 nd Ed., 4500 CN
23	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/3111B AAS
24	Zinc (as Zn)	mg/l	5	15	0.06	APHA 22 nd Ed., 3120 B (ICP-OES)/3111 B (AAS)
25	Anionic Detergent (as MBAS)	mg/l	0.2	1	<0.01	APHA 22 nd Ed., 5540 (c)
26	Chromium (as Cr ⁶⁺)	mg/l	0.05	No Relaxation	<0.01	IS : 3025(Pt-52)-2003
27	Mineral oil	mg/l	0.5	No Relaxation	<0.1	IS: 3025(Pt-39)1991, Reaff. 2003
28	Alkalinity (as CaCO ₃)	mg/l	200	600	313	IS: 3025(Pt-23)1986, Reaff. 2003
29	Aluminum (as Al)	mg/l	0.03	0.2	<0.02	APHA 22 nd Ed 3120 B (ICP-OES)/3111 B (AAS)/IS 3025 (pt-55)2003
30	Boron (as B)	mg/l	0.5	1	0.1	IS: 3025(Pt-57)-2005, APHA 22 nd Ed., 3120 B (ICP-OES)
Bacteriological Parameters						
1	Total Coli form	MPN/100ml	Shall Not Be Detectable	Not Detected (<2)		IS : 1622-1981 (Reaff.2003)
2	E.coli	E.coli/100ml	Shall Not Be Detectable	Absent		IS : 1622-1981 (Reaff.2003)

**** End of Report ****



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Test Report

Report Code: W20151014-089

Issue Date: 14.10.2015

Issued To : Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Sample Received on: 06.10.2015
Analysis Duration: 07.10.2015 to 13.10.2015

Sample Description: Ground Water

RESULTS

Water Quality Analysis

SAMPLING DETAILS

Date of Sampling	: 06.10.2015
Sampling Location	: Rehawar
Sample Collected by	: Mr. Narendra
Sampling Protocol	: IS-3025(Pt-1)-1987 Reaff: 2003 & IS-1622- 1981(Reaff.2003)
Weather Condition	: Clear Sky
Sample Quantity	: 5 L+500 ml
Sample Packing & Mark	: Plastic/ Glass Bottle & IE/OCT/GW9

S. No.	Parameters	Units	Limits (as per IS:10500-2012)		Results	Test Method
			Desirable Limit	Permissible Limit		
1	Color	Hazen	5	15	<5	IS : 3025(Pt-4) 1983, Reaff. 2003
2	Odour	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-5) 1983, Reaff. 2002
3	Taste	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-8)-1984, Reaff. 2006
4	Turbidity	NTU	1	5	1	IS: 3025(Pt-10)-1984,Reaff. 2006
5	pH	-	6.5-8.5	No Relaxation	7.85	IS : 3025(Pt-11)1983, Reaff. 2002
6	Total Hardness (as CaCO ₃)	mg/l	200	600	319	IS : 3025(Pt-21)1983, Reaff. 2009
7	Iron (as Fe)	mg/l	0.3	No Relaxation	0.4	APHA 22 nd Ed., 3120B (ICP-OES)/ 3111B (AAS),
8	Chlorides (as Cl)	mg/l	250	1000	185	IS : 3025(Pt-32)1988, Reaff. 2003
9	Fluoride (as F)	mg/l	1	1.5	0.5	APHA 22 nd Ed., 4500F(D)
10	TDS	mg/l	500	2000	808	IS: 3025(Pt-16)1984, Reaff. 2006
11	Calcium (as Ca ²⁺)	mg/l	75	200	77	IS : 3025(Pt-40)1991, Reaff. 2003
12	Magnesium (as Mg ²⁺)	mg/l	30	100	30	APHA 22 nd Ed., 3500-Mg (B)
13	Copper (as Cu)	mg/l	0.05	1.5	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B (AAS)
14	Manganese(as Mn)	mg/l	0.1	0.3	0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B(AAS)
15	Sulphate (as SO ₄)	mg/l	200	400	91	IS : 3025(Pt-24)1986, Reaff. 2003
16	Nitrate(as NO ₃)	mg/l	45	No Relaxation	5	IS : 3025(Pt-34)1988, Reaff. 2003

Authorized Signatory
(Seal & Signature)

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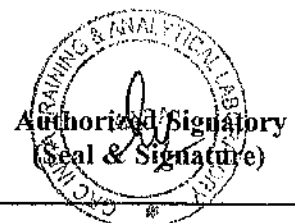
Test Report

Report Code: W20151014-089

Issue Date: 14.10.2015

17	Phenolic Compounds (as C ₆ H ₅ OH)	mg/l	0.001	0.002	<0.001	APHA 22 nd Ed., 5530 (c)
18	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	APHA 22 nd Ed. 3120 B (ICP-OES-VGA), 3112 (AAS-VGA)
19	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.001	APHA 22 nd Ed., 3120 B (ICP-OES)/3111B (AAS)
20	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B(ICP-OES)/ 3114, AAS-VGA
21	Arsenic (as As)	mg/l	0.01	0.05	<0.01	APHA 22 nd Ed., 3120 B(ICP-OES)/ 3114, AAS-VGA
22	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.01	APHA 22 nd Ed., 4500 CN
23	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B(ICP-OES)/3111B AAS
24	Zinc (as Zn)	mg/l	5	15	0.12	APHA 22 nd Ed., 3120 B (ICP-OES) / 3111 B (AAS)
25	Anionic Detergent (as MBAS)	mg/l	0.2	1	<0.01	APHA 22 nd Ed., 5540 (c)
26	Chromium (as Cr ⁶⁺)	mg/l	0.05	No Relaxation	<0.01	IS : 3025(Pt-52)-2003
27	Mineral oil	mg/l	0.5	No Relaxation	<0.1	IS: 3025(Pt-39)1991, Reaff. 2003
28	Alkalinity (as CaCO ₃)	mg/l	200	600	302	IS: 3025(Pt-23)1986, Reaff. 2003
29	Aluminum (as Al)	mg/l	0.03	0.2	<0.02	APHA 22 nd Ed 3120 B (ICP-OES)/ 3111 B (AAS)/IS 3025 (pt-55)2003
30	Boron (as B)	mg/l	0.5	1	0.1	IS: 3025(Pt-57):2005, APHA 22 nd Ed., 3120 B(ICP-OES)
Bacteriological Parameters						
1	Total Coli form	MPN/100ml	Shall Not Be Detectable	Not Detected (<2)	IS : 1622-1981 (Reaff.2003)	
2	E.coli	E.coli/100ml	Shall Not Be Detectable	Absent	IS : 1622-1981 (Reaff.2003)	

** End of Report **



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Test Report

Report Code: W20151113-001

Issue Date: 13.11.2015

**Issued To : Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana**

**Sample Received on: 02.11.2015
Analysis Duration: 03.11.2015 to 12.11.2015**

Sample Description: Ground Water

RESULTS

Water Quality Analysis

SAMPLING DETAILS

Date of Sampling : 02.11.2015
Sampling Location : Project Site
Sample Collected by : Mr. Narendra
Sampling Protocol : IS-3025(Pt-1)-1987 Reaff : 2003 & IS-1622- 1981(Reaff.2003)
Weather Condition : Clear Sky
Sample Quantity : 5 L+500 ml
Sample Packing & Mark : Plastic/ Glass Bottle & IE/NOV/GW1

S. No.	Parameters	Units	Limits (as per IS:10500-2012)		Results	Test Method
			Desirable Limit	Permissible Limit		
1	Color	Hazen	5	15	<5	IS : 3025(Pt-4) 1983, Reaff. 2003
2	Odour	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-5) 1983, Reaff. 2002
3	Taste	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-8)-1984, Reaff. 2006
4	Turbidity	NTU	1	5	1	IS: 3025(Pt-10)-1984,Reaff. 2006
5	pH	-	6.5-8.5	No Relaxation	7.61	IS : 3025(Pt-11)1983, Reaff. 2002
6	Total Hardness (as CaCO ₃)	mg/l	200	600	331	IS : 3025(Pt-21)1983, Reaff. 2009
7	Iron (as Fe)	mg/l	0.3	No Relaxation	0.8	APHA 22 nd Ed., 3120B (ICP-OES)/ 3111B (AAS),
8	Chlorides (as Cl)	mg/l	250	1000	195	IS : 3025(Pt-32)1988, Reaff. 2003
9	Fluoride (as F)	mg/l	1	1.5	0.7	APHA 22 nd Ed., 4500F(D)
10	TDS	mg/l	500	2000	859	IS: 3025(Pt-16)1984, Reaff. 2006
11	Calcium (as Ca ²⁺)	mg/l	75	200	79	IS : 3025(Pt-40)1991, Reaff. 2003
12	Magnesium (as Mg ²⁺)	mg/l	30	100	32	APHA 22 nd Ed., 3500-Mg (B)
13	Copper (as Cu)	mg/l	0.05	1.5	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B (AAS)
14	Manganese(as Mn)	mg/l	0.1	0.3	0.04	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B(AAS)
15	Sulphate (as SO ₄)	mg/l	200	400	98	IS : 3025(Pt-24)1986, Reaff. 2003
16	Nitrate(as NO ₃)	mg/l	45	No Relaxation	8	IS : 3025(Pt-34)1988, Reaff. 2003


 Authorized Signatory
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 Ph. No.: 0120 – 4044630, 4044660, 4323120, Fax: 0120 – 2406519
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Test Report

Report Code: W20151113-001

Issue Date: 13.11.2015

17	Phenolic Compounds (as C ₆ H ₅ OH)	mg/l	0.001	0.002	<0.001	APHA 22 nd Ed., 5530 (c)
18	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	APHA 22 nd Ed. 3120 B (ICP-OES-VGA), 3112 (AAS-VGA)
19	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.001	APHA 22 nd Ed., 3120 B (ICP-OES)/3111B (AAS)
20	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3114, AAS-VGA
21	Arsenic (as As)	mg/l	0.01	0.05	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3114, AAS-VGA
22	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.01	APHA 22 nd Ed., 4500 CN
23	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/3111B AAS
24	Zinc (as Zn)	mg/l	5	15	0.18	APHA 22 nd Ed., 3120 B (ICP-OES) / 3111 B (AAS)
25	Anionic Detergent (as MBAS)	mg/l	0.2	1	<0.01	APHA 22 nd Ed., 5540 (c)
26	Chromium (as Cr ⁶⁺)	mg/l	0.05	No Relaxation	<0.01	IS : 3025(Pt-52)-2003
27	Mineral oil	mg/l	0.5	No Relaxation	<0.1	IS: 3025(Pt-39)1991, Reaff. 2003
28	Alkalinity (as CaCO ₃)	mg/l	200	600	322	IS: 3025(Pt-23)1986, Reaff. 2003
29	Aluminum (as Al)	mg/l	0.03	0.2	<0.02	APHA 22 nd Ed 3120 B (ICP-OES)/ 3111 B (AAS)/IS 3025 (pt-55)2003
30	Boron (as B)	mg/l	0.5	1	0.2	IS: 3025(Pt-57):2005, APHA 22 nd Ed., 3120 B (ICP-OES)
Bacteriological Parameters						
1	Total Coli form	MPN/100ml	Shall Not Be Detectable	Not Detected (<2)	IS : 1622-1981 (Reaff.2003)	
2	<u>E.coli</u>	<u>E.coli</u> /100ml	Shall Not Be Detectable	Absent	IS : 1622-1981 (Reaff.2003)	

** End of Report **



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Test Report

Report Code: W20151113-002

Issue Date: 13.11.2015

Issued To : Industrial Estate at Barwala(HSIIDC),

Distt:- Panchkula, Haryana

Sample Received on: 02.11.2015

Analysis Duration: 03.11.2015 to 12.11.2015

Sample Description: Ground Water

RESULTS

Water Quality Analysis

SAMPLING DETAILS

Date of Sampling	: 02.11.2015
Sampling Location	: Alipur
Sample Collected by	: Mr. Narendra
Sampling Protocol	: IS-3025(Pt-1)-1987 Reaff : 2003 & IS-1622- 1981(Reaff.2003)
Weather Condition	: Clear Sky
Sample Quantity	: 5 L+500 ml
Sample Packing & Mark	: Plastic/ Glass Bottle & IE/NOV/GW2

S. No.	Parameters	Units	Limits (as per IS:10500-2012)		Results	Test Method
			Desirable Limit	Permissible Limit		
1	Color	Hazen	5	15	<5	IS : 3025(Pt-4) 1983, Reaff. 2003
2	Odour	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-5) 1983, Reaff. 2002
3	Taste	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-8)-1984, Reaff. 2006
4	Turbidity	NTU	1	5	1	IS : 3025(Pt-10)-1984, Reaff. 2006
5	pH	-	6.5-8.5	No Relaxation	7.76	IS : 3025(Pt-11)1983, Reaff. 2002
6	Total Hardness (as CaCO ₃)	mg/l	200	600	365	IS : 3025(Pt-21)1983, Reaff. 2009
7	Iron (as Fe)	mg/l	0.3	No Relaxation	0.6	APHA 22 nd Ed., 3120B (ICP-OES)/ 3111B (AAS),
8	Chlorides (as Cl)	mg/l	250	1000	163	IS : 3025(Pt-32)1988, Reaff. 2003
9	Fluoride (as F)	mg/l	1	1.5	0.5	APHA 22 nd Ed., 4500F(D)
10	TDS	mg/l	500	2000	815	IS : 3025(Pt-16)1984, Reaff. 2006
11	Calcium (as Ca ²⁺)	mg/l	75	200	88	IS : 3025(Pt-40)1991, Reaff. 2003
12	Magnesium (as Mg ²⁺)	mg/l	30	100	35	APHA 22 nd Ed., 3500-Mg (B)
13	Copper (as Cu)	mg/l	0.05	1.5	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B (AAS)
14	Manganese(as Mn)	mg/l	0.1	0.3	0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B(AAS)
15	Sulphate (as SO ₄)	mg/l	200	400	92	IS : 3025(Pt-24)1986, Reaff. 2003
16	Nitrate(as NO ₃)	mg/l	45	No Relaxation	7	IS : 3025(Pt-34)1988, Reaff. 2003

Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: W20151113-002

Issue Date: 13.11.2015

17	Phenolic Compounds (as C ₆ H ₅ OH)	mg/l	0.001	0.002	<0.001	APHA 22 nd Ed., 5530 (c)
18	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	APHA 22 nd Ed. 3120 B (ICP-OES-VGA), 3112 (AAS-VGA)
19	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.001	APHA 22 nd Ed. 3120 B (ICP-OES)/3111B (AAS)
20	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/3114, AAS-VGA
21	Arsenic (as As)	mg/l	0.01	0.05	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/3114, AAS-VGA
22	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.01	APHA 22 nd Ed., 4500 CN
23	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/3111B AAS
24	Zinc (as Zn)	mg/l	5	15	0.15	APHA 22 nd Ed., 3120 B (ICP-OES)/3111 B (AAS)
25	Anionic Detergent (as MBAS)	mg/l	0.2	1	<0.1	APHA 22 nd Ed., 5540 (c)
26	Chromium (as Cr ⁶⁺)	mg/l	0.05	No Relaxation	<0.01	IS : 3025(Pt-52)-2003
27	Mineral oil	mg/l	0.5	No Relaxation	<0.1	IS: 3025(Pt-39)1991, Reaff. 2003
28	Alkalinity (as CaCO ₃)	mg/l	200	600	342	IS: 3025(Pt-23)1986, Reaff. 2003
29	Aluminum (as Al)	mg/l	0.03	0.2	<0.02	APHA 22 nd Ed 3120 B (ICP-OES)/3111 B (AAS) IS 3025 (pt-55)2003
30	Boron (as B)	mg/l	0.5	1	0.2	IS: 3025(Pt-57):2005, APHA 22 nd Ed. 3120 B (ICP-OES)
Bacteriological Parameters						
1	Total Coli form	MPN/100ml	Shall Not Be Detectable	Not Detected (<2)	IS : 1622-1981 (Reaff.2003)	
2	<u>E.coli</u>	E.coli/100ml	Shall Not Be Detectable	Absent	IS : 1622-1981 (Reaff.2003)	

** End of Report **

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 (Seal & Signature)

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Test Report

Report Code: W20151113-003

Issue Date: 13.11.2015

Issued To : Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Sample Received on: 02.11.2015

Sample Description: Ground Water

Analysis Duration: 03.11.2015 to 12.11.2015

RESULTS

Water Quality Analysis

SAMPLING DETAILS

Date of Sampling	: 02.11.2015
Sampling Location	: Sukhdarshanpur
Sample Collected by	: Mr. Narendra
Sampling Protocol	: IS-3025(Pt-1)-1987 Reaff: 2003 & IS-1622- 1981(Reaff.2003)
Weather Condition	: Clear Sky
Sample Quantity	: 5 L+500 ml
Sample Packing & Mark	: Plastic/ Glass Bottle & IE/NOV/GW3

S. No.	Parameters	Units	Limits (as per IS:10500-2012)		Results	Test Method
			Desirable Limit	Permissible Limit		
1	Color	Hazen	5	15	<5°	IS-3025(Pt-4)-1983, Reaff. 2003
2	Odour	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-5) 1983, Reaff. 2002
3	Taste	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-8)-1984, Reaff. 2006
4	Turbidity	NTU	1	5	1	IS: 3025(Pt-10)-1984,Reaff. 2006
5	pH	-	6.5-8.5	No Relaxation	7.58	IS : 3025(Pt-11)1983, Reaff. 2002
6	Total Hardness (as CaCO ₃)	mg/l	200	600	339	IS : 3025(Pt-21)1983, Reaff. 2009
7	Iron (as Fe)	mg/l	0.3	No Relaxation	0.6	APHA 22 nd Ed., 3120B (ICP-OES)/ 3111B (AAS),
8	Chlorides (as Cl)	mg/l	250	1000	191	IS : 3025(Pt-32)1988, Reaff. 2003
9	Fluoride (as F)	mg/l	1	1.5	0.4	APHA 22 nd Ed., 4500F(D)
10	TDS	mg/l	500	2000	829	IS: 3025(Pt-16)1984, Reaff. 2006
11	Calcium (as Ca ²⁺)	mg/l	75	200	81	IS : 3025(Pt-40)1991, Reaff. 2003
12	Magnesium (as Mg ²⁺)	mg/l	30	100	33	APHA 22 nd Ed., 3500-Mg (B)
13	Copper (as Cu)	mg/l	0.05	1.5	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B (AAS)
14	Manganese(as Mn)	mg/l	0.1	0.3	0.03	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B(AAS)
15	Sulphate (as SO ₄)	mg/l	200	400	88	IS : 3025(Pt-24)1986, Reaff. 2003
16	Nitrate(as NO ₃)	mg/l	45	No Relaxation	6	IS : 3025(Pt-34)1988, Reaff. 2003

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Test Report

Report Code: W20151113-003

Issue Date: 13.11.2015

17	Phenolic Compounds (as C ₆ H ₅ OH)	mg/l	0.001	0.002	<0.001	APHA 22 nd Ed., 5530 (c)
18	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	APHA 22 nd Ed. 3120 B (ICP-OES-VGA), 3112 (AAS-VGA)
19	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.001	APHA 22 nd Ed., 3120 B (ICP-OES)/3111B (AAS)
20	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/3114, AAS-VGA
21	Arsenic (as As)	mg/l	0.01	0.05	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/3114, AAS-VGA
22	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.01	APHA 22 nd Ed., 4500 CN
23	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/3111B AAS
24	Zinc (as Zn)	mg/l	5	15	0.12	APHA 22 nd Ed., 3120 B (ICP-OES)/3111 B (AAS)
25	Anionic Detergent (as MBAS)	mg/l	0.2	1	<0.01	APHA 22 nd Ed., 5540 (c)
26	Chromium (as Cr ⁶⁺)	mg/l	0.05	No Relaxation	<0.01	IS : 3025(Pt-52)-2003
27	Mineral oil	mg/l	0.5	No Relaxation	<0.1	IS: 3025(Pt-39)1991, Reaff. 2003
28	Alkalinity (as CaCO ₃)	mg/l	200	600	316	IS: 3025(Pt-23)1986, Reaff. 2003
29	Aluminum (as Al)	mg/l	0.03	0.2	<0.02	APHA 22 nd Ed. 3120 B (ICP-OES)/3111 B (AAS)/IS 3025 (pt-55)2003
30	Boron (as B)	mg/l	0.5	1	0.1	IS: 3025(Pt-57).2005, APHA 22 nd Ed. 3120 B (ICP-OES)
Bacteriological Parameters						
1	Total Coli form	MPN/100ml	Shall Not Be Detectable	Not Detected (<2)		IS : 1622-1981 (Reaff.2003)
2	<u>E.coli</u>	<u>E.coli</u> /100ml	Shall Not Be Detectable	Absent		IS : 1622-1981 (Reaff.2003)

** End of Report **



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Test Report

Report Code: W20151113-004

Issue Date: 13.11.2015

Issued To : Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Sample Received on: 02.11.2015

Analysis Duration: 03.11.2015 to 12.11.2015

Sample Description: Ground Water

RESULTS

Water Quality Analysis

SAMPLING DETAILS

Date of Sampling	: 02.11.2015
Sampling Location	: Batwal
Sample Collected by	: Mr. Narendra
Sampling Protocol	: IS-3025(Pt-1)-1987 Reaff : 2003 & IS-1622- 1981(Reaff.2003)
Weather Condition	: Clear Sky
Sample Quantity	: 5 L+500 ml
Sample Packing & Mark	: Plastic/ Glass Bottle & IE/NOV/GW4

S. No.	Parameters	Units	Limits (as per IS:10500-2012)		Results	Test Method
			Desirable Limit	Permissible Limit		
1	Color	Hazen	5	15	<5	IS : 3025(Pt-4) 1983, Reaff. 2003
2	Odour	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-5) 1983, Reaff. 2002
3	Taste	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-8)-1984, Reaff. 2006
4	Turbidity	NTU	1	5	1	IS : 3025(Pt-10)-1984, Reaff. 2006
5	pH	-	6.5-8.5	No Relaxation	7.63	IS : 3025(Pt-11)1983, Reaff. 2002
6	Total Hardness (as CaCO ₃)	mg/l	200	600	359	IS : 3025(Pt-21)1983, Reaff. 2009
7	Iron (as Fe)	mg/l	0.3	No Relaxation	0.3	APHA 22 nd Ed., 3120B (ICP-OES)/ 3111B (AAS),
8	Chlorides (as Cl)	mg/l	250	1000	185	IS : 3025(Pt-32)1988, Reaff. 2003
9	Fluoride (as F)	mg/l	1	1.5	0.6	APHA 22 nd Ed., 4500F(D)
10	TDS	mg/l	500	2000	834	IS : 3025(Pt-16)1984, Reaff. 2006
11	Calcium (as Ca ²⁺)	mg/l	75	200	86	IS : 3025(Pt-40)1991, Reaff. 2003
12	Magnesium (as Mg ²⁺)	mg/l	30	100	35	APHA 22 nd Ed., 3500-Mg (B)
13	Copper (as Cu)	mg/l	0.05	1.5	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B (AAS)
14	Manganese(as Mn)	mg/l	0.1	0.3	0.02	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B(AAS)
15	Sulphate (as SO ₄)	mg/l	200	400	91	IS : 3025(Pt-24)1986, Reaff. 2003
16	Nitrate(as NO ₃)	mg/l	45	No Relaxation	5	IS : 3025(Pt-34)1988, Reaff. 2003



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GRC India

Test Report

Report Code: W20151113-004

Issue Date: 13.11.2015

17	Phenolic Compounds (as C ₆ H ₅ OH)	mg/l	0.001	0.002	<0.001	APHA 22 nd Ed., 5530 (c)
18	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	APHA 22 nd Ed. 3120 B (ICP-OES-VGA), 3112 (AAS-VGA)
19	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.001	APHA 22 nd Ed., 3120 B (ICP-OES) / 3111B (AAS)
20	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES) / 3114, AAS-VGA
21	Arsenic (as As)	mg/l	0.01	0.05	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES) / 3114, AAS-VGA
22	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.01	APHA 22 nd Ed., 4500 CN
23	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES) / 3111B AAS
24	Zinc (as Zn)	mg/l	5	15	0.09	APHA 22 nd Ed., 3120 B (ICP-OES) / 3111 B (AAS)
25	Anionic Detergent (as MBAS)	mg/l	0.2	1	<0.01	APHA 22 nd Ed., 5540 (c)
26	Chromium (as Cr ⁶⁺)	mg/l	0.05	No Relaxation	<0.01	IS : 3025(Pt-52)-2003
27	Mineral oil	mg/l	0.5	No Relaxation	<0.1	IS: 3025(Pt-39)1991, Reaff. 2003
28	Alkalinity (as CaCO ₃)	mg/l	200	600	326	IS: 3025(Pt-23)1986, Reaff. 2003
29	Aluminum (as Al)	mg/l	0.03	0.2	<0.02	APHA 22 nd Ed. 3120 B (ICP-OES) / 3111 B (AAS) / IS 3025 (pt-55) 2003
30	Boron (as B)	mg/l	0.5	1	0.1	IS: 3025(Pt-57):2005, APHA 22 nd Ed., 3120 B (ICP-OES)
Bacteriological Parameters						
1	Total Coli form	MPN/100ml	Shall Not Be Detectable		Not Detected (<2)	IS : 1622-1981 (Reaff.2003)
2	E.coli	E.coli/100ml	Shall Not Be Detectable		Absent	IS : 1622-1981 (Reaff.2003)

** End of Report **



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Test Report

Report Code: W20151113-005

Issue Date: 13.11.2015

Issued To : Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Sample Received on: 02.11.2015
Analysis Duration: 03.11.2015 to 12.11.2015

Sample Description: Ground Water

RESULTS

Water Quality Analysis

SAMPLING DETAILS

Date of Sampling : 02.11.2015
Sampling Location : Raipur Rani
Sample Collected by : Mr. Narendra
Sampling Protocol : IS-3025(Pt-1)-1987 Reaff: 2003 & IS-1622- 1981(Reaff.2003)
Weather Condition : Clear Sky
Sample Quantity : 5 L+500 ml
Sample Packing & Mark : Plastic/ Glass Bottle & IE/NOV/GW5

S. No.	Parameters	Units	Limits (as per IS:10500-2012)		Results	Test Method
			Desirable Limit	Permissible Limit		
1	Color	Hazen	5	15	<5	IS : 3025(Pt-4)-1983, Reaff. 2003
2	Odour	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-5) 1983, Reaff. 2002
3	Taste	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-8)-1984, Reaff. 2006
4	Turbidity	NTU	1	5	1	IS: 3025(Pt-10)-1984,Reaff. 2006
5	pH	-	6.5-8.5	No Relaxation	7.62	IS : 3025(Pt-11)1983, Reaff. 2002
6	Total Hardness (as CaCO ₃)	mg/l	200	600	319	IS : 3025(Pt-21)1983, Reaff. 2009
7	Iron (as Fe)	mg/l	0.3	No Relaxation	0.4	APHA 22 nd Ed., 3120B (ICP-OES)/ 3111B (AAS)
8	Chlorides (as Cl)	mg/l	250	1000	174	IS : 3025(Pt-32)1988, Reaff. 2003
9	Fluoride (as F)	mg/l	1	1.5	0.3	APHA 22 nd Ed., 4500F(D)
10	TDS	mg/l	500	2000	776	IS: 3025(Pt-16)1984, Reaff. 2006
11	Calcium (as Ca ²⁺)	mg/l	75	200	77	IS : 3025(Pt-40)1991, Reaff. 2003
12	Magnesium (as Mg ²⁺)	mg/l	30	100	30	APHA 22 nd Ed., 3500-Mg (B)
13	Copper (as Cu)	mg/l	0.05	1.5	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B (AAS)
14	Manganese(as Mn)	mg/l	0.1	0.3	0.03	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B(AAS)
15	Sulphate (as SO ₄)	mg/l	200	400	86	IS : 3025(Pt-24)1986, Reaff. 2003
16	Nitrate(as NO ₃)	mg/l	45	No Relaxation	4	IS : 3025(Pt-34)1988, Reaff. 2003

Authorized Signatory
(Seal & Signature)

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Ph. No.: 0120 - 4044630, 4044660, 4323120, Fax: 0120 - 2406519

Website: <http://www.grc-india.com>, E-mail : info@grc-india.com, lab@grc-india.com

Test Report

Report Code: W20151113-005

Issue Date: 13.11.2015

17	Phenolic Compounds (as C ₆ H ₅ OH)	mg/l	0.001	0.002	<0.001	APHA 22 nd Ed., 5530 (c)
18	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	APHA 22 nd Ed. 3120 B (ICP-OES-VGA), 3112 (AAS-VGA)
19	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.001	APHA 22 nd Ed., 3120 B (ICP-OES)/3111B (AAS)
20	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B(ICP-OES)/ 3114, AAS-VGA
21	Arsenic (as As)	mg/l	0.01	0.05	<0.01	APHA 22 nd Ed., 3120 B(ICP-OES)/ 3114, AAS-VGA
22	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.01	APHA 22 nd Ed., 4500 CN
23	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B(ICP-OES)/3111B AAS
24	Zinc (as Zn)	mg/l	5	15	0.15	APHA 22 nd Ed., 3120 B (ICP-OES) / 3111 B (AAS)
25	Anionic Detergent (as MBAS)	mg/l	0.2	1	<0.01	APHA 22 nd Ed., 5540 (c)
26	Chromium (as Cr ⁶⁺)	mg/l	0.05	No Relaxation	<0.01	IS : 3025(Pt-52)-2003
27	Mineral oil	mg/l	0.5	No Relaxation	<0.1	IS: 3025(Pt-39)1991, Reaff. 2003
28	Alkalinity (as CaCO ₃)	mg/l	200	600	298	IS: 3025(Pt-23)1986, Reaff. 2003
29	Aluminum (as Al)	mg/l	0.03	0.2*	<0.02	APHA 22 nd Ed. 3120 B (ICP-OES)/ 3111 B (AAS) IS 3025 (pt-55)2003
30	Boron (as B)	mg/l	0.5	1	0.1	IS: 3025(Pt-57):2005, APHA 22 nd Ed., 3120 B(ICP-OES)
Bacteriological Parameters						
1	Total Coli form	MPN/100ml	Shall Not Be Detectable	Not Detected (<2)	IS : 1622-1981 (Reaff.2003)	
2	E.coli	E.coli/100ml	Shall Not Be Detectable	Absent	IS : 1622-1981 (Reaff.2003)	

** End of Report **



Note: 1. The results indicated only refer to the tested samples and listed parameters and do not endorse any product

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4. The samples received shall be destroyed after 30 days from the date of issue of the certificate unless specified otherwise and sample for biological testing will be destroyed after one week of testing.



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Website: <http://www.grc-india.com>, E-mail: info@grc-india.com, lab@grc-india.com

Test Report

Report Code: W20151113-006

Issue Date: 13.11.2015

Issued To : Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Sample Received on: 02.11.2015
Analysis Duration: 03.11.2015 to 12.11.2015

Sample Description: Ground Water

RESULTS

Water Quality Analysis

SAMPLING DETAILS

Date of Sampling	: 02.11.2015
Sampling Location	: Dhandaruru
Sample Collected by	: Mr. Narendra
Sampling Protocol	: IS-3025(Pt-1)-1987 Reaff: 2003 & IS-1622- 1981(Reaff.2003)
Weather Condition	: Clear Sky
Sample Quantity	: 5 L+500 ml
Sample Packing & Mark	: Plastic/ Glass Bottle & IE/NOV/GW6

S. No.	Parameters	Units	Limits (as per IS:10500-2012)		Results	Test Method
			Desirable Limit	Permissible Limit		
1	Color	Hazen	5	15	<5	IS :3025(Pt-4) 1983, Reaff. 2003
2	Odour	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-5) 1983, Reaff. 2002
3	Taste	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-8)-1984, Reaff. 2006
4	Turbidity	NTU	1	5	1	IS: 3025(Pt-10)-1984,Reaff. 2006
5	pH	-	6.5-8.5	No Relaxation	7.54	IS : 3025(Pt-11)1983, Reaff. 2002
6	Total Hardness (as CaCO ₃)	mg/l	200	600	362	IS : 3025(Pt-21)1983, Reaff. 2009
7	Iron (as Fe)	mg/l	0.3	No Relaxation	0.3	APHA 22 nd Ed., 3120B (ICP-OES)/ 3111B (AAS),
8	Chlorides (as Cl)	mg/l	250	1000	142	IS : 3025(Pt-32)1988, Reaff. 2003
9	Fluoride (as F)	mg/l	1	1.5	0.8	APHA 22 nd Ed., 4500F(D)
10	TDS	mg/l	500	2000	693	IS: 3025(Pt-16)1984, Reaff. 2006
11	Calcium (as Ca ²⁺)	mg/l	75	200	87	IS : 3025(Pt-40)1991, Reaff. 2003
12	Magnesium (as Mg ²⁺)	mg/l	30	100	38	APHA 22 nd Ed., 3500-Mg (B)
13	Copper (as Cu)	mg/l	0.05	1.5	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B (AAS)
14	Manganese(as Mn)	mg/l	0.1	0.3	0.04	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B(AAS)
15	Sulphate (as SO ₄)	mg/l	200	400	79	IS : 3025(Pt-24)1986, Reaff. 2003
16	Nitrate(as NO ₃)	mg/l	45	No Relaxation	2	IS : 3025(Pt-34)1988, Reaff. 2003



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Test Report

Report Code: W20151113-006

Issue Date: 13.11.2015

17	Phenolic Compounds (as C ₆ H ₅ OH)	mg/l	0.001	0.002	<0.001	APHA 22 nd Ed., 5530 (c)
18	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	APHA 22 nd Ed. 3120 B (ICP-OES-VGA), 3112 (AAS-VGA)
19	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.001	APHA 22 nd Ed., 3120 B (ICP-OES)/3111B (AAS)
20	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/3114, AAS-VGA
21	Arsenic (as As)	mg/l	0.01	0.05	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/3114, AAS-VGA
22	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.01	APHA 22 nd Ed., 4500 CN
23	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/3111B AAS
24	Zinc (as Zn)	mg/l	5	15	0.08	APHA 22 nd Ed., 3120 B (ICP-OES) / 3111 B (AAS)
25	Anionic Detergent (as MBAS)	mg/l	0.2	1	<0.01	APHA 22 nd Ed., 5540 (c)
26	Chromium (as Cr ⁶⁺)	mg/l	0.05	No Relaxation	<0.01	IS : 3025(Pt-52)-2003
27	Mineral oil	mg/l	0.5	No Relaxation	<0.1	IS : 3025(Pt-39)1991, Reaff. 2003
28	Alkalinity (as CaCO ₃)	mg/l	200	600	285	IS : 3025(Pt-23)1986, Reaff. 2003
29	Aluminum (as Al)	mg/l	0.03	0.2	<0.02	APHA 22 nd Ed. 3120 B (ICP-OES)/3111 B (AAS)/IS.3025 (pt-55)2003
30	Boron (as B)	mg/l	0.5	1	0.1	IS : 3025(Pt-57):2005, APHA 22 nd Ed., 3120 B (ICP-OES)
Bacteriological Parameters						
1	Total Coli form	MPN/100ml	Shall Not Be Detectable	Not Detected (<2)	IS : 1622-1981 (Reaff.2003)	
2	E.coli	E.coli/100ml	Shall Not Be Detectable	Absent	IS : 1622-1981 (Reaff.2003)	

** End of Report **



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Test Report

Report Code: W20151113-007

Issue Date: 13.11.2015

**Issued To : Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana**

**Sample Received on: 02.11.2015
Analysis Duration: 03.11.2015 to 12.11.2015**

Sample Description: Ground Water

RESULTS

Water Quality Analysis

SAMPLING DETAILS

Date of Sampling : 02.11.2015
Sampling Location : Kheri
Sample Collected by : Mr. Narendra
Sampling Protocol : IS-3025(Pt-1)-1987 Reaff: 2003 & IS-1622- 1981(Reaff..2003)
Weather Condition : Clear Sky
Sample Quantity : 5 L+500 ml
Sample Packing & Mark : Plastic/ Glass Bottle & IE/NOV/GW7

S. No.	Parameters	Units	Limits (as per IS:10500-2012)		Results	Test Method
			Desirable Limit	Permissible Limit		
1	Color	Hazen	5	15	<5	IS : 3025(Pt-4) 1983, Reaff. 2003
2	Odour	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-5) 1983, Reaff. 2002
3	Taste	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-8)-1984, Reaff. 2006
4	Turbidity	NTU	1	5	1	IS: 3025(Pt-10)-1984, Reaff. 2006
5	pH	-	6.5-8.5	No Relaxation	7.65	IS : 3025(Pt-11)1983, Reaff. 2002
6	Total Hardness (as CaCO ₃)	mg/l	200	600	359	IS : 3025(Pt-21)1983, Reaff. 2009
7	Iron (as Fe)	mg/l	0.3	No Relaxation	0.2	APHA 22 nd Ed., 3120B (ICP-OES)/ 3111B (AAS),
8	Chlorides (as Cl)	mg/l	250	1000	136	IS : 3025(Pt-32)1988, Reaff. 2003
9	Fluoride (as F)	mg/l	1	1.5	0.7	APHA 22 nd Ed., 4500F(D)
10	TDS	mg/l	500	2000	735	IS: 3025(Pt-16)1984, Reaff. 2006
11	Calcium (as Ca ²⁺)	mg/l	75	200	87	IS : 3025(Pt-40)1991, Reaff. 2003
12	Magnesium (as Mg ²⁺)	mg/l	30	100	34	APHA 22 nd Ed., 3500-Mg (B)
13	Copper (as Cu)	mg/l	0.05	1.5	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B (AAS)
14	Manganese(as Mn)	mg/l	0.1	0.3	0.02	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B(AAS)
15	Sulphate (as SO ₄)	mg/l	200	400	76	IS : 3025(Pt-24)1986, Reaff. 2003
16	Nitrate(as NO ₃)	mg/l	45	No Relaxation	3	IS : 3025(Pt-34)1988, Reaff. 2003


 Authorized Signatory
(Seal & Signature)

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 Website: <http://www.grc-india.com>, E-mail: info@grc-india.com, lab@grc-india.com

Test Report

Report Code: W20151113-007

Issue Date: 13.11.2015

17	Phenolic Compounds (as C ₆ H ₅ OH)	mg/l	0.001	0.002	<0.001	APHA 22 nd Ed., 5530 (c)
18	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	APHA 22 nd Ed. 3120 B (ICP-OES-VGA), 3112 (AAS-VGA)
19	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.001	APHA 22 nd Ed., 3120 B (ICP-OES)/3111B (AAS)
20	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/3114, AAS-VGA
21	Arsenic (as As)	mg/l	0.01	0.05	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/3114, AAS-VGA
22	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.01	APHA 22 nd Ed., 4500 CN
23	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/3111B AAS
24	Zinc (as Zn)	mg/l	5	15	0.11	APHA 22 nd Ed., 3120 B (ICP-OES) / 3111 B (AAS)
25	Anionic Detergent (as MBAS)	mg/l	0.2	1	<0.01	APHA 22 nd Ed., 5540 (c)
26	Chromium (as Cr ⁶⁺)	mg/l	0.05	No Relaxation	<0.01	IS : 3025(Pt-52)-2003
27	Mineral oil	mg/l	0.5	No Relaxation	<0.1	IS: 3025(Pt-39)1991, Reaff. 2003
28	Alkalinity (as CaCO ₃)	mg/l	200	600	336	IS: 3025(Pt-23)1986, Reaff. 2003
29	Aluminum (as Al)	mg/l	0.03	0.2	<0.02	APHA 22 nd Ed 3120 B (ICP-OES)/3111 B (AAS)/IS 3025 (pt-55)2003
30	Boron (as B)	mg/l	0.5	1	0.2	IS: 3025(Pt-57):2003, APHA 22 nd Ed., 3120 B (ICP-OES)

Bacteriological Parameters

1	Total Coli form	MPN/100ml	Shall Not Be Detectable	Not Detected (<2)	IS : 1622-1981 (Reaff.2003)
2	E.coli	E.coli/100ml	Shall Not Be Detectable	Absent	IS : 1622-1981 (Reaff.2003)

**** End of Report ****



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Website: <http://www.grc-india.com>, E-mail: info@grc-india.com, lab@grc-india.com

Test Report

Report Code: W20151113-008

Issue Date: 13.11.2015

Issued To : Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Sample Received on: 02.11.2015
Analysis Duration: 03.11.2015 to 12.11.2015

Sample Description: Ground Water

RESULTS


Water Quality Analysis

SAMPLING DETAILS

Date of Sampling	: 02.11.2015
Sampling Location	: Haripur
Sample Collected by	: Mr. Narendra
Sampling Protocol	: IS-3025(Pt-1)-1987 Reaff: 2003 & IS-1622- 1981(Reaff.2003)
Weather Condition	: Clear Sky
Sample Quantity	: 5 L+500 ml
Sample Packing & Mark	: Plastic/ Glass Bottle & IE/NOV/GW8

S. No.	Parameters	Units	Limits (as per IS:10500-2012)		Results	Test Method
			Desirable Limit	Permissible Limit		
1	Color	Hazen	5	15	<5	IS : 3025(Pt-4) 1983, Reaff. 2003
2	Odour	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-5) 1983, Reaff. 2002
3	Taste	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-8)-1984, Reaff. 2006
4	Turbidity	NTU	1	5	1	IS : 3025(Pt-10)-1984, Reaff. 2006
5	pH	-	6.5-8.5	No Relaxation	7.79	IS : 3025(Pt-11)1983, Reaff. 2002
6	Total Hardness (as CaCO ₃)	mg/l	200	600	371	IS : 3025(Pt-21)1983, Reaff. 2009
7	Iron (as Fe)	mg/l	0.3	No Relaxation	0.8	APHA 22 nd Ed., 3120B (ICP-OES)/ 3111B (AAS),
8	Chlorides (as Cl)	mg/l	250	1000	160	IS : 3025(Pt-32)1988, Reaff. 2003
9	Fluoride (as F)	mg/l	1	1.5	0.3	APHA 22 nd Ed., 4500F(D)
10	TDS	mg/l	500	2000	806	IS : 3025(Pt-16)1984, Reaff. 2006
11	Calcium (as Ca ²⁺)	mg/l	75	200	89	IS : 3025(Pt-40)1991, Reaff. 2003
12	Magnesium (as Mg ²⁺)	mg/l	30	100	36	APHA 22 nd Ed., 3500-Mg (B)
13	Copper (as Cu)	mg/l	0.05	1.5	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B (AAS)
14	Manganese(as Mn)	mg/l	0.1	0.3	0.06	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B(AAS)
15	Sulphate (as SO ₄)	mg/l	200	400	81	IS : 3025(Pt-24)1986, Reaff. 2003
16	Nitrate(as NO ₃)	mg/l	45	No Relaxation	6	IS : 3025(Pt-34)1988, Reaff. 2003

Authorized Signatory
(Seal & Signature)



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Head Office: F-375, Sec-63, NOIDA - 201 301,

Ph. No.: 0120 - 4044630, 4044660, 4323120, Fax: 0120 - 2406519

Website: <http://www.grc-india.com>, E-mail : info@grc-india.com, lab@grc-india.com

Test Report

Report Code: W20151113-008

Issue Date: 13.11.2015

17	Phenolic Compounds (as C ₆ H ₅ OH)	mg/l	0.001	0.002	<0.001	APHA 22 nd Ed., 5530 (c)
18	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	APHA 22 nd Ed. 3120 B (ICP-OES-VGA), 3112 (AAS-VGA)
19	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.001	APHA 22 nd Ed., 3120 B (ICP-OES)/3111B (AAS)
20	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3114, AAS-VGA
21	Arsenic (as As)	mg/l	0.01	0.05	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3114, AAS-VGA
22	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.01	APHA 22 nd Ed., 4500 CN
23	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/3111B AAS
24	Zinc (as Zn)	mg/l	5	15	0.06	APHA 22 nd Ed., 3120 B (ICP-OES) / 3111 B (AAS)
25	Anionic Detergent (as MBAS)	mg/l	0.2	1	<0.01	APHA 22 nd Ed., 5540 (c)
26	Chromium (as Cr ⁶⁺)	mg/l	0.05	No Relaxation	<0.01	IS : 3025(Pt-52)-2003
27	Mineral oil	mg/l	0.5	No Relaxation	<0.1	IS: 3025(Pt-39)1991, Reaff. 2003
28	Alkalinity (as CaCO ₃)	mg/l	200	600	356	IS: 3025(Pt-23)1986, Reaff. 2003
29	Aluminium (as Al)	mg/l	0.03	0.2	<0.02	APHA 22 nd Ed. 3120 B (ICP-OES)/ 3111 B (AAS)/IS 3025 (pt-55)2003
30	Boron (as B)	mg/l	0.5	1	0.1	IS: 3025(Pt-57):2005, APHA 22 nd Ed., 3120 B (ICP-OES)
Bacteriological Parameters						
1	Total Coli form	MPN/100ml	Shall Not Be Detectable	Not Detected (<2)		IS : 1622-1981 (Reaff.2003)
2	E.coli	E.coli/100ml	Shall Not Be Detectable	Absent		IS : 1622-1981 (Reaff.2003)

** End of Report **



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Website: <http://www.grc-india.com>, E-mail: info@grc-india.com, lab@grc-india.com

Test Report

Report Code: W20151113-009

Issue Date: 13.11.2015

**Issued To : Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana**

**Sample Received on: 02.11.2015
Analysis Duration: 03.11.2015 to 12.11.2015**

Sample Description: Ground Water

RESULTS

Water Quality Analysis

SAMPLING DETAILS

Date of Sampling : 02.11.2015
Sampling Location : Rehawar
Sample Collected by : Mr. Narendra
Sampling Protocol : IS-3025(Pt-1)-1987 Reaff : 2003 & IS-1622- 1981(Reaff.2003)
Weather Condition : Clear Sky
Sample Quantity : 5 L+500 ml
Sample Packing & Mark : Plastic/ Glass Bottle & IE/NOV/GW9

S. No.	Parameters	Units	Limits (as per IS:10500-2012)		Results	Test Method
			Desirable Limit	Permissible Limit		
1	Color	Hazen	5	15	<5	IS : 3025(Pt-4) 1983, Reaff. 2003
2	Odour	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-5) 1983, Reaff. 2002
3	Taste	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-8)-1984, Reaff. 2006
4	Turbidity	NTU	1	5	1	IS : 3025(Pt-10)-1984, Reaff. 2006
5	pH	-	6.5-8.5	No Relaxation	7.96	IS : 3025(Pt-11)1983, Reaff. 2002
6	Total Hardness (as CaCO ₃)	mg/l	200	600	359	IS : 3025(Pt-21)1983, Reaff. 2009
7	Iron (as Fe)	mg/l	0.3	No Relaxation	0.3	APHA 22 nd Ed., 3120B (ICP-OES)/ 3111B (AAS),
8	Chlorides (as Cl)	mg/l	250	1000	192	IS : 3025(Pt-32)1988, Reaff. 2003
9	Fluoride (as F)	mg/l	1	1.5	0.2	APHA 22 nd Ed., 4500F(D)
10	TDS	mg/l	500	2000	869	IS : 3025(Pt-16)1984, Reaff. 2006
11	Calcium (as Ca ²⁺)	mg/l	75	200	86	IS : 3025(Pt-40)1991, Reaff. 2003
12	Magnesium (as Mg ²⁺)	mg/l	30	100	35	APHA 22 nd Ed., 3500-Mg (B)
13	Copper (as Cu)	mg/l	0.05	1.5	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B (AAS)
14	Manganese(as Mn)	mg/l	0.1	0.3	0.04	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B(AAS)
15	Sulphate (as SO ₄)	mg/l	200	400	92	IS : 3025(Pt-24)1986, Reaff. 2003
16	Nitrate(as NO ₃)	mg/l	45	No Relaxation	1	IS : 3025(Pt-34)1988, Reaff. 2003

Authorised Signatory
(Seal & Signature)

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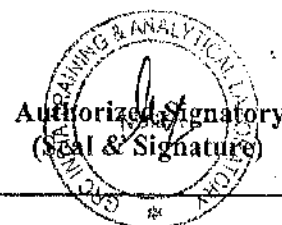
Test Report

Report Code: W20151113-009

Issue Date: 13.11.2015

17	Phenolic Compounds (as C ₆ H ₅ OH)	mg/l	0.001	0.002	<0.001	APHA 22 nd Ed., 5530 (c)
18	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	APHA 22 nd Ed. 3120 B (ICP-OES-VGA), 3112 (AAS-VGA)
19	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.001	APHA 22 nd Ed., 3120 B (ICP-OES) / 3111B (AAS)
20	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES) / 3114, AAS-VGA
21	Arsenic (as As)	mg/l	0.01	0.05	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES) / 3114, AAS-VGA
22	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.01	APHA 22 nd Ed., 4500 CN
23	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES) / 3111B AAS
24	Zinc (as Zn)	mg/l	5	15	0.12	APHA 22 nd Ed., 3120 B (ICP-OES) / 3111 B (AAS)
25	Anionic Detergent (as MBAS)	mg/l	0.2	1	<0.01	APHA 22 nd Ed., 5540 (c)
26	Chromium (as Cr ⁶⁺)	mg/l	0.05	No Relaxation	<0.01	IS : 3025(Pt-52)-2003
27	Mineral oil	mg/l	0.5	No Relaxation	<0.1	IS : 3025(Pt-39)1991, Reaff. 2003
28	Alkalinity (as CaCO ₃)	mg/l	200	600	345	IS : 3025(Pt-23)1986, Reaff. 2003
29	Aluminum (as Al)	mg/l	0.03	0.2	<0.02	APHA 22 nd Ed. 3120 B (ICP-OES) / 3111 B (AAS) / IS 3025 (pt-55) 2003
30	Boron (as B)	mg/l	0.5	1	0.1	IS : 3025(Pt-57):2005, APHA 22 nd Ed., 3120 B (ICP-OES)
Bacteriological Parameters						
1	Total Coli form	MPN/100ml	Shall Not Be Detectable	Not Detected (<2)	IS : 1622-1981 (Reaff.2003)	
2	<u>E.coli</u>	<u>E.coli</u> /100ml	Shall Not Be Detectable	Absent	IS : 1622-1981 (Reaff.2003)	

** End of Report **



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Test Report

Report Code: W20151217-001

Issue Date: 17.12.2015

Issued To : Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Sample Received on: 07.12.2015
Analysis Duration: 08.12.2015 to 16.12.2015

Sample Description: Ground Water

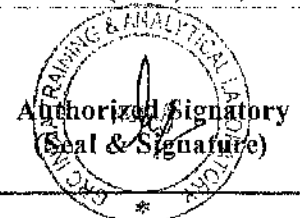
RESULTS

Water Quality Analysis

SAMPLING DETAILS

Date of Sampling	: 07.12.2015
Sampling Location	: Project Site
Sample Collected by	: Mr. Narendra
Sampling Protocol	: IS-3025(Pt-1)-1987 Reaff: 2003 & IS-1622-1981(Reaff.2003)
Weather Condition	: Clear Sky
Sample Quantity	: 5 L+500 ml
Sample Packing & Mark	: Plastic/ Glass Bottle & IE/NOV/GW1

S. No.	Parameters	Units	Limits (as per IS:10500-2012)		Results	Test Method
			Desirable Limit	Permissible Limit		
1	Color	Hazen	5	15	<5	IS: 3025(Pt-4)-1983, Reaff. 2003
2	Odour	-	Agreeable	Agreeable	Agreeable	IS: 3025(Pt-5) 1983, Reaff. 2002
3	Taste	-	Agreeable	Agreeable	Agreeable	IS: 3025(Pt-8)-1984, Reaff. 2006
4	Turbidity	NTU	1	5	1	IS: 3025(Pt-10)-1984, Reaff. 2006
5	pH	-	6.5-8.5	No Relaxation	7.82	IS: 3025(Pt-11)1983, Reaff. 2002
6	Total Hardness (as CaCO ₃)	mg/l	200	600	365	IS: 3025(Pt-21)1983, Reaff. 2009
7	Iron (as Fe)	mg/l	0.3	No Relaxation	0.6	APHA 22 nd Ed., 3120B (ICP-OES)/ 3111B (AAS)
8	Chlorides (as Cl)	mg/l	250	1000	195	IS: 3025(Pt-32)1988, Reaff. 2003
9	Fluoride (as F)	mg/l	1	1.5	0.6	APHA 22 nd Ed., 4500F(D)
10	TDS	mg/l	500	2000	864	IS: 3025(Pt-16)1984, Reaff. 2006
11	Calcium (as Ca ²⁺)	mg/l	75	200	88	IS: 3025(Pt-40)1991, Reaff. 2003
12	Magnesium (as Mg ²⁺)	mg/l	30	100	35	APHA 22 nd Ed., 3500-Mg (B)
13	Copper (as Cu)	mg/l	0.05	1.5	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B (AAS)
14	Manganese(as Mn)	mg/l	0.1	0.3	0.04	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B(AAS)
15	Sulphate (as SO ₄)	mg/l	200	400	99	IS: 3025(Pt-24)1986, Reaff. 2003
16	Nitrate(as NO ₃)	mg/l	45	No Relaxation	5	IS: 3025(Pt-34)1988, Reaff. 2003



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Test Report

Report Code: W20151217-001

Issue Date: 17.12.2015

17	Phenolic Compounds (as C ₆ H ₅ OH)	mg/l	0.001	0.002	<0.001	APHA 22 nd Ed., 5530 (c)
18	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	APHA 22 nd Ed. 3120 B (ICP-OES-VGA), 3112 (AAS-VGA)
19	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.001	APHA 22 nd Ed. 3120 B (ICP-OES)/3111B (AAS)
20	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3114, AAS-VGA
21	Arsenic (as As)	mg/l	0.01	0.05	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3114; AAS-VGA
22	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.01	APHA 22 nd Ed., 4500 CN
23	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/3111B AAS
24	Zinc (as Zn)	mg/l	5	15	0.12	APHA 22 nd Ed., 3120 B (ICP-OES) / 3111 B (AAS)
25	Anionic Detergent (as MBAS)	mg/l	0.2	1	<0.01	APHA 22 nd Ed., 5540 (c)
26	Chromium (as Cr ⁶⁺)	mg/l	0.05	No Relaxation	<0.01	IS : 3025(Pt-52)-2003
27	Mineral oil	mg/l	0.5	No Relaxation	<0.1	IS: 3025(Pt-39)1991, Reaff. 2003
28	Alkalinity (as CaCO ₃)	mg/l	200	600	325	IS: 3025(Pt-23)1986, Reaff. 2003
29	Aluminum (as Al)	mg/l	0.03	0.2	<0.02	APHA 22 nd Ed. 3120 B (ICP-OES)/ 3111 B (AAS)/IS 3025 (pt-55)2003
30	Boron (as B)	mg/l	0.5	1	0.2	IS: 3025(Pt-57):2005, APHA 22 nd Ed. 3120 B (ICP-OES)
Bacteriological Parameters						
1	Total Coli form	MPN/100ml	Shall Not Be Detectable	Not Detected (<2)		IS : 1622-1981 (Reaff.2003)
2	E.coli	E.coli/100ml	Shall Not Be Detectable	Absent		IS : 1622-1981 (Reaff.2003)

** End of Report **



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GRC India

Test Report

Report Code: W20151217-002

Issue Date: 17.12.2015

Issued To : Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Sample Received on: 07.12.2015

Analysis Duration: 08.12.2015 to 16.12.2015

Sample Description: Ground Water

RESULTS

Water Quality Analysis

SAMPLING DETAILS

Date of Sampling	: 07.12.2015
Sampling Location	: Alipur
Sample Collected by	: Mr. Narendra
Sampling Protocol	: IS-3025(Pt-1)-1987 Reaff: 2003 & IS-1622- 1981(Reaff.2003)
Weather Condition	: Clear Sky
Sample Quantity	: 5 L+500 ml
Sample Packing & Mark	: Plastic/ Glass Bottle & IE/NOV/GW2

S. No.	Parameters	Units	Limits (as per IS:10500-2012)		Results	Test Method
			Desirable Limit	Permissible Limit		
1	Color	Hazen	5	15	<5	IS : 3025(Pt-4) 1983, Reaff. 2003
2	Odour	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-5) 1983, Reaff. 2002
3	Taste	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-8)-1984, Reaff. 2006
4	Turbidity	NTU	1	5	1	IS: 3025(Pt-10)-1984,Reaff. 2006
5	pH	-	6.5-8.5	No Relaxation	7.74	IS : 3025(Pt-11)1983, Reaff. 2002
6	Total Hardness (as CaCO ₃)	mg/l	200	600	396	IS : 3025(Pt-21)1983, Reaff. 2009
7	Iron (as Fe)	mg/l	0.3	No Relaxation	0.5	APHA 22 nd Ed., 3120B (ICP-OES)/ 3111B (AAS),
8	Chlorides (as Cl)	mg/l	250	1000	165	IS : 3025(Pt-32)1988, Reaff. 2003
9	Fluoride (as F)	mg/l	1	1.5	0.4	APHA 22 nd Ed., 4500F(D)
10	TDS	mg/l	500	2000	834	IS: 3025(Pt-16)1984, Reaff. 2006
11	Calcium (as Ca ²⁺)	mg/l	75	200	95	IS : 3025(Pt-40)1991, Reaff. 2003
12	Magnesium (as Mg ²⁺)	mg/l	30	100	38	APHA 22 nd Ed., 3500-Mg (B)
13	Copper (as Cu)	mg/l	0.05	1.5	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B (AAS)
14	Manganese(as Mn)	mg/l	0.1	0.3	0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B(AAS)
15	Sulphate (as SO ₄)	mg/l	200	400	86	IS : 3025(Pt-24)1986, Reaff. 2003
16	Nitrate(as NO ₃)	mg/l	45	No Relaxation	6	IS : 3025(Pt-34)1988, Reaff. 2003

Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: W20151217-002

Issue Date: 17.12.2015

17	Phenolic Compounds (as C ₆ H ₅ OH)	mg/l	0.001	0.002	<0.001	APHA 22 nd Ed., 5530 (c)
18	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	APHA 22 nd Ed. 3120 B (ICP-OES-VGA), 3112 (AAS-VGA)
19	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.001	APHA 22 nd Ed., 3120 B (ICP-OES)/3111B (AAS)
20	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/3114, AAS-VGA
21	Arsenic (as As)	mg/l	0.01	0.05	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/3114, AAS-VGA
22	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.01	APHA 22 nd Ed., 4500 CN
23	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/3111B AAS
24	Zinc (as Zn)	mg/l	5	15	0.16	APHA 22 nd Ed., 3120 B (ICP-OES) / 3111 B (AAS)
25	Anionic Detergent (as MBAS)	mg/l	0.2	1	<0.1	APHA 22 nd Ed., 5540 (c)
26	Chromium (as Cr ⁶⁺)	mg/l	0.05	No Relaxation	<0.01	IS : 3025(Pt-52)-2003
27	Mineral oil	mg/l	0.5	No Relaxation	<0.1	IS: 3025(Pt-39)1991, Reaff. 2003
28	Alkalinity (as CaCO ₃)	mg/l	200	600	365	IS: 3025(Pt-23)1986, Reaff. 2003
29	Aluminum (as Al)	mg/l	0.03	0.2	<0.02	APHA 22 nd Ed. 3120 B (ICP-OES)/3111B (AAS)/IS 3025 (pt-55)2003
30	Boron (as B)	mg/l	0.5	1	0.2	IS: 3025(Pt-57):2005, APHA 22 nd Ed., 3120 B (ICP-OES)
Bacteriological Parameters						
1	Total Coli form	MPN/100ml	Shall Not Be Detectable	Not Detected (<2)		IS : 1622-1981 (Reaff.2003)
2	E.coli	E.coli/100ml	Shall Not Be Detectable	Absent		IS : 1622-1981 (Reaff.2003)

** End of Report **



Authorized Signatory
(Seal & Signature)

Note: 1. The results indicated only refer to the tested samples and listed parameters and do not endorse any product
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GRC India

Test Report

Report Code: W20151217-003

Issue Date: 17.12.2015

Issued To : Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Sample Received on: 07.12.2015

Analysis Duration: 08.12.2015 to 16.12.2015

Sample Description: Ground Water

RESULTS

Water Quality Analysis

SAMPLING DETAILS

Date of Sampling : 07.12.2015
Sampling Location : Sukhdarshanpur
Sample Collected by : Mr. Narendra
Sampling Protocol : IS-3025(Pt-1)-1987 Reaff : 2003 & IS-1622- 1981(Reaff.2003)
Weather Condition : Clear Sky
Sample Quantity : 5 L+500 ml
Sample Packing & Mark : Plastic/ Glass Bottle & IE/NOV/GW3

S. No.	Parameters	Units	Limits (as per IS:10500-2012)		Results	Test Method
			Desirable Limit	Permissible Limit		
1	Color	Hazen	5	15	<5	IS : 3025(Pt-4) 1983, Reaff. 2003
2	Odour	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-5) 1983, Reaff. 2002
3	Taste	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-8)-1984, Reaff. 2006
4	Turbidity	NTU	1	5	1	IS : 3025(Pt-10)-1984, Reaff. 2006
5	pH	-	6.5-8.5	No Relaxation	7.61	IS : 3025(Pt-11)1983, Reaff. 2002
6	Total Hardness (as CaCO ₃)	mg/l	200	600	365	IS : 3025(Pt-21)1983, Reaff. 2009
7	Iron (as Fe)	mg/l	0.3	No Relaxation	0.3	APHA 22 nd Ed., 3120B (ICP-OES)/ 3111B (AAS),
8	Chlorides (as Cl)	mg/l	250	1000	152	IS : 3025(Pt-32)1988, Reaff. 2003
9	Fluoride (as F)	mg/l	1	1.5	0.3	APHA 22 nd Ed., 4500F(D)
10	TDS	mg/l	500	2000	789	IS : 3025(Pt-16)1984, Reaff. 2006
11	Calcium (as Ca ²⁺)	mg/l	75	200	88	IS : 3025(Pt-40)1991, Reaff. 2003
12	Magnesium (as Mg ²⁺)	mg/l	30	100	35	APHA 22 nd Ed., 3500-Mg (B)
13	Copper (as Cu)	mg/l	0.05	1.5	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B (AAS)
14	Manganese(as Mn)	mg/l	0.1	0.3	0.03	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B(AAS)
15	Sulphate (as SO ₄)	mg/l	200	400	82	IS : 3025(Pt-24)1986, Reaff. 2003
16	Nitrate(as NO ₃)	mg/l	45	No Relaxation	6	IS : 3025(Pt-34)1988, Reaff. 2003



Note: 1. The results indicated only refer to the tested samples and listed parameters and do not endorse any product
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Website: <http://www.grc-india.com>, E-mail: info@grc-india.com, lab@grc-india.com

Test Report

Report Code: W20151217-003

Issue Date: 17.12.2015

17	Phenolic Compounds (as C ₆ H ₅ OH)	mg/l	0.001	0.002	<0.001	APHA 22 nd Ed., 5530 (c)
18	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	APHA 22 nd Ed. 3120 B (ICP-OES-VGA), 3112 (AAS-VGA)
19	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.001	APHA 22 nd Ed., 3120 B (ICP-OES) / 3111B (AAS)
20	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B(ICP-OES)/ 3114, AAS-VGA
21	Arsenic (as As)	mg/l	0.01	0.05	<0.01	APHA 22 nd Ed., 3120 B(ICP-OES)/ 3114, AAS-VGA
22	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.01	APHA 22 nd Ed., 4500 CN
23	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B(ICP-OES)/3111B AAS
24	Zinc (as Zn)	mg/l	5	15	0.11	APHA 22 nd Ed., 3120 B (ICP-OES) / 3111 B (AAS)
25	Anionic Detergent (as MBAS)	mg/l	0.2	1	<0.01	APHA 22 nd Ed., 5540 (c)
26	Chromium (as Cr ⁶⁺)	mg/l	0.05	No Relaxation	<0.01	IS : 3025(Pt-52)-2003
27	Mineral oil	mg/l	0.5	No Relaxation	<0.1	IS: 3025(Pt-39)1991, Reaff. 2003
28	Alkalinity (as CaCO ₃)	mg/l	200	600	351	IS: 3025(Pt-23)1986, Reaff. 2003
29	Aluminum (as Al)	mg/l	0.03	0.2	<0.02	APHA 22 nd Ed. 3120 B (ICP-OES)/ 3111 B (AAS)/IS:3025 (pt-55)2003
30	Boron (as B)	mg/l	0.5	1	0.1	IS: 3025(Pt-57):2005, APHA 22 nd Ed., 3120 B(ICP-OES)
Bacteriological Parameters						
1	Total Coli form	MPN/100ml	Shall Not Be Detectable	Not Detected (<2)	IS : 1622-1981 (Reaff.2003)	
2	<u>E.coli</u>	E.coli/100ml	Shall Not Be Detectable	Absent	IS : 1622-1981 (Reaff.2003)	

**** End of Report ****



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Test Report

Report Code: W20151217-004

Issue Date: 17.12.2015

**Issued To : Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana**

Sample Received on: 07.12.2015

Analysis Duration: 08.12.2015 to 16.12.2015

Sample Description: Ground Water

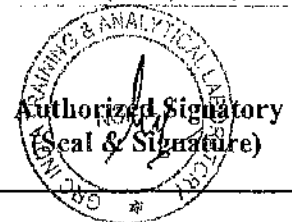
RESULTS

Water Quality Analysis

SAMPLING DETAILS

Date of Sampling	: 07.12.2015
Sampling Location	: Batwal
Sample Collected by	: Mr. Narendra
Sampling Protocol	: IS-3025(Pt-1)-1987 Reaff : 2003 & IS-1622- 1981(Reaff.2003)
Weather Condition	: Clear Sky
Sample Quantity	: 5 L+500 ml
Sample Packing & Mark	: Plastic/ Glass Bottle & IE/NOV/GW4

S. No.	Parameters	Units	Limits (as per IS:10500-2012)		Results	Test Method
			Desirable Limit	Permissible Limit		
1	Gofor	Hazen	5	15	<5	IS : 3025(Pt-4) 1983, Reaff. 2003
2	Odour	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-5) 1983, Reaff. 2002
3	Taste	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-8)-1984, Reaff. 2006
4	Turbidity	NTU	1	5	1	IS: 3025(Pt-10)-1984,Reaff. 2006
5	pH	-	6.5-8.5	No Relaxation	7.81	IS : 3025(Pt-11)1983, Reaff. 2002
6	Total Hardness (as CaCO ₃)	mg/l	200	600	385	IS : 3025(Pt-21)1983, Reaff. 2009
7	Iron (as Fe)	mg/l	0.3	No Relaxation	0.2	APHA 22 nd Ed., 3120B (ICP-OES)/ 3111B (AAS),
8	Chlorides (as Cl)	mg/l	250	1000	143	IS : 3025(Pt-32)1988, Reaff. 2003
9	Fluoride (as F)	mg/l	1	1.5	0.5	APHA 22 nd Ed., 4500F(D)
10	TDS	mg/l	500	2000	804	IS: 3025(Pt-16)1984, Reaff. 2006
11	Calcium (as Ca ²⁺)	mg/l	75	200	88	IS : 3025(Pt-40)1991, Reaff. 2003
12	Magnesium (as Mg ²⁺)	mg/l	30	100	35	APHA 22 nd Ed., 3500-Mg (B)
13	Copper (as Cu)	mg/l	0.05	1.5	<0.01	APHA 22 nd Ed., 3120 R (ICP-OES)/ 3111B (AAS)
14	Manganese(as Mn)	mg/l	0.1	0.3	0.02	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B(AAS)
15	Sulphate (as SO ₄)	mg/l	200	400	93	IS : 3025(Pt-24)1986, Reaff. 2003
16	Nitrate(as NO ₃)	mg/l	45	No Relaxation	5	IS : 3025(Pt-34)1988, Reaff. 2003



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Test Report

Report Code: W20151217-004

Issue Date: 17.12.2015

17	Phenolic Compounds (as C ₆ H ₅ OH)	mg/l	0.001	0.002	<0.001	APHA 22 nd Ed., 5530 (c)
18	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	APHA 22 nd Ed. 3120 B (ICP-OES-VGA), 3112 (AAS-VGA)
19	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.001	APHA 22 nd Ed., 3120 B (ICP-OES) /3111B (AAS)
20	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B(ICP-OES)/ 3114, AAS-VGA
21	Arsenic (as As)	mg/l	0.01	0.05	<0.01	APHA 22 nd Ed., 3120 B(ICP-OES)/ 3114, AAS-VGA
22	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.01	APHA 22 nd Ed., 4500 CN
23	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B(ICP-OES)/3111B AAS
24	Zinc (as Zn)	mg/l	5	15	0.08	APHA 22 nd Ed., 3120 B (ICP-OES) / 3111 B (AAS)
25	Anionic Detergent (as MBAS)	mg/l	0.2	1	<0.01	APHA 22 nd Ed., 5540 (c)
26	Chromium (as Cr ⁶⁺)	mg/l	0.05	No Relaxation	<0.01	IS : 3025(Pt-52)-2003
27	Mineral oil	mg/l	0.5	No Relaxation	<0.1	IS: 3025(Pt-39)1991, Reaff. 2003
28	Alkalinity (as CaCO ₃)	mg/l	200	600	362	IS: 3025(Pt-23)1986, Reaff. 2003
29	Aluminum (as Al)	mg/l	0.03	0.2	<0.02	APHA 22 nd Ed 3120 B (ICP-OES)/ 3111 B (AAS)/IS 3025 (pt-55)2003
30	Boron (as B)	mg/l	0.5	1	0.1	IS: 3025(Pt-57):2005, APHA 22 nd Ed., 3120 B(ICP-OES)
Bacteriological Parameters						
1	Total Coli form	MPN/100ml	Shall Not Be Detectable	Not Detected (<2)	IS : 1622-1981 (Reaff.2003)	
2	E.coli	E.coli/100ml	Shall Not Be Detectable	Absent	IS : 1622-1981 (Reaff.2003)	

** End of Report **



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Test Report

Report Code: W20151217-005

Issue Date: 17.12.2015

Issued To : Industrial Estate at Barwala(HSIIDC),

Sample Received on: 07.12.2015

Distt:- Panchkula, Haryana

Analysis Duration: 08.12.2015 to 16.12.2015

Sample Description: Ground Water

RESULTS

Water Quality Analysis

SAMPLING DETAILS

Date of Sampling	: 07.12.2015
Sampling Location	: Raipur Rani
Sample Collected by	: Mr. Narendra
Sampling Protocol	: IS-3025(Pt-1)-1987 Reaff: 2003 & IS-1622- 1981(Reaff. 2003)
Weather Condition	: Clear Sky
Sample Quantity	: 5 L+500 ml
Sample Packing & Mark	: Plastic/ Glass Bottle & IE/NOV/GW5

S. No.	Parameters	Units	Limits (as per IS:10500-2012)		Results	Test Method
			Desirable Limit	Permissible Limit		
1	Color	Hazen	5	15	<5	IS : 3025(Pt-4) 1983, Reaff. 2003
2	Odour	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-5) 1983, Reaff. 2002
3	Taste	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-8)-1984, Reaff. 2006
4	Turbidity	NTU	1	5	1	IS: 3025(Pt-10)-1984,Reaff. 2006
5	pH	-	6.5-8.5	No Relaxation	7.63	IS : 3025(Pt-11)1983, Reaff. 2002
6	Total Hardness (as CaCO ₃)	mg/l	200	600	338	IS : 3025(Pt-21)1983, Reaff. 2009
7	Iron (as Fe)	mg/l	0.3	No Relaxation	0.3	APHA 22 nd Ed., 3120B (ICP-OES)/ 3111B (AAS),
8	Chlorides (as Cl)	mg/l	250	1000	172	IS : 3025(Pt-32)1988, Reaff. 2003
9	Fluoride (as F)	mg/l	1	1.5	0.4	APHA 22 nd Ed., 4500F(D)
10	TDS	mg/l	500	2000	786	IS: 3025(Pt-16)1984, Reaff. 2006
11	Calcium (as Ca ²⁺)	mg/l	75	200	82	IS : 3025(Pt-40)1991, Reaff. 2003
12	Magnesium (as Mg ²⁺)	mg/l	30	100	32	APHA 22 nd Ed., 3500-Mg (B)
13	Copper (as Cu)	mg/l	0.05	1.5	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B (AAS)
14	Manganese(as Mn)	mg/l	0.1	0.3	0.03	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B(AAS)
15	Sulphate (as SO ₄)	mg/l	200	400	85	IS : 3025(Pt-24)1986, Reaff. 2003
16	Nitrate(as NO ₃)	mg/l	45	No Relaxation	3	IS : 3025(Pt-34)1988, Reaff. 2003

Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: W20151217-005

Issue Date: 17.12.2015

17	Phenolic Compounds (as C ₆ H ₅ OH)	mg/l	0.001	0.002	<0.001	APHA 22 nd Ed., 5530 (c)
18	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	APHA 22 nd Ed. 3120 B (ICP-OES-VGA), 3112 (AAS-VGA)
19	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.001	APHA 22 nd Ed., 3120 B (ICP-OES)/3111B (AAS)
20	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B(ICP-OES)/3114, AAS-VGA
21	Arsenic (as As)	mg/l	0.01	0.05	<0.01	APHA 22 nd Ed., 3120 B(ICP-OES)/3114, AAS-VGA
22	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.01	APHA 22 nd Ed., 4500 CN
23	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B(ICP-OES)/3111B AAS
24	Zinc (as Zn)	mg/l	5	15	0.03	APHA 22 nd Ed., 3120 B (ICP-OES) / 3111 B (AAS)
25	Anionic Detergent (as MBAS)	mg/l	0.2	1	<0.01	APHA 22 nd Ed., 5540 (c)
26	Chromium (as Cr ⁶⁺)	mg/l	0.05	No Relaxation	<0.01	IS : 3025(Pt-52)-2003
27	Mineral oil	mg/l	0.5	No Relaxation	<0.1	IS: 3025(Pt-39)1991, Reaff. 2003
28	Alkalinity (as CaCO ₃)	mg/l	200	600	312	IS: 3025(Pt-23)1986, Reaff. 2003
29	Aluminium (as Al)	mg/l	0.03	0.2	<0.02	APHA 22 nd Ed. 3120 B (ICP-OES)/3111 B (AAS)/IS 3025 (pt-55)2003
30	Boron (as B)	mg/l	0.5	1	0.1	IS: 3025(Pt-57):2005, APHA 22 nd Ed., 3120 B(ICP-OES)
Bacteriological Parameters						
1	Total Coli form	MPN/100ml	Shall Not Be Detectable		Not Detected (<2)	IS : 1622-1981 (Reaff.2003)
2	<u>E.coli</u>	<u>E.coli</u> /100ml	Shall Not Be Detectable		Absent	IS : 1622-1981 (Reaff.2003)

** End of Report **



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Website: <http://www.grc-india.com>, E-mail : info@grc-india.com, lab@grc-india.com

Test Report

Report Code: W20151217-006

Issue Date: 17.12.2015

Issued To : Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Sample Received on: 07.12.2015
Analysis Duration: 08.12.2015 to 16.12.2015

Sample Description: Ground Water

RESULTS

Water Quality Analysis

SAMPLING DETAILS

Date of Sampling	: 07.12.2015
Sampling Location	: Dhandaruru
Sample Collected by	: Mr. Narendra
Sampling Protocol	: IS-3025(Pt-1)-1987 Reaff : 2003 & IS-1622-1981(Reaff.2003)
Weather Condition	: Clear Sky
Sample Quantity	: 5 L+500 ml
Sample Packing & Mark	: Plastic/ Glass Bottle & IE/NOV/GW6

S. No.	Parameters	Units	Limits (as per IS:10500-2012)		Results	Test Method
			Desirable Limit	Permissible Limit		
1	Color	Hazen	5	15	<5	IS : 3025(Pt-4)-1983, Reaff. 2003
2	Odour	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-5) 1983, Reaff. 2002
3	Taste	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-8)-1984, Reaff. 2006
4	Turbidity	NTU	1	5	1	IS : 3025(Pt-10)-1984, Reaff. 2006
5	pH	-	6.5-8.5	No Relaxation	7.55	IS : 3025(Pt-11)1983, Reaff. 2002
6	Total Hardness (as CaCO ₃)	mg/l	200	600	359	IS : 3025(Pt-21)1983, Reaff. 2009
7	Iron (as Fe)	mg/l	0.3	No Relaxation	0.2	APHA 22 nd Ed., 3120B (ICP-OES)/ 3111B (AAS),
8	Chlorides (as Cl)	mg/l	250	1000	143	IS : 3025(Pt-32)1988, Reaff. 2003
9	Fluoride (as F)	mg/l	1	1.5	0.6	APHA 22 nd Ed., 4500F(D)
10	TDS	mg/l	500	2000	741	IS : 3025(Pt-16)1984, Reaff. 2006
11	Calcium (as Ca ²⁺)	mg/l	75	200	86	IS : 3025(Pt-40)1991, Reaff. 2003
12	Magnesium (as Mg ²⁺)	mg/l	30	100	34	APHA 22 nd Ed., 3500-Mg (B)
13	Copper (as Cu)	mg/l	0.05	1.5	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B (AAS)
14	Manganese(as Mn)	mg/l	0.1	0.3	0.04	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B(AAS)
15	Sulphate (as SO ₄)	mg/l	200	400	79	IS : 3025(Pt-24)1986, Reaff. 2003
16	Nitrate(as NO ₃)	mg/l	45	No Relaxation	5	IS : 3025(Pt-34)1988, Reaff. 2003

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(Seal & Signature)

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Head Office: F-375, Sec-63, NOIDA - 201 301,

Ph. No.: 0120 - 4044630, 4044660, 4323120, Fax: 0120 - 2406519

Website: <http://www.grc-india.com>, E-mail: info@grc-india.com, lab@grc-india.com

GRC India

Test Report

Report Code: W20151217-006

Issue Date: 17.12.2015

17	Phenolic Compounds (as C ₆ H ₅ OH)	mg/l	0.001	0.002	<0.001	APHA 22 nd Ed., 5530 (c)
18	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	APHA 22 nd Ed. 3120 B (ICP-OES-VGA), 3112 (AAS-VGA)
19	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.001	APHA 22 nd Ed., 3120 B (ICP-OES) / 3111B (AAS)
20	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES) / 3114, AAS-VGA
21	Arsenic (as As)	mg/l	0.01	0.05	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES) / 3114, AAS-VGA
22	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.01	APHA 22 nd Ed., 4500 CN
23	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES) / 3111B AAS
24	Zinc (as Zn)	mg/l	5	15	0.12	APHA 22 nd Ed., 3120 B (ICP-OES) / 3111 B (AAS)
25	Anionic Detergent (as MBAS)	mg/l	0.2	1	<0.01	APHA 22 nd Ed., 5540 (c)
26	Chromium (as Cr ⁶⁺)	mg/l	0.05	No Relaxation	<0.01	IS : 3025(Pt-52)-2003
27	Mineral oil	mg/l	0.5	No Relaxation	<0.1	IS: 3025(Pt-39)1991, Reaff. 2003
28	Alkalinity (as CaCO ₃)	mg/l	200	600	326	IS: 3025(Pt-23)1986, Reaff. 2003
29	Aluminum (as Al)	mg/l	0.03	0.2	<0.02	APHA 22 nd Ed. 3120 B (ICP-OES) / 3111 B (AAS) / IS 3025 (pt-55) 2003
30	Boron (as B)	mg/l	0.5	1	0.1	IS: 3025(Pt-57):2005, APHA 22 nd Ed., 3120 B (ICP-OES)
Bacteriological Parameters						
1	Total Coli form	MPN/100ml	Shall Not Be Detectable	Not Detected (<2)		IS : 1622-1981 (Reaff.2003)
2	E.coli	E.coli/100ml	Shall Not Be Detectable	Absent		IS : 1622-1981 (Reaff.2003)

** End of Report **



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Test Report

Report Code: W20151217-007

Issue Date: 17.12.2015

**Issued To : Industrial Estate at Barwala(HSIDC),
Distt:- Panchkula, Haryana**

**Sample Received on: 07.12.2015
Analysis Duration: 08.12.2015 to 16.12.2015**

Sample Description: Ground Water

RESULTS

Water Quality Analysis

SAMPLING DETAILS

Date of Sampling	: 07.12.2015
Sampling Location	: Kheri
Sample Collected by	: Mr. Narendra
Sampling Protocol	: IS-3025(Pt-1)-1987 Reaff : 2003 & IS-1622- 1981(Reaff.:2003)
Weather Condition	: Clear Sky
Sample Quantity	: 5 L+500 ml
Sample Packing & Mark	: Plastic/ Glass Bottle & IE/NOV/GW7

S. No.	Parameters	Units	Limits (as per IS:10500-2012)		Results	Test Method
			Desirable Limit	Permissible Limit		
1	Color	Hazen	5	15	<5	IS : 3025(Pt-4)-1983, Reaff-2003
2	Odour	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-5) 1983, Reaff. 2002
3	Taste	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-8)-1984, Reaff. 2006
4	Turbidity	NTU	1	5	1	IS : 3025(Pt-10)-1984, Reaff. 2006
5	pH	-	6.5-8.5	No Relaxation	7.69	IS : 3025(Pt-11)1983, Reaff. 2002
6	Total Hardness (as CaCO ₃)	mg/l	200	600	361	IS : 3025(Pt-21)1983, Reaff. 2009
7	Iron (as Fe)	mg/l	0.3	No Relaxation	0.4	APHA 22 nd Ed., 3120B (ICP-OES)/ 3111B (AAS),
8	Chlorides (as Cl)	mg/l	250	1000	146	IS : 3025(Pt-32)1988, Reaff. 2003
9	Fluoride (as F)	mg/l	1	1.5	0.5	APHA 22 nd Ed., 4500F(D)
10	TDS	mg/l	500	2000	757	IS : 3025(Pt-16)1984, Reaff. 2006
11	Calcium (as Ca ²⁺)	mg/l	75	200	87	IS : 3025(Pt-40)1991, Reaff. 2003
12	Magnesium (as Mg ²⁺)	mg/l	30	100	35	APHA 22 nd Ed., 3500-Mg (B)
13	Copper (as Cu)	mg/l	0.05	1.0	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B (AAS)
14	Manganese(as Mn)	mg/l	0.1	0.3	0.02	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B(AAS)
15	Sulphate (as SO ₄)	mg/l	200	400	75	IS : 3025(Pt-24)1986, Reaff. 2003
16	Nitrate(as NO ₃)	mg/l	45	No Relaxation	9	IS : 3025(Pt-34)1988, Reaff. 2003

Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: W20151217-007

Issue Date: 17.12.2015

17	Phenolic Compounds (as C ₆ H ₅ OH)	mg/l	0.001	0.002	<0.001	APHA 22 nd Ed., 5530 (c)
18	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	APHA 22 nd Ed. 3120 B (ICP-OES-VGA), 3112 (AAS-VGA)
19	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.001	APHA 22 nd Ed., 3120 B (ICP-OES) / 3111B (AAS)
20	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES) / 3114, AAS-VGA
21	Arsenic (as As)	mg/l	0.01	0.05	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES) / 3114, AAS-VGA
22	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.01	APHA 22 nd Ed., 4500 CN
23	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES) / 3111B AAS
24	Zinc (as Zn)	mg/l	5	15	0.1	APHA 22 nd Ed., 3120 B (ICP-OES) / 3111 B (AAS)
25	Anionic Detergent (as MBAS)	mg/l	0.2	1	<0.01	APHA 22 nd Ed., 5540 (c)
26	Chromium (as Cr ⁶⁺)	mg/l	0.05	No Relaxation	<0.01	IS : 3025(Pt-52)-2003
27	Mineral oil	mg/l	0.5	No Relaxation	<0.1	IS : 3025(Pt-39)1991, Reaff. 2003
28	Alkalinity (as CaCO ₃)	mg/l	200	600	342	IS : 3025(Pt-23)1986, Reaff. 2003
29	Aluminum (as Al)	mg/l	0.03	0.2	<0.02	APHA 22 nd Ed. 3120 B (ICP-OES) / 3111 B (AAS) / IS 3025 (pt-55)2003
30	Boron (as B)	mg/l	0.5	1	0.2	IS : 3025(Pt-57):2005, APHA 22 nd Ed., 3120 B (ICP-OES)
Bacteriological Parameters						
1	Total Coli form	MPN/100ml	Shall Not Be Detectable		Not Detected (<2)	IS : 1622-1981 (Reaff.2003)
2	E.coli	E.coli/100ml	Shall Not Be Detectable		Absent	IS : 1622-1981 (Reaff.2003)

** End of Report **



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Test Report

Report Code: W20151217-008

Issue Date: 17.12.2015

Issued To : Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, HaryanaSample Received on: 07.12.2015
Analysis Duration: 08.12.2015 to 16.12.2015

Sample Description: Ground Water

RESULTS

Water Quality Analysis

SAMPLING DETAILS

Date of Sampling	: 07.12.2015
Sampling Location	: Haripur
Sample Collected by	: Mr. Narendra
Sampling Protocol	: IS-3025(Pt-1)-1987 Reaff: 2003 & IS-1622- 1981(Reaff:2003)
Weather Condition	: Clear Sky
Sample Quantity	: 5 L+500 ml
Sample Packing & Mark	: Plastic/ Glass Bottle & IE/NOV/GW8

S. No.	Parameters	Units	Limits (as per IS:10500-2012)		Results	Test Method
			Desirable Limit	Permissible Limit		
1	Color	Hazen	5	15	<5	IS :3025(Pt-4)-1983, Reaff: 2003
2	Odour	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-5) 1983, Reaff. 2002
3	Taste	-	Agreeable	Agreeable	Agreeable	IS : 3025(Pt-8)-1984, Reaff. 2006
4	Turbidity	NTU	1	5	1	IS: 3025(Pt-10)-1984,Reaff. 2006
5	pH	-	6.5-8.5	No Relaxation	7.82	IS : 3025(Pt-11)1983, Reaff. 2002
6	Total Hardness (as CaCO ₃)	mg/l	200	600	372	IS : 3025(Pt-21)1983, Reaff. 2009
7	Iron (as Fe)	mg/l	0.3	No Relaxation	0.7	APHA 22 nd Ed., 3120B (ICP-OES)/ 3111B (AAS),
8	Chlorides (as Cl)	mg/l	250	1000	152	IS : 3025(Pt-32)1988, Reaff. 2003
9	Fluoride (as F)	mg/l	1	1.5	0.2	APHA 22 nd Ed., 4500F(D)
10	TDS	mg/l	500	2000	782	IS: 3025(Pt-16)1984, Reaff. 2006
11	Calcium (as Ca ²⁺)	mg/l	75	200	89	IS : 3025(Pt-40)1991, Reaff. 2003
12	Magnesium (as Mg ²⁺)	mg/l	30	100	36	APHA 22 nd Ed., 3500-Mg (B)
13	Copper (as Cu)	mg/l	0.05	1.5	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B (AAS)
14	Manganese(as Mn)	mg/l	0.1	0.3	0.06	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B(AAS)
15	Sulphate (as SO ₄)	mg/l	200	400	82	IS : 3025(Pt-24)1986, Reaff. 2003
16	Nitrate(as NO ₃)	mg/l	45	No Relaxation	6	IS : 3025(Pt-34)1988, Reaff. 2003

Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: W20151217-008

Issue Date: 17.12.2015

17	Phenolic Compounds (as C ₆ H ₅ OH)	mg/l	0.001	0.002	<0.001	APHA 22 nd Ed., 5530 (c)
18	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	APHA 22 nd Ed. 3120 B (ICP-OES-VGA), 3112 (AAS-VGA)
19	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.001	APHA 22 nd Ed., 3120 B (ICP-OES)/3111B (AAS)
20	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B(ICP-OES)/ 3114, AAS-VGA
21	Arsenic (as As)	mg/l	0.01	0.05	<0.01	APHA 22 nd Ed., 3120 B(ICP-OES)/ 3114, AAS-VGA
22	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.01	APHA 22 nd Ed., 4500 CN
23	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B(ICP-OES)/3111B AAS
24	Zinc (as Zn)	mg/l	5	15	0.04	APHA 22 nd Ed., 3120 B (ICP-OES) / 3111 B (AAS)
25	Anionic Detergent (as MBAS)	mg/l	0.2	1	<0.01	APHA 22 nd Ed., 5540 (c)
26	Chromium (as Cr ⁶⁺)	mg/l	0.05	No Relaxation	<0.01	IS : 3025(Pt-52)-2003
27	Mineral oil	mg/l	0.5	No Relaxation	<0.1	IS: 3025(Pt-39)1991, Reaff. 2003
28	Alkalinity (as CaCO ₃)	mg/l	200	600	345	IS: 3025(Pt-23)1986, Reaff. 2003
29	Aluminum (as Al)	mg/l	0.03	0.2	<0.02	APHA 22 nd Ed.3120 B (ICP-OES)/ 3111 B (AAS)/IS 3025 (pt-55)2003
30	Boron (as B)	mg/l	0.5	1	0.1	IS: 3025(Pt-57):2005, APHA 22 nd Ed., 3120 B(ICP-OES)
Bacteriological Parameters						
1	Total Coli form	MPN/100ml	Shall Not Be Detectable		Not Detected (<2)	IS : 1622-1981 (Reaff.2003)
2	<u>E.coli</u>	<u>E.coli</u> /100ml	Shall Not Be Detectable		Absent	IS : 1622-1981 (Reaff.2003)

** End of Report **



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Test Report

Report Code: W20151217-009

Issue Date: 17.12.2015

Issued To : Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Sample Received on: 07.12.2015
Analysis Duration: 08.12.2015 to 16.12.2015

Sample Description: Ground Water

RESULTS

Water Quality Analysis

SAMPLING DETAILS

Date of Sampling : 07.12.2015
Sampling Location : Rehawar
Sample Collected by : Mr. Narendra
Sampling Protocol : IS-3025(Pt-1)-1987 Reaff: 2003 & IS-1622- 1981(Reaff.2003)
Weather Condition : Clear Sky
Sample Quantity : 5 L+500 ml
Sample Packing & Mark : Plastic/ Glass Bottle & IE/NOV/GW9

S. No.	Parameters	Units	Limits (as per IS:10500-2012)		Results	Test Method
			Desirable Limit	Permissible Limit		
1	Color	Hazen	5	15	<5	IS: 3025(Pt-4) 1983, Reaff. 2003
2	Odour	-	Agreeable	Agreeable	Agreeable	IS: 3025(Pt-5) 1983, Reaff. 2002
3	Taste	-	Agreeable	Agreeable	Agreeable	IS: 3025(Pt-8)-1984, Reaff. 2006
4	Turbidity	NTU	1	5	1	IS: 3025(Pt-10)-1984, Reaff. 2006
5	pH	-	6.5-8.5	No Relaxation	7.84	IS: 3025(Pt-11)1983, Reaff. 2002
6	Total Hardness (as CaCO ₃)	mg/l	200	600	368	IS: 3025(Pt-21)1983, Reaff. 2009
7	Iron (as Fe)	mg/l	0.3	No Relaxation	0.6	APHA 22 nd Ed., 3120B (ICP-OES)/ 3111B (AAS),
8	Chlorides (as Cl)	mg/l	250	1000	182	IS: 3025(Pt-32)1988, Reaff. 2003
9	Fluoride (as F)	mg/l	1	1.5	0.3	APHA 22 nd Ed., 4500F(D)
10	TDS	mg/l	500	2000	842	IS: 3025(Pt-16)1984, Reaff. 2006
11	Calcium (as Ca ²⁺)	mg/l	75	200	88	IS: 3025(Pt-40)1991, Reaff. 2003
12	Magnesium (as Mg ²⁺)	mg/l	30	100	36	APHA 22 nd Ed., 3500-Mg (B)
13	Copper (as Cu)	mg/l	0.05	1.5	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B (AAS)
14	Manganese(as Mn)	mg/l	0.1	0.3	0.04	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3111B(AAS)
15	Sulphate (as SO ₄)	mg/l	200	400	90	IS: 3025(Pt-24)1986, Reaff. 2003
16	Nitrate(as NO ₃)	mg/l	45	No Relaxation	1	IS: 3025(Pt-34)1988, Reaff. 2003

Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: W20151217-009

Issue Date: 17.12.2015

17	Phenolic Compounds (as C ₆ H ₅ OH)	mg/l	0.001	0.002	<0.001	APHA 22 nd Ed., 5530 (c)
18	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	APHA 22 nd Ed. 3120 B (ICP-OES-VGA), 3112 (AAS-VGA)
19	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.001	APHA 22 nd Ed., 3120 B (ICP-OES)/3111B (AAS)
20	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3114, AAS-VGA
21	Arsenic (as As)	mg/l	0.01	0.05	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/ 3114, AAS-VGA
22	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.01	APHA 22 nd Ed., 4500 CN
23	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01	APHA 22 nd Ed., 3120 B (ICP-OES)/3111B AAS
24	Zinc (as Zn)	mg/l	5	15	0.09	APHA 22 nd Ed., 3120 B (ICP-OES) / 3111 B (AAS)
25	Anionic Detergent (as MBAS)	mg/l	0.2	1	<0.01	APHA 22 nd Ed., 5540 (c)
26	Chromium (as Cr ⁶⁺)	mg/l	0.05	No Relaxation	<0.01	IS : 3025(Pt-52)-2003
27	Mineral oil	mg/l	0.5	No Relaxation	<0.1	IS: 3025(Pt-39)1991, Reaff. 2003
28	Alkalinity (as CaCO ₃)	mg/l	200	600	339	IS: 3025(Pt-23)1986, Reaff. 2003
29	Aluminum (as Al)	mg/l	0.03	0.2	<0.02	APHA 22 nd Ed 3120 B (ICP-OES)/ 3111 B (AAS)/IS 3025 (pt-55)2003
30	Boron (as B)	mg/l	0.5	1	0.1	IS: 3025(Pt-57):2005, APHA 22 nd Ed., 3120 B (ICP-OES)
Bacteriological Parameters						
1	Total Coli form	MPN/100ml	Shall Not Be Detectable	Not Detected (<2)		IS : 1622-1981 (Reaff.2003)
2	E.coli	E.coli/100ml	Shall Not Be Detectable	Absent		IS : 1622-1981 (Reaff.2003)

** End of Report **



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Ph. No.: 0120 - 4044630, 4044660, 4323120, Fax: 0120 - 2406519
Website: <http://www.grc-india.com>, E-mail : info@grc-india.com, lab@grc-india.com

Test Report

Report Code: W20151014-091

Issue Date: 14.10.2015

Issued To: Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Sample Received on: 06.10.2015
Analysis Duration: 07.10.2015 to 13.10.2015

Sample Description: Surface Water

RESULTS

Water Quality Analysis

SAMPLING DETAILS

Date of Sampling : 06.10.2015
Sampling Location : Ghaggar River(Upstream)
Sample Collected by : Mr. Narendra
Sampling Protocol : IS-3025(Pt-1)-1987 Reaff. 2003 & IS-1622- 1981(Reaff. 2003)
Weather Condition : Clear Sky
Sample Quantity : 5 L+500 ml
Sample Packing & Mark : Plastic/ Glass Bottle & IE/OCT/SW01

S. No.	Parameters	Units	Results	Test Method
1.	pH	-	7.46	IS: 3025(Pt-11)1983, Reaff. 2002
2.	Dissolved Oxygen (DO)	mg/l	4.5	IS: 3025(Pt-38)1989, Reaff. 2003
3.	BOD (3Days at 27°C)	mg/l	9	IS: 3025(Pt-44)1993, Reaff. 2003
4.	Free Ammonia(as N)	mg/l	0.9	IS: 3025(Pt-34)1993, Reaff. 2003
5.	Sodium Adsorption Ratio	-	2.88	IS : 11624
6.	Boron	mg/l	0.4	IS 3025 (Part 57): 2005, APHA 22 nd Ed ICP-3120 B
7.	Specific Conductivity	µmhos/cm	1460	IS: 3025(Pt-14)1984, Reaff. 2002
8.	Temperature	°C	24.6	IS: 3025(Pt-9)1984, Reaff. 2002
9.	Turbidity	NTU	60	IS: 3025(Pt-10)-1984, Reaff. 2006
10.	Magnesium Hardness (asCaCO ₃)	mg/l	112	APHA 22 nd Ed., 3500-Mg (B)
11.	Total Alkalinity (asCaCO ₃)	mg/l	320	IS: 3025(Pt-23)1986, Reaff. 2003
12.	Chloride (as Cl)	mg/l	185	IS: 3025(Pt-32)1988, Reaff. 2002
13.	Sulphate (as SO ₄)	mg/l	76	IS : 3025(Pt-24)1986, Reaff. 2003
14.	Nitrate(as NO ₃)	mg/l	7.6	IS : 3025(Pt-34)1988, Reaff. 2003



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Report Code: W20151014-091

Issue Date: 14.10.2015

15.	Fluoride(as F)	mg/l	0.5	APHA 22 nd Ed., 4500F(D)
16.	Sodium (as Na)	mg/l	160	IS: 3025(Pt-45)-1993, Reaff. 2003
17.	Potassium (as K)	mg/l	11.3	IS: 3025(Pt-45)-1993, Reaff. 2003
18.	TKN (as N)	mg/l	2.1	IS: 3025(Pt-34)-1988, Reaff. 2003
19.	Total Phosphorus (as P)	mg/l	1.1	IS: 3025(Pt-31)-1988, Reaff. 2003
20.	COD	mg/l	30	IS : 3025(Pt-58)-2006
21.	Phenolic compounds (as C ₆ H ₅ OH)	mg/l	<0.001	APHA 22 nd Ed., 5530 (c)
22.	Lead (as Pb)	mg/l	<0.01	APHA 22 nd Ed ICP-3120B /3111B(AAS)
23.	Iron (as Fe)	mg/l	1.1	APHA 22 nd Ed ICP-3120B /3111B(AAS)
24.	Cadmium (as Cd)	mg/l	<0.001	APHA 22 nd Ed ICP-3120B /3111B(AAS)
25.	Zinc (as Zn)	mg/l	0.5	APHA 22 nd Ed ICP-3120B /3111B(AAS)
26.	Arsenic (as As)	mg/l	<0.01	APHA 22 nd Ed ICP-3120B /3114(AAS-VGA)
27.	Mercury (as Hg)	mg/l	<0.001	APHA 22 nd Ed ICP-3120 B/ 3112(AAS-VGA)
28.	Chromium (as Cr)	mg/l	<0.01	APHA 22 nd Ed ICP-3120B /3111B(AAS)
29.	Nickel (as Ni)	mg/l	<0.01	APHA 22 nd Ed ICP-3120B /3111B(AAS)
30.	TDS	mg/l	876	IS: 3025(Pt-16)1984, Reaff. 2006
Bacteriological Parameter				
1.	Total Coliform	MPN /100ml	1.2 x 10 ⁵	IS 1622-1981 (Reaff.2003)
2.	Faecal Coliform	MPN /100ml	5.4 x 10 ⁴	IS 1622-1981 (Reaff.2003)

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Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: W20151014-092

Issue Date: 14.10.2015

Issued To: Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Sample Received on: 06.10.2015
Analysis Duration: 07.10.2015 to 13.10.2015

Sample Description: Surface Water

RESULTS

Water Quality Analysis

SAMPLING DETAILS

Date of Sampling	: 06.10.2015
Sampling Location	: Ghaggar River(Centre)
Sample Collected by	: Mr. Narendra
Sampling Protocol	: IS-3025(Pt-1)-1987 Reaff. 2003 & IS-1622- 1981(Reaff. .2003)
Weather Condition	: Clear Sky
Sample Quantity	: 5 L+500 ml
Sample Packing & Mark	: Plastic/ Glass Bottle & IE/OCT/SW02

S. No.	Parameters	Units	Results	Test Method
1.	pH	-	7.31	IS: 3025(Pt-11)1983, Reaff. 2002
2.	Dissolved Oxygen (DO)	mg/l	3.6	IS: 3025(Pt-38)1989, Reaff. 2003
3.	BOD (3Days at 27°C)	mg/l	21	IS: 3025(Pt-44)1993, Reaff. 2003
4.	Free Ammonia(as N)	mg/l	1.6	IS: 3025(Pt-34)1993, Reaff. 2003
5.	Sodium Adsorption Ratio	-	3.67	IS : 11624
6.	Boron	mg/l	0.6	IS 3025 (Part 57): 2005, APHA 22 nd Ed ICP-3120 B
7.	Specific Conductivity	µmhos/cm	1429	IS: 3025(Pt-14)1984, Reaff. 2002
8.	Temperature	°C	24.3	IS: 3025(Pt-9)1984, Reaff. 2002
9.	Turbidity	NTU	81	IS: 3025(Pt-10)-1984, Reaff. 2006
10.	Magnesium Hardness (asCaCO ₃)	mg/l	96	APHA 22 nd Ed., 3500-Mg (B)
11.	Total Alkalinity (asCaCO ₃)	mg/l	270	IS: 3025(Pt-23)1986, Reaff. 2003
12.	Chloride (as Cl)	mg/l	172	IS: 3025(Pt-32)1988, Reaff. 2002
13.	Sulphate (as SO ₄)	mg/l	113	IS : 3025(Pt-24)1986, Reaff. 2003
14.	Nitrate(as NO ₃)	mg/l	9.2	IS : 3025(Pt-34)1988, Reaff. 2003



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Test Report

Report Code: W20151014-092

Issue Date: 14.10.2015

15.	Fluoride(as F)	mg/l	0.5	APHA 22 nd Ed., 4500F(D)
16.	Sodium (as Na)	mg/l	164	IS: 3025(Pt-45)-1993, Reaff. 2003
17.	Potassium (as K)	mg/l	16.1	IS: 3025(Pt-45)-1993, Reaff. 2003
18.	TKN (as N)	mg/l	3.2	IS: 3025(Pt-34)-1988, Reaff. 2003
19.	Total Phosphorus (as P)	mg/l	1.3	IS: 3025(Pt-31)-1988, Reaff. 2003
20.	COD	mg/l	58	IS : 3025(Pt-58)-2006
21.	Phenolic compounds (as C ₆ H ₅ OH)	mg/l	<0.001	APHA 22 nd Ed., 5530 (c)
22.	Lead (as Pb)	mg/l	<0.01	APHA 22 nd Ed ICP-3120B /3111B(AAS)
23.	Iron (as Fe)	mg/l	1.70	APHA 22 nd Ed ICP-3120B /3111B(AAS)
24.	Cadmium (as Cd)	mg/l	<0.001	APHA 22 nd Ed ICP-3120B /3111B(AAS)
25.	Zinc (as Zn)	mg/l	0.8	APHA 22 nd Ed ICP-3120B /3111B(AAS)
26.	Arsenic (as As)	mg/l	<0.01	APHA 22 nd Ed ICP-3120B /3114(AAS-VGA)
27.	Mercury (as Hg)	mg/l	<0.001	APHA 22 nd Ed ICP-3120 B/ 3112(AAS-VGA)
28.	Chromium (as Cr)	mg/l	<0.01	APHA 22 nd Ed ICP-3120B /3111B(AAS)
29.	Nickel (as Ni)	mg/l	<0.01	APHA 22 nd Ed ICP-3120B /3111B(AAS)
30.	TDS	mg/l	857	IS: 3025(Pt-16)1984, Reaff. 2006
Bacteriological Parameter				
1.	Total Coliform	MPN /100ml	3.5 x 10 ⁵	IS 1622-1981 (Reaff.2003)
2.	Faecal Coliform	MPN /100ml	9.2 x 10 ⁴	IS 1622-1981 (Reaff.2003)

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Test Report

Report Code: W20151014-093

Issue Date: 14.10.2015

Issued To: Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Sample Received on: 06.10.2015
Analysis Duration: 07.10.2015 to 13.10.2015

Sample Description: Surface Water

RESULTS

Water Quality Analysis

SAMPLING DETAILS

Date of Sampling	: 06.10.2015
Sampling Location	: Ghaggar River(Downstream)
Sample Collected by	: Mr. Narendra
Sampling Protocol	: IS-3025(Pt-1)-1987 Reaff: 2003 & IS-1622- 1981(Reaff: .2003)
Weather Condition	: Clear Sky
Sample Quantity	: 5 L+500 ml
Sample Packing & Mark	: Plastic/ Glass Bottle & IE/OCT/SW03

S. No.	Parameters	Units	Results	Test Method
1.	pH	-	7.54	IS: 3025(Pt-11)1983, Reaff. 2002
2.	Dissolved Oxygen (DO)	mg/l	4.2	IS: 3025(Pt-38)1989, Reaff. 2003
3.	BOD (3Days at 27°C)	mg/l	13	IS: 3025(Pt-44)1993, Reaff. 2003
4.	Free Ammonia(as N)	mg/l	1.2	IS: 3025(Pt-34)1993, Reaff. 2003
5.	Sodium Adsorption Ratio	-	3.02	IS : I1624
6.	Boron	mg/l	0.3	IS 3025 (Part 57): 2005, APHA 22 nd Ed ICP-3120 B
7.	Specific Conductivity	µmhos/cm	1664	IS: 3025(Pt-14)1984, Reaff. 2002
8.	Temperature	°C	25.1	IS: 3025(Pt-9)1984, Reaff. 2002
9.	Turbidity	NTU	73	IS: 3025(Pt-10)-1984, Reaff. 2006
10.	Magnesium Hardness (asCaCO ₃)	mg/l	132	APHA 22 nd Ed., 3500-Mg (B)
11.	Total Alkalinity (asCaCO ₃)	mg/l	340	IS: 3025(Pt-23)1986. Reaff. 2003
12.	Chloride (as Cl)	mg/l	212	IS: 3025(Pt-32)1988, Reaff. 2002
13.	Sulphate (as SO ₄)	mg/l	102	IS : 3025(Pt-24)1986, Reaff. 2003
14.	Nitrate(as NO ₃)	mg/l	8.1	IS : 3025(Pt-34)1988, Reaff. 2003



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Test Report

Report Code: W20151014-093

Issue Date: 14.10.2015

15.	Fluoride(as F)	mg/l	0.7	APHA 22 nd Ed., 4500F(D)
16.	Sodium (as Na)	mg/l	174	IS: 3025(Pt-45)-1993, Reaff. 2003
17.	Potassium (as K)	mg/l	14.5	IS: 3025(Pt-45)-1993, Reaff. 2003
18.	TKN (as N)	mg/l	2.6	IS: 3025(Pt-34)-1988, Reaff. 2003
19.	Total Phosphorus (as P)	mg/l	1.7	IS: 3025(Pt-31)-1988, Reaff. 2003
20.	COD	mg/l	40	IS : 3025(Pt-58)-2006
21.	Phenolic compounds (as C ₆ H ₅ OH)	mg/l	<0.001	APHA 22 nd Ed., 5530 (c)
22.	Lead (as Pb)	mg/l	<0.01	APHA 22 nd Ed ICP-3120B /3111B(AAS)
23.	Iron (as Fe)	mg/l	1.5	APHA 22 nd Ed ICP-3120B /3111B(AAS)
24.	Cadmium (as Cd)	mg/l	<0.001	APHA 22 nd Ed ICP-3120B /3111B(AAS)
25.	Zinc (as Zn)	mg/l	0.7	APHA 22 nd Ed ICP-3120B /3111B(AAS)
26.	Arsenic (as As)	mg/l	<0.01	APHA 22 nd Ed ICP-3120B /3114(AAS-VGA)
27.	Mercury (as Hg)	mg/l	<0.001	APHA 22 nd Ed ICP-3120 B/ 3112(AAS-VGA)
28.	Chromium (as Cr)	mg/l	<0.01	APHA 22 nd Ed ICP-3120B /3111B(AAS)
29.	Nickel (as Ni)	mg/l	<0.01	APHA 22 nd Ed ICP-3120B /3111B(AAS)
30.	TDS	mg/l	998	IS: 3025(Pt-16)1984, Reaff. 2006
Bacteriological Parameter				
1.	Total Coliform	MPN /100ml	1.9 x 10 ⁵	IS 1622-1981 (Reaff.2003)
2.	Faecal Coliform	MPN /100ml	7.1 x 10 ⁴	IS 1622-1981 (Reaff.2003)

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Test Report

Report Code: W20151113-091

Issue Date: 13.11.2015

Issued To: Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Sample Received on: 02.11.2015
Analysis Duration: 03.11.2015 to 12.11.2015

Sample Description: Surface Water

RESULTS

Water Quality Analysis

SAMPLING DETAILS

Date of Sampling	: 02.11.2015
Sampling Location	: Ghaggar River (Upstream)
Sample Collected by	: Mr. Narendra
Sampling Protocol	: IS-3025(Pt-1)-1987 Reaff: 2003 & IS-1622- 1981(Reaff: .2003)
Weather Condition	: Clear Sky
Sample Quantity	: 5 L+500 ml
Sample Packing & Mark	: Plastic/ Glass Bottle & IE/NOV/SW01

S. No.	Parameters	Units	Results	Test Method
1.	pH	-	7.36	IS: 3025(Pt-11)1983, Reaff. 2002
2.	Dissolved Oxygen (DO)	mg/l	4.2	IS: 3025(Pt-38)1989, Reaff. 2003
3.	BOD (3Days at 27°C)	mg/l	10	IS: 3025(Pt-44)1993, Reaff. 2003
4.	Free Ammonia(as N)	mg/l	1.1	IS: 3025(Pt-34)1993, Reaff. 2003
5.	Sodium Adsorption Ratio	-	4.05	IS : 11624
6.	Boron	mg/l	0.3	IS 3025 (Part 57): 2005, APHA 22 nd Ed ICP-3120 B
7.	Specific Conductivity	µmhos/cm	1402	IS: 3025(Pt-14)1984, Reaff. 2002
8.	Temperature	°C	24.1	IS: 3025(Pt-9)1984, Reaff. 2002
9.	Turbidity	NTU	61	IS: 3025(Pt-10)-1984, Reaff. 2006
10.	Magnesium Hardness (asCaCO ₃)	mg/l	105	APHA 22 nd Ed., 3500-Mg (B)
11.	Total Alkalinity (asCaCO ₃)	mg/l	310	IS: 3025(Pt-23)1986, Reaff. 2003
12.	Chloride (as Cl)	mg/l	178	IS: 3025(Pt-32)1988, Reaff. 2002
13.	Sulphate (as SO ₄)	mg/l	71	IS : 3025(Pt-24)1986, Reaff. 2003
14.	Nitrate(as NO ₃)	mg/l	7.6	IS : 3025(Pt-34)1988, Reaff. 2003

Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: W20151113-091

Issue Date: 13.11.2015

15.	Fluoride(as F)	mg/l	0.5	APHA 22 nd Ed., 4500F(D)
16.	Sodium (as Na)	mg/l	157	IS: 3025(Pt-45)-1993, Reaff. 2003
17.	Potassium (as K)	mg/l	12.3	IS: 3025(Pt-45)-1993, Reaff. 2003
18.	TKN (as N)	mg/l	2.5	IS: 3025(Pt-34)-1988, Reaff. 2003
19.	Total Phosphorus (as P)	mg/l	1.2	IS: 3025(Pt-31)-1988, Reaff. 2003
20.	COD	mg/l	32	IS : 3025(Pt-58)-2006
21.	Phenolic compounds (as C ₆ H ₅ OH)	mg/l	<0.001	APHA 22 nd Ed., 5530 (c)
22.	Lead (as Pb)	mg/l	<0.01	APHA 22 nd Ed ICP-3120B /3111B(AAS)
23.	Iron (as Fe)	mg/l	1.2	APHA 22 nd Ed ICP-3120B /3111B(AAS)
24.	Cadmium (as Cd)	mg/l	<0.001	APHA 22 nd Ed ICP-3120B /3111B(AAS)
25.	Zinc (as Zn)	mg/l	0.4	APHA 22 nd Ed ICP-3120B /3111B(AAS)
26.	Arsenic (as As)	mg/l	<0.01	APHA 22 nd Ed ICP-3120B /3114(AAS-VGA)
27.	Mercury (as Hg)	mg/l	<0.001	APHA 22 nd Ed ICP-3120 B/ 3112(AAS-VGA)
28.	Chromium (as Cr)	mg/l	<0.01	APHA 22 nd Ed ICP-3120B /3111B(AAS)
29.	Nickel (as Ni)	mg/l	<0.01	APHA 22 nd Ed ICP-3120B /3111B(AAS)
30.	TDS	mg/l	841	IS: 3025(Pt-16)1984, Reaff. 2006
Bacteriological Parameter				
1.	Total Coliform	MPN/100ml	2.0 x 10 ⁵	IS 1622-1981 (Reaff.2003)
2.	Faecal Coliform	MPN/100ml	6.9 x 10 ⁴	IS 1622-1981 (Reaff.2003)

** End of Report **



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Ph. No.: 0120 - 4044630, 4044660, 4323120, Fax: 0120 - 2406519
Website: <http://www.grc-india.com>, E-mail: info@grc-india.com, lab@grc-india.com

Test Report

Report Code: W20151113-092

Issue Date: 13.11.2015

Issued To: Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Sample Received on: 02.11.2015
Analysis Duration: 03.11.2015 to 12.11.2015

Sample Description: Surface Water

RESULTS

Water Quality Analysis

SAMPLING DETAILS

Date of Sampling : 02.11.2015
Sampling Location : Ghaggar River (Centre)
Sample Collected by : Mr. Narendra
Sampling Protocol : IS-3025(Pt-1)-1987 Reaff. 2003 & IS-1622- 1981(Reaff. 2003)
Weather Condition : Clear Sky
Sample Quantity : 5 L+500 ml
Sample Packing & Mark : Plastic/ Glass Bottle & IE/NOV/SW02

S. No.	Parameters	Units	Results	Test Method
1.	pH	-	7.48	IS: 3025(Pt-11)1983, Reaff. 2002
2.	Dissolved Oxygen (DO)	mg/l	3.5	IS: 3025(Pt-38)1989, Reaff. 2003
3.	BOD (3Days at 27°C)	mg/l	23	IS: 3025(Pt-44)1993, Reaff. 2003
4.	Free Ammonia(as N)	mg/l	1.6	IS: 3025(Pt-34)1993, Reaff. 2003
5.	Sodium Adsorption Ratio	-	5.17	IS : 11624
6.	Boron	mg/l	0.5	IS 3025 (Part 57): 2005, APHA 22 nd Ed ICP-3120 B
7.	Specific Conductivity	µmhos/cm	1650	IS: 3025(Pt-14)1984, Reaff. 2002
8.	Temperature	°C	24.8	IS: 3025(Pt-9)1984, Reaff. 2002
9.	Turbidity	NTU	76	IS: 3025(Pt-10)-1984, Reaff. 2006
10.	Magnesium Hardness (asCaCO ₃)	mg/l	106	APHA 22 nd Ed., 3500-Mg (B)
11.	Total Alkalinity (asCaCO ₃)	mg/l	325	IS: 3025(Pt-23)1986, Reaff. 2003
12.	Chloride (as Cl)	mg/l	216	IS: 3025(Pt-32)1988, Reaff. 2002
13.	Sulphate (as SO ₄)	mg/l	103	IS : 3025(Pt-24)1986, Reaff. 2003
14.	Nitrate(as NO ₃)	mg/l	8.5	IS : 3025(Pt-34)1988, Reaff. 2003

Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: W20151113-092

Issue Date: 13.11.2015

15.	Fluoride(as F)	mg/l	0.6	APHA 22 nd Ed., 4500F(D)
16.	Sodium (as Na)	mg/l	201	IS: 3025(Pt-45)-1993, Reaff. 2003
17.	Potassium (as K)	mg/l	16.8	IS: 3025(Pt-45)-1993, Reaff. 2003
18.	TKN (as N)	mg/l	3.2	IS: 3025(Pt-34)-1988, Reaff. 2003
19.	Total Phosphorus (as P)	mg/l	1.5	IS: 3025(Pt-31)-1988, Reaff. 2003
20.	COD	mg/l	66	IS : 3025(Pt-58)-2006
21.	Phenolic compounds (as C ₆ H ₅ OH)	mg/l	<0.001	APHA 22 nd Ed., 5530 (c)
22.	Lead (as Pb)	mg/l	<0.01	APHA 22 nd Ed ICP-3120B /3111B(AAS)
23.	Iron (as Fe)	mg/l	1.40	APHA 22 nd Ed ICP-3120B /3111B(AAS)
24.	Cadmium (as Cd)	mg/l	<0.001	APHA 22 nd Ed ICP-3120B /3111B(AAS)
25.	Zinc (as Zn)	mg/l	0.6	APHA 22 nd Ed ICP-3120B /3111B(AAS)
26.	Arsenic (as As)	mg/l	<0.01	APHA 22 nd Ed ICP-3120B /3114(AAS-VGA)
27.	Mercury (as Hg)	mg/l	<0.001	APHA 22 nd Ed ICP-3120 B/ 3112(AAS-VGA)
28.	Chromium (as Cr)	mg/l	<0.01	APHA 22 nd Ed ICP-3120B /3111B(AAS)
29.	Nickel (as Ni)	mg/l	<0.01	APHA 22 nd Ed ICP-3120B /3111B(AAS)
30.	TDS	mg/l	990	IS: 3025(Pt-16)1984, Reaff. 2006
Bacteriological Parameter				
1.	Total Coliform	MPN /100ml	5.1 x 10 ⁵	IS 1622-1981 (Reaff.2003)
2.	Faecal Coliform	MPN /100ml	9.7 x 10 ⁴	IS 1622-1981 (Reaff.2003)

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Test Report

Report Code: W20151113-093

Issue Date: 13.11.2015

Issued To: Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Sample Received on: 02.11.2015
Analysis Duration: 03.11.2015 to 12.11.2015

Sample Description: Surface Water

RESULTS

Water Quality Analysis

SAMPLING DETAILS

Date of Sampling	: 02.11.2015
Sampling Location	: Ghaggar River(Downstream)
Sample Collected by	: Mr. Narendra
Sampling Protocol	: IS-3025(Pt-1)-1987 Reaff: 2003 & IS-1622- 1981(Reaff: .2003)
Weather Condition	: Clear Sky
Sample Quantity	: 5 L+500 ml
Sample Packing & Mark	: Plastic/ Glass Bottle & IE/NOV/SW03

S. No.	Parameters	Units	Results	Test Method
1.	pH	-	7.51	IS: 3025(Pt-11)1983, Reaff. 2002
2.	Dissolved Oxygen (DO)	mg/l	3.9	IS: 3025(Pt-38)1989, Reaff. 2003
3.	BOD (3Days at 27°C)	mg/l	12	IS: 3025(Pt-44)1993, Reaff. 2003
4.	Free Ammonia(as N)	mg/l	1.4	IS: 3025(Pt-34)1993, Reaff. 2003
5.	Sodium Adsorption Ratio	-	4.43	IS : 11624
6.	Boron	mg/l	0.2	IS 3025 (Part 57): 2005, APHA 22 nd Ed ICP-3120 B
7.	Specific Conductivity	µmhos/cm	1684	IS: 3025(Pt-14)1984, Reaff. 2002
8.	Temperature	°C	23.5	IS: 3025(Pt-9)1984, Reaff. 2002
9.	Turbidity	NTU	75	IS: 3025(Pt-10)-1984, Reaff. 2006
10.	Magnesium Hardness (asCaCO3)	mg/l	125	APHA 22 nd Ed., 3500-Mg (B)
11.	Total Alkalinity (asCaCO3)	mg/l	371	IS: 3025(Pt-23)1986, Reaff. 2003
12.	Chloride (as Cl)	mg/l	206	IS: 3025(Pt-32)1988, Reaff. 2002
13.	Sulphate (as SO ₄)	mg/l	94	IS : 3025(Pt-24)1986, Reaff. 2003
14.	Nitrate(as NO ₃)	mg/l	9.6	IS : 3025(Pt-34)1988, Reaff. 2003



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Test Report

Report Code: W20151113-093

Issue Date: 13.11.2015

15.	Fluoride(as F)	mg/l	0.7	APHA 22 nd Ed., 4500F(D)
16.	Sodium (as Na)	mg/l	187	IS: 3025(Pt-45)-1993, Reaff. 2003
17.	Potassium (as K)	mg/l	17.2	IS: 3025(Pt-45)-1993, Reaff. 2003
18.	TKN (as N)	mg/l	2.8	IS: 3025(Pt-34)-1988, Reaff. 2003
19.	Total Phosphorus (as P)	mg/l	1.1	IS: 3025(Pt-31)-1988, Reaff. 2003
20.	COD	mg/l	39	IS : 3025(Pt-58)-2006
21.	Phenolic compounds (as C ₆ H ₅ OH)	mg/l	<0.001	APHA 22 nd Ed., 5530 (c)
22.	Lead (as Pb)	mg/l	<0.01	APHA 22 nd Ed ICP-3120B /3111B(AAS)
23.	Iron (as Fe)	mg/l	1.5	APHA 22 nd Ed ICP-3120B /3111B(AAS)
24.	Cadmium (as Cd)	mg/l	<0.001	APHA 22 nd Ed ICP-3120B /3111B(AAS)
25.	Zinc (as Zn)	mg/l	0.7	APHA 22 nd Ed ICP-3120B /3111B(AAS)
26.	Arsenic (as As)	mg/l	<0.01	APHA 22 nd Ed ICP-3120B /3114(AAS-VGA)
27.	Mercury (as Hg)	mg/l	<0.001	APHA 22 nd Ed ICP-3120 B/ 3112(AAS-VGA)
28.	Chromium (as Cr)	mg/l	<0.01	APHA 22 nd Ed ICP-3120B /3111B(AAS)
29.	Nickel (as Ni)	mg/l	<0.01	APHA 22 nd Ed ICP-3120B /3111B(AAS)
30.	TDS	mg/l	1010	IS: 3025(Pt-16)1984, Reaff. 2006
Bacteriological Parameter				
1.	Total Coliform	MPN/100ml	2.8 x 10 ⁵	IS 1622-1981 (Reaff.2003)
2.	Faecal Coliform	MPN /100ml	8.5 x 10 ⁴	IS 1622-1981 (Reaff.2003)

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Test Report

Report Code: W20151216-011

Issue Date: 16.12.2015

Issued To: Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Sample Received on: 07.12.2015
Analysis Duration: 08.12.2015 to 15.12.2015

Sample Description: Surface Water

RESULTS

Water Quality Analysis

SAMPLING DETAILS

Date of Sampling	: 07.12.2015
Sampling Location	: Ghaggar River (Upstream)
Sample Collected by	: Mr. Narendra
Sampling Protocol	: IS-3025(Pt-1)-1987 Reaff: 2003 & IS-1622- 1981(Reaff: .2003)
Weather Condition	: Clear Sky
Sample Quantity	: 5 L+500 ml
Sample Packing & Mark	: Plastic/ Glass Bottle & IE/DEC/SW01

S. No.	Parameters	Units	Results	Test Method
1.	pH	-	7.41	IS: 3025(Pt-11)1983, Reaff. 2002
2.	Dissolved Oxygen (DO)	mg/l	4.1	IS: 3025(Pt-38)1989, Reaff. 2003
3.	BOD (3Days at 27°C)	mg/l	12	IS: 3025(Pt-44)1993, Reaff. 2003
4.	Free Ammonia(as N)	mg/l	0.8	IS: 3025(Pt-34)1993, Reaff. 2003
5.	Sodium Adsorption Ratio	-	4.27	IS : 11624
6.	Boron	mg/l	0.4	IS 3025 (Part 57): 2005, APHA 22 nd Ed ICP-3120 B
7.	Specific Conductivity	µmhos/cm	1544	IS: 3025(Pt-14)1984, Reaff. 2002
8.	Temperature	°C	23.8	IS: 3025(Pt-9)1984, Reaff. 2002
9.	Turbidity	NTU	66	IS: 3025(Pt-10)-1984, Reaff. 2006
10.	Magnesium Hardness (asCaCO ₃)	mg/l	115	APHA 22 nd Ed., 3500-Mg (B)
11.	Total Alkalinity (asCaCO ₃)	mg/l	342	IS: 3025(Pt-23)1986, Reaff. 2003
12.	Chloride (as Cl)	mg/l	192	IS: 3025(Pt-32)1988, Reaff. 2002
13.	Sulphate (as SO ₄)	mg/l	82	IS : 3025(Pt-24)1986, Reaff. 2003
14.	Nitrate(as NO ₃)	mg/l	6.9	IS : 3025(Pt-34)1988, Reaff. 2003



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Test Report

Report Code: W20151216-011

Issue Date: 16.12.2015

15.	Fluoride(as F)	mg/l	0.4	APHA 22 nd Ed., 4500F(D)
16.	Sodium (as Na)	mg/l	173	IS: 3025(Pt-45)-1993, Reaff. 2003
17.	Potassium (as K)	mg/l	13.1	IS: 3025(Pt-45)-1993, Reaff. 2003
18.	TKN (as N)	mg/l	1.8	IS: 3025(Pt-34)-1988, Reaff. 2003
19.	Total Phosphorus (as P)	mg/l	1.1	IS: 3025(Pt-31)-1988, Reaff. 2003
20.	COD	mg/l	34	IS : 3025(Pt-58)-2006
21.	Phenolic compounds (as C ₆ H ₅ OH)	mg/l	<0.001	APHA 22 nd Ed., 5530 (c)
22.	Lead (as Pb)	mg/l	<0.01	APHA 22 nd Ed ICP-3120B /3111B(AAS)
23.	Iron (as Fe)	mg/l	1	APHA 22 nd Ed ICP-3120B /3111B(AAS)
24.	Cadmium (as Cd)	mg/l	<0.001	APHA 22 nd Ed ICP-3120B /3111B(AAS)
25.	Zinc (as Zn)	mg/l	0.5	APHA 22 nd Ed ICP-3120B /3111B(AAS)
26.	Arsenic (as As)	mg/l	<0.01	APHA 22 nd Ed ICP-3120B /3114(AAS-VGA)
27.	Mercury (as Hg)	mg/l	<0.001	APHA 22 nd Ed ICP-3120 B/3112(AAS-VGA)
28.	Chromium (as Cr)	mg/l	<0.01	APHA 22 nd Ed ICP-3120B /3111B(AAS)
29.	Nickel (as Ni)	mg/l	<0.01	APHA 22 nd Ed ICP-3120B /3111B(AAS)
30.	TDS	mg/l	926	IS: 3025(Pt-16)1984, Reaff. 2006
Bacteriological Parameter				
I.	Total Coliform	MPN /100ml	1.8 x 10 ⁵	IS 1622-1981 (Reaff.2003)
2.	Faecal Coliform	MPN /100ml	4.9 x 10 ⁴	IS 1622-1981 (Reaff.2003)

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Test Report

Report Code: W20151216-012

Issue Date: 16.12.2015

Issued To: Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, HaryanaSample Received on: 07.12.2015
Analysis Duration: 08.12.2015 to 15.12.2015

Sample Description: Surface Water

RESULTS

Water Quality Analysis

SAMPLING DETAILS

Date of Sampling	: 07.12.2015
Sampling Location	: Ghaggar River(Centre)
Sample Collected by	: Mr. Narendra
Sampling Protocol	: IS-3025(Pt-1)-1987 Reaff: 2003 & IS-1622- 1981(Reaff: .2003)
Weather Condition	: Clear Sky
Sample Quantity	: 5 L+500 ml
Sample Packing & Mark	: Plastic/ Glass Bottle & IE/DEC/SW02

S. No.	Parameters	Units	Results	Test Method
1.	pH	-	7.38	IS: 3025(Pt-11)1983, Reaff. 2002
2.	Dissolved Oxygen (DO)	mg/l	3.4	IS: 3025(Pt-38)1989, Reaff. 2003
3.	BOD (3Days at 27°C)	mg/l	20	IS: 3025(Pt-44)1993, Reaff. 2003
4.	Free Ammonia(as N)	mg/l	1.3	IS: 3025(Pt-34)1993, Reaff. 2003
5.	Sodium Adsorption Ratio	-	4.59	IS : 11624
6.	Boron	mg/l	0.5	IS 3025 (Part 57): 2005, APHA 22 nd Ed ICP-3120 B
7.	Specific Conductivity	µmhos/cm	1672	IS: 3025(Pt-14)1984, Reaff. 2002
8.	Temperature	°C	25.2	IS: 3025(Pt-9)1984, Reaff. 2002
9.	Turbidity	NTU	78	IS: 3025(Pt-10)-1984, Reaff. 2006
10.	Magnesium Hardness (asCaCO ₃)	mg/l	121	APHA 22 nd Ed., 3500-Mg (B)
11.	Total Alkalinity (asCaCO ₃)	mg/l	356	IS: 3025(Pt-23)1986, Reaff. 2003
12.	Chloride (as Cl)	mg/l	210	IS: 3025(Pt-32)1988, Reaff. 2002
13.	Sulphate (as SO ₄)	mg/l	96	IS : 3025(Pt-24)1986, Reaff. 2003
14.	Nitrate(as NO ₃)	mg/l	7.5	IS : 3025(Pt-34)1988, Reaff. 2003

Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: W20151216-012

Issue Date: 16.12.2015

15.	Fluoride(as F)	mg/l	0.5	APHA 22 nd Ed., 4500F(D)
16.	Sodium (as Na)	mg/l	191	IS: 3025(Pt-45)-1993, Reaff. 2003
17.	Potassium (as K)	mg/l	11.6	IS: 3025(Pt-45)-1993, Reaff. 2003
18.	TKN (as N)	mg/l	2.6	IS: 3025(Pt-34)-1988, Reaff. 2003
19.	Total Phosphorus (as P)	mg/l	1.8	IS: 3025(Pt-31)-1988, Reaff. 2003
20.	COD	mg/l	54	IS : 3025(Pt-58)-2006
21.	Phenolic compounds (as C ₆ H ₅ OH)	mg/l	<0.001	APHA 22 nd Ed., 5530 (c)
22.	Lead (as Pb)	mg/l	<0.01	APHA 22 nd Ed ICP-3120B /3111B(AAS)
23.	Iron (as Fe)	mg/l	1.60	APHA 22 nd Ed ICP-3120B /3111B(AAS)
24.	Cadmium (as Cd)	mg/l	<0.001	APHA 22 nd Ed ICP-3120B /3111B(AAS)
25.	Zinc (as Zn)	mg/l	0.8	APHA 22 nd Ed ICP-3120B /3111B(AAS)
26.	Arsenic (as As)	mg/l	<0.01	APHA 22 nd Ed ICP-3120B /3114(AAS-VGA)
27.	Mercury (as Hg)	mg/l	<0.001	APHA 22 nd Ed ICP-3120 B/ 3112(AAS-VGA)
28.	Chromium (as Cr)	mg/l	<0.01	APHA-22 nd Ed ICP-3120B /3111B(AAS)
29.	Nickel (as Ni)	mg/l	<0.01	APHA 22 nd Ed ICP-3120B /3111B(AAS)
30.	TDS	mg/l	1003	IS: 3025(Pt-16)1984, Reaff. 2006
Bacteriological Parameter				
1.	Total Coliform	MPN /100ml	4.6 x 10 ⁵	IS 1622-1981 (Reaff.2003)
2.	Faecal Coliform	MPN /100ml	8.4 x 10 ⁴	IS 1622-1981 (Reaff.2003)

**** End of Report ****



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Ph. No.: 0120 - 4044630, 4044660, 4323120, Fax: 0120 - 2406519
Website: <http://www.grc-india.com>, E-mail : info@grc-india.com, lab@grc-india.com

Test Report

Report Code: W20151216-013

Issue Date: 16.12.2015

Issued To: Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Sample Received on: 07.12.2015
Analysis Duration: 08.12.2015 to 15.12.2015

Sample Description: Surface Water

RESULTS

Water Quality Analysis

SAMPLING DETAILS

Date of Sampling : 07.12.2015
Sampling Location : Ghaggar River(Downstream)
Sample Collected by : Mr. Narendra
Sampling Protocol : IS-3025(Pt-1)-1987 Reaff: 2003 & IS-1622- 1981(Reaff: 2003)
Weather Condition : Clear Sky
Sample Quantity : 5 L+500 ml
Sample Packing & Mark : Plastic/ Glass Bottle & IE/DEC/SW03

S. No.	Parameters	Units	Results	Test Method
1.	pH	-	7.56	IS: 3025(Pt-11)1983, Reaff. 2002
2.	Dissolved Oxygen (DO)	mg/l	3.8	IS: 3025(Pt-38)1989, Reaff. 2003
3.	BOD (3Days at 27°C)	mg/l	15	IS: 3025(Pt-44)1993, Reaff. 2003
4.	Free Ammonia(as N)	mg/l	1.1	IS: 3025(Pt-34)1993, Reaff. 2003
5.	Sodium Adsorption Ratio	-	4.55	IS: 11624
6.	Boron	mg/l	0.3	IS 3025 (Part 57): 2005, APHA 22 nd Ed ICP-3120 B
7.	Specific Conductivity	µmhos/cm	1852	IS: 3025(Pt-14)1984, Reaff. 2002
8.	Temperature	°C	24.1	IS: 3025(Pt-9)1984, Reaff. 2002
9.	Turbidity	NTU	71	IS: 3025(Pt-10)-1984, Reaff. 2006
10.	Magnesium Hardness (as CaCO ₃)	mg/l	141	APHA 22 nd Ed., 3500-Mg (B)
11.	Total Alkalinity (as CaCO ₃)	mg/l	415	IS: 3025(Pt-23)1986, Reaff. 2003
12.	Chloride (as Cl)	mg/l	224	IS: 3025(Pt-32)1988, Reaff. 2002
13.	Sulphate (as SO ₄)	mg/l	102	IS : 3025(Pt-24)1986, Reaff. 2003
14.	Nitrate(as NO ₃)	mg/l	8.9	IS : 3025(Pt-34)1988, Reaff. 2003

Authorized Signatory
(Seal & Signature)

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Test Report

Report Code: W20151216-013

Issue Date: 16.12.2015

15.	Fluoride(as F)	mg/l	0.6	APHA 22 nd Ed., 4500F(D)
16.	Sodium (as Na)	mg/l	204	IS: 3025(Pt-45)-1993, Reaff. 2003
17.	Potassium (as K)	mg/l	14.8	IS: 3025(Pt-45)-1993, Reaff. 2003
18.	TKN (as N)	mg/l	2.3	IS: 3025(Pt-34)-1988, Reaff. 2003
19.	Total Phosphorus (as P)	mg/l	1.4	IS: 3025(Pt-31)-1988, Reaff. 2003
20.	COD	mg/l	44	IS : 3025(Pt-58)-2006
21.	Phenolic compounds (as C ₆ H ₅ OH)	mg/l	<0.001	APHA 22 nd Ed., 5530 (c)
22.	Lead (as Pb)	mg/l	<0.01	APHA 22 nd Ed ICP-3120B /3111B(AAS)
23.	Iron (as Fe)	mg/l	1.3	APHA 22 nd Ed ICP-3120B /3111B(AAS)
24.	Cadmium (as Cd)	mg/l	<0.001	APHA 22 nd Ed ICP-3120B /3111B(AAS)
25.	Zinc (as Zn)	mg/l	0.6	APHA 22 nd Ed ICP-3120B /3111B(AAS)
26.	Arsenic (as As)	mg/l	<0.01	APHA 22 nd Ed ICP-3120B /3114(AAS-VGA)
27.	Mercury (as Hg)	mg/l	<0.001	APHA 22 nd Ed ICP-3120 B/ 3112(AAS-VGA)
28.	Chromium (as Cr)	mg/l	<0.01	APHA 22 nd Ed ICP-3120B /3111B(AAS)
29.	Nickel (as Ni)	mg/l	<0.01	APHA 22 nd Ed ICP-3120B /3111B(AAS)
30.	TDS	mg/l	1112	IS: 3025(Pt-16)1984, Reaff. 2006
Bacteriological Parameter				
1.	Total Coliform	MPN /100ml	2.4 x 10 ⁵	IS 1622-1981 (Reaff.2003)
2.	Faecal Coliform	MPN /100ml	7.2 x 10 ⁴	IS 1622-1981 (Reaff.2003)

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Test Report

Report Code: S20151113-001

Issue Date: 13.11.2015

Issued To: Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Sample Received on: 02.11.2015
Analysis Duration: 03.11.2015 to 12.11.2015

Sample Description: Soil

RESULTS

Soil Quality Analysis

SAMPLING DETAILS

Date of Sampling : 02.11.2015
Sampling Location : Project Site
Sample Collected by : Mr. Mohit Gupta
Sampling Protocol : GRC/LAB/STP/SOIL/01
Weather Condition : Clear Sky
Sample Quantity : 5 kg
Sample Packing & Marking : Zip Polybag; IE/NOV/SQ1

S. No.	Parameters	Units	Results	Test Method
1	Texture	-	Sandy Clay Loam	
	Sand	%	59.7	IS: 2720 (part-4), 1985 (Reaff:2006)
	Silt	%	18.4	
	Clay	%	21.9	
pH (1:2 Suspension)	-	7.63	IS: 2720 (part-26),1987 (Reaff:2007)	
2	Electrical Conductivity (1:2)	µmhos/cm	356	IS: 14767(2002)
4	Cation exchange capacity	meq/100 gm	14.2	IS : 2720 (Part-24)-1976(Reaff.2005)
5	Exchangeable Potassium	meq/100 gm	0.12	GRC/LAB/STP/SOIL/07
6	Exchangeable Sodium	meq/100 gm	0.39	GRC/LAB/STP/SOIL /06
7	Exchangeable Calcium	meq/100 gm	10.23	GRC/LAB/STP/SOIL/ 08
8	Exchangeable Magnesium	meq/100 gm	3.45	GRC/LAB/STP/SOIL/ 08
9	Sodium Absorption Ratio	-	0.47	GRC/LAB/STP/SOIL/20
10	Water Holding Capacity	%	25.3	GRC/LAB/STP/SOIL/13
11	Porosity	%	36.1	GRC/LAB/STP/SOIL/10
12	Permeability	cm/hr	2.1	IS : 2720 (Part-17)-1986(Reaff.2002)
13	Total kjehdahl Nitrogen	%	0.046	GRC/LAB/STP/SOIL/18
14	Phosphorus(Olsen's)	mg/kg	7.3	GRC/LAB/STP/SOIL/10
15	Organic Matter	%	0.28	IS : 2720 (Part-22)-1972(Reaff.2006)

End of Report

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Test Report

Report Code: S20151113-002

Issue Date: 13.11.2015

Issued To: Industrial Estate at Barwala(HSIIDC),
Dist:- Panchkula, Haryana

Sample Received on: 02.11.2015

Analysis Duration: 03.11.2015 to 12.11.2015

Sample Description: Soil

RESULTS

Soil Quality Analysis

SAMPLING DETAILS

Date of Sampling	: 02.11.2015
Sampling Location	: Alipur
Sample Collected by	: Mr. Mohit Gupta
Sampling Protocol	: GRCLAB/STP/SOIL/01
Weather Condition	: Clear Sky
Sample Quantity	: 5 kg
Sample Packing & Marking	: Zip Polybag; IE/NOV/SQ2

S. No.	Parameters	Units	Results	Test Method
1	Texture	-	Sandy Loam	
	Sand	%	65.8	IS: 2720 (part-4), 1985 (Reaff:2006)
	Silt	%	15.5	
	Clay	%	18.7	
2	pH (1:2 Suspension)	-	7.52	IS: 2720 (part-26), 1987 (Reaff:2007)
3	Electrical Conductivity (1:2)	µmhos/cm	325	IS: 14767(2002)
4	Cation exchange capacity	meq/100 gm	15.6	IS : 2720 (Part-24)-1976(Reaff.2005)
5	Exchangeable Potassium	meq/100 gm	0.15	GRC/LAB/STP/SOIL/07
6	Exchangeable Sodium	meq/100 gm	0.41	GRC/LAB/STP/SOIL/06
7	Exchangeable Calcium	meq/100 gm	11.21	GRC/LAB/STP/SOIL/08
8	Exchangeable Magnesium	meq/100 gm	3.85	GRC/LAB/STP/SOIL/08
9	Sodium Absorption Ratio	-	0.47	GRC/LAB/STP/SOIL/20
10	Water Holding Capacity	%	24.3	GRC/LAB/STP/SOIL/13
11	Porosity	%	37.2	GRC/LAB/STP/SOIL/19
12	Permeability	cm/hr	2.3	IS : 2720 (Part-17)-1986(Reaff.2002)
13	Total kjehdahl Nitrogen	%	0.033	GRC/LAB/STP/SOIL/18
14	Phosphorus(Olsen's)	mg/kg	5.9	GRC/LAB/STP/SOIL/10
15	Organic Matter	%	0.26	IS : 2720 (Part-22)-1972(Reaff.2006)

End of Report



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Test Report

Report Code: S20151113-004

Issue Date: 13.11.2015

Issued To: Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Sample Received on: 02.11.2015

Analysis Duration: 03.11.2015 to 12.11.2015

Sample Description: Soil

RESULTS

Soil Quality Analysis

SAMPLING DETAILS

Date of Sampling

: 02.11.2015

Sampling Location

: Batwal

Sample Collected by

: Mr. Mohit Gupta

Sampling Protocol

: GRC/LAB/STP/SOIL/01

Weather Condition

: Clear Sky

Sample Quantity

: 5 kg

Sample Packing & Marking

: Zip Polybag; IE/NOV/SQ4

S. No.	Parameters	Units	Results	Test Method
	Texture	-	Sandy Loam	
1	Sand	%	65.6	IS: 2720 (part-4), 1985 (Reaff:2006)
	Silt	%	16.1	
	Clay	%	18.3	
2	pH (1:2 Suspension)	-	7.36	IS: 2720 (part-26),1987 (Reaff:2007)
3	Electrical Conductivity (1:2)	µmhos/cm	285	IS: 14767(2002)
4	Cation exchange capacity	meq/100 gm	15.4	IS : 2720 (Part-24)-1976(Reaff.2005)
5	Exchangeable Potassium	meq/100 gm	0.17	GRC/LAB/STP/SOIL/07
6	Exchangeable Sodium	meq/100 gm	0.41	GRC/LAB/STP/SOIL /06
7	Exchangeable Calcium	meq/100 gm	11.26	GRC/LAB/STP/SOIL/ 08
8	Exchangeable Magnesium	meq/100 gm	3.51	GRC/LAB/STP/SOIL/ 08
9	Sodium Absorption Ratio	-	0.48	GRC/LAB/STP/SOIL/20
10	Water Holding Capacity	%	25.3	GRC/LAB/STP/SOIL/13
11	Porosity	%	33.2	GRC/LAB/STP/SOIL /10
12	Permeability	cm/hr	2.2	IS : 2720 (Part-17)-1986(Reaff.2002)
13	Total kjehdahl Nitrogen	%	0.039	GRC/LAB/STP/SOIL/18
14	Phosphorus(Olsen's)	mg/kg	7.1	GRC/LAB/STP/SOIL/10
15	Organic Matter	%	0.26	IS : 2720 (Part-22)-1972(Reaff.2006)

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Test Report

Report Code: S20151113-005

Issue Date: 13.11.2015

Issued To: Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Sample Received on: 02.11.2015

Analysis Duration: 03.11.2015 to 12.11.2015

Sample Description: Soil

RESULTS

Soil Quality Analysis

SAMPLING DETAILS

Date of Sampling : 02.11.2015
Sampling Location : Raipur Rani
Sample Collected by : Mr. Mohit Gupta
Sampling Protocol : GRC/LAB/STP/SOIL/01
Weather Condition : Clear Sky
Sample Quantity : 5 kg
Sample Packing & Marking : Zip Polybag; IE/NOV/SQ5

S. No.	Parameters	Units	Results	Test Method
1	Texture	-	Sandy Clay Loam	
	Sand	%	56.5	
	Silt	%	21.2	IS: 2720 (part-4), 1985 (Reaff:2006)
	Clay	%	22.3	
2	pH (1:2 Suspension)	-	6.86	IS: 2720 (part-26), 1987 (Reaff:2007)
3	Electrical Conductivity (1:2)	µmhos/cm	226	IS: 14767(2002)
4	Cation exchange capacity	meq/100 gm	14.4	IS : 2720 (Part-24)-1976(Reaff.2005)
5	Exchangeable Potassium	meq/100 gm	0.16	GRC/LAB/STP/SOIL/07
6	Exchangeable Sodium	meq/100 gm	0.37	GRC/LAB/STP/SOIL /06
7	Exchangeable Calcium	meq/100 gm	10.21	GRC/LAB/STP/SOIL/ 08
8	Exchangeable Magnesium	meq/100 gm	3.62	GRC/LAB/STP/SOIL/ 08
9	Sodium Absorption Ratio	-	0.44	GRC/LAB/STP/SOIL/20
10	Water Holding Capacity	%	29.3	GRC/LAB/STP/SOIL/13
11	Porosity	%	34.1	GRC/LAB/STP/SOIL/19
12	Permeability	cm/hr	1.8	IS : 2720 (Part-17)-1986(Reaff.2002)
13	Total kjehdahl Nitrogen	%	0.051	GRC/LAB/STP/SOIL/18
14	Phosphorus(Olsen's)	mg/kg	10.2	GRC/LAB/STP/SOIL/10
15	Organic Matter	%	0.35	IS : 2720 (Part-22)-1972(Reaff.2006)

End of Report

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(Seal & Signature)

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Test Report

Report Code: S20151113-006

Issue Date: 13.11.2015

Issued To: Industrial Estate at Barwala(HSIIDC),
Dist:- Panchkula, Haryana

Sample Received on: 02.11.2015

Analysis Duration: 03.11.2015 to 12.11.2015

Sample Description: Soil

RESULTS

Soil Quality Analysis

SAMPLING DETAILS

Date of Sampling

: 02.11.2015

Sampling Location

: Dhandaruru

Sample Collected by

: Mr. Mohit Gupta

Sampling Protocol

: GRC/LAB/STP/SOIL/01

Weather Condition

: Clear Sky

Sample Quantity

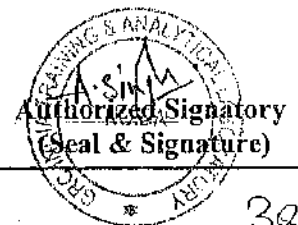
: 5 kg

Sample Packing & Marking

: Zip Polybag; IE/NOV/SQ6

S. No.	Parameters	Units	Results	Test Method
1	Texture	-	Sandy Clay Loam	IS: 2720 (part-4), 1985 (Reaff:2006)
	Sand	%	64.3	
	Silt	%	13.4	
	Clay	%	22.3	
2	pH (1:2 Suspension)	-	7.36	IS: 2720 (part-26),1987 (Reaff:2007)
3	Electrical Conductivity (1:2)	µmhos/cm	315	IS: 14767(2002)
4	Cation exchange capacity	meq/100 gm	14.3	IS : 2720 (Part-24)-1976(Reaff.2005)
5	Exchangeable Potassium	meq/100 gm	0.14	GRC/LAB/STP/SOIL/07
6	Exchangeable Sodium	meq/100 gm	0.32	GRC/LAB/STP/SOIL /06
7	Exchangeable Calcium	meq/100 gm	10.12	GRC/LAB/STP/SOIL/ 08
8	Exchangeable Magnesium	meq/100 gm	3.74	GRC/LAB/STP/SOIL/ 08
9	Sodium Absorption Ratio	-	0.38	GRC/LAB/STP/SOIL/20
10	Water Holding Capacity	%	25.1	GRC/LAB/STP/SOIL/13
11	Porosity	%	36.3	GRC/LAB/STP/SOIL /10
12	Permeability	cm/hr	2.3	IS : 2720 (Part-17)-1986(Reaff.2002)
13	Total kjehdahl Nitrogen	%	0.043	GRC/LAB/STP/SOIL/18
14	Phosphorus(Olsen 's)	mg/kg	8.1	GRC/LAB/STP/SOIL/10
15	Organic Matter	%	0.32	IS : 2720 (Part-22)-1972(Reaff.2006)

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Test Report

Report Code: S20151113-007

Issue Date: 13.11.2015

Issued To: Industrial Estate at Barwala(HSIIDC),
Distt:- Panchkula, Haryana

Sample Received on: 02.11.2015
Analysis Duration: 03.11.2015 to 12.11.2015

Sample Description: Soil

RESULTS
Soil Quality Analysis

SAMPLING DETAILS

Date of Sampling : 02.11.2015
Sampling Location : Kheri
Sample Collected by : Mr. Mohit Gupta
Sampling Protocol : GRC/LAB/STP/SOIL/01
Weather Condition : Clear Sky
Sample Quantity : 5 kg
Sample Packing & Marking : Zip Polybag; IE/NOV/SQ7

Table with 5 columns: S. No., Parameters, Units, Results, Test Method. Rows include Texture (Sandy Loam), Sand (66.8%), Silt (15.9%), Clay (17.3%), pH (7.41), Electrical Conductivity (295), Cation exchange capacity (15.7), Exchangeable Potassium (0.18), Exchangeable Sodium (0.42), Exchangeable Calcium (11.20), Exchangeable Magnesium (3.85), Sodium Absorption Ratio (0.48), Water Holding Capacity (24.8), Porosity (58.2), Permeability (2.1), Total kjehdahl Nitrogen (0.036), Phosphorus(Olsen's) (5.9), Organic Matter (0.26).

End of Report



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Website: <http://www.grc-india.com>, E-mail: info@grc-india.com, lab@grc-india.com

Test Report

Report Code: S20151113-009

Issue Date: 13.11.2015

Issued To: Industrial Estate at Barwala(HSIIDC),

Sample Received on: 02.11.2015

Distt:- Panchkula, Haryana

Analysis Duration: 03.11.2015 to 12.11.2015

Sample Description: Soil

RESULTS

Soil Quality Analysis

SAMPLING DETAILS

Date of Sampling

: 02.11.2015

Sampling Location

: Rehawar

Sample Collected by

: Mr. Mohit Gupta

Sampling Protocol

: GRC/LAB/STP/SOIL/01

Weather Condition

: Clear Sky

Sample Quantity

: 5 kg

Sample Packing & Marking

: Zip Polybag; IE/NOV/SQ9

S. No.	Parameters	Units	Results	Test Method
1	Texture	-	Sandy Clay Loam	
	Sand	%	60.3	IS: 2720 (part-4), 1985 (Reaff:2006)
	Silt	%	18.5	
	Clay	%	21.2	
2	pH (1:2 Suspension)	-	7.23	IS: 2720 (part-26), 1987 (Reaff:2007)
3	Electrical Conductivity (1:2)	µmhos/cm	294	IS: 14767(2002)
4	Cation exchange capacity	meq/100 gm	15.7	IS : 2720 (Part-24)-1976(Reaff.2005)
5	Exchangeable Potassium	meq/100 gm	0.15	GRC/LAB/STP/SOIL/07
6	Exchangeable Sodium	meq/100 gm	0.43	GRC/LAB/STP/SOIL /06
7	Exchangeable Calcium	meq/100 gm	11.23	GRC/LAB/STP/SOIL/ 08
8	Exchangeable Magnesium	meq/100 gm	3.85	GRC/LAB/STP/SOIL/ 08
9	Sodium Absorption Ratio	-	0.50	GRC/LAB/STP/SOIL/20
10	Water Holding Capacity	%	26.3	GRC/LAB/STP/SOIL/13
11	Porosity	%	37.2	GRC/LAB/STP/SOIL /19
12	Permeability	cm/hr	2.3	IS : 2720 (Part-17)-1986(Reaff.2002)
13	Total kjehdahl Nitrogen	%	0.042	GRC/LAB/STP/SOIL/18
14	Phosphorus(Olsen's)	mg/kg	7.3	GRC/LAB/STP/SOIL/10
15	Organic Matter	%	0.31	IS : 2720 (Part-22)-1972(Reaff.2006)

End of Report



- Note: 1. The results indicated only refer to the tested samples and listed parameters and do not endorse any product.
2. This certificate shall not be reproduced wholly or in part without prior written consent of the laboratory.
3. 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.
4. The samples received shall be destroyed after 30 days from the date of issue of the certificate unless specified otherwise and sample for biological testing will be destroyed after one week of testing.

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HARYANA STATE POLLUTION CONTROL BOARD

C-11, SECTOR-6, PANCHKULA

Ph-2577870-73 E-mail: hspcb.sec1@gmail.com

No. HSPCB/468/2016/

Dated:

To

The Secretary,
Ministry of Environment, Forest and Climate Change,
Indira Paryavaran Bhavan, Jorbagh Road, New Delhi - 110 003.

Sub: Proceeding/minutes of the public consultation (Hearing) under the provisions of EIA notification, 2006 (amended to date) for proposed development project of M/s HSIIDC Industrial State, Barwala, phase-2 Panchkula having area of 557.75 acres at Vill. Alipur, Panchkula.

Kindly refer to the subject noted above.

Please find enclosed herewith the proceeding/minutes of the public hearing conducted on 07.10.2016 at 01:00 PM under the provisions of EIA Notification dated 14.09.2006 for proposed development project of M/s HSIIDC Industrial State, Barwala, Phase-2, Panchkula having area of 557.75 acres at Vill. Alipur, Panchkula in original, forwarded by Regional Officer, Panchkula, Haryana State Pollution Control Board vide letter no. 3321 dated 24.10.2016 alongwith attendance sheet, CD, photographs and other relevant documents, for information and further necessary action.

DA/As above.

Sr. Environmental Engineer - I (HQ)
For Chairman

Dated: 17/11/16

Endst. No. HSPCB/468/2016/ 1946-56

A copy of above alongwith copy of proceeding with attendance sheet is forwarded to following for information and further necessary action please:-

1. The Member Secretary, SEIAA, Bays No. 55 - 58, Prayatan Bhawan, 1st floor, Sector 2, Panchkula.
2. Principal Secretary to Govt. Haryana, Environment Department, Chandigarh.
3. The Director General, Environment, Haryana.
4. The Deputy Commissioner, Panchkula.
5. The Chairman, Zila Parishad, Panchkula.
6. Municipal Council, Panchkula.
7. Regional Officer, Panchkula. He is required to send the copy of proceedings to all the concerned Village Panchyat for displaying in their offices.
8. PS to Chairman.
9. PA to Member Secretary.
10. Sh. Sandeep Sharma, Jr. Programmer (HQ) for uploading the proceeding on the website of the Board.
11. M/s HSIIDC Industrial State, Barwala, Phase-2, Panchkula.

DA/Copy of Proceeding.

Sr. Environmental Engineer - I (HQ)
For Chairman

Be send it to m/s HSIIDC for further information in this regard.

M/S (A)



HSPCB



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Haryana State Pollution Control Board
SCO-180, II ND FLOOR, SECTOR-5, PANCHKULA,
PHONE: 0172-2566286, 2587962

No. HSPCB/PKL/

3321

Dated: 24/10/2016

To


The Chairman,
Haryana State Pollution Control Board,
Panchkula.

Sub:- Minutes of the Public Hearing pertaining to Environmental Clearance for the project development of M/s Haryana State Industrial & Infrastructure Development Corporation Ltd., Industrial Estate, Phase-II, Barwala, Panchkula, having area of 557.75 acres at Alipur, Barwala, Panchkula.

Ref: H.O Letter No. HSPCB/2016/1268-70 dated 02.09.2016.

Please find enclosed herewith the Minutes of the Public Hearing pertaining to Environmental Clearance for the proposed project for development of Industrial Area at village Alipur, Barwala, Panchkula of **M/s Haryana State Industrial & Infrastructure Development Corporation Ltd., Industrial Estate, Phase-II, Barwala, Panchkula, having area of 557.75 acres** held on 07.10.2016 At 01:00 PM, along with attendance sheet of Public, Photographs, C.D of Public hearing & Executive Summary. The copy of statement of issues/questions asked during hearing is annexed as **annexure-C**.

Submitted for information & further necessary action please.


Regional Officer,
Panchkula Region.

D.A:-

1. Minutes of Public Hearing
2. Annexure 'A' (Attendance sheet of officers)
3. Annexure 'B' (Attendance sheet of Public)
4. Annexure 'C' (Copy of statements of issue/questions)
5. Videography of Public Hearing (02 CDs).
6. Photographs/Album of Public Hearing (02 sets).

MINUTES OF PUBLIC HEARING CONDUCTED AS PER MOEF. (GOVT. OF INDIA) NOTIFICATION DATED 14/09/2006.

PROJECT: DEVELOPMENT OF M/s Haryana State Industrial & Infrastructure Development Corporation Ltd., Industrial Estate, Phase-II, Barwala, Panchkula, having area of 557.75 acres.

Date and Time : 07.10.2016 at 1:00 PM

Venue : Village Alipur, Industrial Estate Phase-II, Barwala District Panchkula.

The Public notice for public hearing to be held on 07.10.2016 was advertised in news paper of The Tribune Chandigarh Edition dated 06.09.2016 by HSPCB for general information regarding environmental clearance of M/s Haryana State Industrial & Infrastructure Development Corporation Ltd., for the development of Industrial Estate, Phase-II, Barwala, Panchkula.

The public hearing has been attended by:-

1. Sh. Satinder Pal, Regional Officer, HSPCB, Panchkula.
2. Sh. J.P, Khalsa, DTP, Panchkula.
3. Sh. Mukesh Gupta, DGM, HSIIDC, Barwala.
4. Sh. Kamaljeet Singh, A.E.E, Regional Office, HSPCB, Panchkula.
5. Sh. Rohit Kanwar, Manager, HSIIDC, Barwala.
6. Sh. Jagdish Chand, Revenue, Department, Panchkula.
7. Sh. Sitender Kumar, AIPRO, Panchkula.
8. Sh. Suresh Kumar, Office of DIC, Panchkula.
9. Sh. Rakesh Kumar representative of Forest Department.

The public hearing has been organized by HSPCB at the project site. The public hearing is chaired by Smt.Hema Sharma, HCS, Additional Deputy Commissioner, Panchkula on 07.10.2016.

With the permission of Additional Deputy Commissioner-cum-Chairperson, Public Hearing, the Regional Officer, HSPCB started the public hearing and addressed the public present in hearing. He informed that the public hearing is regarding the development of HSIIDC, Industrial Estate, Phase-II, Barwala and M/s Haryana State Industrial & Infrastructure Development Corporation Ltd. Panchkula has acquired the land as per Haryana Govt. Land acquisition policy.



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It is further informed to public that M/s Haryana State Industrial & Infrastructure Development Corporation Ltd. Panchkula required Environment clearance from Ministry of Environment, Forest and Climate Change, Govt. of India as the project falls under activity 7(c) in schedule of EIA Notification under Category A. Therefore HSIIDC has applied for the Env. Clearance to MOEF & CC, New Delhi. As per procedure of Environmental Clearance, MOEF & CC has asked HSPCB to conduct the public hearing for this project. The Regional Officer, HSPCB further informed public about the impact of establishment of Industrial Estate on Environment and invited public to ask question related to the project verbally or in writing or to give suggestions or apprehensions regarding the said project.

The Regional officer, HSPCB further asked the Project Consultant of Haryana State Industrial & Infrastructure Development Corporation Ltd. Panchkula to give presentation and explain about the project in detail to the public in local language.

The Consultant Miss Akshara welcomed the officers and the participants present during the public hearing. The consultant of the project proponent distributed the copies of the executive summary to the public and given their presentation about the proposed project. During public hearing detailed presentation, introduction, salient features, benefits and environmental aspects of the proposed project were discussed.

After completion of the presentation by the consultant of the unit, the Regional Officer, HSPCB, with permission of worthy Additional Deputy Commissioner - cum - Chairperson has invited objection / questions / apprehensions in verbal as well as in writing from the public.

The questions / observations raised are as under:-

1. Question by Sh. Virender Singh , Village Khangesra, Tehsil Barwala , District Panchkula .

The acquired Land is a part of district Panchkula and there are Mango, Popular & Ashoka tree farms in this area. In my opinion HSIIDC should have taken prior permission before acquisition of land but after acquiring the land you are taking environmental clearance through public hearing and this is wrong. Moreover a river is flowing nearby the villages where our cattles goes for drinking of water. But after the establishment of Industrial Estate entire

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garbage and polluted water will be put in the river which might be dangerous for our cattles. The authorities have claimed to setup the common effluent treatment plant but lateron nobody pays attention, there is a bird sanctuary also near village Barwal which is just 3 miles (cross fly distance) away from the project site and no permission has been taken up by the HSIIDC in this regard.

Answer by - DGM HSIIDC, Barwala.

As per the master plan prepared by Director Town & Country Planning Department, Panchkula, the said area has been ear marked as Industrial zone and the land was acquired accordingly in year 2011-12. HSIIDC have just implemented the directions of the Government and regarding polluted water there is a provisions for establishment of CETP in Industrial Estate wherein the sewage as well as industrial effluent will be treated and reused for the plantation/horticulture purpose. If there will be a requirement to take clearance in context to the Bird Sanctuary, the same will be taken as per the Government norms.

2. Question by Sh. Virender Singh, Village Khangesra, Tehsil Barwala , District Panchkula.

As per the orders of Supreme court the fertile land cannot be acquired, however the land from the villages Khatauli, khangesra, Naggal, Alipur has been acquired which is very good & fertile land and we are objecting to this land acquisition because the most fertile land of the villages has been acquired. The then DRO also informed that Bheed Babupur and Bheed Firozpur is having unfertile land and can be used for this purpose where as on the said land residential zone has been planned by Govt. which is adjacent to the Industrial area of Punjab and garbage plant of the Punjab. Nobody pay attention to this and wrong planning has been done. We are not against the industrial setup, however the estate already developed in 1996 is still not occupied fully.

Answer by - DGM HSIIDC, Barwala.

The development plan of this area was finalized by the top officials of the Govt. and after final approval of the development plan by Director Town and Country Planning, Department, the land was acquired by HSIIDC.

3. Question by Sh. Virender Singh , Village Khangesra, Tehsil Barwala , District Panchkula.

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The Government has done planning but HSIIDC is the execution agency therefore it is duty of the concerned officer to examine the issue.

Answer by Sh. Satinder Pal, Regional Officer, HSPCB, Panchkula

We heard all your grievances and the same will be mentioned in proceedings of the public hearing and will be conveyed to the higher authorities for taking further necessary action.

4. Question by Sh. Gurdas, Village Alipur, Tehsil Barwala , District Panchkula.

He requested to the ADC, Panchkula to ensure that the work should be done in such a manner that there should not be any bad effect on the life of the nearby residents. Department should take all measures for all those peoples whose land has been acquired.

Answer by - DGM HSIIDC, Barwala

HSIIDC will adhere to the resettlement & rehabilitation policy for those whose land has been acquired and there is provisions of compensation and also plot will be given to the land owners whose 70% land has been acquired. Moreover, the question regarding impact on the environment, in this regard we will take all necessary precautionary measures for prevention of the environment from this project.

5. Question by Sh. Husan Lal , Village Shamtu, alongwith the residents of village Rattewali, Toka, Miyanpur, Shabilpur, Khetpurali Tehsil Barwala , District Panchkula ?.

We had a 12 Gatha wide very old link road of PWD from village Naggal to Shabilpur and the same has been broken/damaged due to the activities of HSIIDC in the nearby area. The villagers who wants to travel to Barwala have to take longer route. The temporary bridge constructed by the contractor has also been washed away during rains. We request HSIIDC to rejoin the link road so that the villagers would not face any problem.

Answer by - DGM HSIIDC, Barwala

For connectivity of Alipur-Toka road a 60 mt Sectoral road and also a diversion channel has been prepared, however after the completion of the project the wide connectivity of the roads will be provided. The old existing damaged road will also be repaired within 2-3 months for proper connectivity and facility of the villagers.

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6. Question by Sh. Yaseen Khan, Village Khangesra, Tehsil Barwala ,

District Panchkula.

He said that nobody pays attention to the problems related to pollution or Jamindars and for solution of any issue or regarding royalty etc we have to travel from Alipur to Panchkula. HSIIDC has also constructed boundary wall therefore the access of the villagers has been stopped. The Govt. is giving different compensation amount for the lands acquired earlier and now. Moreover the compensation amount also differ and varies from village to village.

Answer by - DGM HSIIDC, Barwala

HSIIDC is having a policy that boundary wall has to be constructed within the acquired area for the safety of the industrial units. However till proper connectivity is not provided to the affected villages, the excess shall be provided to the nearby residents. The matter regarding announcing compensation is related to the District Commissioner and was given by DRO, as per the potential of land or as per the circle rates defined by District Collector. There is no separate role of HSIIDC in the said matter. If anybody is not satisfied with the compensation amount he may proceed to the court for their claim.

7. Question by Sh. Padam Singh , Village Khatouli, Tehsil Barwala , District Panchkula.

He welcomed all the District Administration officers and requested that we are already suffering from various environmental pollution problems due to abundance of domestic flies and mosquitoes from poultry farms in our area despite of the Swatch Bharat Mission which is launched by the Hon'ble Prime Minister of India. We are not living in hygienic conditions due to fly menace from the nearby poultry farms and this issue has not been resolved till date. Whenever we talk about it to the higher authorities they said that the land was given by you for the concerned purpose & for the establishment of Poultry Farm/Industry etc. He further said that property/land was not given willingly. It is upto the government that they can acquire the land by giving the pre-decided value of the land and we cannot go against the Government. However after coming of the industries, our cattles would not be able to drink pure water from the nearby river or ponds as it would be polluted after coming of the



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industries. The underground drinking water will also gets polluted after coming of industries in this area. We do not have any issue with the setting up of the industrial estate but we want proper arrangements should be done so that our river, ground water and land would not get polluted . We do not allow any compromise on Environmental issues therefore right now we are not in favour of the establishment of the industrial estate project of HSIIDC phase-II, in Barwala.

Beside this we have two grain markets in this area, one is in Barwala and another is in Raipur Rani. The Crops of the Landholders of this area are lying in the open areas whereas in the grain market the paddy is being procured by brokers from Punjab, as a result the farmers of this area are facing huge problem in selling their paddy in Anaj Mandi. We request the Additional Deputy Commissioner to solve the problem of crops too.

Answer by Satinder Pal, Regional Officer, Panchkula, It is the duty of the pollution control board and Government to control and prevent the environment and nobody will be allowed to pollute air and water. HSIIDC is duty bound to install CETP for proper treatment of the effluent being generated from the industrial units and HSIIDC would not be allowed to discharge any treated water into the drain/river. HSIIDC will have to make provisions for reuse/recycling of the treated effluent inside their premises as per the directions of CPCB.

8. Question by Sh. Sehjwinder Singh, village Alipur, Panchkula.

You said that proper CETP will be established for the project but for the old industries, HSIIDC has not installed any CETP in the industrial estate.

Answer by Sh. Satinder Pal, Regional Officer, HSPCB, Panchkula.

The CETP for the existing industries has already been established and the same can be checked alongwith the Officers of HSIIDC.

9. Question by Sh. Sehjwinder singh, village Alipur, Panchkula.

He asked that the water is still discharged in to the river and no proper nallah system has been developed. The factories are putting waste material /garbage near the river bed and burn the waste resulting into the air pollution in nearby area.

Answer : by Sh. Satinder Pal, Regional Officer, HSPCB, Panchkula

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HSI IDC is responsible for management of the solid waste generated and has to ensure that no open dumping and burning of the waste of industry be allowed. If there is any specific complaint the same may be provided to the officer of Pollution Control Board and appropriate action will be taken if any violation is found on the part of industry. For this project 1.5 acre land has been earmarked by HSI IDC for solid waste disposal. HSI IDC should ensure that management of solid waste generated from the industrial estate be done properly and at the designated site.

10. Question by Sh. Sehjwinder singh, village Alipur, Panchkula

The plants/trees and houses on our land have not yet been compensated by HSI IDC and the land has been acquired earlier before giving any compensation associated with the loss.

Answer by -DGM HSI IDC, Barwala

The land acquisition matter is related to DRO and HSI IDC has deposited all the amount as per the demand received from DRO, however if any matter is left the same may be informed to HSI IDC in written and accordingly the matter will be taken up with DRO.

11. Question by Sh. Sehjwinder singh, village Alipur, Panchkula

One month has gone after submission of the affidavit and amount has been deposited on 26th, now farmers are asking for the interest.

Answer by - DGM HSI IDC, Barwala:-

As per the demand the disbursement of the fund has to be done by DRO, might be the scrutiny of the documents is going on. However the amount will be released by Monday or Tuesday as per the discussion held with DRO.

12. Question by Sh. Sehjwinder singh, village Alipur, Panchkula

It was promised that the lease rent will be enhanced @ of Rs. 750/- annum but you have only enhanced Rs. 500/ annum.

Answer by - DGM HSI IDC, Barwala

As per our record the increment of Rs. 750/- has been given and for the acquisition of land done before 2009 Rs. 500/- were given as increment. However if there is an doubt regarding calculation you can come to our office for clarification.

13. Question by Sh. Sehjwinder singh, village Alipur, Panchkula

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It was told to us that for the industrial plot which will be allotted to the jamindars in the industrial estate, for that they can give amount in the instalments and no interest will be charged. But now they are asking for the interest.

Answer by - DGM HSIIDC, Barwala

This matter is related to the Estate office of HSIIDC but still you can give in written your grievance with name and address. The reply will be given immediately plot wise.

14. Question by Sh. Sehjwinder singh, village Alipur, Panchkula

After establishment of industrial estate the facilities of Electricity and water are being affected. The supply of light is always available in the industrial estate whereas no proper electricity supply in the nearby villages.

Answer by - DGM HSIIDC, Barwala

For industrial Estate, Ph-II, the electrical wing of HSIIDC is going to setup 66 KVA power substation and power will also be provided to the villagers from this substation.

Sh. Baljit Singh R/o Village- Alipur, Barwala:-

No grievances and I am thankful for the kind hearing given to the public.

15. Question by Sh. Kamaljit Singh, A.E.E. HSPCB, Panchkula.

Is HSIIDC is having the Zero Liquid discharge provision for the CETP to be installed.

Answer by - DGM HSIIDC, Barwala

The CETP of 6.5 MLD will be having tertiary treatment but ZLD will not be achieved, however 70% water will be recycled and used for horticulture purpose.

16. Question by Sh. Kamaljit Singh, A.E.E. HSPCB, Panchkula.

Is Industrial as well as Domestic effluent of the industries will be treated in the CETP and what type of industries will be allowed in Industrial Estate.

Answer by - DGM HSIIDC, Barwala

The common treatment of the industrial as well as of domestic effluent will be done however at present there is no allotment of any plot to the industries as when there will be allotment it will be kept in the mind for finalizing the parameters for CETP and the matter will be taken accordingly. Mixed type of industries will be allowed in phase-II.

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17. Suggestions by Sh. Rajnish Garg, Industrialist of Phase-1, Barwala. 312

He suggested that in the upcoming industrial estate there should be provision for a crèche to facilitate female workers. The another observation is regarding providing proper parking space (Lay by area) for parking of the big trucks to avoid traffic problem.

Answer by - DGM HSIIDC, Barwala

Proper provision has already been taken of parking space for the vehicles in phase-II and there will not be any such traffic jam problem. He further replied that the proposal for crèche may kindly be provided in writing so that the same could be forwarded to the planning cell for earmarking a site for the crèche like other community development activities such as Police post, Fire station, ESI Dispensary etc in the Industrial Estate, Ph-II.

18. Suggestions by Sh. Rajnish Garg, Industrialist of Phase-1, Barwala.

He suggested that there should also be a provision for "Ran Basera" for the workers who got late or for stay in the severe conditions like rainy/winter season.

Answer by - DGM HSIIDC, Barwala

He replied that the demand for providing proper transport facility for the large number of workers may kindly be submitted in writing so that the matter in this regard be conveyed to the Transport Department through our Managing Director.

19. Suggestions by Sh. Rajnish Garg, Industrialist of Phase-1, Barwala.

After the establishment of the industrial estate there will be around 6000-10000 workers in the said industrial estate therefore there must be separate provisions for cycle & walking track for the convenience and safety of the workers.

Answer by - DGM HSIIDC, Barwala

The full development of Industrial Estate will take 5 to 10 years therefore the open space can be utilized till that time. However there is provision of 60 mt roads in Industrial Estate and in 60 mt road there is already provision for service road therefore that can be used by the workers. However the written suggestion may kindly be given for taking the said matter with higher authorities for providing the separate cycle and walking track.



20. Suggestion by Sh. Virender Singh, village Khangesra, Barwala.

The local labour should be given employment in the Industrial Estate and Govt. has already given houses under Indra Awas Yogna to the labours.

21. Suggestion by - Sh. Rajnish Garg, Industrialist of Phase-1, Barwala.

There should be provision of labour housing in the Industrial Estate as in the nearby villages there are not sufficient provisions for the stay of Labourers.

Answer by - DGM HSIIDC, Barwala

In our R & R policy the provision has been mentioned for the residential complex for the workers but that is in bigger Industrial Estates i.e. around 2000 Acres, however if any such demand is there than the same could be considered as per the eligibility and requirement.

22. Suggestion by - Sh. Rajnish Garg, Industrialist of Phase-1, Barwala.

He further suggested that efforts should made for the benefit of the workers through CSIR policy and the industry will also help in doing the same for the development of workers.

23. Suggestion/Demand by Sh. Rajnish Garg, Industrialist of Phase-1, Barwala and Gurdas Ex-sarpanch of village Alipur, Barwala.

Proper provision should be carried out for turning, entry and exist of the big trucks from main road to the Industrial Estate internal roads. There should also be a cremation ground in the nearby area of Industrial Estate.

Answer by - DGM HSIIDC, Barwala

It will be ensured that proper structure should be provided for entry & exist of the vehicles from the main roads into the Industrial Estate. The matter regarding cremation ground shall be taken under village development scheme and can be earmarked subject to the resolution passed by the President, as this area now comes under Municipal Corporation, Panchkula.

24. Question by Sh. Satinder Pal, Regional Officer, HSPCB, Panchkula.

Whether any permission has been obtained from the Central Ground water Authority for withdrawal of ground water.

Answer by - DGM HSIIDC, Barwala

The permission in this regard is in process, whenever we get permission only than the tube wells will be installed.

25. Suggestion/Directions by Sh. Satinder Pal, Regional Officer, HSPCB, Panchkula.

Ok

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HSI IDC has to ensure compliance of fly ash notification 1999 and amendments thereafter in their project. HSI IDC should also adhere to the directions of Hon'ble NGT, New Delhi for taking all preventive measures to control dust and noise pollution during construction phase. The compliance of these directions has to be ensured by HSI IDC by making it mandatory in their allotment letters.

Answer by - DGM HSI IDC, Barwala.

HSI IDC will adhere to all such directions and try to get it implemented through Estate Division.

26. Sh. Satinder Pal, Regional Officer, HSPCB, Panchkula. asked for any other question/suggestion from the public before closing the public hearing.

27. Suggestions by Sh. Rajnish Garg, Industrialist of Phase-1, Barwala.

The ground water level in this area is quite high therefore there must be some provision for channelizing the water to be made in Industrial Estate even for the treated water.

Answer by Sh. Satinder Pal, Regional Officer, HSPCB, Panchkula.

HSI IDC shall make separate channels for transfer and reuse of the treated effluent of the CETP into the flushing system, horticulture and also in the process of the industrial units. No treated/untreated water will be allowed by HSPCB to be discharged on land therefore HSI IDC will make all such planning in their Industrial Estate. Proper green belt as per the requirement of the area shall be developed by HSI IDC for further controlling any water logging problem.

Answer by - DGM HSI IDC, Barwala

The directions of pollution control board will be adhered and implemented in the said project.

Smt. Hema Sharma, HCS, Additional Deputy Commissioner, Panchkula.

The Chairperson concludes the public hearing and informed to all participants that all questions/suggestion/discussion held in the hearing will be the part of the proceedings and will be sent to the Ministry of Environment and Forest, climate change for their consideration.

The attendance of officers present from various departments and the residents of nearby villages is annexed as **Annexure A & B**. The copy of the


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questions asked by the public is annexed as **Annexure-C**. 04 no letters were received during the public hearing are also annexed as **Annexure -D**. (The photographs and CD are also attached for reference).

At the end of public hearing Sh. Satinder Pal, Regional Officer, HSPCB thanked all the local residents presented in the public hearing for giving their valuable suggestions & time.

The Public hearing ended with the vote of thanks.


(Smt. Hema Sharma, HCS)
Additional Deputy Commissioner,
District- Panchkula, (Haryana)


(Satinder Pal)
Regional Officer
HSPCB, Panchkula.

ATTENDANCE SHEET OF OFFICERS

PUBLIC HEARING ON DATED 07.10.2016, 1:00 PM

M/S Haryana State Industrial & Infrastructure Development Corporation Ltd.,
for the development of Industrial Estate, Phase-II, Barwala, Panchkula having
area of 557.75 acre in District Panchkula.

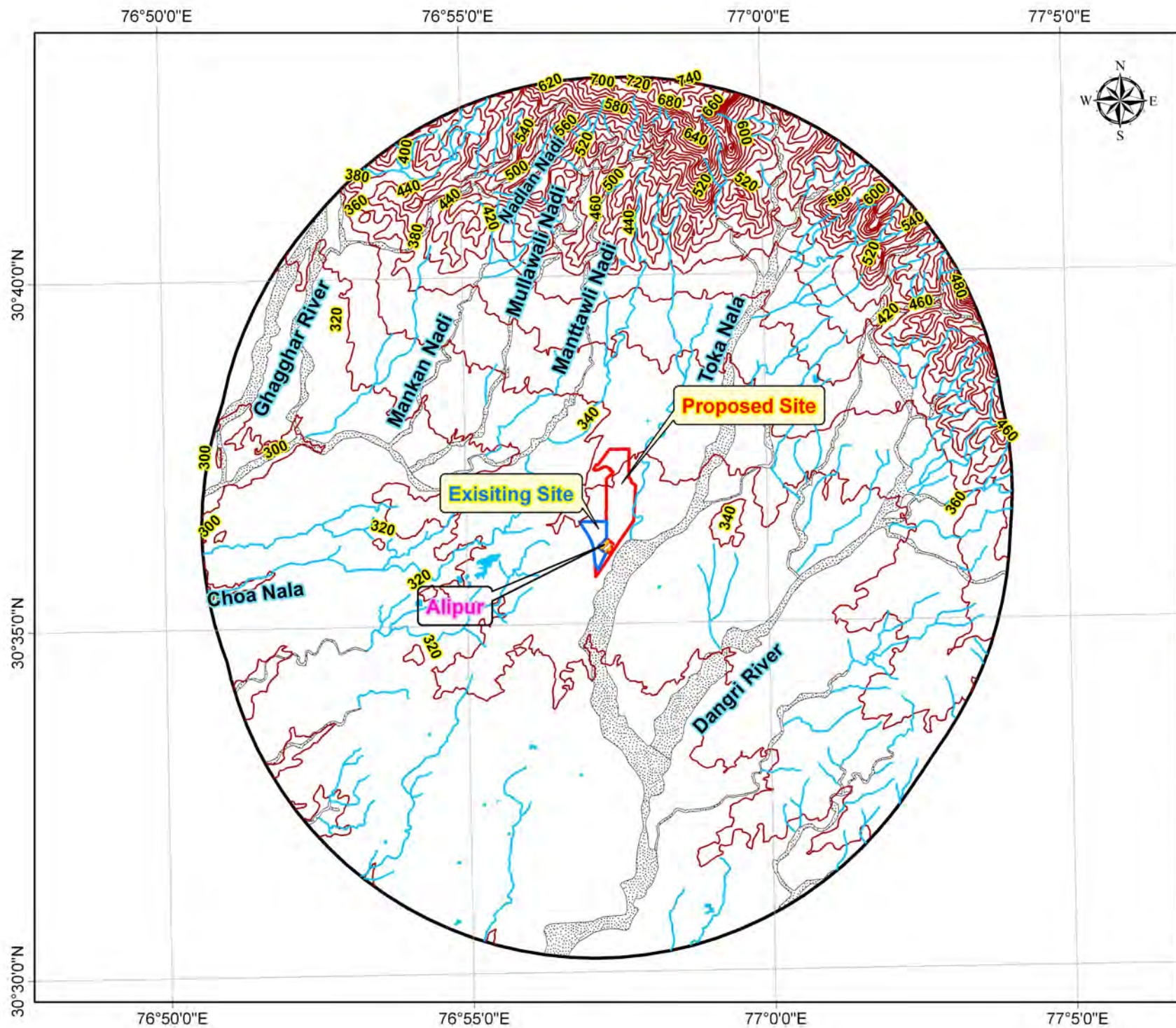
Sr.No.	Name of the officer	Department	Signature
1	J. P. Khosla	D.T.P.	<u>Law</u> 7/10
2	Mandeep Gupta	DCO/ASIA Barwala	<u>Mandeep</u> 7/10
3	Rohit Kanwar	Manager/ASIA Barwala	<u>Rohit</u> 7/10
4	Jagmohan Chandel	Revenue	<u>Jagmohan</u>
5	Kamaljit Singh, AEE	HSRCE, Pal	<u>Kamaljit</u>
6	Satinder Pal, PO	HSRCE, Barwala	<u>Satinder</u>
7	Sitender Kumar BIKS	DIPRO/PL	<u>Sitender</u> 7/10/16
8	Sandeep Kumar, AEE	DIC, PCC	<u>Sandeep</u> 7/10/16
9	Rohit Kumar	Forest Dept	<u>Rohit</u>
10	Pawan Kumar	HSRCE, Pal	<u>Pawan</u>





S.No.	NAME	VILLAGE	CONTACT NO.	SIGNATURE
13	Rajneesh Garg	HSLDC, J.A.	981401200	Raj
14	Anam Kumar	HSLDC	9872815337	Anam Kumar
15	SHALEKH GOEL	HSLDC	946251724	Shalekh
16	SACHIN GUPTA	HSLDC	89010 60600	Sachin
17	VED PARKASH	HSLDC	94671-35035	Ved
18	Lalchand Garg	HSLDC	9815777788	Lalchand
19	LATESH GUPTA	HSLDC	967991345	Latesh
20	श्रीराम लाल	Shamta	98989 09154	श्रीराम लाल
21	श्रीराम लाल	TJBR	9467486921	श्रीराम लाल
22	Johar Singh	- do -	9729915092	Johar Singh
23	श्रीराम लाल	- do -	9466363002	श्रीराम लाल
24	श्रीराम लाल	- do -		श्रीराम लाल
25	श्रीराम लाल	- do -	9813155831	श्रीराम लाल
26	Norban Singh	- do -	9415461150	Norban Singh
27	Sandeep Kumar	- do -	9813667200	Sandeep Kumar
28	Ganesh Kumar	- do -	9901188565	Ganesh Kumar
29	श्रीराम लाल	- do -		श्रीराम लाल
30	Mudra Singh	Shamta	8901261357	Mudra Singh
31	NITJarnand	227 AILPUR	9988704602	NITJarnand
32	Baldev Singh	227 AILPUR	9501727751	Baldev Singh
33	Grew	227 AILPUR	9881349172	Grew
34	DR Padam Singh	Shabab	9818755000	DR Padam Singh
35	Pranav Singh	Shabab	9466635779	Pranav Singh
36	Vinod Kumar			Vinod Kumar
37	Sanjay Kumar	Ratan	9466620000	Sanjay Kumar
38	Kamran Singh	Shamta		Kamran Singh
39	श्रीराम लाल	श्रीराम लाल		श्रीराम लाल
40	Subidi			Subidi





	NAME	Village	Cont	Signatures
41	Rakesh Kumar	Vul	8553803531	R
42	Arjun Singh	Budhaur	8901332012	Arjun
43	GURDAS SINGH	ALIPUR	999185796	28 Bah
44	Hem Chand	Kani	9462848000	Hem
45	Bhuvan Singh	Bellasi	9467932884	Bhuvan
46	Hemant Singh	Matla	941612798	Hemant
47	Vinod Kumar	KRAGAR	45157803	Vinod
48	Pooja Singh	TAKA	941612798	Pooja
49	Sunil Kumar	Alipur	9892350000	Sunil
50	Jaspreet Singh	Balau	941612798	Jaspreet
51	NOORUZZAMAN	Alipur	805320626	Noor
52				
53	Krishan Lal	Alipur	941612798	Krishan
54	Sandeep	Alipur	941612798	Sandeep
55	Jaspreet Singh	Alipur	941612798	Jaspreet
56	Mandeep Singh	Alipur	987635503	Mandeep
57	Balinder Singh	Alipur	941612798	Balinder
58	Sukhdev Singh	Mattarwal	941612798	Sukhdev
59	Harpreet Singh	Alipur	941612798	Harpreet
60	Rajpreet Singh	Alipur	708302498	Rajpreet
61	Arvind Singh	Alipur	708302498	Arvind
62	Manoj Singh	Alipur	708302498	Manoj
63	Neelam Singh	Alipur	941612798	Neelam
64	Vijay Singh	Alipur		Vijay
65	Harpreet Singh	Alipur		Harpreet
66	Harpreet Singh	Alipur		Harpreet
67	Harpreet Singh	Alipur		Harpreet
68				
	Subtotal			

SN	Name	Village	POST	PHONE No.
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Sub...



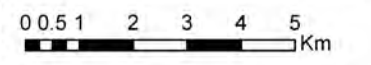
-  Project Site
-  Existing Project Site
-  Proposed Project Site
-  Buffer Boundary

-  Contour
-  Distributary/Drain
-  River
-  Water Bodies

Contour Interval :20 Meters

**Industrial Estate Project
Phase-II, At Barwala
Dist.-Panchkula,Haryana**

Drainage Map of The Study Area



वन विभाग हरियाणा सरकार

कार्यालय:- वन मण्डल अधिकारी, मोरनी पिंजौर वन मण्डल, पिंजौर
वन परिसर पिंजौर, दूरभाष / फैक्स नं0 01733. 230537,
E-mail: dfomorni@gmail.com, dfo.pjr-hry@nic.in

क्रमांक:-
सेवा में

दिनांक:-

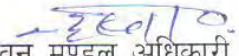
वन संरक्षक उत्तरी परिमण्डल
हरियाणा पंचकूला।

1058
1/2/16

विषय:-

Diversion of 2.14 Ha of forest land for Development of Infrastructural facilities on Turkey basis in HSIIDC Industrial Estate Phase -II, Barwala

उपरोक्त विषय के सम्बन्ध में सहायक जनरल मैनेजर (आई0ए0) हरियाणा राज्य इण्डस्ट्रीयल एवं इन्फ्रास्ट्रक्चर डिवलपमेंट कारपोरेशन लिमिटेड द्वारा उक्त कार्य करने हेतु वन क्षेत्र को डाईवर्ट करवाने के लिए प्रस्ताव दिया था जिसको पूर्ण करके 4 प्रतियों में आपकी सेवा में आवश्यक स्वीकृति हेतु प्रेषित है। प्रस्ताव में वन क्षेत्र का 2.14 है0 वन क्षेत्र प्रभावित होता है। जिसमें 673 वृक्ष प्रभावित होते हैं जिनकी मार्किंग सूची प्रस्ताव के साथ संलग्न है। जो गैर जानिकी भूमि वन विभाग को देना चाहते हैं उस भूमि के राजस्व अभिलेख जमाबन्दी अक्श सजरे की प्रतियां एवं नक्शे में भूमि को मारकर द्वारा दर्शाया गया है। क्षतिपूर्ति पौधारोपण गांव खंगेसरा अलीपुर गांव की प्रस्तावित भूमि में करवाया जाना है तथा क्षतिपूर्ति पौधारोपण स्कीम अनुसार एन0पी0वी0 हेतु राशि 4696868/- रुपये प्रयोक्ता एजेंसी से ली जानी बनती है।


वन मण्डल अधिकारी,
मोरनी पिंजौर वन मण्डल
पिंजौर।

पृ0क्र0:- 2452

दिनांक:- 13-1-2016

एक प्रति Asstt General Manager HSIIDC Ltd Barwala उनके पत्र क्रमांक HSIIDC:IA:BRW&2015/467 dated 15.07.2015 के संदर्भ में सूचनार्थ प्रेषित है।


*Closest
to forest of & following as
discussed.*

*No
2/2/16*

*Mg
1/2/16*

*Pur
1/2/2016*

ANLW


वन मण्डल अधिकारी,
मोरनी पिंजौर वन मण्डल
पिंजौर।

हरियाणा राज्य औद्योगिक
एवं संरचना विकास
निगम लिमिटेड



Haryana State Industrial and
Infrastructure Development
Corporation Ltd.

CIN No. : U29199HR1967SGC034545
(A State Government Undertaking)

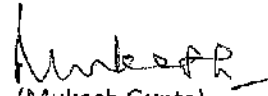
INDUSTRIAL ESTATE
BARWALA (PANCHKULA)
(Near Vill. Alipur)
Telefax : 01733-256507

UNDERTAKING

We, Haryana State Industrial and Infrastructure Development Corporation Limited having our registered office at Plot No.: C-13-14, Sector 6, Panchkula- 134109, Haryana, India do hereby solemnly affirm, declare and undertake as under;

We have proposed Industrial Estate Phase-II at Barwala, Dist. Panchkula, Haryana, and we submit an undertaking for the following:

- That no archeological site is falling in project area.


(Mukesh Gupta)

Asstt. General Manager (IA)

For Haryana State Indl. & Infrs. Dev. Corpn. Ltd.,

Dated:

HSIIDC - your partner in progress

पंजीकृत कार्यालय : नं. सी. 13 - 14, सेक्टर-6, पंचकूला - 134 109

390



भारत सरकार
केन्द्रीय भूमि जल प्राधिकरण
जल संसाधन, नदी विकास
और गंगा संरक्षण मंत्रालय

Government of India
Central Ground Water Authority
Ministry of Water Resources,
River Development & Ganga Rejuvenation

Member (CGWA)

File No: - 21-4/690/HR/INF/2017-374

NOC No: - CGWA/NOC/INF/ORIG/2019/4844

Date:- 12 MAR 2019

✓ To

M/s HSIIDC Industrial Estate Barwala (Phase-II)
Village Alipur, Block Barwala,
District Panchkula, Haryana - 134118

Sub: - NOC for ground water withdrawal to M/s HSIIDC Industrial Estate Barwala (Phase-II) in respect of their proposed "SEZ" project located at Village Alipur, Town Khangesra (240), Block Barwala, District Panchkula, Haryana – reg.

Refer to your application dated 23/05/2017 for grant of NOC for ground water withdrawal. Based on recommendation of Regional Director, Central Ground Water Board, Western Region, Chandigarh vide his letter dated 23/08/2018 and further deliberations on the subject, the NOC of Central Ground Water Authority is hereby accorded to **M/s HSIIDC Industrial Estate Barwala (Phase-II) in respect of their proposed "SEZ" project located at Village Alipur, Town Khangesra (240), Block Barwala, District Panchkula, Haryana.** This NOC is valid from 18/02/2019 to 17/02/2021 and is subject to the following conditions:-

1. The firm may abstract **15,36,050 cu.m/year** of ground water through eleven (11) proposed tube wells only. No additional ground water abstraction structures shall be constructed for this purpose without prior approval of the CGWA.
2. All the wells shall be fitted with digital water flow meter by the firm at its own cost and monthly ground water abstraction data of each well shall be recorded in a log book. Compliance to this condition shall be reported within one month from the date of issue of this letter.
3. **M/s HSIIDC Industrial Estate Barwala (Phase-II)**, in consultation with the Regional Director, Central Ground Water Board, Western Region, Chandigarh shall implement ground water recharge measures atleast to the tune of **20,03,850 cu.m/year** as proposed, for augmenting the ground water resources of the area. Firm shall report the compliance within six months from the date of issue of this letter. Firm shall also undertake periodic maintenance of recharge structures at its own cost.
4. The photographs of the recharge structures after completion of the same are to be furnished immediately to the Regional Director, Central Ground Water Board, Western Region, Chandigarh for verification under intimation to this office.

18/11, Jamnagar House, Mansingh Road, New Delhi-110011

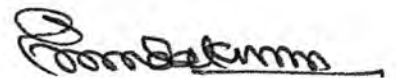
Phone : (011) 23383561 Fax : 23382051, 23386743

Website: www.cgwa.noc.gov.in

स्वच्छ सुरक्षित जल - सुन्दर खुशहाल कल

CONSERVE WATER - SAVE LIFE

5. The firm, at its own cost, shall construct two (2) observation wells (piezometers) at suitable locations and install digital water level recorders for monthly ground water level monitoring in consultation with the Regional Director, Central Ground Water Board, Western Region, Chandigarh. Firm shall install telemetry system in one of the piezometers and share user ID and password of the telemetry system with the Regional Director, Central Ground Water Board, Western Region, Chandigarh.
6. The ground water quality shall be monitored once in a year during pre- monsoon period.
7. The ground water monitoring data in respect of S. No. 2, 5 & 6 shall be submitted to the Regional Director, Central Ground Water Board, Western Region, Chandigarh on regular basis at least once in a year.
8. The firm shall ensure proper recycling and reuse of waste water after adequate treatment.
9. No water intensive industries should be established in the area.
10. Action taken report in respect of S. No. 1 to 9 shall be submitted to CGWA within one year period.
11. This NOC is liable to be cancelled in case of non-compliance of any of the conditions as mentioned in S. No. 1 to 10.
12. The project proponent shall take all necessary measures to prevent contamination of groundwater in the premises failing which the firm shall be responsible for any consequences arising there upon.
13. This NOC is subject to prevailing Central/State Government rules/laws or Court orders related to construction of tubewell/ground water withdrawal/construction of recharge or conservation structure/discharge of effluents or any such matter as applicable.
14. The firm shall report self compliance online in the website (www.cgwa-noc.gov.in) within one year from the date of issue of this NOC.
15. This NOC does not absolve the applicant / proponent of this obligation / requirement to obtain other statutory and administrative clearances from other statutory and administrative authorities.
16. The NOC does not imply that other statutory / administrative clearances shall be granted to the project by the concerned authorities. Such authorities would consider the project on merits and be taking decisions independently of the NOC.



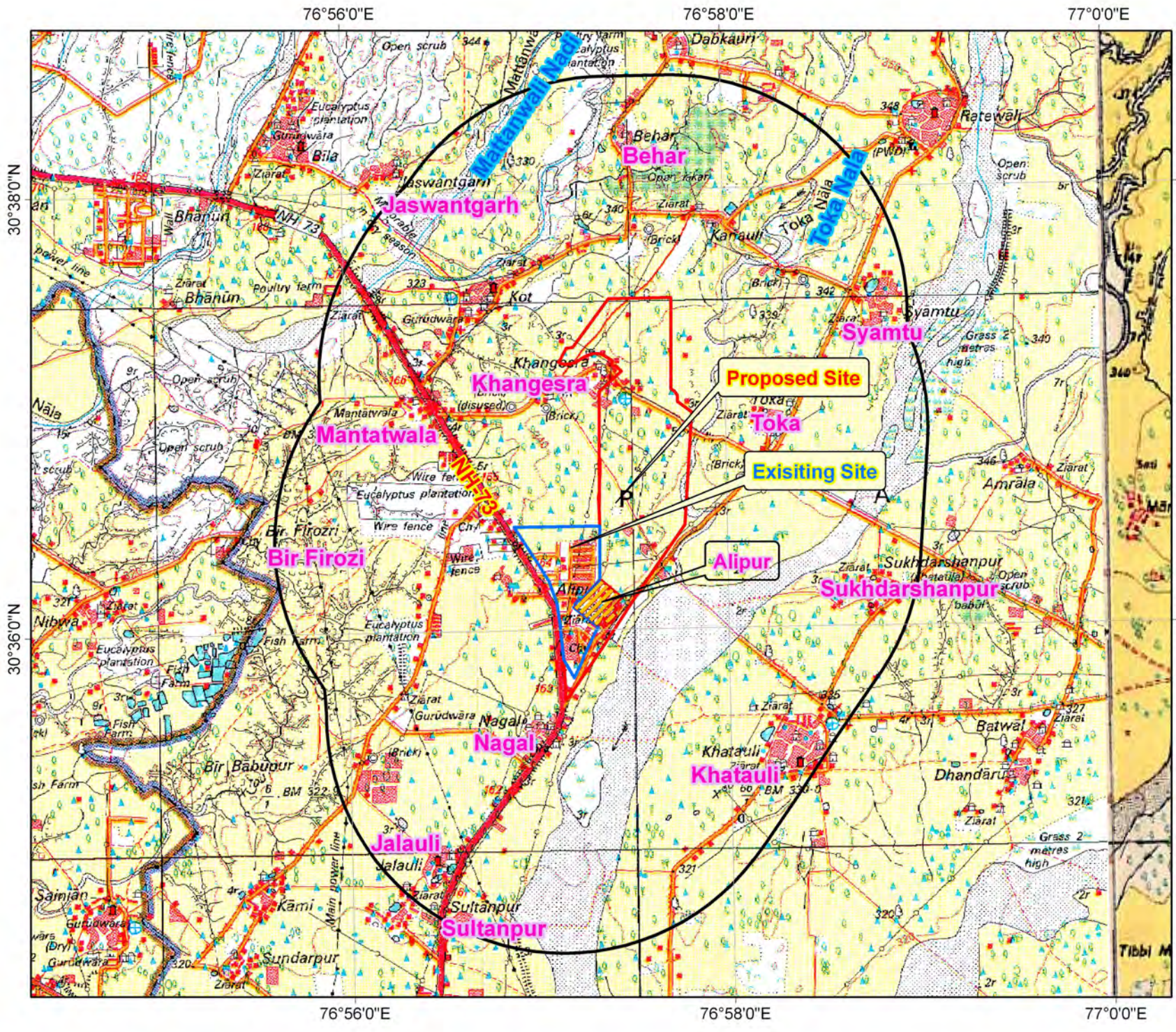
Member (CGWA)





Copy to:

1. The Member Secretary, Haryana State Pollution Control Board, C-11, Sector 6, Panchkula, Haryana.
2. The Deputy Commissioner, District Panchkula, Haryana for necessary action.
3. The Regional Director, Central Ground Water Board, North Western Region, Chandigarh. This has reference to your recommendation dated 23/08/2018.
4. Guard File 2018-19.

/

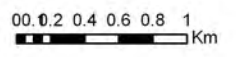
Member (CGWA)



-  **Project Site**
-  Existing Project Site
-  Proposed Project Site
-  **Buffer Boundary**

**Industrial Estate Project
Phase-II, At Barwala
Dist.-Panchkula, Haryana**

**2 km
Buffer Map of Study Area**

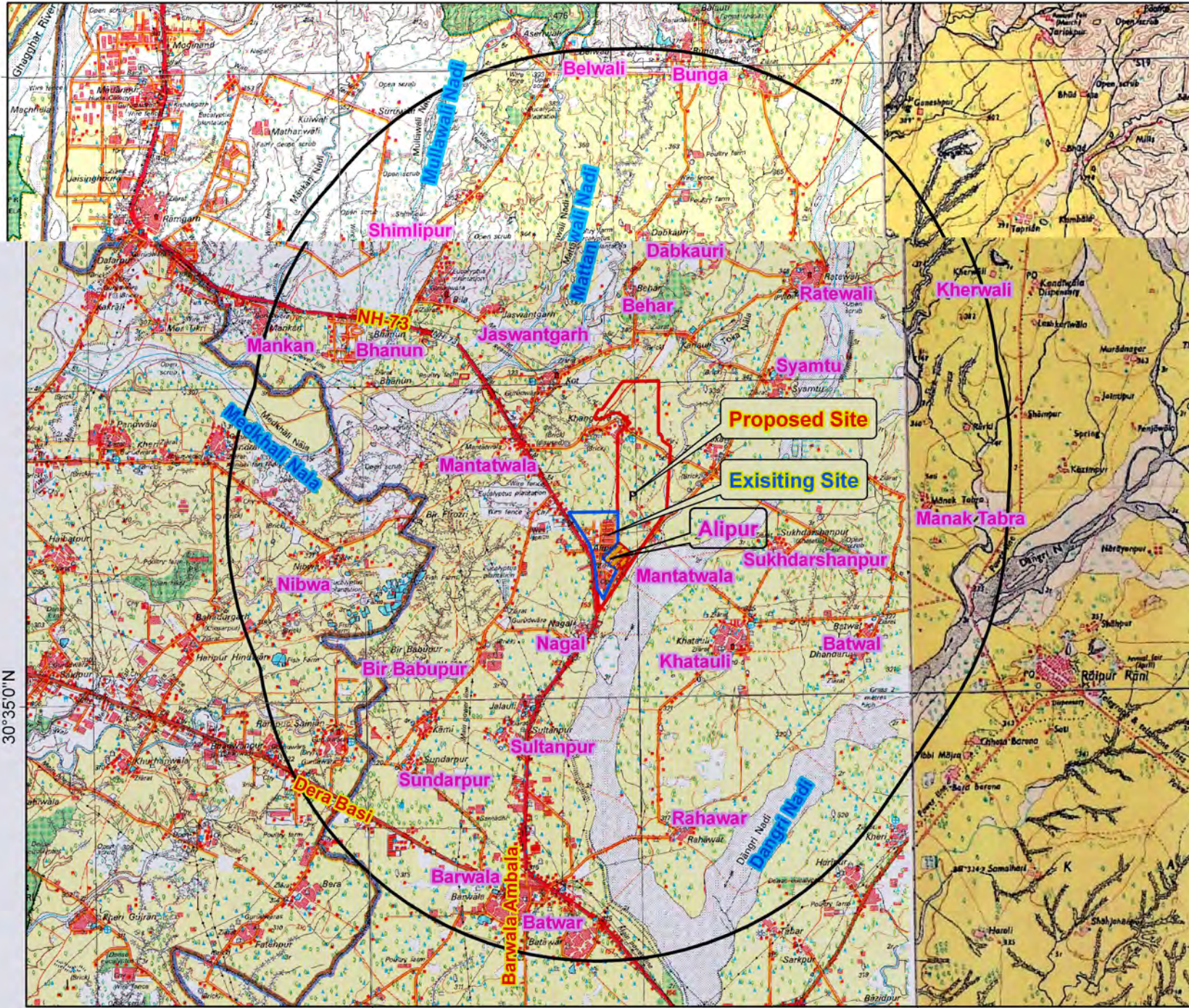



76°55'0"E



77°0'0"E


30°40'0"N

30°40'0"N



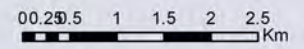
 Project Site

 Existing Project Site
 Proposed Project Site

 Buffer Boundary

Industrial Estate Project
 Phase-II, At Barwala
 Dist.-Panchkula, Haryana

5 km
 Buffer Map of Study Area



76°55'0"E

77°0'0"E

30°35'0"N

30°35'0"N

Responsibilities of Industrial Estate Administration

DIVISION	RESPONSIBILITIES
Managerial	<ul style="list-style-type: none"> • To implement the admission of the sponsors • To enforce the restrictive covenants in lease • To maintain the buildings and services on the estate
	<ul style="list-style-type: none"> • To arrange the payment of taxes and all charges that may be levied on the estate and the wages of estate employees • To collect rents and other dues from tenants • To be responsible for the general good order of the
Technical Division	<ul style="list-style-type: none"> • This division of the administration is responsible for the common facilities, technical and training services that are provided
Environment Division	<ul style="list-style-type: none"> • Operation of the central workshop and other common • Operation of plant hire scheme • Preparation of feasibility studies and project reports for tenant enterprises • Provision of marketing information • Organization of training schemes • Organization of exhibitions • An Environment Officer is responsible to comply all the environment standards applicable with the specific project.
Financial Division	<ul style="list-style-type: none"> • The functions of the division are • Either to provide direct loans to estate tenants or to guarantee loans extended to tenants by • To arrange bulk purchasing of materials • To allocate scarce materials to estate enterprises

Form-2
APPLICATION FOR PRIOR ENVIRONMENTAL CLEARANCE

1 Details of Project						
a.	Name of the Project (s)	:	Industrial Estate Project, Phase- II, At Barwala, District Panchkula, Haryana			
b.	Name of the Company / Organisation	:	Haryana State Industrial & Infrastructure Development Corporation Ltd.			
c.	Registered Address	:	C-13/14, Sec-6, Panchkula Haryana			
d.	Legal Status of the Company	:	State Government Undertaking			
e.	Joint Venture (Yes/No)	:	No			
	If Yes,					
	(i) No. of JV Partners (<i>Multiple Entries Allowed</i>)	:				
	Name of the JV Partner	Share of the JV Partner	Address of the JV Partner	Email Id of JV Partner	Mobile No. of JV Partner	
2 Address for the correspondence						
a.	Name of the applicant	:	Haryana State Industrial & Infrastructure Development Corporation Ltd			
b.	Designation (Owner / Partner / CEO)	:	Senior Manager			
c.	Address		Barwala, District Panchkula, Haryana			
d.	Pin code		134118			
e.	e-mail		barwalahsiidc@yahoo.com			
f.	Telephone No.		0172-2590481-82-83			
g.	Fax No.		01733-258507			
3 Category of the Project/Activity as per Schedule of EIA Notification,2006						
a.	Project / Activity [1(a)(i) / 1(a)(ii) / 1(b) / 1(c) / 1(d) / 1 (e) / 2(a) / 2(b) / 3(a) / 3(b) / 4(a) / 4(b)(i)/ 4(b) (ii) / 4(c) / 4(d) / 4(e) / 4(f) / 5(a) / 5(b) / 5(c) / 5(d) / 5(e) / 5(f) / 5(g) / 5(h) / 5(i) / 5(j) / 6(a) / 6(b) / 7(a) / 7(b) / 7 (c) / 7 (d) / 7 (da) / 7 (e) / 7 (f) / 7 (g) / 7 (h) / 7 (i) / 8 (a) / 8 (b)					7(c)
b.	Category (A/B ₁ /B ₂)	:	A			
	If B ₁ or B ₂					
	Reason for application at Central Level / State level (in case of B ₂ projects)	:				
	If Others					
c.	Please Specify	:				
d.	EAC concerned (for category A Projects only) (Coal Mining / Non-coal Mining / Thermal / River Valley & Hydro / Industry- I / Industry-II / Infrastructure-I / Infrastructure-II / Nuclear & Defence / CRZ	:	Infrastructur e-I			
e.	New / Expansion /Modernization / One Time Capacity expansion (only for Coal Mining) / Expansion under Para 7(ii) / Modernization under Para 7(ii) / Change of Product Mix under Para 7(ii)	:	New			

4	Location of the Project			
	a.	Plot / Survey / Khasra No.	:	-
	b.	Village	:	Barwala
	c.	Tehsil	:	-
	d.	District	:	Panchkula
	e.	State	:	Haryana
	f.	Pin Code	:	134118
	g.	Bounded Latitudes (North)		
		From	:	30° 62'29.05"N
		To	:	30° 59'42.07"N
	h.	Bounded Longitudes(East)		
		From	:	76°94'78.01"E
		To	:	76°96'52.76"E
	i.	Survey of India Topo Sheet No.	:	53D12
	j.	Upload Topo Sheet File (<i>Upload pdf only</i>)	:	Uploaded at MoEFCC Web
	k.	Maximum Elevation Above Means Sea Level (AMSL)	:	344 m
	l.	Upload (kml) File (<i>Upload kml only</i>)	:	Uploaded at MoEFCC Web
	m.	Distance of Nearest HFL from the project boundary within the study area	:	325 m
	n.	Seismic Zone (Zone: 1 / 2 / 3 / 4 / 5)	:	4
5	Whether project is executed in multiple States (Yes / No)?			No
	If Yes			
	a.	Number of States in which Project will be Executed (e.g. 1,2,3,4,5,6)		1
	b.	Main State of the Project		Haryana
	c.	Other State (<i>Multiple Entries Allowed</i>) (If the project to be executed, does not belong to any state, then state category could be selected as 'Other')		
		State	District	Tehsil
				Village
6	Details of Terms of Reference (ToR)			
	a.	Whether ToR is mandatory for submitting application (Yes / No)?	:	Yes
		If Yes		
	b.	Date of issue of ToR / Standard ToR	:	18 th June 2015
	c.	MoEF&CC / SEIAA File No.	:	F. No. 21-36/2015-IA.III
	d.	Upload ToR letter (PDF only)	:	Uploaded at MoEFCC Web
7	Details of Public Consultation			
	a.	Whether the Project Exempted from Public Hearing (Yes/No)?	:	No
		If yes, Reason	:	Project is Category A under Schedule 7(c)
	b.	Supporting Document (<i>upload pdf only</i>)	:	Uploaded at MoEFCC Web and Attached.

	Others) - Mode of Transport/Transmission of Product (Road, Rail, Conveyor Belt, Pipe Conveyor, Aerial Ropeway, combination of two or three modes, Others)					
9	If Expansion / Modernization / One Time Capacity expansion (only for Coal Mining) / Expansion under Clause 7(ii) / Modernization under Clause 7(ii) / Change of Product Mix under Clause 7(ii)) – Not Applicable					
	a.	Details of environmental clearance granted earlier			Not Applicable	
		(i)	Date of issue of environmental clearance	:		
		(ii)	MoEFCC / SEIAA File Number	:		
		(iii)	Upload EC Letter	:		
	b.	Details of certified report on compliance of earlier environmental clearance conditions			Not Applicable	
		(i)	Details of Regional Office of MoEFCC / Zonal Office of CPCB / SPCB / UTPCC from which certified report on compliance of earlier environmental clearance conditions obtained	:	NA	
		(ii)	Letter No	:	NA	
		(iii)	Status of Compliance	:	NA	
		(iv)	Certified report on compliance of earlier environmental clearance conditions (Including Monitoring Report) (<i>Upload pdf only</i>)	:	NA	
		(v)	Date of site visit	:	NA	
	c.	Details of Consent to Operate			Not Applicable	
		(i)	Whether Consent to operate obtained (Yes/No)?	:		
			If yes,	:		
		(ii)	Upload Copies of all Consent to operate obtained since inception (<i>Upload pdf only</i>)	:		
		(iii)	Date of issue	:		
		(iv)	Valid up to	:		
		(v)	File No.	:		
		(vi)	Application No.	:		
		(vii)	Upload Copy of Consent to operate valid as on date (<i>Upload pdf only</i>)	:		
	d.	Details of Capacity Expansion (<i>Multiple Entries Allowed</i>)			Not Applicable	
		Product/Activity (Capacity/Area)	Quantity From	Quantity To	Unit	Mode of Transport / Transmission of Product
		- Unit:- (Tons per Annum(TPA), Mega Watt(MW), Hectares(ha), Kilo Litre per Day(KLD), Tons Crushed per Day(TCD), Cubic Meter per Day, Kilometers(Km), Million Liters per Day(MLD), Others)				

		- Mode of Transport/Transmission of Product (Road, Rail, Conveyor Belt, Pipe Conveyor, Arial Ropeway, combination of two or three modes, Others)				
	e.	Details of Configuration (<i>Multiple Entries Allowed</i>) Not Applicable				
		Plant / Equipment / Facility	Existing Configuration	Proposed Configuration	Final configuration after expansion	Remarks if any
10	Project Cost					
	a.	Total Cost of the Project at current price level (in Lakhs)			:	53100
	b.	Funds Allocated for Environment Management (Capital) (in Lakhs)			:	297
	c.	Funds Allocated Towards ESC (Entrepreneur Social Responsibility) (in Lakhs)			:	1032
	d.	Funds Allocated for Environment Management Plan (EMP) (Recurring per Annum) (in Lakhs)			:	
11	Whether project attracts the General Condition specified in the Schedule of EIA Notification (Yes/No)? [provide name of WL/CPA/ESA/Inter-state boundary / International boundary and distance from the project]				:	No
		If Yes				
	a.	Protected Area Notified Under the Wild Life(Protection) Act,1972			:	
	b.	Critically Polluted Areas as identified by the Central Pollution Control Board from Time to Time			:	
	c.	Notified Eco-Sensitive Areas			:	
	d.	Inter-State Boundaries and International Boundaries			:	
12	Whether projects attract the Specific Condition specified in the Schedule of EIA Notification (Yes/No)?				:	No
		If Yes				
	a.	If any Industrial Estate/Complex / Export processing Zones /Special Economic Zones/Biotech Parks / Leather Complex with homogeneous type of industries such as Items 4(d), 4(f), 5(e), 5(f), or those Industrial estates with pre-defined set of activities (not necessarily homogeneous, obtains prior environmental clearance, individual industries including proposed industrial housing within such estates /complexes will not be required to take prior environmental clearance, so long as the Terms and Conditions for the industrial estate/complex are complied with (Such estates/complexes must have a clearly identified management with the legal responsibility of ensuring adherence to the Terms and Conditions of prior environmental clearance, who may be				

		held responsible for violation of the same throughout the life of the complex/estate						
13	Raw Material / Fuel Requirement (Multiple Entries Allowed) : Not Applicable							
	a.	Details of Raw Material / Fuel Requirement						
		Raw Material / Fuel	Quantity per Annum	Unit	Source (incase of Import, please specify country and Name of the port from which Raw Material / Fuel is received)	Mode of Transport	Distance of Source from Project Site (in Kilo meters) (In case of import, distance from the port from which the raw material / fuel is received)	Type of Linkage (Linkage / Fuel Supply Agreement / e-auction / MoU / LOA / Captive / Open market / Others)
		In case of expansion proposals, total requirement of raw material / fuel shall be given						
		<ul style="list-style-type: none"> - Unit:- (Tons per Annum(TPA), Mega Watt(MW), Hectares(ha), Kilo Litre per Day(KLD), Tons Crushed per Day(TCD), Cubic Meter per Day, Kilometers(Km), Million Liters per Day(MLD), Others) - Mode of Transport/Transmission of Product (Road, Rail, Conveyor Belt, Pipe Conveyor, Aerial Ropeway, combination of two or three modes, Others) 						
	b.	Upload copy of Linkage / Fuel Supply Agreement / e-auction / Memorandum of Understanding / Letter of Allocation / Captive source / others.				:		
14	Baseline Data (Air / Water / Noise / Soil / Ground water table/ Others)							
	a.	Period of Base Line Data Collection			:	October-15 to December,15		
		From (DD/MM/YYYY)			:	01.10.2015		
		To (DD/MM/YYYY)			:	31.12.2015		
	b.	Season (Summer / Pre-monsoon / Post-monsoon / Winter)			:	Post-Monsoon		
	c.	No. of Ambient Air Quality (AAQ) Monitoring Locations			:	9		
	d.	Details of AAQ Monitoring (Multiple Entries Allowed)						
		Criteria Pollutants	Unit	Maximum Value	Minimum Value	98 Percentile Value	Prescribed Standard	
		PM2.5	µg/m ³	91.2	91.2	112.4	60	
		PM10	µg/m ³	208.9	208.9	241.4	100	
		SO2	µg/m ³	8.8	8.8	11.3	80	
		NOx	µg/m ³	23.8	23.8	34.4	80	
		CO	µg/m ³	1460	1460	1799	4000	
		<ul style="list-style-type: none"> - Criteria Pollutants: - (PM10, PM2.5, SO2, NOx, Others parameters specific to sector) - Unit: - (Micro Gram per Meter Cube, Nano Gram per Meter Cube, Mili Gram per Meter Cube, NA) 						

e.	No. of Ground Water Monitoring Locations (<i>Multiple Entries Allowed</i>)		:	9		
f.	Details of Ground Water Monitoring					
	Criteria Pollutants	Unit	Maximum Value	Minimum Value	98 Percentile Value	Prescribed Standard
	pH	-	7.65	7.52		6.5-8.5
	TDS	mg/l	855	682		500-2000
	Total Hardness	mg/l	370	327		200-600
	Chlorides	mg/l	196	195		250 -1000
	Fluoride	mg/l	0.8	0.6		1-1.5
	Criteria Pollutants: - (pH, TSS, TDS, Total Hardness, Chlorides, Fluoride, Heavy Metals, other parameters specific to the sector) - Unit :- (mg/l, NA)					
g.	No. of Surface Water Monitoring Locations		:	3		
h.	Details of Ground Water Monitoring (<i>Multiple Entries Allowed</i>)					
	Criteria Pollutants	Unit	Maximum Value	Minimum Value	98 Percentile Value	Prescribed Standard
	pH	-	7.46	7.31		6.5-8.5
	DO	mg/l	3.6	3.4		6 or More
	BOD	mg/l	23	20		2-3
	COD	mg/l	66	54		250
	TDS	mg/l	1003	857		500-2100
	Coliform	MPN/100 ml	3.5×10^5	5.1×10^5		50-5000
	- Parameter :- (pH, DO, BOD, COD, Others parameters specific to the sector) - Unit :- (mg/l, NA)					
i.	No. of Ambient Noise Monitoring Locations		:	5		
j.	Details of Noise Monitoring (<i>Multiple Entries Allowed</i>)					
	Parameter	Unit	Maximum Value	Minimum Value	98 Percentile Value	Prescribed Standard
	Leq(Day)	dB(A)	64.3	51.6		75
	Leq(Night)	dB(A)	56.2	41.2		70
	- Parameter:- (Leq(Day), Leq(Night)) - Unit :- (A-weighted decibels(dB(A)))					
k.	No. of Soil Monitoring Locations (<i>Multiple Entries Allowed</i>)		:	9		
	Parameter	Unit	Maximum Value	Minimum Value	98 Percentile Value	
	pH	-	7.63	6.86		
	Electrical Conductivity	$\mu\text{mhos/cm}$	356	226		
	Potassium	meq/100gm	0.18	0.12		
	Sodium	meq/100gm	0.52	0.32		
	Calcium	meq/100gm	11.26	9.76		
	Magnesium	meq/100gm	3.85	3.12		

	<ul style="list-style-type: none"> - Parameter :- (pH, N(Nitrogen), P(Phosphorus), K(Potassium), Electric Conductivity) - Unit :- (Millisiemens per Centimeter, Milligram per Litre, Percent, Centimeter per Second, Milliequivalents per 100 Gram, Milligram per Kilogram, Parts per Million, Kilogram per hectare, Others) 						
1	Ground Water Table						
i	Range of Water Table Pre-Monsoon Season (Meters Below Ground Level (m bgl)):						
	From	:	8.11				
	To	:	29.44				
ii	Range of Water Table Post-Monsoon Season (Meters Below Ground Level (m bgl)):						
	From	:	6.78				
	To	:	29.00				
iii	Whether Ground Water Intersection will be there (Yes / No)?						
	If Yes,						
	(i) Upload Copy of Central Ground Water Authority Letter (Upload pdf only)						
	(ii) Letter No.						
	(iii) Date of issue						
15	Details of Water Requirement (During Operation)(Multiple Entries Allowed)						
a.	Details						
	Source	Quantity in KLD	Method of water withdrawal	Distance from Source	Mode of Transport		
	CGWB	1536	Borewell	0	Pipeline		
	<ul style="list-style-type: none"> - Source: Surface /Ground Water /Sea /Others - Mode of Transportation: Pipeline /Canal /Others - Method of water withdrawal: Barrage / Weir / Intake well / Jackwell / Tube well / Open well / Others 						
b.	Upload Copy of Permission from Competent Authority (Upload pdf only)						
c.	Letter No.						
	21-41690/HR/INF/2017-374						
d.	Date of issue						
	12 th March 2019						
e.	Permitted quantity						
	1536050 m ³ /year						
f.	Whether Desalination is proposed (Yes/ No)						
	No						
	If Yes,						
	(i) Desalination capacity (KLD)						
	(ii) Quality of Brine (KLD)						
	(iii) Mode of Disposal of brine						
16	Waste Water Management (During Operation)						
	Type / Source	Quantity of Waste Water	Treatment Capacity (Kilo	Treatment Method	Mode of Disposal	Quantity of Treated Water Used	Quantity of Discharged Water (Kilo Litre per

		Generated (Kilo Litre per Day)	Litre per Day)			in Recycling / Reuse (Kilo Litre per Day)	Day)	
	Domestic and Industrial		6100	CETP	-			
	a.	Total Waste Water Generation				:	6100 KLD	
	b.	Total Discharged Water				:	4730 KLD	
	c.	Total Reused Water				:	1065 KLD	
17	Solid Waste Generation Management (Multiple Entries Allowed)							
		Item	Quantity per Day	Unit	Distance from Site	Mode of Transport	Mode of Disposal	
		Solid Waste	40.05	MT/day		Road	Authorised Agency	
		<ul style="list-style-type: none"> - Item:- (Industrial waste,Municipal Solid waste,Fly ash, Bottom Ash, Hazardous Waste (as per Hazardous and Other Waste Management Rules 2016),E Waste,Bio-Medical waste,Construction & Demolition waste,Plastic Waste,Others) - Unit:- (Tons,Kiloliter) - Mode of Disposal:- (Treatment, Storage and Disposal Facility(TSDF),Authorized Recyclers,Landfills,Sanitary Landfills,Others) 						
18	Air Quality Impact Prediction (Multiple Entries Allowed)							
		Criteria Pollutants	Unit	Baseline Concentration	Minimum Value	Incremental Concentration	Total GLC	Prescribed Standard
		NO2	µg/m ³	29.0	21.4		29.0	80
		SO2	µg/m ³	9.9	6.6		9.9	80
		CO	µg/m ³	1599	940		1599	4000
		<ul style="list-style-type: none"> - Parameter:- (PM10, PM, SO2, NOx, Others parameters specific to the sector) - Unit :- (Microgram per Meter Cube, NA) 						
19	Power Requirement – Yes							
	a.	Quantity (Kilo Volt Amps (KVA))				:	66 kv Electric Substation	
	b.	Source				:	Uttar Haryana BijliVitrان Nigam (UHBVN)	
	c.	Upload Copy of Agreement (<i>Upload pdf only</i>)				:		
	d.	Standby Arrangement (Details of DG Sets)				:	Provided by individual plot owners	
	e.	Stack Height (in m)				:		
20	Land Ownership Pattern (Prior to the project proposal) in Ha							
	a.	Forest land				:		
	b.	Private Land				:	267.39 Ha.	

	c.	Government Land	:		
	d.	Revenue Land	:		
	e.	Other Land	:		
		Total land		267.39 Ha.	
21	Present Land Use breakup in Ha				
	a.	Agriculture Area	:	22978.31	
	b.	Waste/Barren Area	:		
	c.	Grazing/ Community Area	:		
	d.	Surface Water bodies	:	52.23	
	e.	Settlements	:	3154.32	
	f.	Industrial	:		
	g.	Forest	:		
	h.	Mangroves	:	6453.22	
	i.	Marine area	:		
	j.	Others (Specify) <ul style="list-style-type: none"> • River with dry channel • vegetation • open scrub • open land • Settlement • Agricultural Land 	:	<ul style="list-style-type: none"> • 2779.26 • 437.11 • 2896.59 • 836.89 • 3154.32 • 22978.31 	
		Total	:	39587.93	
22	Land requirement for various activities (Multiple entries allowed) in Ha				
	Description of Activity / Facility / Plant / Others		Land requirement	Remarks	
	- Activity / Facility / Plant / Others include: Main Plant, Township, Greenbelt, Ash pond, Quarry area, OB dump Area, Safety zone, Tailing pond, Landfill, Water reservoir, De-salination plant, Area for solid waste management, Built-up area, others				
23	Ecological and Environmental Sensitivity (Within 10 Km):-WLS-Wild Life Species; NPA-Notified Protected Area; ESAs-Eco Sensitive Areas;ESZs- Eco Sensitive Zones)				
	a.	Details of Ecological Sensitivity		:	
		Details of Ecological Sensitivity	Name	Distance from the Project (Km)	Remarks
		Nil			
		- Details of Ecological Sensitivity: - (Critically Polluted Area, WLS, NPA, ESAs, ESZs, Corridors, Wildlife Corridors)			
	b.	Whether NBWL recommendation is required (Yes/No)?		:	No

		If yes	:																																	
		Upload NBWL recommendation in PDF	:																																	
	c.	Details of Environmental Sensitivity	:																																	
		<table border="1"> <thead> <tr> <th>Details of Environmental Sensitivity</th> <th>Name</th> <th>Distance from the Project (Km)</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>Palasra PF</td> <td>Palasra PF</td> <td>8.5 (NE)</td> <td></td> </tr> <tr> <td>Ponta PF</td> <td>Ponta PF</td> <td>9.0 (NE)</td> <td></td> </tr> <tr> <td>Rajpura PF</td> <td>Rajpura PF</td> <td>8.0 (NE)</td> <td></td> </tr> <tr> <td>Kadna PF</td> <td>Kadna PF</td> <td>8.5 (ENE)</td> <td></td> </tr> <tr> <td>BirppurMachhela RF</td> <td>BirppurMachhela RF</td> <td>8.0 (NW)</td> <td></td> </tr> <tr> <td>BirDadrara PF</td> <td>BirDadrara PF</td> <td>8.5 (WSW)</td> <td></td> </tr> <tr> <td>Birkher PF</td> <td>Birkher PF</td> <td>9.5 (SW)</td> <td></td> </tr> </tbody> </table>	Details of Environmental Sensitivity	Name	Distance from the Project (Km)	Remarks	Palasra PF	Palasra PF	8.5 (NE)		Ponta PF	Ponta PF	9.0 (NE)		Rajpura PF	Rajpura PF	8.0 (NE)		Kadna PF	Kadna PF	8.5 (ENE)		BirppurMachhela RF	BirppurMachhela RF	8.0 (NW)		BirDadrara PF	BirDadrara PF	8.5 (WSW)		Birkher PF	Birkher PF	9.5 (SW)			
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		- Details of Environmental Sensitivity:- (Forest, Archaeological Sites, Defence Installations, Others)																																		
	d.	Whether NoC / Permission from the competent authority is required (Yes/No)?	:	No																																
		If yes	:																																	
		Upload NoC / Permission from the competent authority in PDF	:																																	
24	Forest Land																																			
	1	Whether any Forest Land involved (Yes/No)?	:	No																																
		If Yes	:																																	
	a.	Forests Clearance Status (In-Principle(Stage-I) Approval Obtained / Final (Stage-II) Approval Obtained / Forest Clearance Under Process(Stage-I) / Forest Clearance Under Process(Stage-II) / Application for Forest Clearance yet to be Submitted)	:																																	
		If In-Principle (Stage-I) Approval Obtained,																																		
		(i) MoEFCC file number	:																																	
		(ii) Date of InPrinciple (Stage-I) approval	:																																	
		(iii) Area diverted	:																																	
		(iv) Upload FC Letter (Upload pdf only and attach it as Annexure-FC letter)	:																																	
		If Final (Stage-II) Approval Obtained,																																		
		(i) MoEFCC file number	:																																	
		(ii) Date of Final Approval	:																																	
		(iii) Date of In-Principle Approval	:																																	
		(iv) Area diverted	:																																	
		(v) Upload FC Letter(Upload pdf only and attach it as Annexure-FC letter)	:																																	
		If Forest Clearance under process (Stage-I),																																		

		(i) MoEFCC file number	:		
		(ii) Area applied	:		
		If Forest Clearance under process (Stage-II),			
		(i) MoEFCC file number	:		
		(ii) Area applied	:		
	b.	Legal Status of Forest Land (Reserved, Protected, Private, Village, Others)			
		If Others,			
		Please Specify Others	:		
25	Tree Cutting, if any				
	a.	No. of Trees Cut for the Project (if Forestland not involved)	:	673 trees on 2.14 Hectare area to be felled (Permission obtained)	
	b.	Details of Tree Cutting and Planting of Trees (<i>Upload pdf Only</i>)	:		
26	Land Acquisition Status				
	a.	Acquired Land	:	267.39 Ha.	
	b.	Land yet to be acquired	:	Acquired	
	c.	Status of Land acquisition if not acquired	:		
27	Rehabilitation and Resettlement (R&R)–Applicable				
	a.	No. of Villages		6	
	b.	No. of Households			
	c.	No. of PDFs (Project Displaced Families)			
	d.	No. of PAFs (Project Affected Families)		4600 Persons	
	e.	Funds Allocated for R&R		Under the policy all the affected persons will receive annuity for a period of 33 years besides usual land compensation. The amount of annuity is Rs. 15,000/- per acre per annum, which will increase by Rs. 500/- every year.	
	f.	Status of R&R (Completed / In-progress / Yet to start)		In Progress	
28	Whether there is Presence of Schedule-I Species (Yes/No)?			:	No
		If yes,			
	a.	Details of Schedule-I Species	:		
	b.	Whether conservation plan for Schedule-I Species has been prepared (Yes/ No)?	:		
		If Yes,			

	(i)	Upload conservation plan (Upload only PDF)	:	
	(ii)	Fund Provision made	:	
	(iii)	Period of Implementation	:	
	c.	Whether conservation plan for Schedule-I Species has been approved by competent authority (Yes/ No)?		
	(i)	Upload copy of approval (Upload PDF Only)	:	
	(ii)	Letter No.	:	
	(iii)	Date of issue	:	
	(iv)	Recommendations if any	:	
29	Whether there is Presence of Water Bodies in Core Area(Yes/No)?		:	No
		If yes,		
	a.	Details of Water Bodies in Core Area	:	
	b.	Whether there is Diversion required (Yes/No)?	:	
		If yes,		
	c.	Details of diversion required		
	d.	Details of study conducted		
	e.	Whether permission has been obtained from competent authority (Yes/No)?		
	(i)	Upload copy of permission (Upload PDF Only)		
	(ii)	Letter No.		
	(iii)	Date of issue		
	(iv)	Recommendations if any		
30	Whether there is Presence of Water Bodies in Buffer Area(Yes/No)?		:	Yes
		If Yes		
	a.	Details of Water Bodies in Buffer Area	:	Ghaggar River
	b.	Direction of Water Bodies in Buffer Area (North / South / East / West / North East / North West / South East / South West)	:	WNW
	c.	Distance of Water Bodies in Buffer Area (kilo meters)	:	8.89
31	Manpower Requirement			
	a.	Permanent employment during construction	:	
	b.	Permanent employment during operation	:	945
	c.	Temporary employment during construction	:	582
	d.	Temporary employment during operation	:	
	e.	No. of working days	:	365
	f.	Total manpower	:	945

32	Green Belt in Ha																							
	a.	In case of new projects	:																					
	i.	Total Area of Green Belt		<table border="1"> <thead> <tr> <th>S. No</th> <th>Description</th> <th>Area (Sqm)</th> <th>Area (Acre)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Green Area</td> <td>27,429</td> <td>6.78</td> </tr> <tr> <td>2.</td> <td>Green Belt</td> <td>25,437</td> <td>6.29</td> </tr> <tr> <td>3.</td> <td>Green Avenue</td> <td>2,42,447</td> <td>59.91</td> </tr> <tr> <td></td> <td>TOTAL</td> <td>2,95,313</td> <td>72.98</td> </tr> </tbody> </table>	S. No	Description	Area (Sqm)	Area (Acre)	1	Green Area	27,429	6.78	2.	Green Belt	25,437	6.29	3.	Green Avenue	2,42,447	59.91		TOTAL	2,95,313	72.98
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2.	Green Belt	25,437	6.29																					
3.	Green Avenue	2,42,447	59.91																					
	TOTAL	2,95,313	72.98																					
	ii.	Percentage of Total Project Area	:	33 %																				
	iii.	No. of Plants to be Planted	:																					
	iv.	Funds Allocated for Plantation	:																					
	v	Upload Green Belt Plan (Upload PDF Only)	:	Uploaded																				
	b.	Incase of expansion / modernization / change in product mix etc.																						
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Funds Allocated																								
	ii.	Upload Green Belt Plan (Upload PDF Only)																						
33	Project Benefit (Multiple entry allowed)																							
	Type of Project Benefits		Details of Project Benefit																					
	Physical		Road, Market, Green Cover, Infrastructure																					
	Social		Employment, Development of the area																					
	(Project benefits shall include environmental, social and others)																							
34	Whether the Project / Activity attracts the provisions of CRZ (Yes/No)?			Not Applicable																				
	If yes,																							
	1	Project Details		NA																				
	a.	CRZ Classification: (CRZ I (A), CRZ I(B), CRZ II, CRZ III, CRZ IV (A), CRZ IV(B))																						
	b.	Location type: (Non-Eroding Coast, Low and Medium Eroding Coast, High Eroding Coast)																						
	c.	Details of Mangroves Land Involved, if Any																						
	d.	Area of Mangroves Land (hectare)																						
	e.	EIA (Terrestrial) Studies: (Carried Out, Not Carried Out)																						
		<i>If Carried Out,</i>																						

		1)	Summary Details of EIA (Terrestrial) Studies		
		2)	Upload Recommendation made in EIAs (Upload pdf only)		
		3)	Period of Study from (EIA Terrestrial)		
		4)	Period of Study to (EIA Terrestrial)		
			<i>If Not Carried out</i>		
			Give Reason		
	f.		EIA (Marine) Studies: (Carried Out, Not Carried Out)		
			If carried out		
		1)	Summary Details of EIA (Marine) Studies		
		2)	Upload Recommendation made in EIAs		
		3)	Period of Study from (EIA Marine)		
		4)	Period of Study to (EIA Marine)		
			<i>If Not Carried out,</i>		
			Give Reason		
	g.		Disaster Management Plan/National Oil Spill Disaster Contingency Plan (if Applicable)		
2.	Description of the Project Under Consideration				NA
	a.	Type of Project: (Resort/Buildings/civic amenities, Coastal Roads/Roads on Stilt, Pipelines from Thermal power Blow Down, Marine Disposal of Treated Effluent, Facility for Storage of Goods/Chemicals, Offshore structures, Desalination Plant, Mining of Rare Earth/Atomic Minerals, Sewage Treatment Plants, Lighthouse, Wind Mills, Others)			
		<i>If Resort/Buildings/civic amenities,</i>			
		1)	Agency Name for Preparing CRZ Maps		
		2)	Total Area/Built-up Area (hectare)		
		3)	Height of Structure		
		4)	FSI Ratio		
		5)	The governing Town Planning Rules/Regulations		
		6)	Details of Provision of Car Parking Area		
		<i>If Coastal Roads/Roads on stilt,</i>			
		1)	Agency Name for Preparing CRZ Maps		
		2)	Area of Land Reclamation		
		3)	Estimated Quantity of Muck/Earth for Reclamation		

		4)	Carrying Capacity of Traffic			
		<i>If Pipelines from Thermal Power Blow Down,</i>				
		1)	Agency Name for Preparing CRZ Maps			
		2)	Length of Pipeline			
		3)	Length Traversing CRZ Area			
		4)	Depth of Excavation			
		5)	Width of Excavation			
		6)	Length of Pipeline from Seashore to Deep Sea			
		7)	Depth of Outfall Point from Surface of Sea Water			
		8)	Temperature of effluent above Ambient at Disposal Point			
		<i>If Marine Disposal of Treated Effluent,</i>				
		1)	Agency Name for Preparing CRZ Maps			
		2)	Location of Intake/Outfall			
		3)	Depth of Outfall Point			
		4)	Length of Pipeline			
		5)	Length Traversing CRZ Area			
		6)	Depth of Excavation			
		7)	Width of Excavation			
		8)	Length of Pipeline from Seashore to Deep Sea/Creek			
		9)	Depth of Outfall Point from Surface of Sea Water			
		10)	Depth of Water at Disposal Point			
		11)	Type of Disposal			
		<i>If Facility for Storage of Goods/Chemicals,</i>				
		1)	Agency Name for Preparing CRZ Maps			
		2)	Name and Type of Chemical			
		3)	End use of the Chemical			
		4)	No. of Tanks for Storage			
		5)	Capacity of tanks			
		<i>If offshore structures,</i>				
		1)	Agency Name for Preparing CRZ Maps			
		2)	Exploration or Development			
		3)	Depth of Sea Bed			
		4)	No. of Rigs/Platform			

		5)	Details of Group Gathering Stations			
		<i>If Desalination Plant,</i>				
		1)	Agency Name for Preparing CRZ Maps			
		2)	Capacity of Desalination			
		3)	Total Brine Generation			
		4)	Temperature of Effluent above Ambient at Disposal Point			
		5)	Ambient Salinity			
		6)	Disposal Point			
		<i>If Mining of Rare Earth/Atomic Minerals,</i>				
		1)	Agency Name for Preparing CRZ Maps			
		2)	Capacity of Mining			
		3)	Volume/Area to be mined			
		4)	Type of Mineral to be Extracted			
		5)	End use of the Mineral			
		<i>If Sewage Treatment Plants,</i>				
		1)	Agency Name for Preparing CRZ Maps			
		2)	Capacity			
		3)	Total Area of Construction			
		4)	Compliance of effluent parameters as laid down by CPCB/SPCB/other authorized agency			
		5)	Whether discharge is in sea water/creek? If yes,			
			Distance of Marine Outfall Point from Shore/from the tidal river bank			
			Depth of Outfall Point from Sea Water Surface			
			Depth of Sea at Outfall Point			
		<i>If Lighthouse,</i>				
		1)	Agency Name for Preparing CRZ Maps			
		2)	Total Area of Construction			
		3)	Height of the Structure			
		<i>If Wind Mills,</i>				
		1)	Agency Name for Preparing CRZ Maps			
		2)	Capacity (MW)			
		3)	Transmission Lines: (Overhead, Underground)			
		4)	Diameter of Windmill			
		5)	Length of Blade			

		6)	Speed of Rotation			
		7)	Height of the Structure			
		<i>If Others,</i>				
		1)	Agency Name for Preparing CRZ Maps			
		2)	Please Specify with salient features			
		3)	Upload relevant Document (<i>Upload pdf only</i>)			
	3.	Distance of Project (In Meters) from LTL/HTL to be Stated			NA	
		a.	Clause of CRZ Notification Under which the Project is a Permissible/Regulated Activity			
		b.	Whether CRZ Map Indicating HTL, LTL Demarcation in 1:4000 Scales Prepared? (Yes/No)			
		<i>If Yes,</i>				
		1)	Distance of Project (in meters) from HTL to be Stated			
		2)	Upload Maps(<i>kml File</i>)			
		3)	Distance of Project(in meters) from LTL to be Stated			
		4)	Upload Maps (<i>kml File</i>)			
		c.	Whether Project Layout Superimposed on CRZ Map 1:4000 Scales?: (Yes/No)			
		<i>If Yes,</i>				
		1)	Upload Maps (<i>kml File</i>)			
		d.	Whether CRZ Map 1:25000 Covering 7 km Radius Around Project Site Prepared? (Yes/No)			
		<i>If Yes,</i>				
		1)	Upload Maps (<i>kml File</i>)			
		e.	Whether CRZ Map Indicating CRZ-I,II,III and IV Including Other Notified ESAs Prepared?: (Yes/No)			
		<i>If Yes,</i>				
		1)	Upload Maps (<i>kml File</i>)			
		f.	NOC from State Pollution Control Boards Obtained: (Yes/No)			
		<i>If Yes</i>				
		1)	Upload Copy of NOC (<i>Upload pdf only</i>)			
		g.	Details of Rain Water Harvesting System			
	4.	Recommendation of State Coastal Zone Management				

		Authority			
	a.	Upload Copy of CZMA (<i>Upload pdf Only</i>)			
	b.	State the Conditions Imposed			
	c.	Social and Environmental Issues and Mitigations Measures Suggested Including but not Limited to R&R, Water, Air, Hazardous Wastes, Ecological aspects, etc. (Brief Details to be Provided)			
35	Sector Specific Details				
I	Whether the proposal is mining of minerals (coal / non-coal) project (Yes/No)?				No
		If yes,			
	1	No. of Mineral to be Mined (Multiple Entries Allowed)	:		
		Minerals To be Mined	Major or Minor Mineral		
	2	Mine Capacity in ROM (Run of Mine)			
	3	Upload 500 meters Cluster Certificate from State Mines and Geology in case of minor minerals (<i>Upload pdf Only</i>)			
	4	Mining Plan			
	a.	Approval Letter No.			
	b.	Date of Approval			
	c.	Upload Approved Letter (<i>Upload pdf only</i>)			
	d.	Approved by State Mines & Geology Department / Indian Bureau of Mines / Ministry of Coal /Ministry of Mines /State Government /Atomic Mineral Directorate / Others)			
	e.	If Others,			
		Please specify			
	f.	Approved Mining Lease Area			
	g.	Approved Capacity			
	5	Technical Details			
	a.	Total Geological Reserves (Million Ton)			
	b.	Mineable Reserves (Million Ton)			
	c.	Extractable Reserves(Million Ton)			
	d.	Percent of Extraction(%)			
	e.	Grade of Coal /Ore /Mineral			
	f.	Stripping Ratio			
	g.	Category of Gaseousness (Only for Coal Mining, Others may write Not applicable)			
	h.	Average Gradient(Degree)			

		i.	Maximum Thickness of Seams(meters) (Only for Coal Mining, Others may write Not applicable)			
		j.	Mining Method (Opencast / Underground /Mixed(Opencast + Underground) /Adit			
		k.	Life of Mine (Years)			
	6	Details of beneficiation (including crushing / screening/others)				
		a.	Whether it is proposed to install crusher within the mining lease area (Yes/No)?			
			If yes,			
		b.	No. of crushers			
		c.	Details of crusher (Multiple entries allowed)			
			Crusher ID	Capacity (in TPH)	Remarks	
		d.	Whether it is proposed to install beneficiation plant / Coal washery within the mining lease area (Yes/No)?			
			If yes,			
		e.	Beneficiation / washing Technology			
		f.	Capacity			
	7	Details of Seams if applicable				
		a.	No. of seams			
		b.	Thickness of seams to be worked on			
		c.	Maximum Thickness of Seams(meters) (if not Applicable,may Write NA)			
	8	Details of Mining Lease				
		a.	Details of Mining Lease			
		b.	Upload Letter of Intent (Upload pdf only)			
		c.	Date of Execution of Mining Lease with Reference Number			
		d.	Validity of Mining Lease			
		e.	Upload Copy of Executed Lease deed valid as on Date (Upload pdf only)			
		f.	Earlier Renewals (Multiple Entries Allowed)			
			Uploaded Copy of Earlier Lease	Date of Renewal		
	9	OB (Over Burden) Management (Only if Mining Method: Opencast)				

	a.	Details of External Dumps				
		i)	No. of OB Dumps			
		ii)	Total Area (in Hectare)			
		iii)	Height (in meter)			
		iv)	Quantity (in Million Cubic meter)			
		v)	No. of year back fill up			
	b.	Details of Internal Dump				
		i)	No. of Internal Dumps			
		ii)	Total Area (in Hectare)			
		iii)	Height (in meter)			
		iv)	Quantity (in Million Cubic meter)			
10		Details of Topsoil Management				
	a.	Quantity of Topsoil excavated during the entire life of the mine (in Million Cubic meter)				
	b.	Quantity of Topsoil proposed for utilization for reclamation during the entire life of the mine (in Million Cubic meter)				
	c.	Quantity of Topsoil proposed for utilization for other activities during the entire life of the mine (in Million Cubic meter)				
11		Detail of Final Mine Void(Only if Mining Method: Opencast)				
	a.	Area (in Hectare)				
	b.	Depth (in meter)				
	c.	Volume (in Million Cubic meter)				
12		Details of Quarry(Only if Mining Method: Opencast)				
	a.	Final Void of (hectare)				
	b.	At a Depth of (meter which is proposed to be converted into a Water Body.)				
	c.	Total Quarry Area (ha)				
13		Details of Transportation				
	a.	In Pit/Underground to Surface				
	b.	Surface to Siding/Loading				
	c.	Transportation / Conveyor Details				
14		Details of Land Usage (Pre-Mining)				
		Land Use	Within ML Area (Hectare)	Outside ML Area (Hectare)	Total	

15	Details of Transportation					
	a.	In Pit/Underground to Surface				
	b.	Surface to Siding/Loading				
	c.	Transportation / Conveyor Details				
16	Details of Land Usage (Pre-Mining)					
		Land Use	Within ML Area (Hectare)	Outside ML Area (Hectare)	ML	Total
17	Details of Land Usage (Post-Mining)					
		Land Use	Plantation	Water Body	Public Use	Others
		Excavation / quarry				
		Top Soil Storage				
		External OB dumps				
		Internal OB dumps				
		Roads				
		Built Up Area (Colony/Office)				
		Green Belt				
		Virgin Area				
		Other				
		Total				
18	Details of Reclamation(Only if Mining Method: Opencast)Total Afforestation Plan shall be Implemented Covering of Mining. This will include:					
	a.	External OB Dump(in hectare)				
	b.	Internal Dump(in hectare)				
	c.	Quarry(in hectare)				
	d.	Safety Zone(in hectare)			:	
	e.	Final Void of (hectare)			:	
	f.	At a Depth of (<i>meter which is proposed to be</i>			:	

			<i>converted into a Water Body.)</i>					
		g.	Density of Tree Plantation per ha (in no.)			:		
		h.	Others in ha (such as Excavation Area along ML Boundary, along Roads and Infrastructure, Embankment Area and in Township Located outside the Lease etc.)					
		i.	Total afforestation plant (in hectare)					
	19	Status of Progressive Mining Closure Plan (For Expansion Projects only)						
		a.	Implementation of Various Activities as per Approved Progressive Mine Closure Plan(in Bar Chart) (pdf) (<i>Upload pdf only</i>)					
		b.	Any Deviation from the Approved Progressive Mine Closure Plan					
		c.	Total Area Excavated(in hectare)					
		d.	Total Area Backfilled after Excavation(in hectare)					
		e.	Total Area Reclaimed (in hectare)					
	20	Actual Coal/Ore Production vis-a-vis sanctioned capacity Since inception (Multiple Entries Allowed)						
		Financial Year	Sanctioned Capacity as per EC (MTPA)	Sanctioned capacity as per CTO	Sanctioned capacity as per approved Mining Plan	Actual Production	Excess Production Beyond the EC / CTO / Mining Plan Sanctioned Capacity (MTPA)	
36	Details of Court Cases if any						No	
	a.	Whether there is any Court Cases pending against the project and/or land in which the project is proposed to be set up (Yes/No)?						
		If Yes,						
	b.	Name of the Court (Districts Court / High Court / NGT / Tribunals / Supreme Court of India)						
		<i>If name of Court: (Districts Court, High Court, NGT, Tribunals)</i>						
	c.	Name of the Sub-court						
	d.	Case No.						
	e.	Orders/Directions of the court,if any and its relevance with the proposed project						
	f.	Case Details						
	g.	Upload Court Order if any (<i>Upload pdf Only</i>)						
37	Details of direction issued under Environment (Protection) Act / Air (Prevention & Control of							

	Pollution)) Act / Water (Prevention & Control of Pollution) Act		
a.	Whether any direction issued under Environment (Protection) Act/Air (Prevention & Control of Pollution) Act/Water (Prevention & Control of Pollution) Act(Yes/No)?		No
	If yes,		
b.	Details of directions issued under Environment (Protection) Act/Air (Prevention & Control of Pollution) Act/Water (Prevention & Control of Pollution) Act		
c.	Upload copy of directions issued under Environment (Protection) Act/Air (Prevention & Control of Pollution) Act/Water (Prevention & Control of Pollution) Act		
d.	Compliance status of the directions		
38	Details of EIA Consultant		
a.	Have you hired Consultant for preparing document(Yes/No)?	:	Yes
	If No,		
	(i) Reason for not engaging the Consultant	:	
	If Yes,		
	(i) Accreditation No.	:	NABET/EIA/1619/RA 0064
	(ii) Name of the EIA Consultant	:	Grass Roots Research and Creation India (P) Ltd.
	(iii) Address		F-375, Sector 63, Noida
	(iv) Mobile No.	:	
	(v) Landline No.	:	0120-4044630
	(vi) E-mail Id	:	eia@grc-india.com
	(vii) Category of Accreditation (Eligible for Category A / Eligible for Category B)	:	A
	(viii) Sector of Accreditation	:	7(c)
	(ix) Validity of Accreditation	:	18 th August 2020
	(x) Upload Certificate of Accreditation certified by QCI/NABET (<i>Upload pdf Only</i>)	:	Submitted with EIA/EMP report.
39	Documents to be attached		
I	<i>If Project Type is New / Expansion / Modernization / one-time capacity expansion for coal mining:</i>		
a.	Upload Copy of EIA/EMP Report		Uploaded
b.	Upload Copy of Risk Assessment Report		Uploaded
c.	Upload Copy of Feasibility Report/ Detailed Project Report(DPR) /Detailed Engineering Report /Detailed Conceptual Plan / Approved Mining Plan (in case of Mining proposals) (<i>Upload pdf only</i>)		
d.	Upload Copy of Final Layout Plan (<i>Upload pdf only</i>)		Uploaded

	e.	Upload Cover Letter(<i>Upload pdf only and attach it as Annexure-document of Cover letter</i>)		Uploaded
	f.	Upload a copy of documents in support of the competence/authority of the person making this application to make application on behalf of the User Agency (<i>Upload pdf only and attach it as Annexure-authorization</i>)		Uploaded
	g.	Upload copy of District Survey Report (for mining of minor minerals only)		
		Upload copy of Replenishment Study Report & Baseline Survey data (for river sand mining proposals only)		
	g.	Upload Additional File, if any (<i>Upload pdf only</i>)		
II	<i>If Project Type is other than New / Expansion / Modernization / one-time capacity expansion for coal mining: -</i>			Not Applicable
	a.	Upload Copy of Feasibility Report/ Detailed Project Report(DPR) /Detailed Engineering Report /Detailed Conceptual Plan (<i>Upload pdf only</i>)		
	b.	Upload Copy of Final Layout Plan (<i>Upload pdf only</i>)		
	c.	Upload Cover Letter(<i>Upload pdf only and attach it as Annexure-document of Cover letter</i>)		
	d.	Upload a copy of documents in support of the competence/authority of the person making this application to make application on behalf of the User Agency(<i>Upload pdf only and attach it as Annexure-authorization</i>)		
	e.	Upload Additional File, if any(<i>Upload pdf only</i>)		
	f.	Upload Updated Form1 (<i>Upload pdf only</i>)		
40	Undertaking			
	a.	I hereby give undertaking that the data and information given in the application and enclosures are true to be best of my knowledge and belief and I am aware that if any part of the data and information found to be false or misleading at any stage,the project will be rejected and clearance given,if any to the project will be revoked at our risk and cost. In addition to above,I hereby give undertaking that no activity / construction / expansion has since been taken up		
	b.	Name	:	Rohit Kanwar
	c.	Designation	:	Senior Manager (IA)
	d.	Company	:	Haryana State Industrial & Infrastructure Development Corporation Ltd.
	e.	Address	:	Industrial Estate Project, Phase- II, at Barwala, District Panchkula, Haryana

Proceeding/Minutes Of The Public Consultation (Hearing) Under The Provisions Of EIA Notification, 2006 (Amended To Date) For Proposed Development Project Of Mis HSIIDC Industrial State, Barwala, Phase-2 Panchkula Having Area of 557.75 Acres At Ville Alipur, Panchkula.

S. N	Name & Village of Participant	Issues Raised	Commitment by Project Proponent	Plan of Action	Budget Allocation
1	Sh. Virender Singh Village Khangesra, Tehsil Barwala District Panchkula .	The acquired Land is a part of district Panchkula and there are Mango, Poplar & Ashoka tree farms in this area. In my opinion HSIIDC should have taken prior permission before acquisition of land but after acquiring the land you are taking environmental clearance through public hearing and this is wrong. Moreover a river is flowing nearby the villages where our cattle goes for drinking of water. But after the establishment of Industrial Estate entire garbage and polluted water will be put in the river which might be dangerous for our cattle. The authorities have claimed to setup the common effluent treatment plant but later on nobody pays attention, there is a bird sanctuary also near village Berwal which is just 3 miles (cross fly distance) away from the project site and no permission has been taken up by the HSIIDC in this regard.	As per the master plan prepared by Director Town & Country Planning Department, Panchkula, the said area has been earmarked as Industrial zone and the land was acquired accordingly in year 2011-12. HSIIDC have just implemented the directions of the Government and regarding polluted water there is a provision for establishment of CETP in Industrial Estate wherein the sewage as well as industrial effluent will be treated and reused for the plantation/horticulture purpose. If there will be a requirement to take clearance in context to the Bird Sanctuary, the same will be taken as per the Government norms.	NA	NA

Virender Singh
AM(IA)

[Signature]
Senior Manager (IA)
Haryana State Industrial & Infrastructure
Development Corporation Limited
Barwala (Panchkula) Haryana

S. N	Name & Village of Participant	Issues Raised	Commitment by Project Proponent	Plan of Action	Budget Allocation
		the HSIIDC in this regard.			
2	Sh. Virender Singh, Village Khangesra. Tehsil Barwala District Panchkula.	As per the orders of Supreme court the fertile land cannot be acquired, however the land from the villages Khatauli, khangesra, Naggal, Alipur has been acquired which is very good & fertile land and we are objecting to this land acquisition because the most fertile land of the villages has been acquired. The then DRO also informed that BheedBabupur and BheedFirozpur is having unfertile land and can be used for this purpose whereas on the said land residential zone has been planned by Govt. which is adjacent to the Industrial area of Punjab and garbage plant of the Punjab, Nobody pay attention to this and wrong planning has been done. We are not against the industrial setup, however the	The development plan of this area was finalized by the top officials of the Govt and after [mal approval of the development plan by Director Town and Country planning, Department, the land was acquired by HSIIDC.	NA	NA

Virender Singh
AM (IA)

[Signature]
Senior Manager (IA)
Haryana State Industrial & Infrastructure
Development Corporation Limited
Barwala (Panchkula) Haryana

S. N	Name & Village of Participant	Issues Raised	Commitment by Project Proponent	Plan of Action	Budget Allocation
		estate already developed in 1996 is still not occupied fully.			
3	Sh. Virender Singh, Village Khangesra, Tehsil Barwala, District Panchkula.	The Government has done planning but HSIIDC IS the execution agency therefore it is duty of the concerned officer to examine the issue.	We heard all your grievances and the same will be mentioned in proceedings of the public hearing and will be conveyed to the higher authorities for taking further necessary action.	----	-----
4	Sh. Gurdas, Village Alipur, Tehsil Barwala, District Panchkula.	He requested to the ADC, Panchkula to ensure that the work should be done in such a manner that there should not be any bad effect on the life of the nearby residents. Department should take all measures for all those peoples whose land has been acquired.	HSIIDC will adhere to the resettlement & rehabilitation policy for those whose land has been acquired and there is provisions of compensation and also plot will be given to the land owners whose 70% land has been acquired. Moreover, the question regarding impact on the environment, in this regard we will take all necessary precautionary measures for prevention of the environment from this project.	No pollution occurred in development work of I.E, Phase-II, Barwala. Distt. Panchkula.	----
5	Sh. Husan Lal, Village Shamtu, alongwith the residents of village Rattewali, Toka, Miyanpur, Shabilpur,	We had a 12 Gatha wide very old link road of PWD from village Naggal to Shabilpur and the same has been broken/ damaged due to the activities of HSIIDC in the nearby area. The villagers who wants to travel to	DGM HSIIDC, Barwala reply for connectivity of Alipur-Toka road a 60 mt Sectoral road and also a diversion channel has been prepared, however after the completion of the project the connectivity of the roads will be	The existing road is part of HSIIDC and will be maintained by HSIIDC Department Only.	Rs.34.80 Crore.

Am (IA)

Senior Manager (IA)
Haryana State Industrial & Infrastructure
Development Corporation Limited
Barwala (Panchkula) Haryana

S. N	Name & Village of Participant	Issues Raised	Commitment by Project Proponent	Plan of Action	Budget Allocation
	Khetpurali Tehsil Barwala District Panchkula	Barwala have to take longer route. The temporary bridge constructed by the contractor has also been washed away during rains. We request HSIIDC to rejoin the linkroad so that the villagers would not face any problem.	provided. The old existing damaged road will also be repaired within 2-3 months for proper connectivity and facility of the villagers.	Maintenance of roads including Alipur-Toka Road for five years including a layer of wearing course for road work has already been approved by competent authority.	
6	Sh. Yaseen Khan, Village Khapgesra, Tehsil Barwaia., District Panchkula.	He said that nobody pays attention to the problems related to pollution or Jamindars and for solution of any issue or regarding royalty etc we have to travel from Alipur to Panchkula. HSIIDC has also constructed boundary wall therefore the access of the villagers has been stopped. The Govt. is giving different compensation amount for the lands acquired earlier and now. Moreover the compensation amount also differ and varies from village to village.	DGM .HSIIDC, Barwala reply that HSIIDC is having a policy that boundary wall has to be constructed within the acquired area for the safety of the industrial units. However till proper connectivity is not provided to the affected villages, the excess shall be provided to the nearby residents. The matter regarding announcing compensation is related to the District Commissioner and was given by DRO, as per the potential of land or as per the circle rates defined by District Collector. There is no separate role of HSIIDC in the said matter. If anybody is not satisfied with the-	No case has been filed regarding royalty and enhancement compensation for Industrial Estate, Phase-II, Barwala. All royalty/annuity payment made by this office through online portal on yearly basis.	

Am(IA)

Senior Manager (IA)
Haryana State Industrial & Infrastructure
Development Corporation
Barwala (Panchkula) Haryana

S. N	Name & Village of Participant	Issues Raised	Commitment by Project Proponent	Plan of Action	Budget Allocation
			compensation amount he may proceed to the court for their claim.		
7	Sh. Padam Singh, Village Khatouli, Tehsil Barwala, District Panchkula.	He welcomed all the District Administration officers and requested that we are already suffeling from various environmental pollution problems due to abundance of domestic flies and mosquitoes from poultry farms in our area despite of the Swatch Bharat Mission which is launched by the Hon'ble Prime Minister of India. We are not living in hygienic conditions due to fly menace from the nearby poultry farms and this issue has not been resolved till date. Whenever we talk about it to the higher authorities they said that the land was given by you for the concerned purpose & for the establishment of Poultry Farm/Industry etc. He further said that property/land was not given willingly. It is upto the government that they can acquire the land by giving the predecided value of the land and we cannot go against the Government.	Satinder Pal, Regional Officer, Panchkula, It is the duty of the Pollution control board and Government to control and prevent the environment and nobody will be allowed to pollute air and water. HSIIDC is duty bound to install CETP for proper treatment of the effluent being generated from the industrial units and HSIIDC would not be allowed to discharge any treated water into the drain/ river. HSIIDC will have to make provisions for reuse / recycling of the treated effluent inside their premises as per the directions of CPCB.	NA	NA

Am (IA)

[Signature]
 Senior Manager (IA)
 Haryana State Industrial & Infrastructure
 Development Corporation Limited
 Barwala (Panchkula) Haryana

S. N	Name & Village of Participant	Issues Raised	Commitment by Project Proponent	Plan of Action	Budget Allocation
		<p>However after coming of the industries, our cattles would not be able to drink pure water from the nearby river or ponds as it would be polluted after coming of the industries. The underground drinking water will also gets polluted after coming of industries in this area. We do not have, any issue with the setting up of the industrial estate but we want proper arrangements should be done so that our river, ground water and land would not get polluted. We do not allow any compromise on Environmental issues therefore right now we are not in favour of the establishment of the industrial estate project of HSIIDC phase-II, in Barwala.</p> <p>Beside this we have two grain markets in this area, one IS in Barwala and another is in Raipur Rani. The Crop of the Landholders of this area are lying in the open areas whereas in the grain market the paddy is being procured by brokers from Punjab, as a result the farmers of this area are facing huge problem in selling their paddy in</p>			

VK
AM(IA)


 Senior Manager (IA)
 Haryana State Industrial & Infrastructure
 Development Corporation Limited
 Barwala (Panchkuia) Haryana

S. N	Name & Village of Participant	Issues Raised	Commitment by Project Proponent	Plan of Action	Budget Allocation
		Anajmandi. We request the Additional Deputy Commissioner to solve the problem of crops too.			
8	Sh. Sehjwinder Singh, village Alipur, Panchkula.	You said that proper CETP will be established for the project but for the old industries, HSIIDC has not installed any CETP in the industrial estate.	Sh. Satinder Pal, Regional Officer, HSPCB, Panchkula. The CETP for the existing industries has already been established and the same can be checked along with the Officers of HSIIDC.	Capacity of existing CETP is 0.5 MLD.	Monthly expenditure of CETP of is 1.48 Lacs. The Lab report is enclosed at 'Annexure-I'
9	Sh. Sehjwinder Singh, village Alipur, Panchkula.	He asked that the water is still discharged in to the river and no proper nallah system has been developed. The factories are putting waste material / garbage near the river bed and burn the waste resulting into the air pollution in nearby area.	Sh. Satinder Pal, Regional Officer, HSPCB, Panchkula reply that HSIIDC is responsible for management of the solid waste generated and has to ensure that no open dumping and burning of the waste of industry be allowed. If there is any specific complaint the same may be provided to the officer of Pollution Control Board and appropriate action will be taken if any violation is found on the part of industry. For this project 1.5 acre land has been earmarked by HSIIDC for solid waste disposal. HSIIDC should ensure that management of solid waste generated from the industrial estate be done properly and at the designated site.	1.55 Acre has been earmarked for Industrial Estate, Phase-II, Barwala.	0.89 crore has been approved for development of Solid Waste Management Facility by competent authority.
10	Sh.	The plants/trees and houses on	DGM HSIIDC, Barwala reply that	No	No

Am(IA)

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Barwala (Panchkula) Haryana

S. N	Name & Village of Participant	Issues Raised	Commitment by Project Proponent	Plan of Action	Budget Allocation
	Sehwindersingh, village Alipur, Panchkula	our land have not yet been compensated by HSIIDC and the land has been acquired earlier before giving any compensation associated with the loss.	the land acquisition matter is related to DRO and HSIIDC has deposited all the amount as per the demand received from DRO, however if any matter is left the same may be informed to HSIIDC in written and accordingly the matter will be taken up with DRO.		
11	Sh. Sehwindersingh, village Alipur, Panchkula	One month has gone after submission of the affidavit and amount has been deposited on 26th, now farmers are asking for the interest.	DGM HSIIDC, Barwala reply that as per the demand the disbursement of the fund has to be done by DRO, might be the scrutiny of the documents is going on. However the amount will be released by Monday or Tuesday as per the discussion held with DRO.	No amount has been pending in this office w.r.t enhancement compensation and royalty. All funds has already been submitted to DRO-cum-LAC, Panchkula.	----
12	Sh. Sehiwinder Singh, village Alipur, Panchkula	It was promised that the lease rent will be enhanced @ of Rs. 750 annum but you have only enhanced Rs. 500/ annum.	DGM HSIIDC, Barwala reply that as per our record the increment of Rs. 750 has been given and for the acquisition of land done before 2009 Rs. 500/- were given as increment. However if there is an doubt regarding calculation you can come to our office for clarification.	Proof of enhanced @ of Rs.750 annum is enclosed at 'Annexure-II'.	-----
13	Sh. Sehwindersingh, village Alipur, Panchkula	It was told to us that for the industrial plot which will be allotted to the jamindars in the	DGM HSIIDC, Barwala reply that this matter is related to the Estate office of HSIIDC but still you can give in written your grievance	It is matter of Estate Management Procedure-	---

Am (IA) ?

Senior Manager (IA)
Haryana State Industrial & Infrastructure
Development Corporation Limited
Barwala (Panchkula), Haryana

S. N	Name & Village of Participant	Issues Raised	Commitment by Project Proponent	Plan of Action	Budget Allocation
		Industrial estate, for that they can give amount in the installments and no interest will be charged. But now they are asking for the interest.	with name and address. The reply will be given immediately plot wise.	2015 decision will be taken accordingly	
14	Sh. Sehjwindersingh, Village-Alipur, Panchkula	After establishment of industrial estate the facilities of Electricity and water are being affected. The supply of light is always available in the industrial estate Whereas no proper electricity supply in the nearby villages.	DGM HSIIDC, Barwala reply that for industrial Estate, Ph-II, the electrical wing of HSIIDC is going to setup 66 KVA power substation and power will also be provided to the villagers from this substation.	DNIT for Development of 66 KVA substation.	Amounting to Rs.5.32 Crore has been approved by competent authority.
15	Sh. Kamaljit Singh, A.E.E. HSPCB, Panchkula.	Is HSIIDC is having the Zero Liquid discharge provision for the CETP to be installed.	DGM HSIIDC, Barwala reply that CETP of 6.5 MLD will be having tertiary treatment but ZLD will not be achieved, however 70% water will be recycled and used for horticulture purpose.	NA	NA
16	Sh. Kamaljit Singh, A.E.E. HSPCB, Panchkula.	Is Industrial as well as Domestic effluent of the industries will be treated in the CETP and what type of industries will be allowed in Industrial Estate.	DGM HSIIDC, Barwala reply that common treatment of the industrial as well as of domestic effluent will be done however at present there is no allotment of any plot to the industries as when there will be allotment it will be kept in the mind for finalizing the parameters for CETP and the matter will be taken accordingly. Mixed type of industries will be allowed in phase-II.	NA	NA

Am (IA)

Senior Manager (IA)
Haryana State Industrial & Infrastructure
Development Corporation Limited
Barwala (Panchkula) Haryana

ftms - 15217

Prevent pollution

Form J

(See Rule 36)
Test Report

Report No- 2266

Dated: 28-February-2020

I hereby, certify that I Dr. Jai Bhagwan Board Analyst duly appointed under sub section (3) of section 53 of the Water (Prevention and Control of Pollution) Act 1974 (06 of 1974), received a sample on the 15 day of February, 2020, collected by Sh. Sidharth Bhargava, AEE on dated 15 day of February, 2020 of M/s 0.5 MLD CETP, Barwala, Panchkula for analysis.

Further certify that I have analyzed the above mentioned sample on 15-February-2020 to 28-February-2020 and declare the result of analysis to be as follows:-

1. Sample Code 2672 2673
2. Sample Collected from # Inlet of CETP Outlet of CETP

OBSERVATION

1. Appearance Greyish Light Greyish
2. Odour Foul Mild

RESULTS

Sr. No.	Parameter Name	Result	Result	Limit	Test Method
1.	pH Value	5.88	6.14	6.0-9.0/5.5-9.0	APHA, 4500-H+B
2.	Suspended Solid mg/l	2650.0	79.0	150/100	APHA, 2540-D
3.	BOD mg/l	780.0	26.0	200/30	IS:3025(P-44)
4.	COD mg/l	2736.0	109.2	325/250	APHA, 5220-B
5.	Oil & Grease mg/l	19.0	2.0	10	APHA, 5520-B
6.	Conductivity Micro S/cm	1584.0	1122.0	-	-
7.	Ammonical Nitrogen (as N) mg/l	BDL	BDL	50	-
8.	Total Chromium (as Cr) mg/l	BDL	BDL	2.0	-
9.	Hexavalent Chromium (as Cr+6) mg/l	BDL	BDL	0.1	-
10.	Nickel (as Ni) mg/l	3.0	2.0	3.0	-
11.	Iron (as Fe) mg/l	4.496	2.581	-	-
12.	Zinc (as Zn) mg/l	0.020	0.029	5.0	-
13.	Copper (as Cu) mg/l	BDL	BDL	3.0	-
	Lead (as Pb) mg/l	BDL	BDL	0.1	-

The Conditions of the seals, listening and container on receipt was as follows:

Container had its seal found intact and in order, slip on the container had the signature of the representative of the industry and the Board.

Signed this 28 day of February-2020

Haryana State Pollution Control Board Laboratory,
SCO-115, 1st & 2nd Floor, Sector-25, Panchkula, Haryana

To
The Member Secretary, HSPCB, Panchkula
Regional Office, Panchkula

Board Analyst

This test report relate only to the particular sample submitted for testing. ***

This information is provided by the field officer.

BDL - Below Deduction Limit.

VR
AM (A7)

Deduction Limit.
Senior Manager (IA)
Haryana State Industrial & Infrastructure
Development Corporation Limited
Barwala (Panchkula) Haryana

HARYANA STATE INDUSTRIAL AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

(Annexure - II)

Regd. Office: C-13 & 14, Sector -6, Panchkula (Haryana)
Telephone : 0172-2590481-83, Fax: 0172-2590474

Sr Number of award statement wise annuity payment report (All) 2017 - 2018

SR NO	DISTRICT	TEHSIL	VILLAGE	AWARD NO	DATE OF AWARD	PROJECT	SR NO. OF AWARD STATEMENT	BENEFICIARY NAME	MARLAS	ACRES	ANNUITY YEAR	TOTAL ANNUITY	PAID AMOUNT	DUE AMOUNT	OUTSTANDING AMOUNT
1	Panchkula	Panchkula	Khangesar	4	2011-12-12	I.E.Barwala, Phase-II	1	Sant Ram S/o Bija Ram	160.000000	1.000000	2017	24791	24791	0	0
2	Panchkula	Panchkula	Khangesar	4	2011-12-12	I.E.Barwala, Phase-II	1	Sant Ram S/o Bija Ram			2018	25541	25541	0	0

Proof of Lease rent @ Rs. 750 per annum to one acre to ex-Landowners.

Am (IA)


Senior Manager (IA)
Haryana State Industrial & Infrastructure
Development Corporation Limited
Barwala (Panchkula) Haryana

13/03/2020 1.38	1	Grand	160.00	1.000000	50.332	50.332	0	0
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Summary Report for construction of New CETP for Development of Industrial Estate Phase II in Barwala, District Panchkula, Haryana (6.25 MLD) on ZLD concept.



Mar-2020

Haryana State Industrial & Infrastructure Development Corporation

Plot No-13-14, Sector-6
Panchkula, (Haryana)



Prepared by

ky Consultants Pvt. Ltd

302-304, Star Tower, Sector 30, Gurgaon – 122001

Ph: +91-124-4034715

Fax: +91-124-4034714

www.kyconsultants.co.in

email-contactus@kyconsultants.in



Summary Report for construction of New CETP for Development of Industrial Estate Phase II in Barwala, District Panchkula, Haryana (6.25 MLD) on ZLD concept.

1. Introduction

- Barwala is a town in Panchkula District, Haryana State. It is located at 17.2 km distance from its District Head Quarter Panchkula.
- It is at 25 km distance from its City of Chandigarh.
- This area is a plain area with backdrop of Shivalik hills.

2. Location

- Latitude : 29.367 °
- Longitude: 75.94585 °

3. Scope of Work

Ky Consultants Pvt. Ltd. have been assigned the job of planning & designing of New CETP for Development of Industrial Estate Phase II in Barwala, District Panchkula, Haryana vide memo no HSIIDC:IA:BRW:2019:98 Dt 15-02-2019

4. Detailed Project Report

- Detailed Project Report covering scope of work specified in preceding Para has been prepared as under

5. Land Use Plan

- Govt. of Haryana has already developed Industrial Estate in Barwala Phase I.
- Haryana State Industrial & Infrastructure Development Corporation is developing 557.75 Acres in Phase-2 as Industrial Area in Barwala, District Panchkula, Haryana.
- Total Area of Project under Phase II = 557.75 Acres

6. Topography of the Area

- The area is located on North-Eastern side of Chandigarh –Yamuna Nagar National Highway.
- The Natural Surface Level of area varies from 312 m to 330 m.
- There is variation of 18 m in Natural Ground Levels.
- The State Road from Kot, Khangsra to Toka is 2 m above the Natural Ground Levels.
- It acts as protective bund on north-Eastern side.
- The Natural Ground Level along Road varies from 330 m to 323 m. i.e. 7 m in length of 1350 M.
- Tangri River flows on Eastern Side of proposed area.

7. Need of the Project

The HSI IDC has proposed to develop the Area of Phase II of 557.75 Acres and will allot the plots after development as per the final development plan 2021 Panchkula District. The development plan proposes the residential area of 171.25 hectare in different sectors with the projected population of 42300 persons. While HSI IDC is developing the industrial area only. Phase I of industrial area already stands developed in an area of 102 acres while Phase II is proposed area of 557.75 acres in sectors 10 & 11 along the National Highway. No further increase of IA has been proposed in the development plan 2031 except sector 9 and 13 (Part) which is reserved for IT sector. As such it is proposed to construct the CETP for ph-2. The industries which will come up in the area will be restricted to less polluted industries as per the Haryana Govt. notification of final Development plan. (Copy of Development plan notification attached).

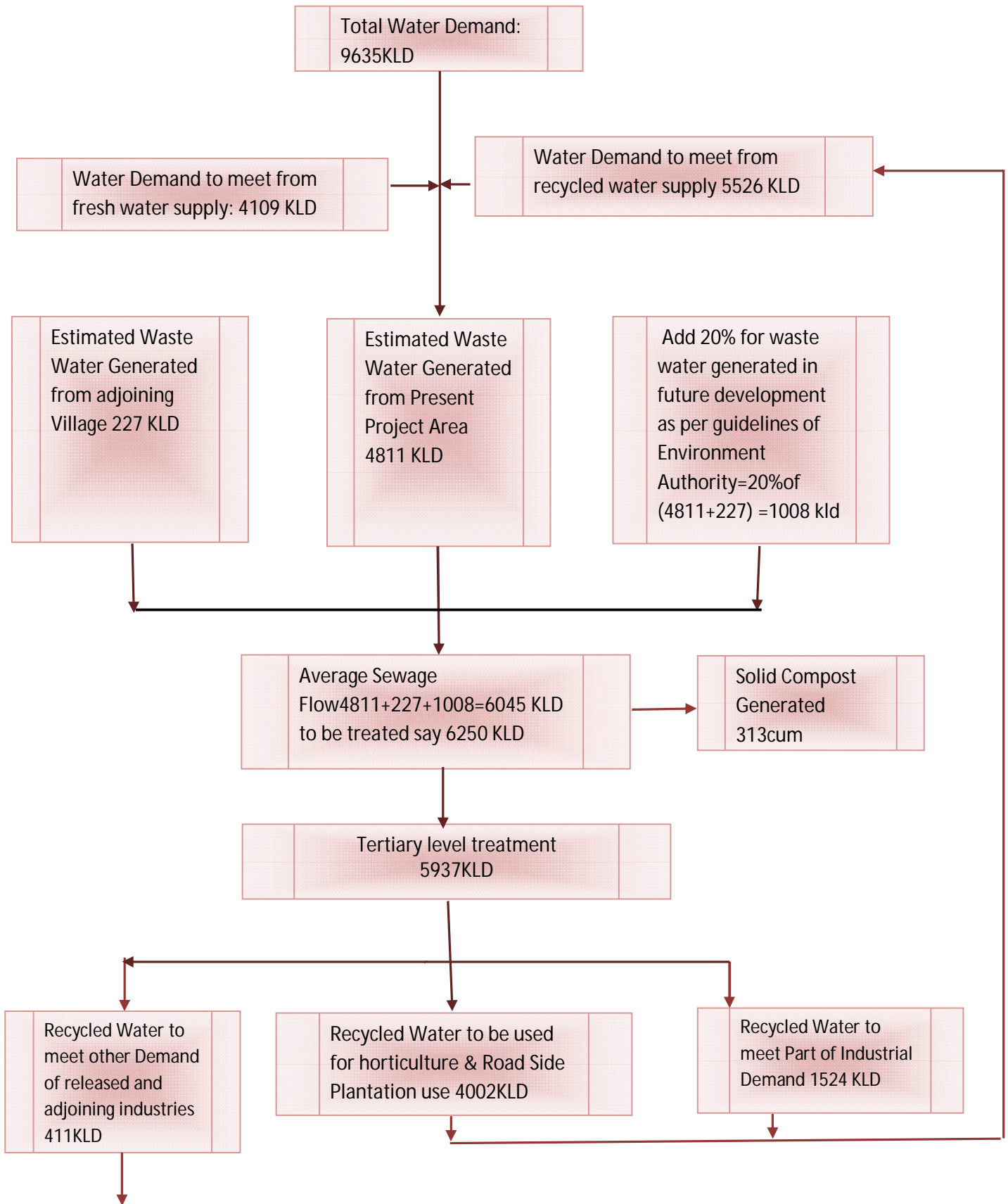
8. Design and Optimization of Water & Wastewater Management

Design and optimization of Water & Waste Wastewater Management will be done as per CPHEEO guidelines. & other allied use

Table - 1

Water & Waste Water Management Plan		
Total Water Demand	9635	KLD
Total Fresh water Demand	4109	KLD
Total Recycled water Demand	5526	KLD
Estimated Waste Water Generated=80% of Fresh water Demand contributing towards Water Generation +100% Recycled Water Demand	4811	KLD
Estimated Waste Water Generated from Adjoining village Alipur will also come to the STP	227	KLD
Sub Total	5038	KLD
Additional 20% for unforeseen demands	1007.64	KLD
Total Capacity of STP required	6046	KLD
Total Capacity of STP provided	6250	KLD
Quantum of Solid Waste Generated is 5%	313	CUM
Quantum of Treated Water available	5937	KLD
Quantum of Treated Water Required for Road Side Plantation +Green Belts +Green Areas & Open spaces outside & within plots	4002.0	KLD
Quantity of treated waste water to be used in Industry	1524	KLD
Additional quantity of treated waste water to be used in Industry for allied use	411.0	KLD
Quantity to be disposed off in dry days	Nil	KLD
Quantity to be disposed off in wet days	4002.0	KLD

**8.1. Flow Chart showing Water & Waste Water Management (Fig-1)
Giving 100% proposed utilization of the treated waste water**



8.2. Quality of Effluent

- Waste water from the following category of Industries is expected.

Transportation Equipment

- This category of Industry is light engineering and is expected to generate waste water containing mineral oil and grease, cutting and coolant oil, and domestic / canteen waste water, copper ingredient from wire drawing operation and acidic / alkaline water from cold rolling operation requiring pre- treatment in the factory premises for removal of copper, iron, nickel and heavy metal etc.

Machinery & Equipment

- This category of Industry is generally of dry operation and hence it may generate mostly sludge type waste water and traces of heavy metals from floor washing

Readymade Garments

- This category of Industry is both dry operated and water intensive such as woven and knitted fabrics and the waste water containing shop solutions and other cleaning detergent and thus need treatment to remove chemicals.

Auto Mobile Parts

- This category of Industries is mostly of dry operation and expected to generate domestic / canteen waste and sludge. The Washing machine and floors of the Industry are likely to generate Oil and Grease, Acidic over Alkaline Waste and traces of heavy metals.

Miscellaneous

- These categories of Industries are generally of dry operation except fresh fruits and vegetable and lubricant which generate biodegradable waste, acidic waste and Grease.

The proposed Industrial operation are not highly polluting categories but is expected to have waste water of sludge and acidic / alkaline in nature with moderately high oil and grease contents and light engineering Industries. Where wire drawing operations are done may generate some waste containing copper ingredients and heavy metals.

8.3. Proposed Inlet Parameter for Design

- The production /manufacturing process proposed in ph-2 will not involve raw leather processing/ leather tanning & heavy pollutant industries, therefore concentration of pollutants in the effluent shall be mild. The domestic sewage of the industrial area will also be mixed with trade effluent. The expected characteristics of composite



equalized untreated / raw effluent (assuming that in future few leather, dying units may also contribute to the effluent) are considered for design purposes.

- The effluent from different industrial units, whose discharges coming to CETP, shall not exceed the effluent discharge per day than already indicated by them to HSI IDC and consent of the same taken from Haryana State Pollution Control Board. The effluent of individual Industrial Unit shall not exceed the following parameters given in Table-2. HSI IDC shall instruct the Industrial Units accordingly to install flow meter and putting up their ETPs so that discharge from the Industrial Units is within the standards prescribed in Table-2 below.
- It has been learnt from the past, that the industries in HSI IDC developed areas come in and as such initially, it cannot be assessed as to what type of industries will come in particular Industrial plot. Hence, to cover all type of permissible industries vide their memo no. 3230-3248 on 31/7/2019 in consultation with HSPCB the inlet parameter were fixed for designing of CETP by HSI IDC. Accordingly, the following parameters at inlet for design of CETP and outlet parameters after tertiary treatment have been proposed.

Table 2

Sr. No.	Description of Parameter	Proposed Inlet Parameter for Design
1	BOD	550 PPM
2	COD	1550 PPM
3	TSS	1200 PPM
4	PH	5.5-9.0
5	Oil & Grease	100 mg/L

8.4. Required Characteristics of Treated Effluent after Tertiary Treatment

Table 3

Sr No	Parameters	Unit	Values
1	pH	--	6.5- 8.5
2	Total Suspended Solids (TSS)	mg/ litre	Less than 5
3	Chemical Oxygen Demand (COD)	mg/ litre	Less than 50
4	Biochemical Oxygen Demand (BOD,3-days,270C)	mg/ litre	Less than 5
5	Oil and Grease	mg/ litre	Less than 5
6	Temperature	deg. C	Less than 25

7	Total Chromium (as Cr)		Less than 2
8	Fecal Coliform	Nos.	Less than 100 per 1000
9	Total residual chlorine	mg/ litre	Less than 1.0
10	Total Chromium (as Cr)	mg/ litre	Less than 2.0
11	Phenolic compounds (as C ₆ H ₅ OH)	mg/ litre	Less than 1.0
12	Lead (as Pb)	mg/ litre	Less than 0.1
13	Total Kjeldahl nitrogen (as N)	mg/ litre	Less than 100
14	Arsenic (as As)	mg/ litre	Less than 0.2
15	Cadmium (as Cd)	mg/ litre	Less than 1.0
16	Selenium (as Se)	mg/ litre	Less than 0.05
17	Nickel (as Ni)	mg/ litre	Less than 3.0
18	Dissolved Iron (as Fe)	mg/ litre	Less than 0.5
19	Cyanide (as CN)	mg/ litre	Less than 0.2
20	Chlorides (as Cl)	mg/ litre	Less than 1000
21	Fluoride (as F)	mg/ litre	Less than 2.0
22	Sulphate (as SO ₄)	mg/ litre	Less than 1000
23	Sulphide (as S)	mg/ litre	Less than 2.0
24	Pesticides	mg/ litre	Absent
25	Manganese (as Mn)	mg/ litre	Less than 0.5
26	Mercury (as Hg)	mg/ litre	Less than 0.01
27	Zinc (as Zn)	mg/ litre	Less than 4.0
28	Colour and odor	--	Refer Note.

Notes:

1. The permissible standards for Fixed Dissolved Solids (FDS) at inlet and outlet shall be maximum 2100 mg/l or as per CPCB/HSPCB norms.
2. After tertiary treatment, the value of ammonium (NH₄) shall be ≤ 5, total N shall be ≤ 10 and fixcal coliform shall be ≤ 100.
3. Other parameters and factors for planning & designing of the CETP's will be adopted in compliance of relevant manuals of CPHEEO/guidelines/standards/codes issued by concerned authorities to make the plant efficient, economical and structurally safe.
 - A. The following additional parameters are fixed for sizing of the units:-
 - i. Oil and Grease trap to be provided.
 - ii. The maximum number of Equalization chambers shall be considered as 2.
 - iii. Aeration as per designer requirement to make the system efficient and economical.
 - iv. SRT (Sludge Retention Time) shall not be less than 15 days.
 - v. N (nitrogen): P (Phosphorous) :: 5:1 per 100 BOD₅ removal in Aeration tank shall be maintained.

- vi. For design of Secondary Clarifier, the surface area shall be maximum of the following two:-
 - a. Surface loading shall not be more than 8 m³/m²/day at average flow.
 - b. Solid loading shall not be more than 70 kg s/ M²/day at (Average Flow + Return Activated Sludge – Excess Activated Sludge).
- vii. Pressure Filters and Rubber lined Activated Carbon Filter with 1000 iodine value shall be used for Tertiary Treatment.
- viii. Gaseous Chlorination is proposed.
- ix. The valves of 300 mm & above shall be Electrically operated, with actuators
- B. Shape of all major units viz. Equalization Tanks, Aeration Tanks, Storage Tanks etc. shall be Rectangular in order to provide equal distribution & collection at inlet & outlet. Operation & Maintenance: The chemical dosing rate will be fixed as per inlet design parameters to have efficient and economical plant.
- C. CCTV monitoring will be provided at the major units of CETP, besides SCADA, sensing analyzers etc.
- D. On line Monitoring System (OCEMS) as per the latest requirement of CPCB is provided.

9. DESIGN PROPOSAL

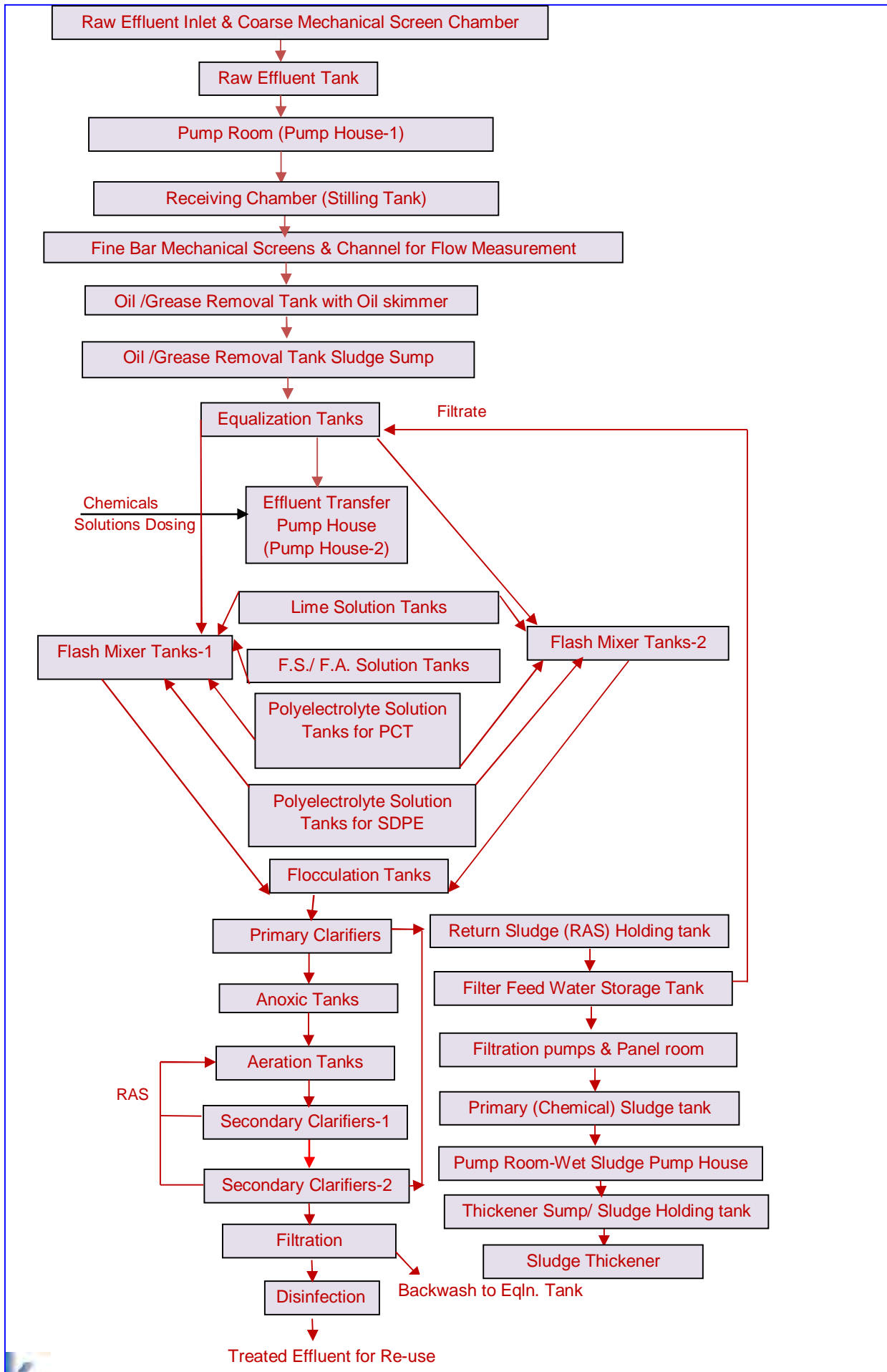
9.1. Technology Selection

- The following treatment processes as also cited in the advisory issued by the Ministry of Urban Development in March 2012 titled ‘Recent trends in Technologies in Sewage Treatment’ fall under the classification of aerobic treatment.
 - .i. Activated Sludge Process(ASP)/extended aeration with Anoxic treatment for removal of Biological Nutrient.
 - .ii. Sequencing Batch Reactor(SBR)
 - .iii. Moving Bed Bio Reactor (MBBR)/Fluidized Aerobic Bioreactor.
 - .iv. Membrane Bio Reactor(MBR)
 - .v. BIOFOR – Biological Filtration and Oxygenated Reactor(BIOFOR)
 - .vi. High Rate Activated Sludge BIOFOR-F Technology
 - .vii. Submerged Aeration Fixed Film(SAFF) Technology
 - .viii. Fixed Bed Biofilm Activated Sludge Process(FBAS)
 - .ix. Fixed media like Rotating Biological Contractor(RBC)

- .x. Out of the above at present mainly first three technologies are being used, in India. The fourth technology i.e. MBR is comparatively a very costly affairs.
- .xi. Out of the first three technologies first two are being extensively used for the biological treatment.
- .xii. In HSI IDC, the major plants constructed so far are based on the ASP(extended) and accordingly it is proposed to construct this plant with Physico chemical treatment along with biological treatment on ASP(extended aeration) with Anoxic treatment and followed by tertiary treatment.

9.2. Process Design

- Based on the practice being followed in HSI IDC, the parameters decided by HSI IDC vide letter no 3230-3248 Dt 31-7-2019, the Treatment based on primary, physico-chemical, biological (extended ASP) with Biological nutrient removal, tertiary treatment have been proposed to be adopted in the project.



- The common effluent treatment plant would have following treatment units.
 - i. Raw Effluent Inlet/
 - ii. Screen chamber/Collecting Tank
 - iii. Fine Screen, Oil cum grease removal traps,
 - iv. Grit removal system / Pre-settlers.
 - v. Pump House-1
 - vi. Equalization tank
 - vii. Chemical House–Chemicals Store, Solution tanks and dosing pumps.
 - viii. Flash mixing Tanks,
 - ix. Flocculation Tank,
 - x. Primary Clarifier.
 - xi. Aeration Tank.
 - xii. Anoxic Tank
 - xiii. Secondary clarifier
 - xiv. Return activated sludge (RAS) Pump House-2
 - xv. Sludge handling system – Filter press.
 - xvi. Tertiary Treatment Pump House-3.
 - xvii. Dual Media Pressure Filters.
 - xviii. Wet sludge pit and Pump House-4
 - xix. Dry Sludge Store / Shed,
 - xx. UGT for treatment waste water
 - xxi. Pumping station for treatment waste water
- The combined effluent from contributing units shall be conveyed under gravity flow through sewer lines approaching to CETP area. A sluice gate shall be provided in the main inlet channel. Effluent shall pass through bar screens (manual cleaned) for removal of pieces & other coarse floating matter. Bar screens would be cleaned regularly in order to prevent surge in level / accumulation of influent into the sewers. The effluent shall enter into wet well and pumped into elevated receiving chamber followed by Oil/grease removal traps. The pumps of Pump house (through MC panel) shall be fitted with on-line flow meters and linked to level controllers for automatic ON / OFF operation.

- Equalization tank of sufficient capacity is provided to dampen the variations in terms of volume and strength and to achieve a consistent effluent quality in downstream processes.
- The combined effluent from equalization tank would flow (under gravity) into three stage flash mixer followed by flocculation tank. Chemical solutions - ferrous sulphate and lime would be added in the first two flash mixers and poly electrolyte solution into the flocculation tank with the help of dosing pumps attached to chemical dosing tanks. Mixing in dosing tanks and flash mixers shall be done through mixers.
- The chemicals with effluent get completely mixed by rapid mixing in flash mixers whereas slow mixing in flocculation tank allows formation of bigger size flocs which results in fast settling in Primary clarifier. The pH of the mixture of ferrous sulphate and effluent in flash mixer is maintained around 8.5 by adjusting dosing of lime solution.
- After floc formation, this mixture enters into Primary clarifier where sludge settles at bottom and the clear effluent collected through launders flows into aeration tank. The sludge from the primary clarifier is withdrawn into wet sludge pit with the help of valve provided in the valve chamber.
- In addition to colour and suspended solids removal, physico-chemical treatment would remove about 20% of BOD load of the raw effluent. The remaining portion of soluble BOD & COD load (organic material present in the effluent) would be removed by biological treatment process.
- The chemically treated effluent from the primary clarifier would be subjected to aerobic biological treatment (activated sludge process) in the aeration tank for removal of residual BOD and COD load up to a desired level. Activated sludge process (ASP) allows for the oxidation of bio-degradable matter in carbon-dioxide, water and conversion into bio-cell mass. The cell mass concentration in the aeration chamber is maintained at required level by maintaining flow rate of sludge recycling from the secondary clarifier. Proper mixing of bio-cells mass with the effluent and necessary oxygen supply for oxidation of bio-degradable matter by aerobic bio-mass in aeration tank is done by means of Activated sludge with fixed type mechanical surface aerators (which have least maintenance).
- The nourishment of good biological activity of microbes requires nutrients i.e. “Nitrogen (N) and “Phosphorous” (P) which are vital elements for the growth of new

cells (biomass) in the effluent. The required DAP and urea shall be added for this purpose. The mixture of treated effluent and bio-mass from the aeration tank would flow into secondary clarifier for separation of bio-mass in the form of sludge. Settled active bio-mass at the bottom of secondary clarifier would be swept by mechanical scrapper into a sludge well provided at the central position of clarifier.

- The sludge slurry is collected under gravity into RAS pump sump, where from active sludge would be recycled in to the aeration tank with the help of pumps so as to maintain the required degree of MLVSS and excess part (waste sludge) would be sent into wet sludge collection pit / irrigation of green belt.
- The colorless and transparent treated effluent (water) over flowing from secondary clarifier outlet launder shall pass through a long channel fitted with 90° V-notch for flow measurement and then it would be collected into Tertiary Treatment Pump House for filtration.
- Activated Carbon filters to be provided for the purpose & thus after chlorination of the treated waste water, would be recycled in the project area and out side for use.

10. Layout plan attached at Annexure –I

11. Costing

The total cost of the project in as under.

Abstract of Cost			
Sl.	Sub work Nos	Description	Rs. Lac
		CETP Works Head	
i	Sub work No 1	Cost of Civil Works within CETP area including all accessories	1062.46
ii	Sub work No 2	Mechanical & Piping Works	599.15
iii	Sub work No 3	Cost of Electrical Panels, Cables, Instrumentation for total CETP and PLC, Software, SCADA for ASP including all accessories	31.29
iv	Sub work No 4	Supply, Errection, Testing, Commissioning DG sets (1no. @ 500 KVA) including all accessories	38.17
v	Sub work No 5	Supply, Erection ,Testing & Commissioning of 630kva Cu. Wound Transformer with all ancillary items at site including all applicable taxes, levies & duties, Transportation etc.	29.18
		Sub Total	1760.25
		Add 2% Contingency Charges	35.20
		Add 1.5% Project Management	26.40
		Add 1% Quality Control/Quality Assurance	17.60
		Total	1839.46
		Provision 3.5% for Cost escalation in 2 years (time up to completion)	128.76
		Estimated Total Cost	1968.22
		O&M for 5 Yrs.	2383.22
		Grand total	4351

12. Specification

- The civil works shall be carried out in accordance with the National Building Code, the PWD Haryana specification and explanatory notes for building and house drainage in the latest versions. In case of any variation between the PWD Haryana specifications and specifications given herein the latter shall prevail. In cases where the PWD Haryana specification and the specifications given below are silent about any aspects in respect of any item, the work shall be carried out as per the relevant IS code of practice in the latest version and as per sound engineering practice
- The electrical and mechanical work, equipment and material shall be comply with the relevant India standards unless a more rigorous requirement is specifically stipulated. If no applicable Indian Standard is available for any item of equipment or materials, the corresponding British Standards laid down by the regulating authority in the United States dealing with the subject in question shall be adopted. In every situation the latest specifications, Standards etc. shall apply unless otherwise stated. In instances where there is a conflict between two codes (the Indian Standards not available), the more restrictive of the two shall apply.
- All latest guidelines of CPCB, HPCB Green tribunal shall a part of the project & shall be incorporated.

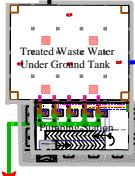
13. Time

It will take about 18 months including 3 month trial run to complete the project.

EXISTING 30M WIDE ROAD

Site of Existing CETP

EXISTING STRUCTURES



BOOSTING STATION FOR RECYCLED WATER

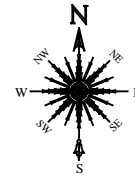
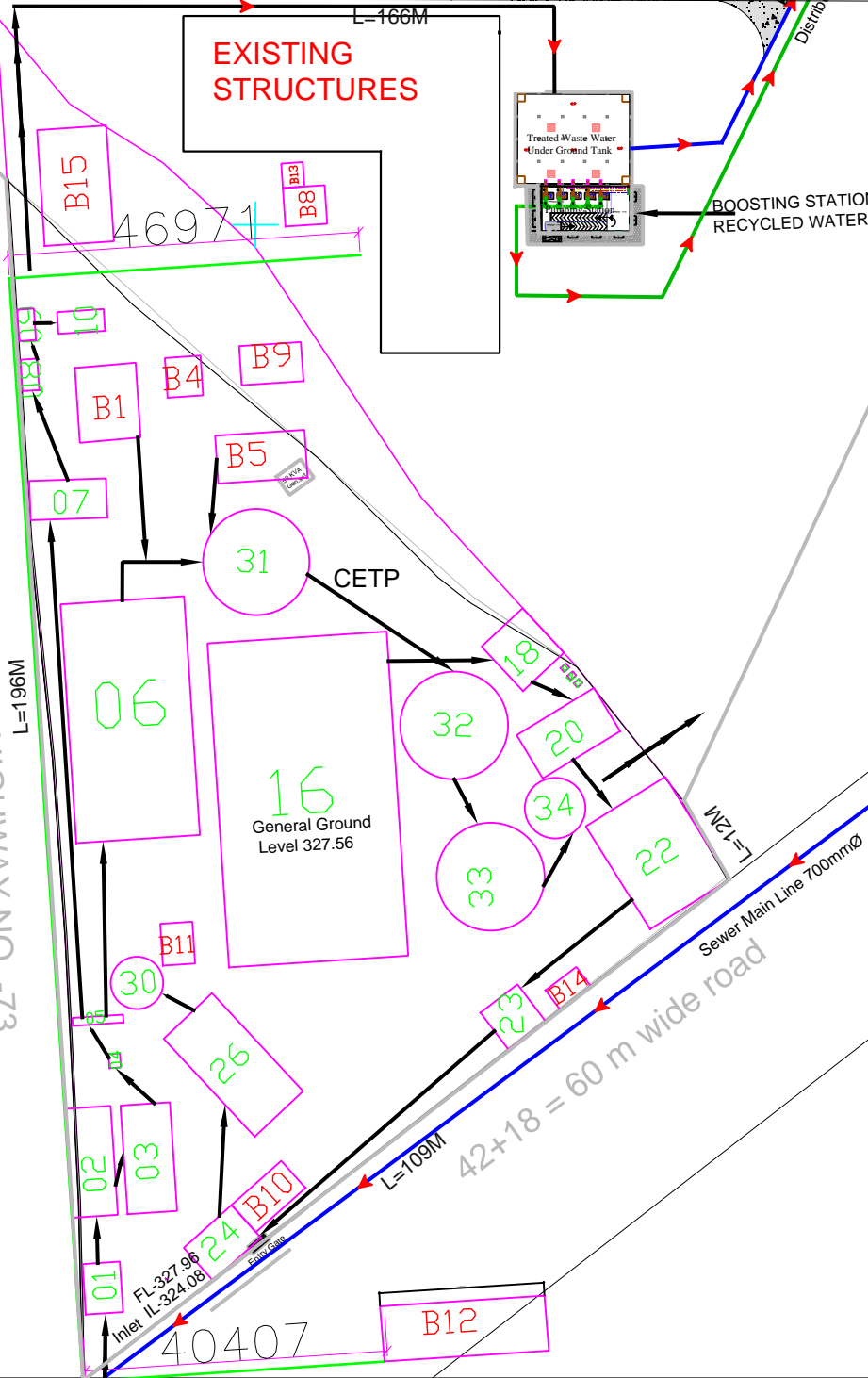
LEGEND :

S.No.	UNITS NAME
1.	RAW EFFLUENT INTAKE & SCREEN CHAMBER,INCL.STAIRCASE
2.	RAW EFFLUENT TANK FOR PUMP HOUSE -1
3.	PUMP ROOM -PUMP HOUSE -1
4.	STILLING CHAMBER
5.	CHANNEL FOR FLOW MEASUREMENT & FINE SCREENS
6.	EQUALIZATION TANK
7.	PUMP ROOM -PUMP HOUSE -2 AFTER EQLN.TANK.
8.	FLASH MIXING TANK -1
9.	FLASH MIXING TANK -2
10.	FLOCCULATION TANK
11.	LIME SOLUTION TANK -2 Nos.
12.	FERROUS SUL. TANK -2 Nos.
13.	POLYELECTRALYTE SOLUTION TANK FOR PCT
14.	POLYELECTRALYTE SOLUTION TANK FOR SDPE
15.	INLET CHANNEL LAUNDER OF AERATION TANK
16.	AERATION TANK WITH ANOXIC TANK
17.	AERATION TANK WALKWAYS ,TIE BEAMS, STAIRCASE COLUMNS -6 Nos.
18.	RETURN SLUDGE (RAS) HOLDING TANK
19.	PUMP ROOM (RAS) PUMP HOUSE
20.	FILTER FEED WATER PUMPING TANK
21.	FILTRATION PUMP HOUSE
22.	CHLORINE CONTACT CUM TREATED WATER STORAGE UG TANK
23.	PRIMARY CHEMICAL WET SLUDGE HOLDING TANK
24.	PUMP ROOM WET SLUDGE PUMP HOUSE
25.	THICKNER SUMP SLUDGE HOLDING TANK
26.	RCC PLAFORM FOUNDNS. FOR DMCF
27.	RCC PLAFORM FOUNDNS. FOR FILTER PRESS & CENTRIFUGE
28.	PLAFORM FOUNDNS.FOR SUBM.PUMP
29.	STORM WATER DRAINS WITHIN CETP AREA
30.	OIL GREASE REMOVAL TANK OIL SKIMMER RECOVERED OIL SUMP
31.	PRIMARY QUARIFIER
32.	SECONDARY QUARIFIER -1
33.	SECONDARY QUARIFIER -2
34.	SLUDGE THICKNER

LEGEND :

S.No.	BUILDINGS NAME
B1.	CHEMICAL HOUSE CC & IPS FLOOR
B2.	PUMP ROOM -PUMP HOUSE -1
B3.	PUMP ROOM -PUMP HOUSE -2
B4.	PUMP ROOM FOR THICKENED SLUDGE
B5.	ROOM FOR AIR BLOWERS
B6.	ROOM FOR AIR CHLORINATORS
B7.	SHED FOR CHLORINE TONNERS
B8.	WORKSHOP CUM STORE
B9.	PANEL ROOM -1
B10.	PANEL ROOM -2
B11.	AIR COMPRESSORS ROOM
B12.	DRY SLUDGE STORAGE SHED
B13.	ROOM FOR WATCHMAN
B14.	TOILET IN PLANT AREA
B15.	OFFICE BUILDING -2 STORY

NATIONAL HIGHWAY NO. -73
L=196M



हरियाणा राज्य औद्योगिक
एवं संचना विकास
निगम लिमिटेड



Haryana State Industrial And
Infrastructure Development
Corporation Ltd.

CIN No.: U29199HR1967SGC034545
(A State Government Undertaking)

INDUSTRIAL ESTATE
BARWALA (PANCHKULA)
(Near Vill. Alipur)
Telefax : 01733-256507

Date:- 18/06/2020

UNDERTAKING

I, Rohit Kanwar working as Senior Manager (IA) in Haryana State Industrial & Infrastructure Development Corporation Limited (HSIIDC), presently posted at Industrial Estate, Barwala do hereby solemnly undertake as under w.r.t. Industrial Estate Project, Phase- II, Barwala, Distt- Panchkula, Haryana.

- ❖ As per the Ministry's Office Memorandum F. No. 22-65/2017-IA.III dated 1st May 2018, an amount of Rs. 8.31 Crores of the total project cost i.e. 531 Crores (Land-278Cr. + Development Cost-253Cr.) shall be earmarked under Corporate Environment Responsibility (CER) for the following activities:

Break up of cost estimation

- @ 2.0 % for ≤ 100 Crores (i.e. 100 Crores = 2.0 Crores)
- @ 1.5 % for > 100 to ≤ 500 Crores (i.e. 400 Crores = 6.0 Crores)
- @ 1.0 % for > 500 to ≤ 1000 Crores (i.e. 31 Crores = 0.31 Crores)

S. No.	ACTIVITY	YEAR-WISE IMPLEMENTATION BUDGET (INR)			TOTAL BUDGET (INR)
		1 st Year (2020-2021)	2 nd Year (2021-2022)	3 rd Year (2022-2023)	
1	Infrastructure Creation for Drinking Water Supply	-	580000	580000	1160000
2	Sanitation Facility	100000	100000	100000	300000
3	Skill Development	500000	500000	500000	1500000
4	Construction of Roads	500000	500000	500000	1500000

HSIIDC - your partner in progress

पंजीकृत कार्यालय : नं. सी. 13-14, सेक्टर-6, पंचकूला-134 109
REGD. OFFICE : NO. C. 13-14, SECTOR-6, PANCHKULA, TEL. : 2590481-83, FAX : 91 (0172) 2590474, E MAIL : hsidc@chd.nic.in, WEBSITE : www.hsidc.nic.in
NEW DELHI OFFICE : TEL. : 23347680-81-82, FAX : 91 (11) 23347688, E-MAIL : hsidc@vsnl.net

हरियाणा राज्य औद्योगिक
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S. No.	ACTIVITY	YEAR-WISE IMPLEMENTATION BUDGET (INR)			TOTAL BUDGET (INR)
		1 st Year (2020-2021)	2 nd Year (2021-2022)	3 rd Year (2022-2023)	
5	Cross Drains	100000	100000	100000	300000
6	Electrification including Solar Power	450000	450000	450000	1350000
7	Rain Water Harvesting	150000	150000	150000	450000
8	Solid Waste Management Facilities	300000	300000	300000	900000
9	Plantation in Community Area	-	425000	425000	850000
TOTAL BUDGET PROPOSED FOR CER					8310000


Rohit Kanwar
Senior Manager(IA)
HSIIDC, Industrial Estate
Barwala, Distt. Panchkula

HSIIDC - your partner in progress

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INDIA NON JUDICIAL

HARYANA

46AA 869517

AFFIDAVIT

I Rohit Kanwar, Sr. Manager(IA) S/o Shri Kuldeep Singh do hereby solemnly affirm, declare and undertake as under:-

I, Senior Manager(IA)/Barwala of Haryana State Industrial & Infrastructure Development Corporation Limited (HSIIDC) empowered and competent to swear this undertaking as given below:-

1. That Haryana State Industrial & Infrastructure Development Corporation Limited (HSIIDC) have planned for development of Industrial Estate Project, Phase-II at Barwala, District Panchkula, Haryana and having its Corporate office at C-13 & 14, Sector-6, Panchkula (hereinafter referred to as "Company").
2. That the company has not commenced any construction work at the project site, we shall commence work only after obtaining the Environmental Clearance and receipt of all applicable NOC's / permission from the prescribed/ competent authorities of State and Centre Govt.

[Signature]
DEPONENT

Name: Rohit Kanwar
Designation: Sr. Manager (IA),
I.E., Barwala

VERIFICATION:-

VERIFIED at Panchkula on this 15th Oct., 2019 that the contents of para no.1 and 2 of the above undertaking are true and correct to the best of my knowledge and records. No parts of it is false and nothing has been concealed therein.

ATTESTED

[Signature]
JITENDER SINGH PANNU
NOTARY, PANCHKULA

16 OCT 2019

Name: Rohit Kanwar
Designation: Senior Manager(IA), I.E., Barwala
Date:- 15th Oct., 2019

[Signature]
DEPONENT

हरियाणा राज्य औद्योगिक
एवं संरचना विकास
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INDUSTRIAL ESTATE
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(Near Vill. Alipur)
Telefax : 01733-256507

UNDERTAKING

I Sh. Rohit Kanwar, Senior Manager(IA) of Haryana State Industrial & Infrastructure Development Corporation Limited (HSI IDC) empowered and competent to swear this undertaking as given below:-

1. That Haryana State Industrial & Infrastructure Development Corporation Limited (HSI IDC) have planned for development of Industrial Estate Project, Phase-II at Barwala, District Panchkula, Haryana and having its Corporate office at C-13 & 14, Sector-6, Panchkula (hereinafter referred to as "Company").
2. That the proposed site is not situated in the critically polluted area as identified by CPCB.

For Haryana State Industrial & Infrastructure Development Corporation Limited.

Rohit Kanwar
Senior Manager(IA),
I.E., Barwala

(Authorized Signatory).

ROHIT KANWAR
Senior Manager (IA)

HSI IDC - your partner in progress

पंजीकृत कार्यालय : नं. सी. 13-14, सेक्टर-6, पंचकूला-134 109