



हिन्दुस्तान पेट्रोलियम कॉर्पोरेशन लिमिटेड

(भारत सरकार का उपक्रम) रजिस्टर्ड ऑफिस : 17, जमशेदजी टाटा रोड, मुंबई 400 020

HINDUSTAN PETROLEUM CORPORATION LIMITED

(A GOVERNMENT OF INDIA ENTERPRISE) REGISTERED OFFICE : 17, JAMSHEDJI TATA ROAD, MUMBAI 400 020

CIN : L23201MH1952GO1008858

6,7,8 वीं मंजिल, नार्थ टॉवर, स्कोप मीनार, डिस्ट्रिक्ट सेन्टर, लक्ष्मी नगर, दिल्ली-92 फोन : (कार्या.) 22408100

6, 7, 8th Floor, North Tower, Scope Minar, District Centre, Laxmi Nagar, Delhi-92 Tel : (O) 22408100

28th Nov, 2020

To,

The Deputy Director / Scientist 'C'

Ministry of Environment, Forests & Climate Change,

Northern Regional Office

Bays No. 24-25, Sector-31A,

Dakshin Marg, Chandigarh-160030

(Email: chdmoefenv@gmail.com)

Sub: Submission of six-monthly compliance report of stipulated conditions of Environmental Clearance for setting up 2G Ethanol Bio-refinery plant of capacity 100KLPD at Village- Nasibpura, Tehsil Talwandi Sabo, Bathinda (Punjab) for the period of December 2020.

Ref: F.No. J-11011/221/2017-IA II (I) Dated- 23.09.2020

Sir/ Madam

This has reference to the EC vide letter no. **J-11011/221/2017-IA II (I) Dated- 23.09.2020**. In this regard, we are submitting hereby status report of compliance with the specific and general conditions for period December, 2020. Documents enclosed along with report are mentioned below as

1. Point- wise compliance of stipulated environmental conditions & safeguards
2. Analysis Reports
3. Supporting Documents

Thanking You

For M/s Hindustan Petroleum Corporation Limited

S. Kumar

(Authorized Signatory)

Name - Sanjay Kumar

Designation - Chief Manager Biofuels (Punjab)

E-mail - sanjoykr@hpcl.in

Contact No. - 9540933499

Copy to:

1. The Member Secretary, Central Pollution Control Board, Parivesh Bhawan East Arjun Nagar, Delhi- 32 (mscb.cpcb@nic.in)
2. The Member Secretary, Punjab Pollution Control Board, Vataran Bhawan, Nabha Road Patiyala, 147001 (Punjab) (msppcb@punjab.gov.in)
3. Director (Industry-2), MoEF & CC, Jor Bagh Road, New Delhi - 03 (rb.lal@nic.in)

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PURPOSE OF THE REPORT

1.0 Introduction

1.1 About Project: M/s Hindustan petroleum Corporation Limited has proposed to set up 2G Ethanol Bio-Refinery plant of capacity 100 KLPD at village Nasibpura, Tehsil Talwandi Sabo, Bathinda (Punjab).

This Project has obtained Environmental Clearance vide letter dated 14th August, 2018 for setting up 2G Bio-refinery Plant of capacity 100 KLD and now has granted amended Environmental Clearance from Ministry of Environment, Forests and Climate Change Delhi, with certain conditions.

1.2 Purpose of the Report

As per the "Sub Para (i)" of "Para 10" of EIA Notification 2006, it is stated that *"It shall be mandatory for the project proponent to submit half-yearly compliance report in respect of the stipulated prior environmental clearance terms and conditions in hard and soft copies to the concerned regulatory authority, on 1st June and 1st December of each calendar year"* and as per compliance condition mentioned in Environment Clearance Letter.

The regulatory authorities in this case are MoEF& CC Delhi, MoEF& CC, Chandigarh and SPCB, Punjab. Various scheduled Site Visits were conducted by a team of Experts to Monitor Pollution related parameters as defined by CPCB / PPCB. Samples for water and soil were also collected by NABL/ MoEF approved laboratory for analysis.

Based on the Specific and General Conditions mentioned in the EC Letter, a Compliance Report has been prepared and submitted regularly to the authority.

The Environmental assessment has been carried out to verify:

- 1) The proposed project does not have any adverse effect on the project site as well as it's surrounding.
- 2) There is compliance with the conditions stipulated in the Environmental Clearance Letter.
- 3) The Project proponent is implementing the environmental safeguards in true spirit.
- 4) The project proponent is implementing the environmental pollution mitigative measures as suggested in approved EIA report.

1.3 Methodology for Preparation of Report is as follows:

- 1) Study of EC Letter & Related Documents,
- 2) Monitoring of Environment Parameters, viz. Ambient Air, Water, Noise & Soil by the NABL/MoEF labs.
- 3) Interpretation of Monitoring Results.
- 4) Preparation of half yearly Environmental Compliance Report.

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1.4 Generic Structure of Report:

- 1) Purpose of the Report, explaining the need of a Compliance Report and Methodology Adopted for preparation of Report.
- 2) Compliance Report, explaining the entire General & specific conditions in the EC Letter and providing details w.r.t. each condition/ guideline.
- 3) Monitoring Reports & Analysis, showing the level of emission within the project site for various Environment Parameters.
- 4) Photographs showing sample collection for environmental monitoring.
- 5) Supporting Documents which are mandatory for the project.

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ADHERENCE TO SPECIFIC AND GENERAL CONDITIONS

PART A- SPECIFIC CONDITION

S. No.	Conditions of Environmental Clearance	Status of Compliance
[A]	The final product (Ethanol) shall be used exclusively for fuel blending only.	<i>Noted.</i>
[B]	Consent to Establish/Operate for the project shall be obtained from the State Pollution Control Board as required under the Air (Prevention and Control of Pollution) Act, 1981 and the Water (Prevention and Control of Pollution) Act, 1974.	<i>Consent to Establish (CTE) was obtained from PPCB and also applied for New CTE as per the amended EC to PPCB, Bathinda. Approval for CTE is yet to be received.</i>
[C]	As already committed by the project proponent, Zero Liquid Discharge shall be ensured and no waste/treated water shall be discharged outside the premises	<i>As proposed zero discharge of waste water will be met during operational phase.</i>
[D]	Necessary authorization required under the Hazardous and Other Wastes (Management and Trans-Boundary Movement) Rules, 2016, Solid Waste Management Rules, 2016 shall be obtained and the provisions contained in the Rules shall be strictly adhered to.	<i>Authorization required for hazardous and Other Wastes (Management and Trans-Boundary Movement) Rules, 2016, Solid waste Management Rules, 2016 will be obtained as per the requirement.</i>
[E]	To control source and the fugitive emissions, suitable pollution control devices shall be installed to meet the prescribed norms and/or the NAAQS. The gaseous emissions shall be dispersed through stack of adequate height as per CPCB/SPCB guidelines	<i>Measures will be taken to control fugitive emission, pollution control devices will be installed as per the requirement. Stack of adequate height as per the guidelines will be installed for the gaseous emission dispersion.</i>
[F]	Total fresh water requirement shall not exceed 2280 cum/day, proposed to be met from canal supply.	<i>Prescribed water requirement will not be exceeded.</i>
[G]	Process effluent/any wastewater shall not be allowed to mix with storm water. Storm water drain shall be passed through a separate conveyance system.	<i>We will ensure that process water is not mixed with storm water.</i>
[H]	The Company shall strictly comply with the rules and guidelines under Manufacture, Storage and Import of Hazardous Chemicals (MSIHC) Rules, 1989 as amended time to time. All transportation of Hazardous Chemicals shall be as per the Motor Vehicle Act (MVA), 1989.	<i>Noted.</i>

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[I]	<p>The company shall undertake waste minimization measures as below:-</p> <ol style="list-style-type: none"> i. Metering and control of quantities of active ingredients to minimize waste. ii. Reuse of by-products from the process as raw materials or as raw material substitutes in other processes. iii. Use of automated filling to minimize spillage. iv. Use of Close Feed system into batch reactors. v. Venting equipment through vapour recovery system vi. Use of high pressure hoses for equipment clearing to reduce wastewater generation. 	<p><i>We will comply with the condition as per the requirement to minimize waste generation in the plant-</i></p> <ol style="list-style-type: none"> <i>i. Metering and control of quantities of active ingredients will be done regularly.</i> <i>ii. By products will be reused as raw material as much as possible according to requirement.</i> <i>iii. Automated filling will be carried out to minimize spillage</i> <i>iv. Close feed system will be used into batch reactors.</i> <i>v. Water scrubber, vent bottle & flame arrestors will be provided as per requirement.</i> <i>vi. High pressure hoses for equipment clearing will be used to reduce waste water generation.</i>
[J]	<p>The green belt of 5-10 m width shall be developed in more than 33% of the total project area, mainly along the plant periphery, in downward wind direction, and along road sides etc. Selection of plant species shall be as per the CPCB guidelines in consultation with the State Forest Department.</p>	<p><i>We have submitted Green belt development plan to the MoEF&CC in the EIA report and same will be developed as per the EC requirement.</i></p>
[K]	<p>All the commitments made regarding issues raised during the public hearing/ consultation meeting shall be satisfactorily implemented.</p>	<p><i>Noted.</i></p>
[L]	<p>At least 1% of the total project cost shall be allocated for Corporate Environment Responsibility (CER) and the details along with time bound action plan shall be submitted to the Ministry's Regional Office.</p>	<p><i>As per the EC amendment received, the total estimated project cost has been revised to Rs 1096.25 Crores. As the estimated project cost is more than Rs 1000 Crores, 0.5% of the total project cost shall be allocated for CER as per notification F. No. 22-65/2017-IA.III dated 1st May'2018.</i></p> <p><i>The project is in initial stage and construction is yet to be commenced. CER details will be submitted to the authority in due course of time. .</i></p>
[M]	<p>For the DG sets, emission limits and the stack height shall be in conformity with the extant regulations and the CPCB guidelines. Acoustic enclosure shall be provided to DG set for controlling the noise pollution.</p>	<p><i>Acoustically enclosed DG sets will be installed and Stack height will be kept as per the CPCB guidelines.</i></p>
[N]	<p>The unit shall make the arrangement for protection of possible fire hazards during manufacturing process in material handling. Firefighting system shall be as per the norms.</p>	<p><i>Fire Fighting system will be installed as per the condition.</i></p>
[O]	<p>Occupational health surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.</p>	<p><i>Regular Health Check-up arrangement will be provided for the workers A qualified doctor will be appointed.</i></p>
[P]	<p>There shall be adequate space inside the plant premises earmarked for parking of vehicles for raw materials and finished products, and no parking to be allowed outside on public places.</p>	<p><i>No parking will be done outside on public places. Plan in this regard has already been submitted to authority.</i></p>
[Q]	<p>Storage of raw materials shall be either stored in silos or in covered areas to prevent dust pollution and other fugitive emissions.</p>	<p><i>During operation phase, raw materials will be stored properly in covered areas</i></p>
[R]	<p>Continuous online (24x7) monitoring system for stack</p>	<p><i>We will comply.</i></p>

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	emissions shall be installed for measurement of flue gas discharge and the pollutants concentration, and the data to be transmitted to the CPCB and SPCB server. For online continuous monitoring of effluent, the unit shall install web camera with night vision capability and flow meters in the channel/drain carrying effluent within the premises.	
[S]	CO ₂ generated from the process shall be bottled/made solid ice/value added products and sold to authorize vendors.	<i>Noted.</i>

11.1 Other Generic Conditions:-

S. No.	Conditions of Environmental Clearance	Status of Compliance
i.	The project authorities must strictly adhere to the stipulations made by the state Pollution Control Board (SPCB), State Government and/ or any other statutory authority.	<i>We ensure to follow the guidelines strictly.</i>
ii.	No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment, Forest and Climate Change. In case of deviations or alterations in the project proposal from those submitted to this Ministry for clearance, a fresh reference shall be made to the Ministry to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any.	<i>Noted.</i>
iii.	The locations of ambient air quality monitoring stations shall be decided in consultation with the State Pollution Control Board (SPCB) and it shall be ensured that at least one stations each is installed in the upwind and downwind direction as well as where maximum ground level concentrations are anticipated	<i>Noted and same will be complied.</i>
iv.	The National Ambient Air Quality Emission Standards issued by the Ministry vide G.S.R No. 826(E) dated 16 th November, 2009 Shall be Complied with.	<i>Noted.</i>
v.	The overall noise levels in and around the plant area shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels shall conform to the standards prescribed under Environment (Protection) Act, 1986 Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time).	<i>We will ensure to keep the noise levels within the standards.</i>
vi.	The Company shall harvest rainwater from the roof tops of the buildings and storm water drains to recharge the ground water and utilize the same for different industrial operations within the plant.	<i>Noted.</i>
vii.	Training shall be imparted to all employees on safety and health aspects of chemicals handling. Pre-employment	<i>Regular training of health & safety will be provided to the employees for chemical handling.</i>

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	and routine periodical medical examinations for all employees shall be undertaken on regular basis. Training to all employees on handling of chemicals shall be imparted.	
viii.	The company shall comply with all the environmental protection measures and safeguards proposed in the documents submitted to the Ministry. All the recommendations made in the EIA/EMP in respect of environmental management, risk mitigation measures and public hearing shall be implemented.	<i>Noted and will be complied as per the requirement.</i>
ix.	The company shall undertake all measures for improving socio-economic conditions of the surrounding area. CSR activities shall be undertaken by involving local villagers, administration and other stake holders. Also eco-developmental measures shall be undertaken for overall improvement of the environment.	<i>CSR activities will be undertaken as per the proposed plan.</i>
x.	A separate Environmental Management Cell equipped with full-fledged laboratory facilities shall be set up to carry out the Environmental Management and Monitoring functions.	<i>Noted.</i>
xi.	The company shall earmark sufficient funds towards capital cost and recurring cost per annum to implement the conditions stipulated by the Ministry of Environment, Forest and Climate Changes well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so earmarked for environment management/Pollution control measures shall not be diverted for any other purpose.	<i>Separate funds will be kept for the implementation of the conditions stipulated by the Ministry of Environment, Forest and Climate Change as well as the State Government.</i>
xii.	A copy of the clearance letter shall be sent by the project proponent to concerned Panchayat, ZilaParisad/ Municipal Corporation, Urban local Body and the local NGO, if any, from whom suggestions/ representations, if any, were received while processing the proposal.	<i>Noted.</i>
xiii.	The project proponent shall also submit six monthly reports on the status of compliance of the stipulated Environmental Clearance conditions including results of monitored data (both in hard copies as well as by e-mail) to the respective Regional Office of MoEF&CC, the respective Zonal office of CPCB and SPCB. A copy of Environmental Clearance and six monthly compliance status reports shall be posted on the website of the company.	<i>Noted. We are complying with the condition.</i>
xiv.	The environmental statement for each financial year ending 31 st March in Form-Vas is mandated shall be submitted to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put	<i>Noted.</i>

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	on the website of the company along with the status of compliance of environmental clearance conditions and shall also be sent to the respective Regional offices of MoEF&CC by e-mail.	
xv.	The project proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB/Committee and may also be seen at Website of the Ministry at http://moef.nic.in . This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the concerned Regional office of the Ministry.	<i>Copy of advertisements attached.</i>
xvi.	The Ministry reserves the right to stipulate additional conditions, if found necessary at subsequent stages and the project proponent shall implement all the said conditions in a time bound manner. The Ministry may revoke or suspend the environmental clearance, if implementation of any of the above conditions is not found satisfactory.	<i>Noted.</i>
xvii.	The above conditions will be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, the Hazardous Waste (Management, Handling and Trans boundary Movement) Rules, 2016 and the Public Liability Insurance Act, 1991 read with subsequent amendments therein.	<i>Noted.</i>

3

DETAILS OF ENVIRONMENTAL MONITORING

3.1 AMBIENT AIR QUALITY MONITORING

3.1.1 Ambient Air Quality Monitoring Stations

Ambient air quality monitoring has been carried out at twelve locations on quarterly bases, to assess the ambient air quality of the project site. This will enable to have a comparative analytical understanding about air quality and the changes in the air environment in the study area with respect to the condition prevailing. The locations of the ambient air quality monitoring stations are given in **Table 3.1**.

Table 3.1 Details of Ambient Air Quality Monitoring Stations

S. No.	Location	Location Name/ Description	
		June 2020	September 2020
1.	AAQ1	Near Project site	Near Project site
2.	AAQ2	Jiwan Singh Wala	Jiwan Singh Wala
3.	AAQ3	Maawala	Maawala
4.	AAQ4	Mahi Nangal	Mahi Nangal
5.	AAQ5	Leleana	Leleana
6.	AAQ6	Baghi Bandar	Baghi Bandar
7.	AAQ7	Nasibpura	Nasibpura
8.	AAQ8	Kothbhara	Kothbhara
9.	AAQ9	Kot Kashmir	Kot Kashmir
10.	AAQ10	Gehri Boghi	Gehri Boghi
11.	AAQ11	Chathewala	Chathewala
12.	AAQ12	KotFatta	Kot Fatta

3.1.2 Ambient Air Quality Monitoring Methodology

Monitoring was conducted in respect of the following parameters:

- Particulate Matter 2.5 (PM 2.5)
- Particulate Matter 10 (PM 10)
- Sulphur Dioxide (SO₂)
- Oxides of Nitrogen (NO₂)
- Carbon Monoxide (CO)
- Ammonia (NH₃)
- Lead (Pb)

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- Benzene (C₆H₆)
- Benzo(a)pyrene
- Ozone (O₃)
- Arsenic (As)
- Nickel (Ni)
- Volatile Organic Carbon (VOCs)
- Hydrocarbon (as Methane)

Installation of Respirable Dust sampler (RDS) & Fine Particulate Sampler (FPS) was done with the attachment for the 24 hourly ambient air qualities monitoring as per Gazette Notification 16th November 2009.

The air samples were analyzed as per standard methods specified by Central Pollution Control Board (CPCB) and IS: 5182. The techniques used for ambient air quality monitoring and minimum detectable levels are given in **Table 3.2**.

Fine Particulate Sampler instruments have been used for monitoring Particulate Matter 2.5 (PM_{2.5} i.e. <2.5 microns), and Respirable Dust Sampler was used for sampling Repairable fraction (<10 microns), gaseous pollutants like SO₂, and NO₂. Bladder and Aspirator bags were used for collection Carbon monoxide samples. Gas Chromatography techniques have been used for the estimation of CO.

Table 3.2 Techniques used for Ambient Air Quality Monitoring

S. No.	Parameter	Technique	Technical Protocol
1	Particulate Matter 2.5	Fine Particulate Sampler, Gravimetric Method	#SOP No. VEL/SOP/01, Section No. SP 63
2	Particulate Matter 10	Respirable Dust Sampler, with cyclone separator, Gravimetric Method	IS: 5182 (P-23), 2006
3	Sulphur dioxide	Modified West and Gaeke	IS: 5182 (P-6)
4	Oxides of Nitrogen	Jacob & Hochheiser	IS: 5182 (P-2)
5	Carbon Monoxide	Gas Chromatography	IS:11255(P-6)
6	Ammonia	Distillation Method	IS: 5182 (P-22)
7	Lead	Atomic Absorption Spectro-photometer	IS: 5182 (P-10)
8	Benzene	Gas Chromatography	IS: 5182 (P-11)
9	Benzo(a)pyrene	Gas Chromatography	IS: 5182 (P-12)
10	Ozone	Colorimetry	IS: 5182 (P-9)
11	Arsenic	Atomic Absorption Spectro-photometer	IS: 5182 (P-22)
12	Nickel	Atomic Absorption Spectro-photometer	IS: 5182 (P-22)
13	Volatile Organic Carbon (VOCs)	IS:5182 (P-11)	IS:5182 (P-11)
14	Hydrocarbon (as Methane)	IS:5182 (P-17), 1979	IS:5182 (P-17), 1979

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3.1.3 Ambient Air Quality Monitoring Results (June-2020)

Table 3.3 Ambient Air Quality Monitoring Results (1-4 Location)

S. No.	Parameter	Test Result				NAAQS*
		AAQ1	AAQ2	AAQ3	AAQ4	
1	Particulate Matter (PM _{2.5}), µg/m ³	54.76	50.64	51.33	53.88	60
2	Particulate Matter (PM ₁₀), µg/m ³	95.17	91.63	92.49	94.79	100
3	Nitrogen Dioxide (NO ₂), µg/m ³	21.82	18.44	17.55	15.67	80
4	Sulphur Dioxide (SO ₂), µg/m ³	12.40	9.92	12.51	10.66	80
5	Carbon Monoxide (CO) mg/m ³	0.95	1.34	0.88	0.98	4
6	Ammonia (NH ₃), µg/m ³	14.31	9.56	10.69	13.61	400
7	Lead (Pb), µg/m ³	**BDL (*DL 0.05 µg/m3)	1			
8	Benzene(C ₆ H ₆), µg/m ³	**BDL (*DL 0.1 µg/m3)	05			
9	Benzo(a)pyrene, ng/m ³	**BDL (*DL 1.0 ng/m3)	01			
10	Ozone (O ₃),µg/m ³	19.50	16.53	20.56	22.15	180
11	Arsenic As, ng/ m ³	**BDL (*DL 5.0ng/ m3)	6			
12	Nickel Ni, ng/ m ³	**BDL (*DL 5.0ng/ m3)	20			
13	Volatile Organic Carbon	**BDL (*DL 5.0 µg/m3)	--			
14	Hydrocarbon (as Methane)	**BDL(*DL 0.2 ppm(v/v))	**BDL(*DL 0.2 ppm(v/v))	**BDL(*DL 0.2 ppm(v/v))	**BDL(*DL 0.2 ppm(v/v))	--

*NAAQS – National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 18.11.2009

Table 3.4 Ambient Air Quality Monitoring Results (5-8 Location)

S. No.	Parameter	Test Result				NAAQS*
		AAQ5	AAQ2	AAQ7	AAQ8	
1	Particulate Matter (PM _{2.5}), µg/m ³	50.64	49.16	51.94	49.76	60
2	Particulate Matter (PM ₁₀), µg/m ³	92.83	90.08	92.63	88.77	100
3	Nitrogen Dioxide (NO ₂), µg/m ³	25.33	21.07	24.72	23.11	80
4	Sulphur Dioxide (SO ₂), µg/m ³	12.16	11.60	13.48	15.98	80
5	Carbon Monoxide (CO) mg/m ³	1.10	1.18	0.91	1.05	4

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6	Ammonia (NH ₃), µg/m ³	14.56	17.11	10.84	12.04	400
7	Lead (Pb), µg/m ³	**BDL (*DL 0.05 µg/m3)	1			
8	Benzene(C ₆ H ₆), µg/m ³	**BDL (*DL 0.1 µg/m3)	05			
9	Benzo(a)pyrene, ng/m ³	**BDL (*DL 1.0 ng/m3)	01			
10	Ozone (O ₃),µg/m ³	24.77	25.66	26.18	18.96	180
11	Arsenic As, ng/ m ³	**BDL (*DL 5.0ng/ m3)	6			
12	Nickel Ni, ng/ m ³	**BDL (*DL 5.0ng/ m3)	20			
13	Volatile Organic Carbon	**BDL (*DL 5.0 µg/m3)	--			
14	Hydrocarbon (as Methane)	*BDL(*DL 0.2 ppm(v/v))	*BDL(*DL 0.2 ppm(v/v))	*BDL(*DL 0.2 ppm(v/v))	*BDL(*DL 0.2 ppm(v/v))	--

*NAAQS – National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 18.11.2009

Table 3.5 Ambient Air Quality Monitoring Results (9-12 Location)

S. No.	Parameter	Test Result				NAAQS*
		AAQ9	AAQ10	AAQ11	AAQ12	
1	Particulate Matter (PM _{2.5}), µg/m ³	53.44	54.08	50.10	52.62	60
2	Particulate Matter (PM ₁₀), µg/m ³	91.67	93.46	91.33	94.16	100
3	Nitrogen Dioxide (NO ₂), µg/m ³	24.08	21.74	21.05	25.12	80
4	Sulphur Dioxide (SO ₂), µg/m ³	9.07	10.84	13.87	11.04	80
5	Carbon Monoxide (CO) mg/m ³	1.06	0.95	1.19	1.06	4
6	Ammonia (NH ₃), µg/m ³	9.48	15.16	18.16	14.09	400
7	Lead (Pb), µg/m ³	**BDL (*DL 0.05 µg/m3)	1			
8	Benzene(C ₆ H ₆), µg/m ³	**BDL (*DL 0.1 µg/m3)	05			
9	Benzo(a)pyrene, ng/m ³	**BDL (*DL 1.0 ng/m3)	01			
10	Ozone (O ₃),µg/m ³	21.04	25.76	18.89	23.13	180
11	Arsenic As, ng/ m ³	**BDL (*DL 5.0ng/ m3)	6			
12	Nickel Ni, ng/ m ³	**BDL (*DL 5.0ng/ m3)	20			
13	Volatile Organic Carbon	**BDL (*DL 5.0 µg/m3)	--			
14	Hydrocarbon (as Methane)	*BDL(*DL 0.2 ppm(v/v))	*BDL(*DL 0.2 ppm(v/v))	*BDL(*DL 0.2 ppm(v/v))	*BDL(*DL 0.2 ppm(v/v))	--

*NAAQS – National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 18.11.2009

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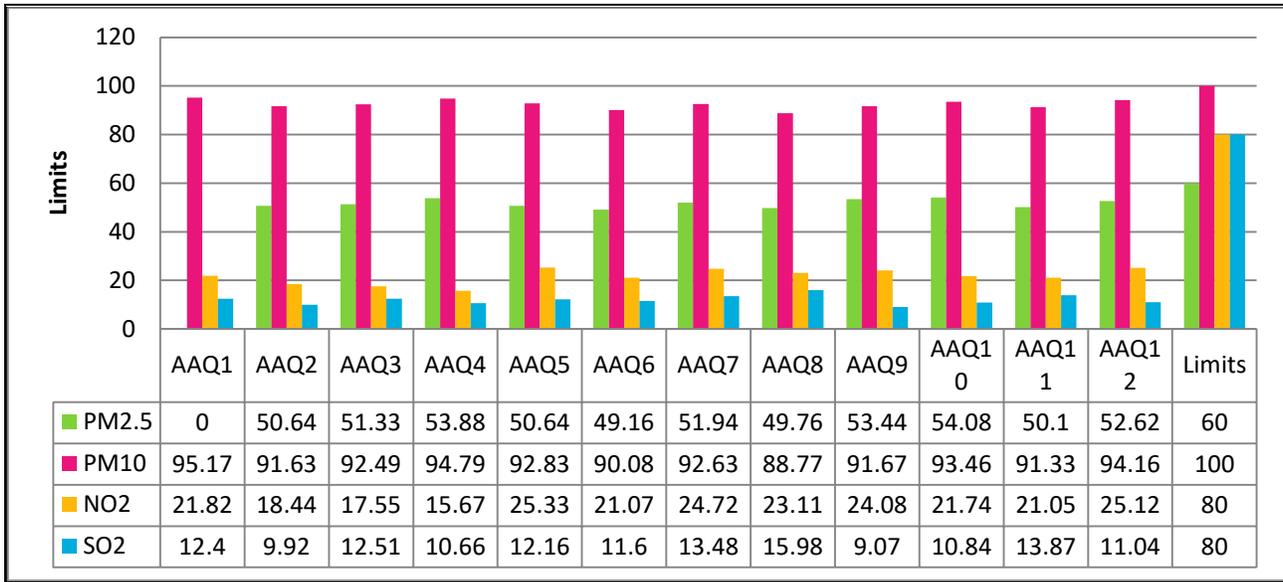


Figure 3.1 Location-wise Variation of Ambient Air Quality (June 2020)

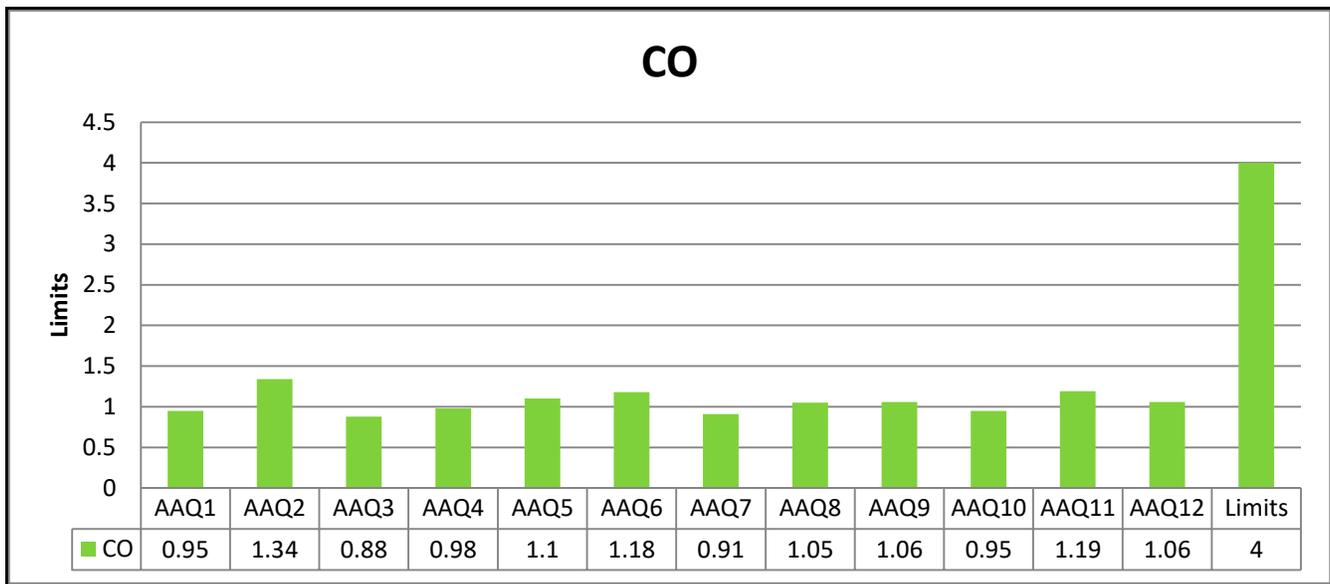


Figure 3.2 Location-wise Variation of CO in Ambient Air Quality (June 2020)

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3.1.4 Ambient Air Quality Monitoring Results (September-2020)

Table 3.6 Ambient Air Quality Monitoring Results (1-4 Location)

S. No.	Parameter	Test Result				NAAQS*
		AAQ1	AAQ2	AAQ3	AAQ4	
1	Particulate Matter (PM _{2.5}), µg/m ³	55.73	49.71	51.74	52.61	60
2	Particulate Matter (PM ₁₀), µg/m ³	94.18	90.28	90.66	91.78	100
3	Nitrogen Dioxide (NO ₂), µg/m ³	23.65	17.15	16.78	14.23	80
4	Sulphur Dioxide (SO ₂), µg/m ³	13.45	9.83	11.87	10.41	80
5	Carbon Monoxide (CO) mg/m ³	0.97	0.86	0.89	0.92	4
6	Ammonia (NH ₃), µg/m ³	15.31	9.12	11.73	12.37	400
7	Lead (Pb), µg/m ³	**BDL (*DL 0.05 µg/m3)	1			
8	Benzene(C ₆ H ₆), µg/m ³	**BDL (*DL 0.1 µg/m3)	05			
9	Benzo(a)pyrene, ng/m ³	**BDL (*DL 1.0 ng/m3)	01			
10	Ozone (O ₃),µg/m ³	22.43	15.18	21.27	19.63	180
11	Arsenic As, ng/ m ³	**BDL (*DL 5.0ng/ m3)	6			
12	Nickel Ni, ng/ m ³	**BDL (*DL 5.0ng/ m3)	20			
13	Volatile Organic Carbon	**BDL (*DL 5.0 µg/m3)	--			
14	Hydrocarbon (as Methane)	*BDL(*DL 0.2 ppm(v/v))	*BDL(*DL 0.2 ppm(v/v))	*BDL(*DL 0.2 ppm(v/v))	*BDL(*DL 0.2ppm(v/v))	--

*NAAQS – National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 18.11.2009

Table 3.7 Ambient Air Quality Monitoring Results (5-8 Location)

S. No.	Parameter	Test Result				NAAQS*
		AAQ5	AAQ2	AAQ7	AAQ8	
1	Particulate Matter (PM _{2.5}), µg/m ³	48.25	47.15	50.21	48.16	60
2	Particulate Matter (PM ₁₀), µg/m ³	89.12	86.21	89.67	87.95	100
3	Nitrogen Dioxide (NO ₂), µg/m ³	21.75	17.30	20.55	21.73	80
4	Sulphur Dioxide (SO ₂), µg/m ³	10.33	9.87	12.37	13.15	80
5	Carbon Monoxide (CO) mg/m ³	1.01	0.91	0.88	0.98	4

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6	Ammonia (NH ₃), µg/m ³	13.26	14.01	13.07	11.04	400
7	Lead (Pb), µg/m ³	**BDL (*DL 0.05 µg/m3)	1			
8	Benzene(C ₆ H ₆), µg/m ³	**BDL (*DL 0.1 µg/m3)	05			
9	Benzo(a)pyrene, ng/m ³	**BDL (*DL 1.0 ng/m3)	01			
10	Ozone (O ₃),µg/m ³	23.64	22.16	24.66	17.38	180
11	Arsenic As, ng/ m ³	**BDL (*DL 5.0ng/ m3)	6			
12	Nickel Ni, ng/ m ³	**BDL (*DL 5.0ng/ m3)	20			
13	Volatile Organic Carbon	**BDL (*DL 5.0 µg/m3)	--			
14	Hydrocarbon (as Methane)	*BDL(*DL 0.2 ppm(v/v))	*BDL(*DL 0.2 ppm(v/v))	*BDL(*DL 0.2 ppm(v/v))	*BDL(*DL 0.2ppm(v/v))	--

*NAAQS – National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 18.11.2009

Table 3.8 Ambient Air Quality Monitoring Results (9-12 Location)

S. No.	Parameter	Test Result				NAAQS*
		AAQ9	AAQ10	AAQ11	AAQ12	
1	Particulate Matter (PM _{2.5}), µg/m ³	51.75	50.31	49.40	50.88	60
2	Particulate Matter (PM ₁₀), µg/m ³	90.22	88.94	89.35	89.37	100
3	Nitrogen Dioxide (NO ₂), µg/m ³	20.63	18.25	18.27	21.05	80
4	Sulphur Dioxide (SO ₂), µg/m ³	9.12	9.88	11.68	12.44	80
5	Carbon Monoxide (CO) mg/m ³	0.97	0.91	1.02	0.98	4
6	Ammonia (NH ₃), µg/m ³	9.05	11.34	12.63	13.54	400
7	Lead (Pb), µg/m ³	**BDL (*DL 0.05 µg/m3)	1			
8	Benzene(C ₆ H ₆), µg/m ³	**BDL (*DL 0.1 µg/m3)	05			
9	Benzo(a)pyrene, ng/m ³	**BDL (*DL 1.0 ng/m3)	01			
10	Ozone (O ₃),µg/m ³	21.75	21.52	17.56	22.18	180
11	Arsenic As, ng/ m ³	**BDL (*DL 5.0ng/ m3)	6			
12	Nickel Ni, ng/ m ³	**BDL (*DL 5.0ng/ m3)	20			
13	Volatile Organic Carbon	**BDL (*DL 5.0 µg/m3)	--			
14	Hydrocarbon (as Methane)	*BDL(*DL 0.2 ppm(v/v))	*BDL(*DL 0.2 ppm(v/v))	*BDL(*DL 0.2 ppm(v/v))	*BDL(*DL 0.2ppm(v/v))	--

*NAAQS – National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 18.11.2009

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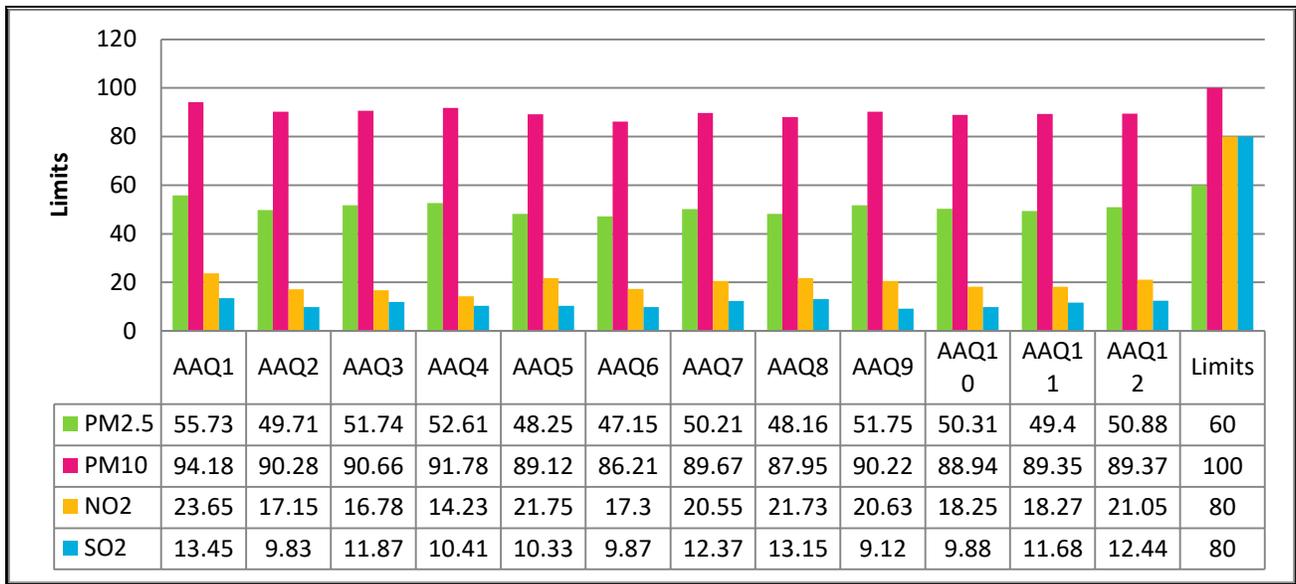


Figure 3.3 Location-wise Variation of Ambient Air Quality (September 2020)

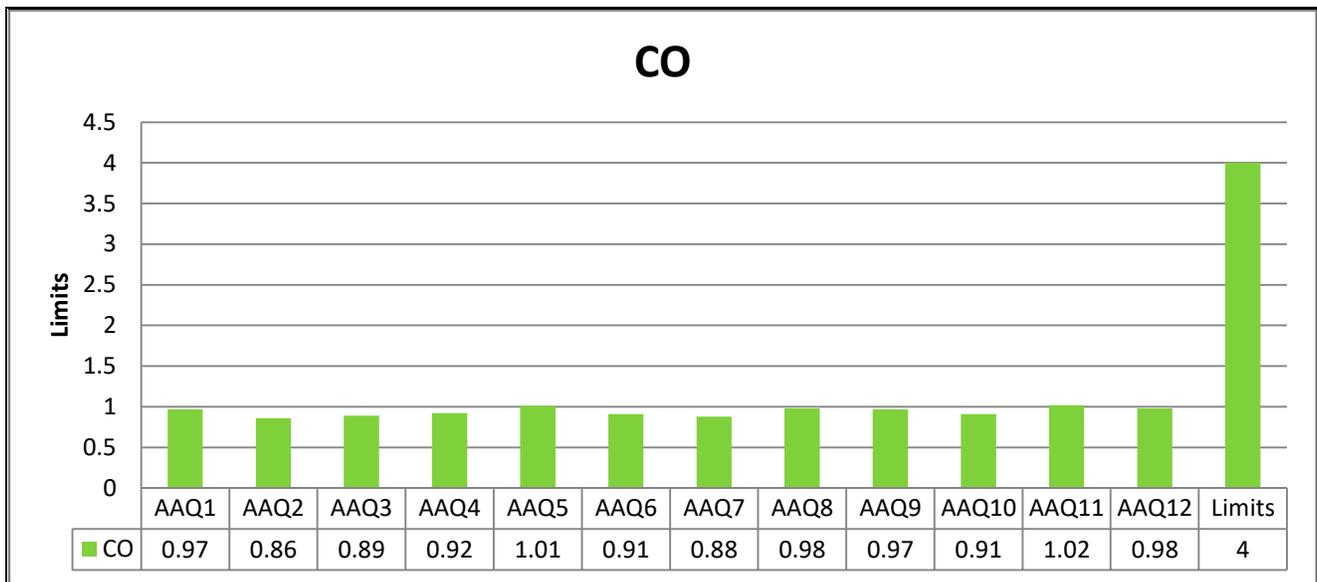


Figure 3.4 Location-wise Variation of CO in Ambient Air Quality (September 2020)

3.1.4 Discussion on Ambient Air Quality in the Study Area

PM₁₀ and PM_{2.5} levels at the project site are within the permissible limit of 100µg/m³ and 60 µg/m³ respectively (for residential, rural and other areas as stipulated in the National Ambient Air Quality Standards). SO₂, NO_x and CO was observed within the corresponding stipulated limits (Limit for SO₂ and NO_x: 80 µg/m³ and limit for CO: 4.0 mg/m³) at all monitoring locations. Station wise variation of ambient air quality parameters has been pictorially shown in **Figure 3.1, 3.2, 3.3 & 3.4**.

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3.2 AMBIENT NOISE MONITORING

3.2.1 Ambient Noise Monitoring Locations

The main objective of noise monitoring in the study area is to assess the present ambient noise levels in near front gate due to various construction allied activities and increased vehicular movement. A preliminary reconnaissance survey has been undertaken to identify the major noise generating sources in the area. Ambient noise monitoring was conducted at 12 locations in and around the project site on quarterly bases as given in **Table 3.9**.

Table 3.9 Details of Ambient Noise Monitoring Stations

S. No.	Location Code	Location Name/ Description		Present Land use
		June 2020	September 2020	
1.	N1	Near Project site	Near Project site	Industrial
2.	N2	Jiwan Singh Wala	Jiwan Singh Wala	Residential
3.	N3	Maawala	Maawala	Residential
4.	N4	Mahi Nangal	Mahi Nangal	Residential
5.	N5	Leleana	Leleana	Residential
6.	N6	Baghi Bandar	Baghi Bandar	Residential
7.	N7	Nasibpura	Nasibpura	Residential
8.	N8	Kothbhara	Kothbhara	Residential
9.	N9	Kot Kashmir	Kot Kashmir	Residential
10.	N10	GehriBoghi	GehriBoghi	Residential
11.	N11	Chathewala	Chathewala	Residential
12.	N12	KotFatta	KotFatta	Residential

3.2.2 Methodology of Noise Monitoring

Noise levels were measured using sound level meter. Noise level monitoring was carried out continuously for 24-hours with one hour interval starting at 06:00hrs to 06:00hrs next day. The noise levels were monitored on working days only. During each hour Leq were directly computed by the instrument based on the sound pressure levels. Monitoring was carried out at 'A' response and fast mode.

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3.2.3 Ambient Noise Monitoring Results (June-2020)

The location wise ambient noise monitoring results is summarized in **Table 3.10, 3.11 & 3.12**. The location-wise variation of noise levels are graphically presented in **Figure**

Table 3.10 Ambient Noise Monitoring Results (1-4 Location)

Parameter	N1		N2		N3		N4	
	Day Time	Night Time						
Lmax	71.3	60.3	62.4	51.4	66.3	56.5	62.3	52.5
Lmin	52.6	41.8	44.7	33.9	45.2	35.8	40.2	32.7
Leq	61.70	51.20	51.12	42.67	53.10	42.50	51.19	40.24
CPCB Limit (Leq in dB(A) Industrial Limit & Residential Limit)	75.00	70.00	55.00	45.00	55.00	45.00	55.0	45.0

Note: *A “decibel” is a unit in which noise is measured.

Table 3.11 Ambient Noise Monitoring Results (5-8 Location)

Parameter	N5		N6		N7		N8	
	Day Time	Night Time						
Lmax	63.8	50.6	60.2	48.9	63.5	53.6	60.4	49.9
Lmin	41.2	31.5	40.6	30.8	42.1	32.3	37.7	30.6
Leq	49.20	39.60	51.30	41.32	51.50	41.34	49.57	38.68
CPCB Limit (Leq in dB(A) Residential Limit)	55.00	45.00	55.00	45.00	55.00	45.00	55.00	45.00

Note: *A “decibel” is a unit in which noise is measured.

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Table 3.12 Ambient Noise Monitoring Results (9-12 Location)

Parameter	N9		N10		N11		N12	
	Day Time	Night Time						
Lmax	58.2	49.5	64.2	56.9	56.8	51.6	61.8	52.3
Lmin	43.1	35.2	46.5	35.4	44.3	30.5	42.6	33.7
Leq	52.70	41.78	53.63	43.80	50.45	42.11	52.21	41.26
CPCB Limit (Leq in dB(A) Residential Limit)	55.00	45.00	55.00	45.00	55.00	45.00	55.00	45.00

Note: *A “decibel” is a unit in which noise is measured

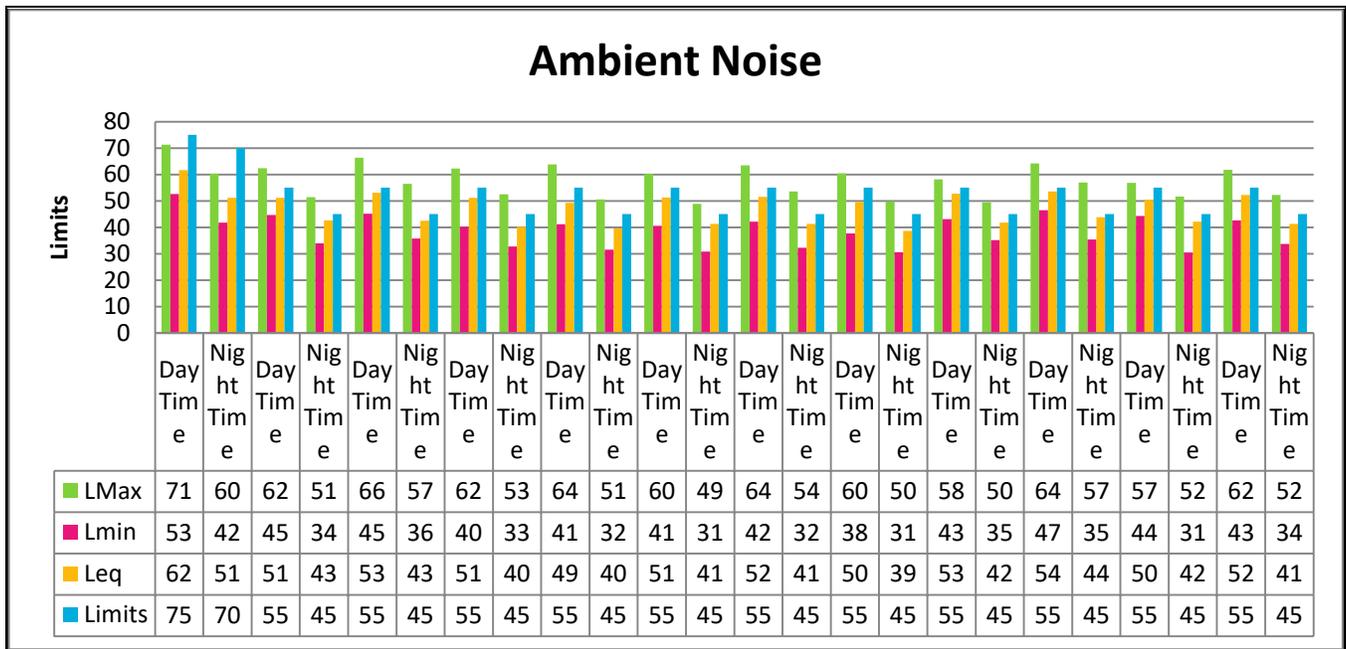


Figure 3.5 Location-wise Variation of Ambient Noise Levels (June 2020)

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3.2.4 Ambient Noise Monitoring Results (September-2020)

The location wise ambient noise monitoring results is summarized in **Table 3.13, 3.14 & 3.15**. The location-wise variation of noise levels are graphically presented in **Figure**

Table 3.13 Ambient Noise Monitoring Results (1-4 Location)

Parameter	N1		N2		N3		N4	
	Day Time	Night Time						
Lmax	73.5	61.2	52.9	44.3	59.2	45.3	57.7	47.5
Lmin	54.7	43.3	37.6	28.3	39.9	25.7	37.6	29.3
Leq	62.50	53.10	41.60	35.20	48.10	34.50	48.60	36.40
CPCB Limit (Leq in dB(A) Industrial Limit & Residential Limit)	75.00	70.00	55.00	45.00	55.00	45.00	55.0	45.5

Note: *A “decibel” is a unit in which noise is measured.

Table 3.14 Ambient Noise Monitoring Results (5-8 Location)

Parameter	N5		N6		N7		N8	
	Day Time	Night Time						
Lmax	58.3	45.3	58.3	45.3	57.8	47.7	67.5	59.8
Lmin	35.1	27.8	35.1	27.8	39.6	28.3	45.2	33.6
Leq	46.70	34.50	46.70	34.50	49.60	38.30	51.40	41.20
CPCB Limit (Leq in dB(A) ResidentialLimit)	55.00	45.00	55.00	45.00	55.00	45.00	55.00	45.00

Note: *A “decibel” is a unit in which noise is measured.

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Table 3.15 Ambient Noise Monitoring Results (9-12 Location)

Parameter	N9		N10		N11		N12	
	Day Time	Night Time						
Lmax	59.4	55.6	61.9	52.7	56.2	46.3	62.1	53.5
Lmin	41.3	32.2	43.2	33.5	35.3	30.5	43.7	32.8
Leq	50.30	42.60	52.40	42.80	48.10	37.50	51.20	41.50
CPCB Limit (Leq in dB(A) Residential Limit)	55.00	45.00	55.00	45.00	55.00	45.00	55.00	45.00

Note: *A “decibel” is a unit in which noise is measured

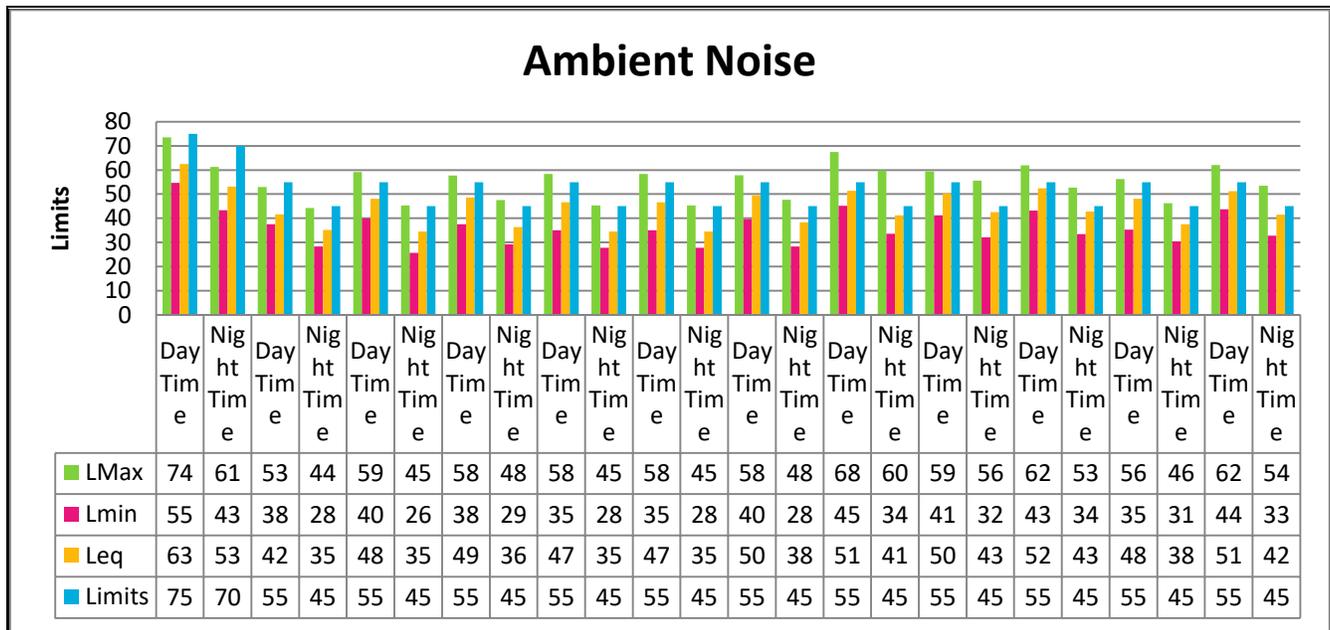


Figure 3.6 Location-wise Variation of Ambient Noise Levels (September 2020)

3.2.4 Discussion on Ambient Noise Levels in the Study Area

Day Time Noise Levels (L_{day}):

The day time noise level at all the locations were found to within limits prescribed for Industrial area i.e. 75 dB (A) and for residential are 55 dB (A).

Night Time Noise Levels (L_{night}):

The night time noise level at all the locations were found to within limit prescribed for Industrial area i.e. 70 dB (A) and for residential are 45 dB (A).

3.3 WATER QUALITY MONITORING

3.3.1 Ground Water Quality Monitoring Locations

Keeping in view the importance of Ground water & Surface water as an important source of water to the local population, sample of ground water & surface water was collected from the project site for the assessment of impacts of the project on the ground water quality & surface water quality.

Water sample was collected from the project site and nearby villages. The sample was analyzed for various parameters to compare with the standards for water as per IS: 10500 for water sources. The details of water sampling locations are given in **Table 3.16**

Table 3.16 Details of Water Quality Monitoring Station

S. No.	Location Code	Location Name/ Description	
		June 2020	September 2020
1.	W 1	Ground Water (Near Project Site)	Ground Water (Near Project Site)
2.	W 2	Ground Water (Jiwan Singh Wala)	Ground Water (Jiwan Singh Wala)
3.	W 3	Ground Water (Maanwala)	Ground Water (Maanwala)
4.	W 4	Ground Water (Mahi Nangal)	Ground Water (Mahi Nangal)
5.	W 5	Ground Water (Kot Kashmir)	Ground Water (Kot Kashmir)
6.	W 6	Ground Water (NasibPura)	Ground Water (NasibPura)
7.	W 7	Ground Water (Baghi Bandar)	Ground Water (Baghi Bandar)
8.	W 8	Surface Water (KotFatta)	Surface Water (KotFatta)
9.	W 9	Surface Water (Chathewala)	Surface Water (Chathewala)

3.3.2 Methodology of Groundwater & Surface water Quality Monitoring

Sampling of water was carried out on **June & September 2020**. Samples were collected as grab sample and sampling forms are filled in as per the sampling plan. The preservative sample were properly added to preserve as per standard operating procedures (SOP) and stored immediately in ice boxes, which were ensured for appropriate temperatures. Sample for chemical analysis was collected in polyethylene carboys. Sample collected for metal content were acidified to <2 pH with 1 ml HNO₃. A sample for bacteriological analysis was collected in sterilized glass bottles.

Soon after the completion of sampling, chain of custody sheets for the samples are filled in and then they were transported to laboratory for further analysis. Proper care was taken during packing and transportation of samples. All the samples reached the central laboratory within the holding times for different parameters. After ensuring the same the samples were forwarded immediately for analysis.

The samples were analyzed as per the standard procedures specified in 'Standard Methods for the Examination of Water and Wastewater' published by American Public Health Association (APHA) and CPCB. The analytical techniques and the test methods adopted for testing of water are given in **Table 3.17-3.34**.

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3.3.3 Ground Water & Surface Water Quality Monitoring Results (June 2020)

The detailed ground water & surface water quality monitoring results are presented in **Table 3.17-3.25**

Table 3.17 Ground water Quality Monitoring Result (Near Project Site)

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limits)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 0C)	APHA ,4500-H+ B Electrometric	7.62	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison	*BDL (**DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephelometric	*BDL (**DL 1 NTU)	NTU	1	5
4.	Odour	APHA, 2150 B , Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA , 2160 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO3	APHA , 2340 C, EDTA Titrimetric Method	301.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	73.15	mg/l	75	200
8.	Alkalinity as CaCO3	APHA , 2320 B, Titrimetric Method	210.34	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl- B, Argentometric Method	81.49	mg/l	250	1000
10.	#Cyanide as CN	APHA , 4500 CN- D	*BDL (**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	28.79	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	927.00	mg/l	500	2000
13.	Sulphate as SO4	APHA , 4500 E, Turbidimetric Method	48.27	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F- D, SPADNS Method	0.91	mg/l	1.0	1.5
15.	Nitrate as NO3	IS 3025 (P-34) ,Chromotropic	10.62	mg/l	45	No Relaxation
16.	Iron as Fe	APHA , 3500-Fe B 1,10 Phenanthroline Method	0.21	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA , 3111 D Nitrous Oxide	*BDL(**DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA, 4500B C, Carmine Method	*BDL(**DL 0.1 mg/l)	mg/l	0.5	1
19.	Total Chromium as Cr	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	No Relaxation
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction	*BDL(**DL 0.001	mg/l	0.001	0.002
21.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.01mg/l)	mg/l	0.5	No Relaxation
22.	#Anionic Detergents	APHA, 5540 C MBAS Method	*BDL(**DL 0.02 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	APHA , 3111 B, Direct Air, Acetylene Flame Method	0.29	mg/l	5	15
24.	Copper as Cu	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.05	1.5

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25.	Manganese as Mn	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	0.05
30.	Mercury as Hg	APHA , 3112 B, Cold Vapour AAS Method	*BDL (**DL 0.001 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1545	µS/cm	--	--
32.	Ammonia as NH3	IS 3025 (P-34) , Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA, 3500 Na B Flame Photometric Method	29.6	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	5.8	mg/l	--	--
35.	Total Coliform	IS 1622:2009 : 1987, RA:2019	< 2	MPN/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 1622:2009 : 1987, RA:2019	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note: - *BDL-Below Detection Limit, **DL- Detection Limit

Table 3.18 Ground water Quality Monitoring Result (Jiwan Singh Wala)

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limits)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 0C)	APHA ,4500-H+ B Electrometric	7.74	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison	*BDL (**(DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephelometric	*BDL (**DL 1 NTU)	NTU	1	5
4.	Odour	APHA, 2150 B , Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA , 2160 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO3	APHA , 2340 C, EDTA Titrimetric Method	265.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	62.78	mg/l	75	200
8.	Alkalinity as CaCO3	APHA , 2320 B, Titrimetric Method	171.16	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl- B, Argentometric Method	74.68	mg/l	250	1000

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10.	#Cyanide as CN	APHA , 4500 CN- D	*BDL (**DL 0.05 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	26.33	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	876.00	mg/l	500	2000
13.	Sulphate as SO4	APHA , 4500 E, Turbidimetric Method	31.49	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F- D, SPADNS Method	0.86	mg/l	1.0	1.5
15.	Nitrate as NO3	IS 3025 (P-34) ,Chromotropic	9.78	mg/l	45	No Relaxation
16.	Iron as Fe	APHA , 3500-Fe B 1,10 Phenanthroline Method	0.21	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA , 3111 D Nitrous Oxide	*BDL(**DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA, 4500B C, Carmine Method	*BDL(**DL 0.1 mg/l)	mg/l	0.5	1
19.	Total Chromium as Cr	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	No Relaxation
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction	*BDL(**DL 0.001	mg/l	0.001	0.002
21.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.01mg/l)	mg/l	0.5	No Relaxation
22.	#Anionic Detergents	APHA, 5540 C MBAS Method	*BDL(**DL 0.02 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	APHA , 3111 B, Direct Air, Acetylene Flame Method	0.53	mg/l	5	15
24.	Copper as Cu	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.13 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	0.05
30.	Mercury as Hg	APHA , 3112 B, Cold Vapour AAS Method	*BDL(**DL 0.01 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1460	µS/cm	--	--
32.	Ammonia as NH3	IS 3025 (P-34) , Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA, 3500 Na B Flame Photometric Method	26.8	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	5.3	mg/l	--	--
35.	Total Coliform	IS 1622:2009 : 1987, RA:2019	< 2	MPN/100ml	Shall not be detectable in any 100ml sample	

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36.	E. Coli	IS 1622:2009 : 1987, RA:2019	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample
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Note: - *BDL-Below Detection Limit, **DL- Detection Limit

Table 3.19 Ground water Quality Monitoring Result (Maanwala)

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limits)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 OC)	APHA ,4500-H+ B Electrometric	7.81	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison	*BDL (**DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephlelometric	*BDL (**DL 1 NTU)	NTU	1	5
4.	Odour	APHA, 2150 B , Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA , 2160 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO3	APHA , 2340 C, EDTA Titrimetric Method	451.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	83.25	mg/l	75	200
8.	Alkalinity as CaCO3	APHA , 2320 B, Titrimetric Method	312.57	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl- B, Argentometric Method	205.16	mg/l	250	1000
10.	#Cyanide as CN	APHA , 4500 CN- D	*BDL (**DL 0.05 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	59.11	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	989.00	mg/l	500	2000
13.	Sulphate as SO4	APHA , 4500 E, Turbidimetric Method	121.03	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F- D, SPADNS Method	1.35	mg/l	1.0	1.5
15.	Nitrate as NO3	IS 3025 (P-34) ,Chromotropic	13.05	mg/l	45	No Relaxation
16.	Iron as Fe	APHA , 3500-Fe B 1,10 Phenanthroline Method	0.37	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA , 3111 D Nitrous Oxide	*BDL(**DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA, 4500B C, Carmine Method	*BDL(**DL 0.1 mg/l)	mg/l	0.5	1
19.	Total Chromium as Cr	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	No Relaxation
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction	*BDL(**DL 0.001	mg/l	0.001	0.002
21.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.01mg/l)	mg/l	0.5	No Relaxation
22.	#Anionic Detergents	APHA, 5540 C MBAS Method	*BDL(**DL 0.02 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	APHA , 3111 B, Direct Air, Acetylene Flame Method	0.41	mg/l	5	15

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24.	Copper as Cu	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.13 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	0.05
30.	Mercury as Hg	APHA , 3112 B, Cold Vapour AAS Method	*BDL(**DL 0.01 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1648	µS/cm	--	--
32.	Ammonia as NH3	IS 3025 (P-34) , Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA, 3500 Na B Flame Photometric Method	28.7	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	6.4	mg/l	--	--
35.	Total Coliform	IS 1622:2009 : 1987, RA:2019	< 2	MPN/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 1622:2009 : 1987, RA:2019	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note: - *BDL-Below Detection Limit, **DL- Detection Limit

Table 3.20 Ground water Quality Monitoring Result (Mahi Nangal)

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limits)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 0C)	APHA ,4500-H+ B Electrometric	7.61	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison	*BDL (**DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephelometric	*BDL (**DL 1 NTU)	NTU	1	5
4.	Odour	APHA, 2150 B , Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA , 2160 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO3	APHA , 2340 C, EDTA Titrimetric Method	375.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	93.86	mg/l	75	200
8.	Alkalinity as CaCO3	APHA , 2320 B, Titrimetric Method	287.18	mg/l	200	600

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9.	Chloride as Cl	APHA, 4500-Cl- B, Argentometric Method	89.16	mg/l	250	1000
10.	#Cyanide as CN	APHA , 4500 CN- D	*BDL (**DL 0.05 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	34.21	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	936.00	mg/l	500	2000
13.	Sulphate as SO ₄	APHA , 4500 E, Turbidimetric Method	80.11	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F- D, SPADNS Method	0.82	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) ,Chromotropic	11.06	mg/l	45	No Relaxation
16.	Iron as Fe	APHA , 3500-Fe B 1,10 Phenanthroline Method	0.25	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA , 3111 D Nitrous Oxide	*BDL(**DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA, 4500B C, Carmine Method	*BDL(**DL 0.1 mg/l)	mg/l	0.5	1
19.	Total Chromium as Cr	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	No Relaxation
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction	*BDL(**DL 0.001	mg/l	0.001	0.002
21.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.01mg/l)	mg/l	0.5	No Relaxation
22.	#Anionic Detergents	APHA, 5540 C MBAS Method	*BDL(**DL 0.02 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	APHA , 3111 B, Direct Air, Acetylene Flame Method	0.62	mg/l	5	15
24.	Copper as Cu	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.13 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	0.05
30.	Mercury as Hg	APHA , 3112 B, Cold Vapour AAS Method	*BDL(**DL 0.01 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1560	µS/cm	--	--
32.	Ammonia as NH ₃	IS 3025 (P-34) , Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA, 3500 Na B Flame Photometric Method	29.7	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	7.5	mg/l	--	--
35.	Total Coliform	IS 1622:2009 : 1987, RA:2019	< 2	MPN/100ml	Shall not be detectable in any 100ml sample	

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36.	E. Coli	IS 1622:2009 : 1987, RA:2019	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample
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Note: - *BDL-Below Detection Limit, **DL- Detection Limit

Table 3.21 Ground water Quality Monitoring Result (Kot Kashmir)

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limits)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 OC)	APHA ,4500-H+ B Electrometric	7.91	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison	*BDL (**DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephelometric	*BDL (**DL 1 NTU)	NTU	1	5
4.	Odour	APHA, 2150 B , Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA , 2160 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO3	APHA , 2340 C, EDTA Titrimetric Method	411.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	98.26	mg/l	75	200
8.	Alkalinity as CaCO3	APHA , 2320 B, Titrimetric Method	320.16	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl- B, Argentometric Method	117.07	mg/l	250	1000
10.	#Cyanide as CN	APHA , 4500 CN- D	*BDL (**DL 0.05 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	40.30	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	1024.00	mg/l	500	2000
13.	Sulphate as SO4	APHA , 4500 E, Turbidimetric Method	90.12	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F- D, SPADNS Method	0.93	mg/l	1.0	1.5
15.	Nitrate as NO3	IS 3025 (P-34) ,Chromotropic	12.05	mg/l	45	No Relaxation
16.	Iron as Fe	APHA , 3500-Fe B 1,10 Phenanthroline Method	0.29	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA , 3111 D Nitrous Oxide	*BDL(**DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA, 4500B C, Carmine Method	*BDL(**DL 0.1 mg/l)	mg/l	0.5	1
19.	Total Chromium as Cr	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	No Relaxation
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction	*BDL(**DL 0.001	mg/l	0.001	0.002
21.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.01mg/l)	mg/l	0.5	No Relaxation
22.	#Anionic Detergents	APHA, 5540 C MBAS Method	*BDL(**DL 0.02 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	APHA , 3111 B, Direct Air, Acetylene Flame Method	0.72	mg/l	5	15
24.	Copper as Cu	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.1	0.3

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26.	Cadmium as Cd	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.13 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	0.05
30.	Mercury as Hg	APHA , 3112 B, Cold Vapour AAS Method	*BDL(**DL 0.01 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1707	µS/cm	--	--
32.	Ammonia as NH3	IS 3025 (P-34) , Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA, 3500 Na B Flame Photometric Method	31.8	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	8.1	mg/l	--	--
35.	Total Coliform	IS 1622:2009 : 1987, RA:2019	< 2	MPN/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 1622:2009 : 1987, RA:2019	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note: - *BDL-Below Detection Limit, **DL- Detection Limit

Table 3.22 Ground water Quality Monitoring Result (Nasibpura)

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limits)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 0C)	APHA ,4500-H+ B Electrometric	7.88	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison	*BDL (**DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephelometric	*BDL (**DL 1 NTU)	NTU	1	5
4.	Odour	APHA, 2150 B , Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA , 2160 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO3	APHA , 2340 C, EDTA Titrimetric Method	396.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	104.36	mg/l	75	200
8.	Alkalinity as CaCO3	APHA , 2320 B, Titrimetric Method	292.47	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl- B, Argentometric Method	101.05	mg/l	250	1000
10.	#Cyanide as CN	APHA , 4500 CN- D	*BDL (**DL 0.05 mg/l)	mg/l	0.05	No

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11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	32.95	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	996.00	mg/l	500	2000
13.	Sulphate as SO ₄	APHA , 4500 E, Turbidimetric Method	87.15	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F- D, SPADNS Method	0.85	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) ,Chromotropic	10.29	mg/l	45	No Relaxation
16.	Iron as Fe	APHA , 3500-Fe B 1,10 Phenanthroline Method	0.34	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA , 3111 D Nitrous Oxide	*BDL(**DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA, 4500B C, Carmine Method	*BDL(**DL 0.1 mg/l)	mg/l	0.5	1
19.	Total Chromium as Cr	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	No Relaxation
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction	*BDL(**DL 0.001	mg/l	0.001	0.002
21.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.01mg/l)	mg/l	0.5	No Relaxation
22.	#Anionic Detergents	APHA, 5540 C MBAS Method	*BDL(**DL 0.02 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	APHA , 3111 B, Direct Air, Acetylene Flame Method	0.81	mg/l	5	15
24.	Copper as Cu	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.13 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	0.05
30.	Mercury as Hg	APHA , 3112 B, Cold Vapour AAS Method	*BDL(**DL 0.01 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1660	µS/cm	--	--
32.	Ammonia as NH ₃	IS 3025 (P-34) , Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA, 3500 Na B Flame Photometric Method	28.3	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	6.4	mg/l	--	--
35.	Total Coliform	IS 1622:2009 : 1987, RA:2019	< 2	MPN/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 1622:2009 : 1987, RA:2019	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note: - *BDL-Below Detection Limit, **DL- Detection Limit

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Table 3.23 Ground water Quality Monitoring Result (Baghi Bandar)

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limits)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 OC)	APHA ,4500-H+ B Electrometric	7.68	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison	*BDL (**DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephelometric	*BDL (**DL 1 NTU)	NTU	1	5
4.	Odour	APHA, 2150 B , Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA , 2160 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO3	APHA , 2340 C, EDTA Titrimetric Method	430.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	98.42	mg/l	75	200
8.	Alkalinity as CaCO3	APHA , 2320 B, Titrimetric Method	251.04	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl- B, Argentometric Method	86.15	mg/l	250	1000
10.	#Cyanide as CN	APHA , 4500 CN- D	*BDL (**DL 0.05 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	44.82	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	1105.00	mg/l	500	2000
13.	Sulphate as SO4	APHA , 4500 E, Turbidimetric Method	90.05	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F- D, SPADNS Method	0.82	mg/l	1.0	1.5
15.	Nitrate as NO3	IS 3025 (P-34) ,Chromotropic	11.68	mg/l	45	No Relaxation
16.	Iron as Fe	APHA , 3500-Fe B 1,10 Phenanthroline Method	0.27	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA , 3111 D Nitrous Oxide	*BDL(**DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA, 4500B C, Carmine Method	*BDL(**DL 0.1 mg/l)	mg/l	0.5	1
19.	Total Chromium as Cr	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	No Relaxation
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction	*BDL(**DL 0.001	mg/l	0.001	0.002
21.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.01mg/l)	mg/l	0.5	No Relaxation
22.	#Anionic Detergents	APHA, 5540 C MBAS Method	*BDL(**DL 0.02 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	APHA , 3111 B, Direct Air, Acetylene Flame Method	0.67	mg/l	5	15
24.	Copper as Cu	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.1	0.3

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26.	Cadmium as Cd	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.13 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	0.05
30.	Mercury as Hg	APHA , 3112 B, Cold Vapour AAS Method	*BDL(**DL 0.01 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1841	µS/cm	--	--
32.	Ammonia as NH3	IS 3025 (P-34) , Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA, 3500 Na B Flame Photometric Method	33.6	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	9.2	mg/l	--	--
35.	Total Coliform	IS 1622:2009 : 1987, RA:2019	< 2	MPN/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 1622:2009 : 1987, RA:2019	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note: - *BDL-Below Detection Limit, **DL- Detection Limit

Table 3.24 Surface water Quality Monitoring Result (KotFatta)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 OC)	APHA ,4500-H+ B Electrometric Method	7.86	--
2.	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**DL 5Hazen)	Hazen
3.	Turbidity	APHA, 2130 B, Nephelometric Method	25	NTU
4.	Odour	APHA, 2150 B , Threshold Test Method	Agreeable	--
5.	Taste	APHA , 2160 B, Threshold Test Method	None	--
6.	Chloride as Cl	APHA, 4500-Cl- B, Argentometric Method	122.15	mg/l
7.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1301	µS/cm
8.	Nitrate as NO3	IS 3025 (P-34) ,Chromotropic Method	18.44	mg/l
9.	Iron as Fe	APHA , 3500-Fe B 1,10 Phenanthroline Method	0.35	mg/l
10.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	781.00	mg/l
11.	Lead as Pb	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l
12.	Boron	APHA, 4500B C, Carmine Method	0.21	mg/l
13.	Sulphate as SO4	APHA , 4500 E, Turbidimetric Method	17.02	mg/l
14.	Fluoride as F	APHA , 4500-F D, SPADNS Method	0.64	mg/l

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15.	BOD (3 Days at 27 ⁰ C)	APHA, 5210 C / IS 3025,P-44	4.00	mg/l
16.	COD	APHA, 5220 B, Open Reflux Method	33.07	mg/l
17.	Free Ammonia as NH ₃	IS 3025 (P-34) , Titrimetric Method	15.24	mg/l
18.	Total Coliform	IS 1622	35	MPN/100ml
19.	Arsenic as As	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l
20.	Total Hardness as	APHA , 2340 C, EDTA Titrimetric Method	413.41	mg/l
21.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	98.77	mg/l
22.	Alkalinity as CaCO ₃	APHA , 2320 B, Titrimetric Method	325.16	mg/l
23.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	40.57	mg/l
24.	Copper as Cu	APHA , 3111 B, Direct Air, Acetylene Flame Method	3.9	mg/l
25.	Sodium	APHA, 3500 Na B Flame Photometric Method	118.70	mg/l
26.	Potassium	APHA, 3500 Na B Flame Photometric Method	39.61	mg/l
27.	Total Chromium as Cr	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l

Note: - *BDL-Below Detection Limit, **DL- Detection Limit

Table 3.25 Surface water Quality Monitoring Result (Chathewala)

S. No.	Parameter	Test-Method	Result	Unit
1	pH (at 25 0C)	APHA ,4500-H+ B Electrometric Method	7.75	--
2	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**DL 5Hazen)	Hazen
3	Turbidity	APHA, 2130 B, Nephelometric Method	19	NTU
4	Odour	APHA, 2150 B, Threshold Test Method	Agreeable	--
5	Taste	APHA , 2160 B, Threshold Test Method	None	--
6	Chloride as Cl	APHA, 4500-Cl- B, Argentometric Method	119.10	mg/l
7	Conductivity	APHA, 2510 B, Conductivity Meter Method	1275	μS/cm
8	Nitrate as NO ₃	IS 3025 (P-34) ,Chromotropic Method	9.98	mg/l
9	Iron as Fe	APHA , 3500-Fe B 1,10 Phenanthroline Method	0.45	mg/l
10	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	765.00	mg/l
11	Lead as Pb	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l
12	Boron	APHA, 4500B C, Carmine Method	0.17	mg/l
13	Sulphate as SO ₄	APHA , 4500 E, Turbidimetric Method	31.26	mg/l
14	Fluoride as F	APHA , 4500-F D, SPADNS Method	0.57	mg/l
15	BOD (3 Days at 27 ⁰ C)	APHA, 5210 C / IS 3025,P-44	8.00	mg/l
16	COD	APHA, 5220 B, Open Reflux Method	29.50	mg/l
17	Free Ammonia as NH ₃	IS 3025 (P-34) , Titrimetric Method	13.57	mg/l

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18	Total Coliform	IS 1622	33	MPN/100ml
19	Arsenic as As	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l
20	Total Hardness as	APHA , 2340 C, EDTA Titrimetric Method	351.00	mg/l
21	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	81.57	mg/l
22	Alkalinity as CaCO ₃	APHA , 2320 B, Titrimetric Method	301.35	mg/l
23	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	35.84	mg/l
24	Copper as Cu	APHA , 3111 B, Direct Air, Acetylene Flame Method	3.64	mg/l
25	Sodium	APHA, 3500 Na B Flame Photometric Method	120.7	mg/l
26	Potassium	APHA, 3500 Na B Flame Photometric Method	43.2	mg/l
27	Total Chromium as Cr	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l

Note: - *BDL-Below Detection Limit, **DL- Detection Limit

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3.3.4 Ground Water & Surface Water Quality Monitoring Results (September 2020)

The detailed ground water & surface water quality monitoring results are presented in **Table 3.26-3.34**

Table 3.26 Ground water Quality Monitoring Result (Near Project Site)

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limits)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 OC)	APHA ,4500-H+ B Electrometric	7.57	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison	*BDL (**DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephelometric	*BDL (**DL 1 NTU)	NTU	1	5
4.	Odour	APHA, 2150 B , Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA , 2160 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO3	APHA , 2340 C, EDTA Titrimetric Method	298.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	78.86	mg/l	75	200
8.	Alkalinity as CaCO3	APHA , 2320 B, Titrimetric Method	205.47	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl- B, Argentometric Method	85.36	mg/l	250	1000
10.	#Cyanide as CN	APHA , 4500 CN- D	*BDL (**DL 0.05 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	24.60	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	896.00	mg/l	500	2000
13.	Sulphate as SO4	APHA , 4500 E, Turbidimetric Method	46.71	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F- D, SPADNS Method	0.89	mg/l	1.0	1.5
15.	Nitrate as NO3	IS 3025 (P-34) ,Chromotropic	9.97	mg/l	45	No Relaxation
16.	Iron as Fe	APHA , 3500-Fe B 1,10 Phenanthroline Method	0.20	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA , 3111 D Nitrous Oxide	*BDL(**DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA, 4500B C, Carmine Method	*BDL(**DL 0.1 mg/l)	mg/l	0.5	1
19.	Total Chromium as Cr	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	No Relaxation
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction	*BDL(**DL 0.001	mg/l	0.001	0.002
21.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.01mg/l)	mg/l	0.5	No Relaxation
22.	#Anionic Detergents	APHA, 5540 C MBAS Method	*BDL(**DL 0.02 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	APHA , 3111 B, Direct Air, Acetylene Flame Method	0.25	mg/l	5	15
24.	Copper as Cu	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.1	0.3

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26.	Cadmium as Cd	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	0.05
30.	Mercury as Hg	APHA , 3112 B, Cold Vapour AAS Method	*BDL (**DL 0.001 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1493	µS/cm	--	--
32.	Ammonia as NH3	IS 3025 (P-34) , Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA, 3500 Na B Flame Photometric Method	27.5	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	5.6	mg/l	--	--
35.	Total Coliform	IS 1622:2009 : 1987, RA:2019	< 2	MPN/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 1622:2009 : 1987, RA:2019	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note: - *BDL-Below Detection Limit, **DL- Detection Limit

Table 3.27 Ground water Quality Monitoring Result (Jiwan Singh Wala)

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limits)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 OC)	APHA ,4500-H+ B Electrometric	7.68	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison	*BDL (**DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephelometric	*BDL (**DL 1 NTU)	NTU	1	5
4.	Odour	APHA, 2150 B , Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA , 2160 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO3	APHA , 2340 C, EDTA Titrimetric Method	257.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	66.23	mg/l	75	200
8.	Alkalinity as CaCO3	APHA , 2320 B, Titrimetric Method	183.16	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl- B, Argentometric Method	76.15	mg/l	250	1000
10.	#Cyanide as CN	APHA , 4500 CN- D	*BDL (**DL 0.05 mg/l)	mg/l	0.05	No

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11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	22.29	mg/l	30	100
12.	Total Dissolved	APHA , 2540 C, Gravimetric Method	852.00	mg/l	500	2000
13.	Sulphate as SO4	APHA , 4500 E, Turbidimetric Method	29.07	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F- D, SPADNS Method	0.82	mg/l	1.0	1.5
15.	Nitrate as NO3	IS 3025 (P-34) ,Chromotropic	9.71	mg/l	45	No Relaxation
16.	Iron as Fe	APHA , 3500-Fe B 1,10 Phenanthroline Method	0.23	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA , 3111 D Nitrous Oxide	*BDL(**DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA, 4500B C, Carmine Method	*BDL(**DL 0.1 mg/l)	mg/l	0.5	1
19.	Total Chromium as Cr	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	No Relaxation
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction	*BDL(**DL 0.001 mg/l)	mg/l	0.001	0.002
21.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.01mg/l)	mg/l	0.5	No
22.	#Anionic Detergents	APHA, 5540 C MBAS Method	*BDL(**DL 0.02 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	APHA , 3111 B, Direct Air, Acetylene Flame Method	0.49	mg/l	5	15
24.	Copper as Cu	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.13 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	0.05
30.	Mercury as Hg	APHA , 3112 B, Cold Vapour AAS Method	*BDL(**DL 0.01 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1420	µS/cm	--	--
32.	Ammonia as NH3	IS 3025 (P-34) , Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA, 3500 Na B Flame Photometric Method	30.6	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	7.3	mg/l	--	--
35.	Total Coliform	IS 1622:2009 : 1987, RA:2019	< 2	MPN/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 1622:2009 : 1987, RA:2019	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note: - *BDL-Below Detection Limit, **DL- Detection Limit

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Table 3.28 Ground water Quality Monitoring Result (Maanwala)

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limits)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 0C)	APHA ,4500-H+ B Electrometric	7.85	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison	*BDL (**DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephlelometric	*BDL (**DL 1 NTU)	NTU	1	5
4.	Odour	APHA, 2150 B , Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA , 2160 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO3	APHA , 2340 C, EDTA Titrimetric Method	415.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	86.54	mg/l	75	200
8.	Alkalinity as CaCO3	APHA , 2320 B, Titrimetric Method	304.19	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl- B, Argentometric Method	153.12	mg/l	250	1000
10.	#Cyanide as CN	APHA , 4500 CN- D	*BDL (**DL 0.05 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	48.37	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	950.00	mg/l	500	2000
13.	Sulphate as SO4	APHA , 4500 E, Turbidimetric Method	112.65	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F- D, SPADNS Method	1.12	mg/l	1.0	1.5
15.	Nitrate as NO3	IS 3025 (P-34) ,Chromotropic	11.86	mg/l	45	No Relaxation
16.	Iron as Fe	APHA , 3500-Fe B 1,10 Phenanthroline Method	0.28	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA , 3111 D Nitrous Oxide	*BDL(**DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA, 4500B C, Carmine Method	*BDL(**DL 0.1 mg/l)	mg/l	0.5	1
19.	Total Chromium as Cr	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	No Relaxation
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction	*BDL(**DL 0.001 mg/l)	mg/l	0.001	0.002
21.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.01mg/l)	mg/l	0.5	No Relaxation
22.	#Anionic Detergents	APHA, 5540 C MBAS Method	*BDL(**DL 0.02 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	APHA , 3111 B, Direct Air, Acetylene Flame Method	0.38	mg/l	5	15
24.	Copper as Cu	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.003	No Relaxation

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27.	Lead as Pb	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.13 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	0.05
30.	Mercury as Hg	APHA , 3112 B, Cold Vapour AAS Method	*BDL(**DL 0.01 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1583	µS/cm	--	--
32.	Ammonia as NH3	IS 3025 (P-34) , Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA, 3500 Na B Flame Photometric Method	26.1	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	3.7	mg/l	--	--
35.	Total Coliform	IS 1622:2009 : 1987, RA:2019	< 2	MPN/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 1622:2009 : 1987, RA:2019	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note: - *BDL-Below Detection Limit, **DL- Detection Limit

Table 3.29 Ground water Quality Monitoring Result (Mahi Nangal)

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limits)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 0C)	APHA ,4500-H+ B Electrometric	7.53	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison	*BDL (**DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephelometric	*BDL (**DL 1 NTU)	NTU	1	5
4.	Odour	APHA, 2150 B , Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA , 2160 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO3	APHA , 2340 C, EDTA Titrimetric Method	337.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	91.75	mg/l	75	200
8.	Alkalinity as CaCO3	APHA , 2320 B, Titrimetric Method	253.18	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl- B, Argentometric Method	81.31	mg/l	250	1000
10.	#Cyanide as CN	APHA , 4500 CN- D	*BDL (**DL 0.05 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	26.26	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	910.00	mg/l	500	2000

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13.	Sulphate as SO ₄	APHA , 4500 E, Turbidimetric Method	62.49	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F- D, SPADNS Method	0.80	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) ,Chromotropic	10.50	mg/l	45	No Relaxation
16.	Iron as Fe	APHA , 3500-Fe B 1,10 Phenanthroline Method	0.26	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA , 3111 D Nitrous Oxide	*BDL(**DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA, 4500B C, Carmine Method	*BDL(**DL 0.1 mg/l)	mg/l	0.5	1
19.	Total Chromium as Cr	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	No Relaxation
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction	*BDL(**DL 0.001 mg/l)	mg/l	0.001	0.002
21.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.01mg/l)	mg/l	0.5	No
22.	#Anionic Detergents	APHA, 5540 C MBAS Method	*BDL(**DL 0.02 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	APHA , 3111 B, Direct Air, Acetylene Flame Method	0.59	mg/l	5	15
24.	Copper as Cu	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.13 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	0.05
30.	Mercury as Hg	APHA , 3112 B, Cold Vapour AAS Method	*BDL(**DL 0.01 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1493	µS/cm	--	--
32.	Ammonia as NH ₃	IS 3025 (P-34) , Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA, 3500 Na B Flame Photometric Method	32.8	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	8.3	mg/l	--	--
35.	Total Coliform	IS 1622:2009 : 1987, RA:2019	< 2	MPN/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 1622:2009 : 1987, RA:2019	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note: - *BDL-Below Detection Limit, **DL- Detection Limit

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Table 3.30 Ground water Quality Monitoring Result (Kot Kashmir)

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limits)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 OC)	APHA ,4500-H+ B Electrometric	7.88	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison	*BDL (**DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephelometric	*BDL (**DL 1 NTU)	NTU	1	5
4.	Odour	APHA, 2150 B , Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA , 2160 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO3	APHA , 2340 C, EDTA Titrimetric Method	391.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	96.88	mg/l	75	200
8.	Alkalinity as CaCO3	APHA , 2320 B, Titrimetric Method	269.18	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl- B, Argentometric Method	101.66	mg/l	250	1000
10.	#Cyanide as CN	APHA , 4500 CN- D	*BDL (**DL 0.05 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	36.27	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	998.00	mg/l	500	2000
13.	Sulphate as SO4	APHA , 4500 E, Turbidimetric Method	86.10	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F- D, SPADNS Method	0.89	mg/l	1.0	1.5
15.	Nitrate as NO3	IS 3025 (P-34) ,Chromotropic	11.76	mg/l	45	No Relaxation
16.	Iron as Fe	APHA , 3500-Fe B 1,10 Phenanthroline Method	0.27	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA , 3111 D Nitrous Oxide	*BDL(**DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA, 4500B C, Carmine Method	*BDL(**DL 0.1 mg/l)	mg/l	0.5	1
19.	Total Chromium as Cr	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	No Relaxation
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction	*BDL(**DL 0.001 mg/l)	mg/l	0.001	0.002
21.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.01mg/l)	mg/l	0.5	No Relaxation
22.	#Anionic Detergents	APHA, 5540 C MBAS Method	*BDL(**DL 0.02 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	APHA , 3111 B, Direct Air, Acetylene Flame Method	0.63	mg/l	5	15
24.	Copper as Cu	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.003	No Relaxation

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27.	Lead as Pb	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.13 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	0.05
30.	Mercury as Hg	APHA , 3112 B, Cold Vapour AAS Method	*BDL(**DL 0.01 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1663	µS/cm	--	--
32.	Ammonia as NH3	IS 3025 (P-34) , Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA, 3500 Na B Flame Photometric Method	29.5	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	7.9	mg/l	--	--
35.	Total Coliform	IS 1622:2009 : 1987, RA:2019	< 2	MPN/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 1622:2009 : 1987, RA:2019	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note: - *BDL-Below Detection Limit, **DL- Detection Limit

Table 3.31 Ground water Quality Monitoring Result (Nasibpura)

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limits)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 0C)	APHA ,4500-H+ B Electrometric	7.74	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison	*BDL (**DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephelometric	*BDL (**DL 1 NTU)	NTU	1	5
4.	Odour	APHA, 2150 B , Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA , 2160 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO3	APHA , 2340 C, EDTA Titrimetric Method	379.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	99.82	mg/l	75	200
8.	Alkalinity as CaCO3	APHA , 2320 B, Titrimetric Method	267.13	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl- B, Argentometric Method	86.44	mg/l	250	1000
10.	#Cyanide as CN	APHA , 4500 CN- D	*BDL (**DL 0.05 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	31.58	mg/l	30	100

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12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	980.00	mg/l	500	2000
13.	Sulphate as SO4	APHA , 4500 E, Turbidimetric Method	80.61	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F- D, SPADNS Method	0.82	mg/l	1.0	1.5
15.	Nitrate as NO3	IS 3025 (P-34) ,Chromotropic	9.68	mg/l	45	No Relaxation
16.	Iron as Fe	APHA , 3500-Fe B 1,10 Phenanthroline Method	0.29	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA , 3111 D Nitrous Oxide	*BDL(**DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA, 4500B C, Carmine Method	*BDL(**DL 0.1 mg/l)	mg/l	0.5	1
19.	Total Chromium as Cr	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	No Relaxation
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction	*BDL(**DL 0.001 mg/l)	mg/l	0.001	0.002
21.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.01mg/l)	mg/l	0.5	No Relaxation
22.	#Anionic Detergents	APHA, 5540 C MBAS Method	*BDL(**DL 0.02 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	APHA , 3111 B, Direct Air, Acetylene Flame Method	0.73	mg/l	5	15
24.	Copper as Cu	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.13 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	0.05
30.	Mercury as Hg	APHA , 3112 B, Cold Vapour AAS Method	*BDL(**DL 0.01 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1493	µS/cm	--	--
32.	Ammonia as NH3	IS 3025 (P-34) , Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA, 3500 Na B Flame Photometric Method	30.1	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	6.9	mg/l	--	--
35.	Total Coliform	IS 1622:2009 : 1987, RA:2019	< 2	MPN/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 1622:2009 : 1987, RA:2019	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note: - *BDL-Below Detection Limit, **DL- Detection Limit

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Table 3.32 Ground water Quality Monitoring Result (Baghi Bandar)

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limits)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 0C)	APHA ,4500-H+ B Electrometric	7.57	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison	*BDL (**DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephlelometric	*BDL (**DL 1 NTU)	NTU	1	5
4.	Odour	APHA, 2150 B , Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA , 2160 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO3	APHA , 2340 C, EDTA Titrimetric Method	412.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	112.56	mg/l	75	200
8.	Alkalinity as CaCO3	APHA , 2320 B, Titrimetric Method	238.87	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl- B, Argentometric Method	90.54	mg/l	250	1000
10.	#Cyanide as CN	APHA , 4500 CN- D	*BDL (**DL 0.05 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	31.87	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	1086.00	mg/l	500	2000
13.	Sulphate as SO4	APHA , 4500 E, Turbidimetric Method	83.14	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F- D, SPADNS Method	0.87	mg/l	1.0	1.5
15.	Nitrate as NO3	IS 3025 (P-34) ,Chromotropic	12.53	mg/l	45	No Relaxation
16.	Iron as Fe	APHA , 3500-Fe B 1,10 Phenanthroline Method	0.25	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA , 3111 D Nitrous Oxide	*BDL(**DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA, 4500B C, Carmine Method	*BDL(**DL 0.1 mg/l)	mg/l	0.5	1
19.	Total Chromium as Cr	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	No Relaxation
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction	*BDL(**DL 0.001 mg/l)	mg/l	0.001	0.002
21.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.01mg/l)	mg/l	0.5	No Relaxation
22.	#Anionic Detergents	APHA, 5540 C MBAS Method	*BDL(**DL 0.02 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	APHA , 3111 B, Direct Air, Acetylene Flame Method	0.65	mg/l	5	15
24.	Copper as Cu	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.003	No Relaxation

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27.	Lead as Pb	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.13 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	0.05
30.	Mercury as Hg	APHA , 3112 B, Cold Vapour AAS Method	*BDL(**DL 0.01 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1810	µS/cm	--	--
32.	Ammonia as NH3	IS 3025 (P-34) , Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA, 3500 Na B Flame Photometric Method	32.5	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	8.7	mg/l	--	--
35.	Total Coliform	IS 1622:2009 : 1987, RA:2019	< 2	MPN/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 1622:2009 : 1987, RA:2019	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note: - *BDL-Below Detection Limit, **DL- Detection Limit

Table 3.33 Surface water Quality Monitoring Result (KotFatta)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 0C)	APHA ,4500-H+ B Electrometric Method	7.78	--
2.	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**DL 5Hazen)	Hazen
3.	Turbidity	APHA, 2130 B, Nephelometric Method	24	NTU
4.	Odour	APHA, 2150 B, Threshold Test Method	Agreeable	--
5.	Taste	APHA , 2160 B, Threshold Test Method	None	--
6.	Chloride as Cl	APHA, 4500-Cl- B, Argentometric Method	118.50	mg/l
7.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1280	µS/cm
8.	Nitrate as NO3	IS 3025 (P-34) ,Chromotropic Method	17.64	mg/l
9.	Iron as Fe	APHA , 3500-Fe B 1,10 Phenanthroline Method	0.32	mg/l
10.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	768.00	mg/l
11.	Lead as Pb	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l
12.	Boron	APHA, 4500B C, Carmine Method	0.20	mg/l
13.	Sulphate as SO4	APHA , 4500 E, Turbidimetric Method	16.21	mg/l
14.	Fluoride as F	APHA , 4500-F D, SPADNS Method	0.62	mg/l
15.	BOD (3 Days at 27 ⁰ C)	APHA, 5210 C / IS 3025,P-44	5.00	mg/l
16.	COD	APHA, 5220 B, Open Reflux Method	35.60	mg/l

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17.	Free Ammonia as NH ₃	IS 3025 (P-34) , Titrimetric Method	16.35	mg/l
18.	Total Coliform	IS 1622	37	MPN/100ml
19.	Arsenic as As	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l
20.	Total Hardness as	APHA , 2340 C, EDTA Titrimetric Method	460.35	mg/l
21.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	105.84	mg/l
22.	Alkalinity as CaCO ₃	APHA , 2320 B, Titrimetric Method	343.81	mg/l
23.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	47.69	mg/l
24.	Copper as Cu	APHA , 3111 B, Direct Air, Acetylene Flame Method	4.1	mg/l
25.	Sodium	APHA, 3500 Na B Flame Photometric Method	122.50	mg/l
26.	Potassium	APHA, 3500 Na B Flame Photometric Method	43.72	mg/l
27.	Total Chromium as Cr	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l

Note: - *BDL-Below Detection Limit, **DL- Detection Limit

Table 3.34 Surface water Quality Monitoring Result (Chathewala)

S. No.	Parameter	Test-Method	Result	Unit
1	pH (at 25 0C)	APHA ,4500-H+ B Electrometric Method	7.67	--
2	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**DL 5Hazen)	Hazen
3	Turbidity	APHA, 2130 B, Nephelometric Method	21	NTU
4	Odour	APHA, 2150 B, Threshold Test Method	Agreeable	--
5	Taste	APHA , 2160 B, Threshold Test Method	None	--
6	Chloride as Cl	APHA, 4500-Cl- B, Argentometric Method	115.64	mg/l
7	Conductivity	APHA, 2510 B, Conductivity Meter Method	1257	µS/cm
8	Nitrate as NO ₃	IS 3025 (P-34) ,Chromotropic Method	9.79	mg/l
9	Iron as Fe	APHA , 3500-Fe B 1,10 Phenanthroline Method	0.42	mg/l
10	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	754.00	mg/l
11	Lead as Pb	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l
12	Boron	APHA, 4500B C, Carmine Method	0.16	mg/l
13	Sulphate as SO ₄	APHA , 4500 E, Turbidimetric Method	30.84	mg/l
14	Fluoride as F	APHA , 4500-F D, SPADNS Method	0.55	mg/l
15	BOD (3 Days at 27 ⁰ C)	APHA, 5210 C / IS 3025,P-44	7.00	mg/l
16	COD	APHA, 5220 B, Open Reflux Method	26.10	mg/l
17	Free Ammonia as NH ₃	IS 3025 (P-34) , Titrimetric Method	12.88	mg/l
18	Total Coliform	IS 1622	29	MPN/100ml
19	Arsenic as As	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l

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20	Total Hardness as	APHA , 2340 C, EDTA Titrimetric Method	336.52	mg/l
21	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	77.28	mg/l
22	Alkalinity as CaCO ₃	APHA , 2320 B, Titrimetric Method	296.34	mg/l
23	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	34.92	mg/l
24	Copper as Cu	APHA , 3111 B, Direct Air, Acetylene Flame Method	3.46	mg/l
25	Sodium	APHA, 3500 Na B Flame Photometric Method	118.2	mg/l
26	Potassium	APHA, 3500 Na B Flame Photometric Method	40.4	mg/l
27	Total Chromium as Cr	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l

Note: - *BDL-Below Detection Limit, **DL- Detection Limit

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3.4 SOIL MONITORING

3.4.1 Soil Monitoring Locations

The objective of the soil monitoring is to identify the impacts of ongoing project activities on soil quality and also predict impacts, which have arisen due to execution of various constructions allied activities. Accordingly, a study of assessment of the soil quality has been carried out.

To assess impacts of ongoing project activities on the soil in the area, the physico-chemical characteristics of soils were examined by obtaining soil samples from selected points and analysis of the same. Single sample of soil was collected from the project site for studying soil characteristics, the location of which is listed in **Table 3.35**.

Table 3.35 Details of Soil Quality Monitoring Location

S. No.	Location Code	Location Name/ Description	
		June 2020	September 2020
1.	S1	Near Project Site	Near Project Site
2.	S2	Jiwan Singh wala	Jiwan Singh wala
3.	S3	MaanWala	MaanWala
4.	S4	Mahi Nangal	Mahi Nangal
5.	S5	Leleana	Leleana
6.	S6	Baghi Bandar	Baghi Bandar
7.	S7	NasibPura	NasibPura
8.	S8	Kotbhara	Kotbhara
9.	S9	Kot Kashmir	Kot Kashmir
10.	S10	GehriBoghi	GehriBoghi
11.	S11	Chathewala	Chathewala
12.	S12	KotFatta	KotFatta

3.4.2 Methodology of Soil Monitoring

The sampling has been done in line with IS: 2720 & Methods of Soil Analysis, Part-1, 2nd edition, 1986 of American Society for Agronomy and Soil Science Society of America. The homogenized samples were analyzed for physical and chemical characteristics (physical, chemical and heavy metal concentrations). The soil samples were collected in the month of **June & September 2020**.

The samples have been analyzed as per the established scientific methods for physico-chemical parameters. The heavy metals have been analyzed by using Atomic Absorption Spectrophotometer.

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3.4.3 Soil Monitoring Results (June 2020)

Single sample of soil is collected from the site to check the quality of soil of the study area .The physio-chemical characteristics of the soil, as obtained from the analysis of the soil sample, are presented in **Table 3.36-3.47**.

Table 3.36 Physico-Chemical Characteristics of Soil in the Study Area (Near Project Site)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.85	--
2.	Conductivity	IS:14767 by Conductivity meter	0.339	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silt	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	28.21	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.69	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	58.36	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	43.21	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	51.19	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	143.11	kg/hect.
11.	Iron as Fe	USDA Method, 1968	0.75	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.64	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	22.08	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	220.18	kg./hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	20.29	kg./hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	12.08	mg/kg
17.	Organic Carbon	USEPA 3050B	0.47	%
18.	Lead (as Pb)	USEPA 3050B	0.89	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.78	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.92	mg/kg
21.	Copper (as Cu)	USEPA 3050B	6.81	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.42	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	19.1	%

*SOP-Laboratory Standard Operating Procedure.

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Table 3.37 Physico-Chemical Characteristics of Soil in the Study Area (Jiwan Singh Wala)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.59	--
2.	Conductivity	IS:14767 by Conductivity meter	0.331	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silt	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	32.01	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.58	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	52.14	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	43.18	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	54.04	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	153.18	kg/hect.
11.	Iron as Fe	USDA Method, 1968	0.55	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.52	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	30.29	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	241.00	kg./hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	21.08	kg./hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	11.52	mg/kg
17.	Organic Carbon	USEPA 3050B	0.36	%
18.	Lead (as Pb)	USEPA 3050B	0.78	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.85	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.51	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.91	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.45	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	17.4	%

*SOP-Laboratory Standard Operating Procedure.

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Table 3.38 Physico-Chemical Characteristics of Soil in the Study Area (Maanwala)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 OC)	IS : 2720 (P-26) by pH Meter	7.68	--
2.	Conductivity	IS:14767 by Conductivity meter	0.335	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silt	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	32.84	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.85	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	42.36	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	63.01	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	58.44	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	132.61	kg/hect.
11.	Iron as Fe	USDA Method, 1968	0.34	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.74	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	22.18	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	230.00	kg./hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	31.25	kg./hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	12.64	mg/kg
17.	Organic Carbon	USEPA 3050B	0.25	%
18.	Lead (as Pb)	USEPA 3050B	0.62	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.74	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.62	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.14	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.45	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	22.5	%

*SOP-Laboratory Standard Operating Procedure.

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Table 3.39 Physico-Chemical Characteristics of Soil in the Study Area (Mahi Nangal)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 OC)	IS : 2720 (P-26) by pH Meter	7.51	--
2.	Conductivity	IS:14767 by Conductivity meter	0.344	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silt	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	27.54	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.28	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	52.61	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	47.22	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	62.12	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	142.65	kg/hect.
11.	Iron as Fe	USDA Method, 1968	0.74	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.77	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	30.15	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	234.00	kg./hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	18.32	kg./hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	8.14	mg/kg
17.	Organic Carbon	USEPA 3050B	0.22	%
18.	Lead (as Pb)	USEPA 3050B	0.65	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.70	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.41	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.80	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.84	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	19.6	%

*SOP-Laboratory Standard Operating Procedure.

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Table 3.40 Physico-Chemical Characteristics of Soil in the Study Area (Leleana)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.73	--
2.	Conductivity	IS:14767 by Conductivity meter	0.345	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silt	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	35.04	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.87	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	65.12	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	53.11	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	60.15	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	159.47	kg/hect.
11.	Iron as Fe	USDA Method, 1968	0.82	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.75	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	27.05	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	237.04	kg./hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	25.12	kg./hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	8.86	mg/kg
17.	Organic Carbon	USEPA 3050B	0.25	%
18.	Lead (as Pb)	USEPA 3050B	0.95	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.82	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.91	mg/kg
21.	Copper (as Cu)	USEPA 3050B	7.27	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.53	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	17.1	%

*SOP-Laboratory Standard Operating Procedure.

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Table 3.41 Physico-Chemical Characteristics of Soil in the Study Area (Baghi Bandar)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.57	--
2.	Conductivity	IS:14767 by Conductivity meter	0.349	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silt	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	42.40	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.75	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	57.36	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	46.81	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	56.73	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	165.18	kg/hect.
11.	Iron as Fe	USDA Method, 1968	0.66	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.75	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	36.18	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	251.05	kg./hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	21.54	kg./hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	9.81	mg/kg
17.	Organic Carbon	USEPA 3050B	0.35	%
18.	Lead (as Pb)	USEPA 3050B	0.76	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.82	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.51	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.82	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.44	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	18.8	%

*SOP-Laboratory Standard Operating Procedure.

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Table 3.42 Physico-Chemical Characteristics of Soil in the Study Area (Nasibpura)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.84	--
2.	Conductivity	IS:14767 by Conductivity meter	0.368	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silty Loam	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	43.12	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.89	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	55.12	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	72.26	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	64.87	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	132.12	kg/hect.
11.	Iron as Fe	USDA Method, 1968	0.57	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.75	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	25.17	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	245.32	kg./hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	37.19	kg./hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	19.54	mg/kg
17.	Organic Carbon	USEPA 3050B	0.45	%
18.	Lead (as Pb)	USEPA 3050B	0.65	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.78	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.86	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.24	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.63	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	21.2	%

*SOP-Laboratory Standard Operating Procedure.

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Table 3.43 Physico-Chemical Characteristics of Soil in the Study Area (Kotbhara)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.45	--
2.	Conductivity	IS:14767 by Conductivity meter	0.328	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silt	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	24.01	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.18	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	39.57	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	42.00	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	49.11	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	142.39	kg/hect.
11.	Iron as Fe	USDA Method, 1968	0.59	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.67	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	37.12	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	219.00	kg./hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	17.05	kg./hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	79.13	mg/kg
17.	Organic Carbon	USEPA 3050B	0.47	%
18.	Lead (as Pb)	USEPA 3050B	0.58	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.72	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.43	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.31	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.89	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	16.2	%

*SOP-Laboratory Standard Operating Procedure.

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Table 3.44 Physico-Chemical Characteristics of Soil in the Study Area (Kot Kashmir)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.79	--
2.	Conductivity	IS:14767 by Conductivity meter	0.327	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silt	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	27.57	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.64	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	58.74	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	43.29	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	51.18	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	155.00	kg/hect.
11.	Iron as Fe	USDA Method, 1968	0.79	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.67	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	21.98	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	226.00	kg./hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	23.18	kg./hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	8.35	mg/kg
17.	Organic Carbon	USEPA 3050B	0.48	%
18.	Lead (as Pb)	USEPA 3050B	0.87	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.76	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.91	mg/kg
21.	Copper (as Cu)	USEPA 3050B	6.46	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.38	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	20.4	%

*SOP-Laboratory Standard Operating Procedure.

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Table 3.45 Physico-Chemical Characteristics of Soil in the Study Area (GehriBoghi)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.56	--
2.	Conductivity	IS:14767 by Conductivity meter	0.329	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silty Loam	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	36.18	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.59	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	59.35	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	49.12	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	60.76	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	165.01	kg/hect.
11.	Iron as Fe	USDA Method, 1968	0.78	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.86	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	37.08	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	267.36	kg./hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	23.18	kg./hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	13.29	mg/kg
17.	Organic Carbon	USEPA 3050B	0.39	%
18.	Lead (as Pb)	USEPA 3050B	0.79	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.88	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.67	mg/kg
21.	Copper (as Cu)	USEPA 3050B	3.01	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.38	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	21.7	%

*SOP-Laboratory Standard Operating Procedure.

#Chromium- This parameter is not covered our NABL scope.

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Table 3.46 Physico-Chemical Characteristics of Soil in the Study Area (Chathewala)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.84	--
2.	Conductivity	IS:14767 by Conductivity meter	0.325	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silty Loam	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	34.16	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.89	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	67.05	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	50.36	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	52.18	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	143.19	kg/hect.
11.	Iron as Fe	USDA Method, 1968	0.77	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.62	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	24.12	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	215.00	kg./hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	28.16	kg./hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	8.87	mg/kg
17.	Organic Carbon	USEPA 3050B	0.52	%
18.	Lead (as Pb)	USEPA 3050B	1.13	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.85	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.93	mg/kg
21.	Copper (as Cu)	USEPA 3050B	6.51	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.45	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	16.9	%

*SOP-Laboratory Standard Operating Procedure.

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Table 3.47 Physico-Chemical Characteristics of Soil in the Study Area (KotFatta)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.88	--
2.	Conductivity	IS:14767 by Conductivity meter	0.354	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silt	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	36.19	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.95	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	62.34	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	72.48	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	52.14	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	117.00	kg/hec.
11.	Iron as Fe	USDA Method, 1968	0.39	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.87	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	25.39	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	212.16	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	57.46	kg./hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	16.25	mg/kg
17.	Organic Carbon	USEPA 3050B	0.49	%
18.	Lead (as Pb)	USEPA 3050B	0.72	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.83	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.81	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.78	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.49	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	20.5	%

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3.4.4 Soil Monitoring Results (September 2020)

Single sample of soil is collected from the site to check the quality of soil of the study area .The physio-chemical characteristics of the soil, as obtained from the analysis of the soil sample, are presented in **Table 3.48-3.59**.

Table 3.48 Physico-Chemical Characteristics of Soil in the Study Area (Near Project Site)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.81	--
2.	Conductivity	IS:14767 by Conductivity meter	0.324	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silt	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	25.32	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.58	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	55.29	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	41.52	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	49.33	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	140.24	kg/hect.
11.	Iron as Fe	USDA Method, 1968	0.72	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.61	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	21.63	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	215.44	kg/hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	18.65	kg/hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	11.25	mg/kg
17.	Organic Carbon	USEPA 3050B	0.42	%
18.	Lead (as Pb)	USEPA 3050B	0.86	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.75	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.91	mg/kg
21.	Copper (as Cu)	USEPA 3050B	6.77	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.39	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	16.5	%

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Table 3.49 Physico-Chemical Characteristics of Soil in the Study Area (Jiwan Singh Wala)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.62	--
2.	Conductivity	IS:14767 by Conductivity meter	0.337	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silt	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	33.51	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.52	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	50.22	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	41.39	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	52.31	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	151.18	kg/hec.
11.	Iron as Fe	USDA Method, 1968	0.53	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.51	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	29.54	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	237.00	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	20.16	kg./hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	11.43	mg/kg
17.	Organic Carbon	USEPA 3050B	0.34	%
18.	Lead (as Pb)	USEPA 3050B	0.75	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.83	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.49	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.88	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.43	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	17.1	%

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Table 3.50 Physico-Chemical Characteristics of Soil in the Study Area (Maanwala)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.65	--
2.	Conductivity	IS:14767 by Conductivity meter	0.329	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silt	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	31.05	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.80	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	41.66	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	62.10	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	57.24	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	131.65	kg/hect.
11.	Iron as Fe	USDA Method, 1968	0.33	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.72	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	21.88	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	227.00	kg./hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	30.24	kg./hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	11.93	mg/kg
17.	Organic Carbon	USEPA 3050B	0.24	%
18.	Lead (as Pb)	USEPA 3050B	0.61	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.73	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.59	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.10	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.43	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	20.6	%

*SOP-Laboratory Standard Operating Procedure.

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Table 3.51 Physico-Chemical Characteristics of Soil in the Study Area (Mahi Nangal)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.54	--
2.	Conductivity	IS:14767 by Conductivity meter	0.338	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silt	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	26.31	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.26	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	51.62	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	46.18	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	61.54	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	141.75	kg/hect.
11.	Iron as Fe	USDA Method, 1968	0.72	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.75	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	31.06	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	232.00	kg./hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	17.21	kg./hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	8.06	mg/kg
17.	Organic Carbon	USEPA 3050B	0.21	%
18.	Lead (as Pb)	USEPA 3050B	0.62	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.68	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.37	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.68	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.82	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	18.7	%

*SOP-Laboratory Standard Operating Procedure.

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Table 3.52 Physico-Chemical Characteristics of Soil in the Study Area (Leleana)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.69	--
2.	Conductivity	IS:14767 by Conductivity meter	0.342	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silt	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	34.79	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.81	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	64.25	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	52.16	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	59.04	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	156.84	kg/hect.
11.	Iron as Fe	USDA Method, 1968	0.83	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.74	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	26.15	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	236.27	kg./hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	24.38	kg./hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	8.82	mg/kg
17.	Organic Carbon	USEPA 3050B	0.24	%
18.	Lead (as Pb)	USEPA 3050B	0.93	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.81	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.89	mg/kg
21.	Copper (as Cu)	USEPA 3050B	7.21	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.51	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	16.9	%

*SOP-Laboratory Standard Operating Procedure.

Project: Setting up 2G Ethanol Bio-Refinery plant of capacity 100 KLPD at village Nasibpura, Tehsil Talwandi Sabo, Bhatinda, Punjab

(F.No. J-11011/221/2017-IA II (I) Dated-23/09/2020)

Table 3.53 Physico-Chemical Characteristics of Soil in the Study Area (Baghi Bandar)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.59	--
2.	Conductivity	IS:14767 by Conductivity meter	0.344	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silt	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	41.26	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.72	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	56.21	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	45.46	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	55.81	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	164.62	kg/hect.
11.	Iron as Fe	USDA Method, 1968	0.63	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.74	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	35.92	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	248.74	kg./hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	20.31	kg./hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	9.75	mg/kg
17.	Organic Carbon	USEPA 3050B	0.32	%
18.	Lead (as Pb)	USEPA 3050B	0.74	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.79	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.50	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.76	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.43	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	19.4	%

*SOP-Laboratory Standard Operating Procedure.

Project: Setting up 2G Ethanol Bio-Refinery plant of capacity 100 KLPD at village Nasibpura, Tehsil Talwandi Sabo, Bhatinda, Punjab

(F.No. J-11011/221/2017-IA II (I) Dated-23/09/2020)

Table 3.54 Physico-Chemical Characteristics of Soil in the Study Area (Nasibpura)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.80	--
2.	Conductivity	IS:14767 by Conductivity meter	0.359	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silty Loam	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	44.01	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.87	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	56.31	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	71.22	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	63.48	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	130.29	kg/hect.
11.	Iron as Fe	USDA Method, 1968	0.58	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.76	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	26.62	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	241.00	kg./hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	35.19	kg./hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	18.23	mg/kg
17.	Organic Carbon	USEPA 3050B	0.44	%
18.	Lead (as Pb)	USEPA 3050B	0.63	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.76	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.82	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.21	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.62	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	20.7	%

*SOP-Laboratory Standard Operating Procedure.

Project: Setting up 2G Ethanol Bio-Refinery plant of capacity 100 KLPD at village Nasibpura, Tehsil Talwandi Sabo, Bhatinda, Punjab

(F.No. J-11011/221/2017-IA II (I) Dated-23/09/2020)

Table 3.55 Physico-Chemical Characteristics of Soil in the Study Area (Kotbhara)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.48	--
2.	Conductivity	IS:14767 by Conductivity meter	0.335	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silt	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	24.45	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.21	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	40.32	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	43.10	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	49.51	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	143.62	kg/hect.
11.	Iron as Fe	USDA Method, 1968	0.62	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.69	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	38.05	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	221.00	kg./hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	18.41	kg./hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	80.32	mg/kg
17.	Organic Carbon	USEPA 3050B	0.49	%
18.	Lead (as Pb)	USEPA 3050B	0.60	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.74	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.49	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.40	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.91	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	21.6	%

*SOP-Laboratory Standard Operating Procedure.

Project: Setting up 2G Ethanol Bio-Refinery plant of capacity 100 KLPD at village Nasibpura, Tehsil Talwandi Sabo, Bhatinda, Punjab

(F.No. J-11011/221/2017-IA II (I) Dated-23/09/2020)

Table 3.56 Physico-Chemical Characteristics of Soil in the Study Area (Kot Kashmir)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.83	--
2.	Conductivity	IS:14767 by Conductivity meter	0.334	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silt	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	26.76	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.61	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	57.15	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	42.93	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	50.82	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	153.50	kg/hect.
11.	Iron as Fe	USDA Method, 1968	0.76	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.68	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	22.54	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	227.00	kg./hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	24.37	kg./hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	8.38	mg/kg
17.	Organic Carbon	USEPA 3050B	0.51	%
18.	Lead (as Pb)	USEPA 3050B	0.89	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.78	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.92	mg/kg
21.	Copper (as Cu)	USEPA 3050B	6.53	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.39	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	21.2	%

*SOP-Laboratory Standard Operating Procedure.

Project: Setting up 2G Ethanol Bio-Refinery plant of capacity 100 KLPD at village Nasibpura, Tehsil Talwandi Sabo, Bhatinda, Punjab

(F.No. J-11011/221/2017-IA II (I) Dated-23/09/2020)

Table 3.57 Physico-Chemical Characteristics of Soil in the Study Area (GehriBoghi)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.55	--
2.	Conductivity	IS:14767 by Conductivity meter	0.327	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silty Loam	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	37.46	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.57	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	58.34	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	48.15	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	58.31	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	164.80	kg/hect.
11.	Iron as Fe	USDA Method, 1968	0.77	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.85	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	35.63	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	261.05	kg./hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	24.51	kg./hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	14.50	mg/kg
17.	Organic Carbon	USEPA 3050B	0.41	%
18.	Lead (as Pb)	USEPA 3050B	0.78	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.84	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.65	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.89	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.35	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	17.9	%

*SOP-Laboratory Standard Operating Procedure.

#Chromium- This parameter is not covered our NABL scope.

Project: Setting up 2G Ethanol Bio-Refinery plant of capacity 100 KLPD at village Nasibpura, Tehsil Talwandi Sabo, Bhatinda, Punjab

(F.No. J-11011/221/2017-IA II (I) Dated-23/09/2020)

Table 3.58 Physico-Chemical Characteristics of Soil in the Study Area (Chathewala)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.74	--
2.	Conductivity	IS:14767 by Conductivity meter	0.321	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silty Loam	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	33.52	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.83	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	65.84	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	49.26	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	51.06	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	141.24	kg/hect.
11.	Iron as Fe	USDA Method, 1968	0.76	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.61	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	23.54	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	212.00	kg./hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	27.58	kg./hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	8.79	mg/kg
17.	Organic Carbon	USEPA 3050B	0.50	%
18.	Lead (as Pb)	USEPA 3050B	1.11	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.83	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.91	mg/kg
21.	Copper (as Cu)	USEPA 3050B	6.45	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.41	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	23.5	%

*SOP-Laboratory Standard Operating Procedure.

Project: Setting up 2G Ethanol Bio-Refinery plant of capacity 100 KLPD at village Nasibpura, Tehsil Talwandi Sabo, Bhatinda, Punjab

(F.No. J-11011/221/2017-IA II (I) Dated-23/09/2020)

Table 3.59 Physico-Chemical Characteristics of Soil in the Study Area (KotFatta)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.85	--
2.	Conductivity	IS:14767 by Conductivity meter	0.351	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silt	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	34.59	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.91	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	61.24	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	70.49	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	53.05	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	120.00	kg/hect.
11.	Iron as Fe	USDA Method, 1968	0.42	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.89	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	26.18	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	214.19	kg./hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	59.20	kg./hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	17.31	mg/kg
17.	Organic Carbon	USEPA 3050B	0.52	%
18.	Lead (as Pb)	USEPA 3050B	0.75	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.84	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.88	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.82	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.51	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	16.1	%

*SOP-Laboratory Standard Operating Procedure.

3.4.4 Discussion on Soil Characteristics in the Study Area

The soil in study area is characterized by moderate organic content. The soil quality in the project area has not been affected by the project activities.

3.5 Site Photographs



Ambient Air



Ambient Noise

**Project: Setting up 2G Ethanol Bio-Refinery plant of capacity 100 KLPD at village Nasibpura, Tehsil Talwandi Sabo, Bhatinda, Punjab
(F.No. J-11011/221/2017-IA II (I) Dated-23/09/2020)**



Soil Sampling



Ground water Sampling



Surface Water Sampling

PUNJAB POLLUTION CONTROL BOARD

Application form for obtaining 'Consent to establish' (NOC)/'Consent to Operate' u/s 25/26 of the Water (Prevention & Control of Pollution) Act, 1974 and u/s 21 of the Air(Prevention & Control of Pollution) Act, 1981/Authorization under Rule 6 (1) of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.

**Industry ID :- R19BTI356560
Application ID :- 14320137**

From:

HINDUSTAN PETROLEUM CORPORATION LIMITED
VILL - NASIBPURA, TALUKA - TALWANDI SABO, DISTT - BATHINDA
TALWANDI SABO
BATHINDA

To

The Member Secretary,
Punjab Pollution Control Board,
Patiala.

I/We hereby, apply for obtaining,

- ✓ (i) **'Consent to establish' (NOC) under the provisions of the Water(Prevention & Control of Pollution) Act, 1974 and Air (Prevention & Control of Pollution) Act, 1981.**
- (ii) **'Consent to operate' u/s 25/26 of the Water(Prevention & Control of Pollution) Act, 1974.**
- (iii) **'Consent to operate' u/s 21 of the Air(Prevention & Control of Pollution)Act,1981.**
- (iv) **Authorization under Rule 6 (1) of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.**

1. The detailed information pertaining to my/our industry/project is given in the Annexure-I to this form attached herewith.

2. I/We undertake to furnish any further information sought by the Board from time to time in connection with this application.

3. I/We undertake to obtain revised/varied/fresh consent as the case may be, in case there is any change in the process/product/effluents/hazardous waste etc. before the aforesaid change is affected.

4. I/We that the information furnished herewith is correct to best of my/our knowledge and nothing has been concealed therein. The Board would be at liberty to take penal action against the industry/project and the person(s) responsible to comply with the provisions of the pollution control statues in case information/document is detected as incorrect/false/misleading at any point of time.

5. I/We hereby agree to apply for obtaining renewal of 'consent to establish' (NOC) under the water (Prevention & Control of Pollution) Act, 1974, Air (Prevention & Control of Pollution) Act, 1981 and authorization under the Hazardous Wastes (management, Handling and Trans-boundary Movement) Rules, 2008 three months before the expiry of the previous consent(s)/authorization granted to the industry/project.

Date: 17/11/2020

Signature of Applicant:

Name: Sanjay Kumar

Designation: Chief Manager Bio Fuels

Address: Delhi

**Hindustan Petroleum Corporation Limited, 6th Floor
Core-II North Tower, Scope Minar, Laxmi Nagar
Dellhi
Delhi**

Enclosures:

1. Receiving copy of letter to DTP and CLU
2. Land documents such as Registration deed/ Jamabandi/ Rent deed/ lease deed indicating details of the property
3. Certificate regarding classification of area
4. Plant layout
5. Environmental Clearance
6. Water balance
7. Brief Project Report with Manufacturing Process Flow sheet
8. Certificate of Revenue Authorities (DC/ADC/SDM) indicating the distance of proposed site of industry from the MC limits/Phirni / Lallakir of the nearest village, in case, the industry is to be established at a site other than the site in the industrial area / industrial estate / industrial zone of the draft master plan / industrial zone of the notified master plan
9. Allotment letter of the Designated Authority, if the site of the project is located in the designated Industrial Area/ Industrial Estate/ Focal Point
10. Partnership Deed/Memorandum of Article of Association /Proprietorship certificate/ Resolution of Board of Director/ partners regarding authorized signatory
11. Site Plan/Location Plan of the industry

** This is Computer Generated filled Application Form **

PART-A: GENERAL INFORMATION:

1. **Name & Address of the Industry** : HINDUSTAN PETROLEUM CORPORATION LIMITED
VILL - NASIBPURA,TALUKA - TALWANDI SABO, DISTT - BATHINDA
TALWANDI SABO,BATHINDA
2. **Name & Designation of the Applicant** : Sanjay Kumar/Cheif Manager Bio Fuels
3. (i) **Name(s) and Designation of the Occupier** : Shri Sanjay Kumar/Chief Manager Bio Fuels
- (ii) **Name(s) and Designation of the Director(s)/ Partner(s)/ Proprietor** : Mukesh Kumar Surana, Chairman and Managing Director
Address- Hindustan Petroleum Corporation Limited, 6th Floor, Core-II, Scope Minar, Laxmi Nagar,
Pin- 110092
- (iii) **Name(s) of person(s) authorized to sign the application form. (Please attach self attested copy of resolution/certificate)** : Shri Sanjay Kumar
- (iv) **Ownership of Industry** : Public Limited Company
4. **Communication Details(Telephone No./Fax No./e-mail etc.)** : 011-22408436
-
bathindahpcl@gmail.com
5. **Address of Correspondence** : Hindustan Petroleum Corporation Limited, 6th Floor, Core-II North Tower, Scope Minar, Laxmi Nagar, Delhi, Delhi, 110092
6. **Total investment of the industry/project**
- (i) **Total cost of the industry/project(in Lacs)** : 109625.0
- (ii) **Cost of Plant & Machinery(in Lacs)** : 83441.0
7. (i) **Scale of the Industry(Large/Medium/Small)** : Large
- (ii) **Category/Type of the Industry** : RED / 1060-Distillery (molasses / grain / yeast based)
8. **Name and address of the City/Town/Village/Plot/Khasra/Patwari Halka No. with PIN code where the project site is located** : VILL - NASIBPURA,TALUKA - TALWANDI SABO, DISTT - BATHINDA

Bhatinda
Pin - 151001
9. (i) **Total Land area of the industry/project (in square meters)** : 213666
- (ii) **Built up area of the project(to be mentioned in case of construction/area development projects only) (in square meters)** : 96648.6

10. Whether the site of the industry/project is located within or outside the municipal limits (please attach a certificate from the M.C. in this regard) : Outside M.C. limit
11. Whether the site of the industry/project is situated in any Focal Points/Industrial Estate developed by the Govt. or any other authorized by the Govt. (please attach a copy of allotment letter of plot/land) : No
12. (i) Whether the site of the industry/project is located within the notified/draft Master Plan/LPA (Local planning Area) of any town/city and if yes, the classification of the area in which the site is located.(Please attach the certificate from the Deptt. of the Town & Country Planning, Punjab in this regard.) : No
- (ii) In case the industry/project is not satisfied in the approved industrial area within the notified/draft Master Plan/LPA, whether it has obtained the change of land Use (CLU) from the competent authority of the State or not and if yes, please attach a copy of the same : No
- (iii) In case the industry/project is not covered under (i) and (ii) above ; please attach a certificate from the deptt. of Town & Country Planning, Punjab regarding the classification of the area in which the site is located and whether CLU is required or not : Yes (Enclosures Attached)
13. Whether the industry/project is located in Critically Polluted Area or not and if yes, please indicate the code assigned to the industry by the CPCB/MoEF : NO
14. Month and Year in which the industry was commissioned/is likely to be commissioned : Feb/2023
15. Undepreciated value of the fixed assets of the industry (Please indicate the date as on which the value of fixed assets has been considered) (Applicable in the cases of 'consent to operate' only) :
16. Details of consent fee deposited:

Sr. No.	Fee For	Amount (In Rupees)
1	CTE	1.0

17. **Total No. of average working days in a year and total no. of working shifts per day** : 300 days / 2 shifts
18. (a) **Total No. of Workers including officials working in industry** : 120
- (b) **No. of Workers and officials residing in the industrial permises:** : 30
- (c) **Total population to be served,** : 400
(i) **during construction phase**
- (ii) **during operation phase** : 120

(To be mentioned in case of construction/area development projects only)

19. **Whether the industrty/project:**
- (i) **is covered under the Environment Impact Assessment (EIA) Notification dated 14.9.2006 as amended from time to time or not and if yes, the status of obtaining environment clearance from MoEF/State Level Environment Impact Assessment Authority** : YES /
- (ii) **is covered under the 1st Schedule of Factories Act, 1948 or not if yes, the status of obtaining site clearance from SCA-cum-SAC** : NO /
- (iii) **is covered under Press Note-17 (1984 series) or not and if yes, the status of obtaining the environmental from SCA-cum-SAC** : NO /
20. **Whether the industry has the complete machinery for which it had obtained 'consent to establish'(NOC) from the Board or not and if not, the details thereof. (To be filled up in case of 'consent to operate' cases only** : NO /

Last Consent Details:

Sr. No.	Application Type	Application For	Consent No	Consent For	Date of Issue	Valid Upto
--NIL--	--NIL--	--NIL--	--NIL--	--NIL--	--NIL--	--NIL--

PART-B: TECHNICAL INFORMATION(GENERAL):

1. Raw Material & Chemicals Details:

Sr. No.	Name of the Raw-material/Chemicals used/to be used	Quantity of the Raw-material/Chemicals used/being used	Unit
1	Yeast	0.05	T/day
2	Acid-II	2	T/day
3	Enzyme	3.5	T/day
4	Chemical-I	11	T/day
5	Chemical-II	12	T/day
6	Acid-I	8	T/day
7	Nutrients	4	T/day

2. Production Detail:

Sr. No.	Name of the Product produced/to be produced		Quantity of Products produced/to be produced.			
			Licensed production capacity	Installed Production Capacity	Avg. Actual Production	Average Actual production for which the consent is sought
1	Ethanol	Kilo Liters/Day	100	100	100	100

Sr. No.	Name of the By-Products produced/to be produced		Quantity of By-Products produced/to be produced.			
			Licensed production capacity	Installed Production Capacity	Avg. Actual Production	Average Actual production for which the consent is sought
1	CO2	T/day	76	76	76	76
2	Technical Alcohol	Kilo Liters/Day	2	2	2	2
3	Fuel Oil	Kilo Liters/Day	0.3	0.3	0.3	0.3
4	Ash (Including Silica)	T/day	125	125	125	125

3.Details of Power Load/power consumption:

(i) Total power load available with the : 11500.0 industry(in KW)

(ii) Power Load required by the industry(in : 11500.0 KW)

(iii) Estimated power consumption for : 276000.0 intended production per day(in Units consumed per day)

4. Manufacturing Processes involved : /

(please attach separate sheet, in case the space provided herein with is insufficient)

5. Solid Waste Generation Details:

Sr. No.	Source of Generation of Solid Waste		Nature/Type of solid waste	Quantity of Solid Waste generated/to be generated per day	Mode of Disposal
1	MUD	T/day	Black	10	Dirt will be washed with water and will be filled in trolleys(3-6 ton) and used in construction
2	Ash (Comprising Silica-For Rice Straw)	T/day	Black	125	Proposed to be sold to cement industry in containers Will not be packed in bags
3	Dewatered Sludge	T/day	Black	9	Sold to farms as manure

PART-C: TECHNICAL INFORMATION REQUIRED FOR CONSENT UNDER WATER ACT, 1974 :

1. Source of Water Supply :

(Own Tubewell/Municipal Supply/Surface Water)

Sr. No.	Source Type	Source Name	Quantity (KLD)
1	Canal Water	Local Water Suppliers	2280.0

2. Details of flow measuring devices provided by the industry/project

(i) for measurement of water consumed : Flow Meter

(ii) for measurement of,

(a) Waste water generated : Flow Meter

(b) Waste water recycled : Flow Meter

(c) Waste water discharged : Flow Meter

3. Water Consumption Details:

Sr. No.	Water Consumed For	Quantity(KLD)
1	Domestic	12.0
2	Others Green Belt	204.0
3	Process	456.0
4	Cooling	2196.0
5	Boiler Feed	899.0

4. Wastewater Generation Details:

Sr. No.	Wastewater Generated	Quantity(KLD)
1	Cooling	396.0
2	Boiler Feed	104.0

5. Wastewater Treatment Details:

Sr. No.	Use	Effluent Generation(KLD)	Treatment Arrangement Status	Treatment Details
1	Trade Effluent	500.0	Proposed	ETP

6. Characteristics of Wastewater:

Sr. No.	Type of Effluent	Parameters	Conc. of Pollutant		Unit
			Untreated	Treated	
-----NIL-----					

7. Treated Wastewater Disposal Details:

Sr. No.	Wastewater Disposal System	Quantity	Mode of Disposal (please indicate the land area in acres in case of disposal onto land for plantation/irrigation)
(i)	Wastewater being / to be recycled with or without treatment	500	
(ii)	Wastewater being/ to be discharged after treatment		
1	Trade Effluent	0.0	Recycle/Reuse

8. Power consumption details of wastewater treatment facilities :

(i) Total power load connected to Wastewater treatment facilities (in KW) : 0

(ii) Average daily power consumption on wastewater treatment facilities (i.e. no. of units consumed/day) : 0

PART-D: TECHNICAL INFORMATION REQUIRED FOR CONSENT UNDER AIR ACT,1981 :

1. Sources of Air Pollution :

(a)Boilers/Furnaces :

Sr. No.	Type & Capacity of Boiler/Furnace			Type & Quantity of fuel used/to be used (in TPH and TPD/lts/day)		Details of APCD provided/to be provided	Stack Attached	Height of Stack attached /to be attached (in mts.)	Diameter of Stack at Bottom level	Diameter of Stack at Top level	Whether emission sampling facilities provided or not
	Boiler 1	42	TPH	Rice Straw	42						
1	Boiler 1	42	TPH	Rice Straw	42	Electrostatic Precipitator	Boiler Stack 1	91		2.65	Yes
2	Boiler 2	42	TPH	Rice Straw	42	Electrostatic Precipitator	Boiler Stack 2	91		2.65	Yes

(b) D.G Sets :

Sr. No.	Capacity of D.G. set in(KVA)	Quantity of Fuel used/to be used (in Lts./day)	Ht. of Stack provided/to be provided above roof level(in mts.)	Whether canopy/acoustic enclosure provided/to be provided(please define clearly)
1	2000	240	9	Yes
2	2000	240	9	Yes

(c) Process Emissions: :

Sr. No.	Source of Generation of process Emissions	Name of the emissions(i.e SO2/NOx/Acid Mist/any other).	Details of APCD provided/to be provided to control process emissions.	Height of Stack provided/to be provided for discharge of process emissions(in mts)..		Whether emission sampling facilities provided or not
				Above Ground Level	Above Roof Level	
1	Boiler Stack 1	SPM	[Electrostatic Precipitator]	91	61	Yes
2	Boiler Stack 1	SO2	[Electrostatic Precipitator]	91	61	Yes

3	Boiler Stack 1	NOx	[Electrostatic Precipitator]	91	61	Yes
4	Boiler Stack 2	SPM	[Electrostatic Precipitator]	91	61	Yes
5	Boiler Stack 2	SO2	[Electrostatic Precipitator]	91	61	Yes
6	Boiler Stack 2	NOx	[Electrostatic Precipitator]	91	61	Yes

2. Characteristics of Emissions :

(i) Flue gas Emissions :

Sr. No.	Stack	Parameters	Conc. of pollutants		Units
			Untreated	Treated	
1	Boiler Stack 1	SPM		98	kg/h
2	Boiler Stack 2	SPM		98	kg/h

(ii) Process Emissions:

Sr. No.	Process	Parameters	Conc. of pollutants		Units
			Untreated	Treated	
-----NIL-----					

3. Power consumption details of Air Pollution Control devices: :

(i) Total power load to Air Pollution Control Devices(in KW) : 0

(ii) Average daily power consumption on Air Pollution Control Devices(i.e. no. of units consumed per hr.& per day) : 0

PART-E: TECHNICAL INFORMATION REQUIRED FOR AUTHORIZATION UNDER HWM RULES,2008:

1. Activity for which authorization is required: Collection,Transport,Storage,Disposal,

2. Hazardous Waste Generation Details:

Sr. No.	Source of Generation of Hazardous Waste	Name of Hazardous Waste	Category under which the Hazardous Waste is covered	Quantity of Hazardous Waste generate/to be generated per day(in TPD)
1	5 Industrial operations using mineral/synthetic oil as lubricant in hydraulic systems or other applications	5.1 Used/spent oil	5.1 (Schedule I)	0.023
2	33. Handling of hazardous chemicals and wastes	33.1-Empty barrels/container s/liners contaminated with hazardous chemicals /wastes	116490.1 (Schedule I)	44
3	33. Handling of hazardous chemicals and wastes	33.2- Contaminated cotton rags or other cleaning materials	116490.2 (Schedule I)	57

3. Hazardous Waste Management Details:

(A) Disposal Details:

Sr. No.	Name of the Hazardous Waste generated/to be generated	Nature of Hazardous Waste(recyclable/incinerable/storable)	Category of Hazardous Waste	Total Quantity of Hazardous Waste generated/to be generated(in tones/annum)	Mode of Disposal			
					Quantity of hazardous waste shifted/to be shifted to common TSDF	Quantity of hazardous waste given/to be given to regd. Recycler	Quantity of hazardous waste given to in-house incineration	Quantity of hazardous waste being/to be managed in the premises

1	5.1 Used/spent oil	Recyclable	5.1	8.4	0	8.4	0	0
2	33.1- Empty barrels/container s/liners contaminated with hazardous chemicals /wastes	Recyclable	116490.1	15600	0	1300	0	0
3	33.2- Contaminated cotton rags or other cleaning materials	Recyclable	116490.2	20400	0	1700	0	0

(B) Storage Details:

Sr. No.	Name of the Hazardous Waste generated/to be generated	Catogary of Hazardous Waste	Size of the Room/shed(in sqmts.)	Storage Capacity(in terms of months)
1	5.1 Used/spent oil	5.1		
2	33.1-Empty barrels/container s/liners contaminated with hazardous chemicals /wastes	116490.1		
3	33.2-Contaminated cotton rags or other cleaning materials	116490.2		

4. Re-cycling/Re-processing/Re-using of Hazardous Waste

(a) Whether the industry is recycling/reprocessing/reusing :
the hazardous waste(s) covered under Schedule-IV of the
Hazardous Wastes(Management, Handling and Trans-
boundary Movement) Rules,2008 and if yes, whether it has
obtained Registration/Actual User Certificate form the
CPCB under Rule 8 of the said Rules and if yes, please
attach a copy of the same and if not,please indicate the
status thereof

(b) Details of Registered Recycler to whom the hazardous :
waste is being sold/to be sold

5. Import of the Hazardous Waste

Whether the industry is importing any kind of hazardous waste(s) and if yes, whether it has obtained statutory clearance from the MoEF/CPCB/SPCB or not and if yes, please attach a copy of the same and if not indicate the status thereof :

Date: 17/11/2020

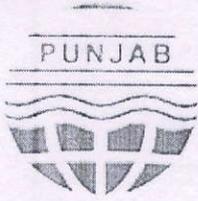
Signature of Applicant:

Name: Sanjay Kumar

Designation: Cheif Manager Bio Fuels

Address: Delhi

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PUNJAB POLLUTION CONTROL BOARD

Zonal Office, Power House Road, Street No. 12, Bathinda.

Website:- www.ppcb.gov.in

Office Dispatch No : 5569

Registered/Speed Post

Date: 27.11.19

Industry Registration ID: R19BTI356560

Application No : 11164379

To,

Shri Sanjay Kumar
Hindustan Petroleum Corporation Limited, 6th Floor, Core-ii North Tower, Scope Minar, Laxmi Nagar
Delhi, Delhi-110092

Subject: Grant of "Consent to Establish"(NOC) for an industrial unit u/s 25 of Water (Prevention & Control of Pollution) Act, 1974 and u/s 21 of Air (Prevention & Control of Pollution) Act, 1981.

With reference to your application for obtaining fresh 'Consent to Establish'(NOC) an industrial plant u/s 25 of Water (Prevention & Control of Pollution) Act, 1974 and u/s 21 of Air (Prevention & Control of Pollution) Act, 1981, you are, hereby, permitted to establish the industrial unit to discharge the effluent(s) & emission(s) arising out of your premises subject to the Terms and Conditions as specified in this Certificate.

1. Particulars of Consent to Establish (NOC) granted to the Industry

Certificate No.	CTE/Fresh/BTI/2019/11164379
Date of issue :	27/11/2019
Date of expiry :	26/11/2020
Certificate Type :	Fresh

2. Particulars of the Industry

Name & Designation of the Applicant	Sanjay Kumar, (Cheif Manager Bio Fuels)
Address of Industrial premises	Hpcl Bathinda, 2g Ethanol Bio-refinery Plant: 1136(39-3), 1137/1(12-10), 1138(29-10), 1139/1(13-10), 1139/2(11-10), 1140(25-0), 1141/1/1(8-5), 1141/1/2(3-2), 1143(25-0), 1144/1(13-0), 1144/2(11-0), 1144/3(9-6), 1144/ Talwandi Sabo, Bathinda-151001
Capital Investment of the Industry	85000.0 lakhs
Category of Industry	Red
Type of Industry	1060-Distillery (molasses / grain / yeast based)
Scale of the Industry	Large
Office District	Bathinda
Consent Fee Details	Rs. 4,70,000/- bearing no. DD no 281286 dt. 26.09.2018 & Rs. 94,000/- bearing no. DD no 288246 dt. 17.12.2018.

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Hpcl Bathinda, 2g Ethanol Bio-refinery Plant: 1136(39-3), 1137/1(12-10), 1138(29-10), 1139/1(13-10), 1139/2(11-10), 1140(25-0), 1141/1/1(8-5), 1141/1/2(3-2), 1143(25-0), 1144/1(13-0), 1144/2(11-0), 1144/3(9-6), 1144/, Talwandi Sabo, Bathinda, 151001

Raw Materials (Name with quantity per day)	Biomass (Rice Straw / Cotton Stalk)
Products (Name with quantity per day)	Ethanol @ 100 KLD
By-Products, if any,(Name with quantity per day)	CO2 @ 80 TPD Fuel Oil @ 0.3 KLD Ash (Including Silica) @ 60 TPD
Details of the machinery and processes	As mentioned in the project report.
Details of the Effluent Treatment Plant	Stream 1: - Effluent to be generated from the bio-mass section i.e. after pretreatment, enzymatic hydrolysis, fermentation and distillation @ 1746 KLD is proposed to be routed to the reverse osmosis followed by MEE. Stream 2: -The effluent to be generated from the cooling tower blow down, boiler blow down, DM reject etc. @ 1595 KLD is proposed to be treated in clarifier - multi grade filters – ultra filtration system – routed to reverse osmosis followed by MEE. Domestic effluent @ 60 KLD
Mode of Disposal of Effluent	Trade Effluent - It has been proposed to achieve Zero Liquid discharge Domestic effluent @ 60 KLD – discharged onto land for plantation after treatment in the STP.
Standards to be achieved under Water (Prevention & Control of Pollution) Act, 1974	As prescribed by the PPCB/CPCB/MOEF.
Sources of emissions and type of pollutants	2 no. boiler furnace of capacity 35 TPH each 2 no. DG sets of capacity 500 KVA each
Mode of disposal of emissions with stack height	Stacks of height 90 meters above ground level with boiler furnaces. Stacks of height 15 meters above roof level with 2 no. DG sets of capacity 500 KVA
Quantity of fuel required in TPD	Fuel to be used in the boilers of capacity 35 TPH each Primary fuel – concentrated lignin stream from MEE and Secondary fuel - Rice Straw / Cotton Stalks HSD for DG sets
Type of Air Pollution Control Devices to be installed	Electrostatic Precipitators (ESP) as APCD with the boilers of capacity 35 TPH each. Canopies with 2 no DG sets of capacity 500 KVA.
Standars to be achieved under Air (Prevention & Control of Pollution) Act, 1981	As prescribed by the PPCB/CPCB/MOEF.

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Hpel Bathinda, 2g Ethanol Bio-refinery Plant: 1136(39-3), 1137/1(12-10), 1138(29-10), 1139/1(13-10), 1139/2(11-10), 1140(25-0), 1141/1/1(8-5), 1141/1/2(3-2), 1143(25-0), 1144/1(13-0), 1144/2(11-0), 1144/3(9-6), 1144/Talwandi Sabo, Bathinda, 151001

27/11/2019

(Ruby Sidhu)
Asstt Environmental Engineer

For & on behalf

of

(Punjab Pollution Control Board)

Endst. No.:

Dated:

A copy of the above is forwarded to the following for information and necessary action please:

Environmental Engineer, Punjab Pollution Control Board, Regional Office, Bathinda.

PUNJAB

27/11/2019

(Ruby Sidhu)
Asstt Environmental Engineer

For & on behalf

of

(Punjab Pollution Control Board)

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Hpel Bathinda, 2g Ethanol Bio-refinery Plant: 1136(39-3), 1137/1(12-10), 1138(29-10), 1139/1(13-10), 1139/2(11-10), 1140(25-0), 1141/1/1(8-5), 1141/1/2(3-2), 1143(25-0), 1144/1(13-0), 1144/2(11-0), 1144/3(9-6), 1144/Talvandi Sabo, Bathinda, 151001

A. GENERAL CONDITIONS

1. The industry shall apply for consent of the Board as required under the provision of Water (Prevention & Control of Pollution) Act, 1974, Air (Prevention & Control of Pollution) Act, 1981 & Authorization under Hazardous and other Wastes (Management and Transboundary Movement) Rules, 2016, two months before the commissioning of the industry.
2. The industry shall provide adequate arrangements for fighting the accidental leakages/ discharge of any air pollutant/gas/liquids from the vessels, mechanical equipments etc. which are likely to cause environmental pollution.
3. The Industry shall apply for further extension in the validity of the CTE atleast two months before the expiry of this CTE, if applicable.
4. The industry shall comply with any other conditions laid down or directions issued by the Board under the provisions of the Water (Prevention & Control of Pollution) Act, 1974 and the Air (Prevention & Control of Pollution) Act, 1981 from time to time.
5. The project has been approved by the Board from pollution angle and the industry shall obtain the approval of site from other concerned departments, if need be.
6. The industry shall get its building plans approved under the provisions of section 3-A of Punjab Factory Rules, 1952.
7. The industry shall put up display board indicating the Environment data in the prescribed format at the main entrance gate.
8. The industry shall provide port-holes, platforms and/or other necessary facilities as may be required for collecting samples of emissions from any chimney, flue or duct or any other outlets.

Specifications of the port-holes shall be as under:-

- i) The sampling ports shall be provided atleast 8 times chimney diameter downstream and 2 times upstream from the flow disturbance. For a rectangular cross section the equivalent diameter (De) shall be calculated from the following equation to determine upstream, downstream distance:-
$$De = 2 LW / (L+W)$$

Where L= length in mts. W= Width in mts.
 - ii) The sampling port shall be 7 to 10 cm in diameter
9. The industry shall discharge all gases through a stack of minimum height as specified in the following standards laid down by the Board.

(i) Stack height for boiler plants

S.NO.	Boiler with Steam Generating Capacity	Stack heights
1.	Less than 2 ton/hr.	9 meters or 2.5 times the height of neighboring building whichever is more
2.	More than 2 ton/hr. to 5 ton/hr.	12 meters
3.	More than 5 ton/hr. to 10 ton/hr	15 meters
4.	More than 10 ton/hr. to 15 ton/hr	18 meters
5.	More than 15 ton/hr. to 20 ton/hr	21 meters
6.	More than 20 ton/hr. to 25 ton/hr.	24 meters
7.	More than 25 ton/hr. to 30 ton/hr.	27 meters
8.	More than 30 ton/hr.	30 meters or using the formula $H = 14 Q_g^{0.3}$ or $H = 74 (Q_p)^{0.24}$ Where Q_g = Quantity of SO ₂ in Kg/hr. Q_p = Quantity of particulate matter in Ton/day.

Note : Minimum Stack height in all cases shall be 9.0 mtr. or as calculated from relevant formula whichever is more.

(ii) For industrial furnaces and kilns, the criteria for selection of stack height would be based on fuel used for the corresponding steam generation.

(iii) Stack height for diesel generating sets:

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Capacity of diesel generating set	Height of the Stack	
0-50 KVA	Height of the building	+ 1.5 mt
50-100 KVA	-do-	+ 2.0 mt.
100-150 KVA	-do-	+ 2.5 mt.
150-200 KVA	-do-	+ 3.0 mt.
200-250 KVA	-do-	+ 3.5 mt.
250-300 KVA	-do-	+ 3.5 mt.

For higher KVA rating stack height H (in meter) shall be worked out according to the formula:

$$H = h + 0.2 (KVA) 0.5$$

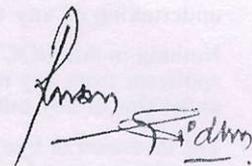
where h = height of the building in meters where the generator set is installed.

10. The industry shall put up canopy on its DG sets and also provide stack of adequate height as per norms prescribed by the Board and shall ensure the compliance of instructions issued by the Board vide office order no. Admin./SA-2/F.No.783/2011/448 dated 8/6/2010.
11. The industry shall put up canopy on its DG sets and also provide stack of adequate height as per norms prescribed by the Board and shall ensure the compliance of instructions issued by the Board vide office order no. Admin./SA-2/F.No.783/2011/448 dated 8/6/2010.
 - (i) Once in Year for Small Scale Industries.
 - (ii) Four in a Year for Large/Medium Scale Industries.
 - (iii) The industry will submit monthly reading/ data of the separate energy meter installed for running of effluent treatment plant/re-circulation system to the concerned Regional Office of the Board by the 5th of the following month.
12. The industry shall provide flow meters at the source of water supply, at the outlet of effluent treatment plant and shall maintain the record of the daily reading and submit the same to the concerned Regional Office by the 5th day of the following month.
13. The industry shall make necessary arrangements for the monitoring of stack emissions and shall get its emissions analyzed from lab approved / authorized by the Board:-
 - (i) Once in Year for Small Scale Industries.
 - (ii) Twice/thrice/four time in a Year for Large/Medium Scale Industries.
14. The pollution control devices shall be interlocked with the manufacturing process of the industry.
15. The Board reserves the right to revoke this "consent to establish" (NOC) at any time, in case the industry is found violating any of the conditions of this "consent to establish" and/or the provisions of Water (Prevention & Control of Pollution) Act, 1974 and Air (Prevention & Control of Pollution) Act, 1981 as amended from time to time.
16. The industry shall plant minimum of three suitable varieties of trees at the density of not less than 1000 trees per acre along the boundary of the industrial premises.
17. The issuance of this consent does not convey any property right in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Central, State or Local Laws or Regulations.
18. The consent does not authorize or approve the construction of any physical structures or facilities for undertaking of any work in any natural watercourse.
19. Nothing in this NOC shall be deemed to neither preclude the institution of any legal action nor relieve the applicant from any responsibilities, liabilities or penalties to which the applicant is or may be subjected under this or any other Act.
20. The diversion or bye pass of any discharge from facilities utilized by the applicant to maintain compliance with the terms and conditions of this consent is prohibited except.
 - (i) Where unavoidable to prevent loss of life or some property damage or
 - (ii) Where excessive storm drainage or run off would damage facilities necessary for compliance with terms and conditions of this consent. The applicant shall immediately notify the consent issuing authority in writing of each such diversion or bye-pass.

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Hpcl Bathinda.2g Ethanol Bio-refinery Plant:1136(39-3), 1137/1(12-10), 1138(29-10), 1139/1(13-10), 1139/2(11-10), 1140(25-0), 1141/1/1(8-5), 1141/1/2(3-2), 1143(25-0), 1144/1(13-0), 1144/2(11-0), 1144/3(9-6), 1144/Talwandi Sabo,Bathinda,151001

21. The industry shall ensure that no water pollution problem is created in the area due to discharge of effluents from its industrial premises.
22. The industry shall comply with the conditions imposed if any by the SEIAA/MOEF in the Environmental Clearance granted to it as required under EIA notification dated 14/9/06, if applicable.
23. The industry shall earmark a land within their premises for disposal of boiler ash in an environmentally sound manner, and / or the industry shall make necessary arrangements for proper disposal of fuel ash in a scientific manner and shall maintain proper record for the same, if applicable.
24. The industry shall obtain and submit Insurance cover as required under the Public Liability Insurance Act, 1991.
25. The industry shall submit a site emergency plan approved by the Chief Inspector of Factories, Punjab as applicable.
26. The industry shall provide proper and adequate air pollution control arrangements for control emission from its coal/fuel handling area, if applicable.
27. The Industry shall comply with the code of practice as notified by the Government / Board for the type of Industries where the siting guidelines / code of practice have been notified
28. Solids, sludge, filter backwash or other pollutant removed from or resulting from treatment or control of waste waters shall be disposed off in such a manner so as to prevent any pollutants from such materials from entering into natural water.
29. The industry shall submit a detailed plan showing therein, the distribution system for conveying waste-waters for application on land for irrigation along with the crop pattern to be adopted throughout the year.
30. The industry shall not irrigate the vegetable crops with the treated effluents which are used/ consumed as raw.
31. The industry shall ensure that its production capacity & quantity of trade effluent do not exceed the quantity mentioned in the NOC and shall not carry out any expansion without the prior permission/NOC of the Board.
32. All amendments/revisions made by the Board in the emission/stack height standards shall be applicable to the industry from the date of such amendments/revisions.
33. The industry shall not cause any nuisance/traffic hazard in vicinity of the area.
34. The industry shall maintain the following record to the satisfaction of the Board :-
 - (i) Log books for running of air pollution control devices or pumps/motors used for it.
 - (ii) Register showing the result of various tests conducted by the industry for monitoring of stack emissions and ambient air.
 - (iii) Register showing the stock of absorbents and other chemicals to be used for scrubbers.
35. The industry shall ensure that there will not be significant visible dust emissions beyond the property line.
36. The industry shall establish sufficient number of piezometer wells in consultation with the concerned Regional Office, of the Board to monitor the impact on the Ground Water Quantity due to the industrial operations, if applicable.
37. The industry shall provide adequate and appropriate air pollution control devices to contain emissions from handling, transportation and processing of raw material & product of the industry



27/11/2019

(Ruby Sidhu)
Asstt Environmental Engineer

For & on behalf

of

"This is computer generated document from OCMMS by PPCB"

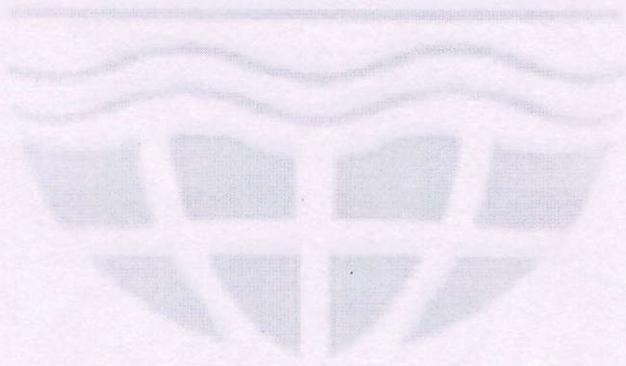
Hpl Bathinda, 2g Ethanol Bio-refinery Plant: 1136(39-3), 1137/1(12-10), 1138(29-10), 1139/1(13-10), 1139/2(11-10), 1140(25-0), 1141/1/1(8-5), 1141/1/2(3-2), 1143(25-0), 1144/1(13-0), 1144/2(11-0), 1144/3(9-6), 1144/Talwandi Sabo, Bathinda, 151001

Page 6

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PUNJAB

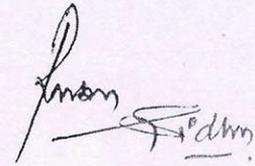


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Hpel Bathinda, 2g Ethanol Bio-refinery Plant: 1136(39-3), 1137/1(12-10), 1138(29-10), 1139/1(13-10), 1139/2(11-10), 1140(25-0), 1141/1/1(8-5), 1141/1/2(3-2), 1143(25-0), 1144/1(13-0), 1144/2(11-0), 1144/3(9-6), 1144/Talwandi Sabo, Bathinda, 151001

B. SPECIAL CONDITIONS

1. The industry shall comply with the conditions of the Environmental Clearance granted to it from MoEF vide F.No. J-11011/221/2017-IA II (I) dated 14.08.2018.
2. The industry will ensure to achieve zero liquid discharge and it shall be ensured that no waste/treated water is discharged, without prior permission of the Board.
3. The industry shall provide continuous online monitoring system for the stack emissions and the data of the same shall be connected with the server of the Board.
4. The industry shall develop thick green belt all along the boundary wall covering 33 % of the total project area as per the karnal technology.
5. The industry shall manage and transport the fuel ash to be generated from its boilers in a scientific manner.



27/11/2019

(Ruby Sidhu)
Asstt Environmental Engineer

For & on behalf

of

(Punjab Pollution Control Board)

PUNJAB

"This is computer generated document from OCMMS by PPCB"

Hpl Bathinda, 2g Ethanol Bio-refinery Plant: 1136(39-3), 1137/1(12-10), 1138(29-10), 1139/1(13-10), 1139/2(11-10), 1140(25-0), 1141/1/1(8-5), 1141/1/2(3-2), 1143(25-0), 1144/1(13-0), 1144/2(11-0), 1144/3(9-6), 1144/Talwandi Sabo, Bathinda, 151001

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सत्यमेव जयते

By Speed Post/Online

F.No.J-11011/221/2017- IA II(I)
Government of India
Ministry of Environment, Forest and Climate Change
(Impact Assessment Division)

Indira Paryavaran Bhawan
Jorbagh Road, New Delhi - 110003

Dated: 23rd September, 2020

To

M/s Hindustan Petroleum Corporation Limited
6th Floor, Core – II, North Tower, Scope Minar
Lakshmi Nagar, Delhi-110092

Email: sanjoykr@hpcl.in

Sub: Setting up 2G Ethanol Bio-refinery Plant of capacity 100 KLPD at Village Nasibpura, Tehsil Talwandi Sabo, Bathinda, Punjab by M/s Hindustan Petroleum Corporation Limited- Amendment in the Environmental Clearance-reg.

Sir,

This has reference to your proposal No. IA/PB/IND2/154665/2020 dated 28th May 2020, for amendment in the environmental clearance (EC) granted for the above project.

2. The Ministry has granted environmental clearance vide letter dated 14th August, 2018 to the project for Setting up 2G Ethanol Bio-refinery Plant of capacity 100 KLPD at Village Nasibpura, Tehsil Talwandi Sabo, Bathinda, Punjab in favour of M/s Hindustan Petroleum Corporation Limited.

3. The project proponent has now requested for amendment in the EC with the details are as under;

S. No.	Para of EC issued by Ministry	Details as per the EC	To be revised/ read as																				
1.	Para No.2	2G Ethanol Bio-refinery plant of capacity 100 KLPD in total area of 15.1 Ha.	The area of Bio-refinery is changed from 15.1 Ha to 20.9 Ha																				
2.	Para No.3	Details of by-products: <table border="1"><tr><td>CO₂ (raw)</td><td>80 TPD</td></tr><tr><td>Methanol</td><td>0.03 KLPD</td></tr><tr><td>Technical Alcohol</td><td>N/A</td></tr><tr><td>FO</td><td>0.3 KLPD</td></tr><tr><td>Ash</td><td>60 TPD</td></tr></table>	CO ₂ (raw)	80 TPD	Methanol	0.03 KLPD	Technical Alcohol	N/A	FO	0.3 KLPD	Ash	60 TPD	Details of By-Product <table border="1"><tr><td>CO₂ (raw)</td><td>75-76 TPD</td></tr><tr><td>Methanol</td><td>N/A</td></tr><tr><td>Technical Alcohol</td><td>2 KLPD</td></tr><tr><td>FO</td><td>0.3 KLPD</td></tr><tr><td>Ash</td><td>115-125 TPD</td></tr></table>	CO ₂ (raw)	75-76 TPD	Methanol	N/A	Technical Alcohol	2 KLPD	FO	0.3 KLPD	Ash	115-125 TPD
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Ash	115-125 TPD																						

3.	Para No.4	Greenbelt will be developed in 4.98 ha. Total Estimated cost is 850 Crores. Environmental pollution control measures will be Rs. 13.5 Crores. The recurring cost (O&M) will be about Rs. 123 Crores per annum.	Greenbelt will be developed in 6.88 ha. Total Estimated cost is Rs. 1096.25 Crores. Environmental pollution control measures will be Rs. 38 Crores. The recurring cost (O&M) will be about Rs. 240.09 Crores per annum.																																
4.	Para No.6	<ul style="list-style-type: none"> • Fresh water requirement 1800 Cum/day. • Power requirement 10.5 MW • 2 X 500 KVA DG sets • Two rice straw/Cotton stalk fired boiler of 35 TPH 	<ul style="list-style-type: none"> • Fresh water requirement 2280 Cum/day. • Power requirement 11.5 MW • 2 X 2000 KVA DG sets • Two rice straw/Cotton stalk fired boiler of 42 TPH 																																
5.	Para No.7	<table border="1"> <tr> <td colspan="2">Hazardous waste</td> </tr> <tr> <td>Used Lubricants</td> <td>0.5 MTM</td> </tr> <tr> <td>Used Containers (Metal & Plastic)</td> <td>1200 (Nos.)</td> </tr> <tr> <td>HDPE/LDTE/Gunny bags</td> <td>800 (Nos.)</td> </tr> <tr> <td colspan="2">Non Hazardous waste</td> </tr> <tr> <td>Mud</td> <td>8 TPD</td> </tr> <tr> <td>Ash</td> <td>79.2 TPD</td> </tr> <tr> <td>Dewatered sludge</td> <td>N/A</td> </tr> </table> <p>Solid and Harzardous waste generated as:Used Lubricants 0.5 MTM , Used Container(Metal and Plastic) 1200, HDPE/LDTE/Gunny Bags 800 Non-Hazardous Waste Generated as: Mud 8 TPD, Ash 79.2 TPD</p>	Hazardous waste		Used Lubricants	0.5 MTM	Used Containers (Metal & Plastic)	1200 (Nos.)	HDPE/LDTE/Gunny bags	800 (Nos.)	Non Hazardous waste		Mud	8 TPD	Ash	79.2 TPD	Dewatered sludge	N/A	<table border="1"> <tr> <td colspan="2">Hazardous waste</td> </tr> <tr> <td>Used Lubricants</td> <td>0.5-0.7 MTM</td> </tr> <tr> <td>Used Containers (Metal & Plastic)</td> <td>1300 (Nos.)</td> </tr> <tr> <td>HDPE/LDTE/Gunny bags</td> <td>1700 (Nos.)</td> </tr> <tr> <td colspan="2">Non Hazardous waste</td> </tr> <tr> <td>Mud</td> <td>8-10 TPD</td> </tr> <tr> <td>Ash</td> <td>115-125 TPD</td> </tr> <tr> <td>Dewatered sludge</td> <td>8-9 TPD</td> </tr> </table> <p>Solid and Harzardous waste generated as:Used Lubricants 0.5-0.7 MTM , Used Container(Metal and Plastic) 1300, HDPE/LDTE/Gunny Bags 1700 Non-Hazardous Waste Generated as: Mud 8-10 TPD, Ash 115-125 TPD and De-watered sludge 8-9 TPD</p>	Hazardous waste		Used Lubricants	0.5-0.7 MTM	Used Containers (Metal & Plastic)	1300 (Nos.)	HDPE/LDTE/Gunny bags	1700 (Nos.)	Non Hazardous waste		Mud	8-10 TPD	Ash	115-125 TPD	Dewatered sludge	8-9 TPD
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6.	Para No.11 (f)	Total fresh water requirement shall not exceed 1800 Cum/day.	Total fresh water requirement shall not exceed 2280 Cum/day.																																

4. The proposal was considered by the Expert Appraisal Committee (Industry-2) in its meeting held on 14-16 July, 2020 in the Ministry. The project proponent has informed the Committee that the previous technology has failed to meet the performance guarantees for water, power, consumables and ethanol yield. The technology had many gaps in BEDP and proprietary equipment hence, HPCL has to adopt new technology which is well proven at demonstration scale plant. All the changes are attributable to change in technology. The additional land of 5.8 ha is under possession of HPCL since March, 2019 and was originally to be utilized for biomass storage. Green belt shall be increased to cover 33% of the project area. Capital cost and O&M cost has increased due to change in equipment and technology.

The EAC noted that the amendment in EC is necessitated due to changes in technology adopted by the project proponent for the bio-refinery project to produce ethanol from Biomass. The Committee took serious note on the techno-economic

viability of the project, and also huge requirement of fresh water and additional land. However, considering adverse impact of burning of paddy/rice straw (stubble burning) in the country and particularly in the NCR, significantly contributing to air pollution especially during winters, the Committee agreed to consider the proposal. The EAC after detailed deliberations, considering the importance of the project, improvement in technology and R&D in the area, has of the view that such projects require encouragement and has accordingly recommended for amendment in EC as proposed by the project proponent.

5. Based on recommendations of the EAC, Ministry hereby accords approval for amendment in the environmental clearance dated 14th August, 2018, with all other terms and conditions stipulated therein remain unchanged.

6. This issues with approval of the competent authority.

23/09/2020
(Dr. R. B. Lal)

Scientist 'E'/Additional Director

Copy to:-

1. The Deputy DGF (C), MoEF&CC Regional Office (NZ), Bays No. 24-25, Sector 31 A, Dakshin Marg, Chandigarh – 30
2. The Secretary, Department of Science, Technology and Environment, Government of Punjab, Civil Secretariat, Chandigarh
3. The Member Secretary, Central Pollution Control Board, Parivesh Bhawan, CBD-cum-Office Complex East Arjun Nagar, Delhi – 32
4. The Member Secretary, Punjab Pollution Control Board, Vatavaran Bhawan, Patiala (Punjab)
5. Guard File/Monitoring File/Website/Record File

o/copy

23/09/2020
(Dr. R. B. Lal)

Scientist 'E'/Additional Director

Tele-fax: 011-24695362

Email-rb.lal@nic.in

F. No. J-11011/221/2017- IA II(I)
Government of India
Ministry of Environment, Forest and Climate Change
(IA-II Division)

Indira Paryavaran Bhawan
Jorbagh Road, New Delhi - 3
Dated: 14th August, 2018

To,

M/s Hindustan Petroleum Corporation Limited
17, Jamshedji Tata Road,
Mumbai - 400 020 (Maharashtra)

Sub: Setting up 2G Ethanol Bio-refinery Plant of capacity 100 KLPD by M/s Hindustan Petroleum Corporation Limited at Village Nasibpura, Tehsil Talwandi Sabo, Bathinda (Punjab) - Environmental Clearance - reg.

Ref: Online proposal No.IA/PB/IND2/64593/2017 dated 18th July, 2018.

Sir,

This has reference to your online proposal No.IA/PB/IND2/64593/2017 dated 18th July, 2018 for environmental clearance to the above project, along with project documents namely, EIA/EMP report containing the public hearing details for the above mentioned project.

2. The Ministry of Environment, Forest and Climate Change has examined the proposal for environmental clearance to the project for setting up 2G Ethanol Bio-refinery plant of capacity 100 KLPD by M/s Hindustan Petroleum Corporation Limited in a total area of 15.1 ha at Village Nasibpura, Tehsil Talwandi Sabo, Bathinda (Punjab).

3. The details of the products and by-products are as under:-

S. No.	Product	Capacity
1	Ethanol	100 KLPD

By-Product		
1	CO ₂	80 TPD
2	Ash (with Silica)	60 TPD
3	Fuel Oil	0.3 KLPD
4	Methanol	0.03 KLPD

4. Total land area requirement will be 15.1 ha. Green belt will be developed in 4.98 ha, covering 33 % of total project area. Total estimated project cost is Rs.850 crore. The capital cost earmarked for environmental pollution control measures will be Rs.13.5 crore, and the recurring cost (operation & maintenance) will be about Rs.123 crore per annum.



5. There are no National Parks, Wildlife Sanctuaries, Biosphere Reserves, Tiger/Elephant Reserves, Wildlife Corridors etc within the 10 km of the project site. Lasara drain is situated at a distance of 0.67 km in SE direction.

6. Total water requirement is estimated to be 4972 cum/day, out of which fresh water requirement of 1800 cum/day will be met from canal supply.

Total effluent generated from different industrial operations is estimated to be 3340 cum/day, which shall be treated through the RO and MEE. Treated water of 3172 cum/day shall be recycled to meet the process requirements. There will be no discharge of treated/ untreated waste water from the unit and thus ensuring zero liquid discharge.

Power requirement of 10.5 MW is proposed to be met from State Power Distribution Corporation Limited (SPDCL). Two DG sets of 500 KVA capacity each will be used during power failure. Adequate stack height shall be provided to the proposed DG sets as per CPCB norms.

Two rice straw/cotton stalk fired boilers of 35 TPH each will be installed. Electrostatic Precipitator (ESP) with a stack height of 70 m will be provided to control the particulate emissions within the statutory norms.

7. Details of solid waste/hazardous waste generation and its management are as under:-

(a) Hazardous Waste

Waste	Quantity	Disposal
Used Lubricants	0.5 MTM	CHWTSDF
Used Containers (Metal & Plastic)	1200 (Nos.)	Decontamination & Re-use or sell to Scrap vendors
HDPE/ LDTE/ Gunny Bags	800 (Nos.)	Decontamination & Re-use or sell to Scrap vendors

(b) Non-Hazardous Solid Waste

Waste	Qty.	Remarks
Mud	8 TPD	used in construction business.
Ash (comprising silica)	60 TPD (For Rice straw)	to be sold
Ash	19.2 TPD (For Cotton Stalk)	to be sold

8. The project/activity is covered under category A of item 5(g) 'Distilleries' of Schedule of Environment Impact Assessment (EIA) Notification, 2006, and requires appraisal at central level by the sectoral EAC in the Ministry.

9. The ToR for the project was granted on 19th July, 2017, and public hearing was conducted by the State Pollution Control Board on 2nd May, 2018.

SKD

10. The proposal was considered by the Expert Appraisal Committee (Industry-2) in its 39th meeting held during 25-27 July, 2018. The project proponent and their accredited consultant M/s Ultratech, presented the EIA / EMP report as per the ToR. The Committee found the EIA / EMP Report to be satisfactory and complying with the ToR. The Committee has recommended the proposal for grant of environmental clearance.

11. Based on the proposal submitted by the project proponent and recommendations of the EAC (Industry-2), the Ministry of Environment, Forest and Climate change hereby accords environmental clearance to the project for setting up **2G Ethanol Bio-Refinery Plant of capacity 100 KLPD** by M/s Hindustan Petroleum Corporation Limited in a total area of 15.1 ha at Village Nasibpura, Tehsil Talwandi Sabo, Bathinda (Punjab), under the provisions of the EIA Notification, 2006, subject to the compliance of terms and conditions as below:-

- (a) The final product (Ethanol) shall be used exclusively for fuel blending only.
- (b) Consent to Establish/Operate for the project shall be obtained from the State Pollution Control Board as required under the Air (Prevention and Control of Pollution) Act, 1981 and the Water (Prevention and Control of Pollution) Act, 1974.
- (c) As already committed by the project proponent, Zero Liquid Discharge shall be ensured and no waste/treated water shall be discharged outside the premises.
- (d) Necessary authorization required under the Hazardous and Other Wastes (Management and Trans-Boundary Movement) Rules, 2016, Solid Waste Management Rules, 2016 shall be obtained and the provisions contained in the Rules shall be strictly adhered to.
- (e) To control source and the fugitive emissions, suitable pollution control devices shall be installed to meet the prescribed norms and/or the NAAQS. The gaseous emissions shall be dispersed through stack of adequate height as per CPCB/SPCB guidelines.
- (f) Total fresh water requirement shall not exceed 1800 cum/day, proposed to be met from canal supply.
- (g) Process effluent/any wastewater shall not be allowed to mix with storm water. Storm water drain shall be passed through a separate conveyance system.
- (h) The Company shall strictly comply with the rules and guidelines under Manufacture, Storage and Import of Hazardous Chemicals (MSIHC) Rules, 1989 as amended time to time. All transportation of Hazardous Chemicals shall be as per the Motor Vehicle Act (MVA), 1989.
- (i) The company shall undertake waste minimization measures as below:-
 - (i) Metering and control of quantities of active ingredients to minimize waste.
 - (ii) Reuse of by-products from the process as raw materials or as raw material substitutes in other processes.
 - (iii) Use of automated filling to minimize spillage.
 - (iv) Use of Close Feed system into batch reactors.
 - (v) Venting equipment through vapour recovery system.
 - (vi) Use of high pressure hoses for equipment clearing to reduce wastewater generation.



- (j) The green belt of 5-10 m width shall be developed in more than 33% of the total project area, mainly along the plant periphery, in downward wind direction, and along road sides etc. Selection of plant species shall be as per the CPCB guidelines in consultation with the State Forest Department.
- (k) All the commitments made regarding issues raised during the public hearing/ consultation meeting shall be satisfactorily implemented.
- (l) At least 1% of the total project cost shall be allocated for Corporate Environment Responsibility (CER) and the details along with time bound action plan shall be submitted to the Ministry's Regional Office.
- (m) For the DG sets, emission limits and the stack height shall be in conformity with the extant regulations and the CPCB guidelines. Acoustic enclosure shall be provided to DG set for controlling the noise pollution.
- (n) The unit shall make the arrangement for protection of possible fire hazards during manufacturing process in material handling. Fire fighting system shall be as per the norms.
- (o) Occupational health surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.
- (p) There shall be adequate space inside the plant premises earmarked for parking of vehicles for raw materials and finished products, and no parking to be allowed outside on public places.
- (q) Storage of raw materials shall be either stored in silos or in covered areas to prevent dust pollution and other fugitive emissions.
- (r) Continuous online (24x7) monitoring system for stack emissions shall be installed for measurement of flue gas discharge and the pollutants concentration, and the data to be transmitted to the CPCB and SPCB server. For online continuous monitoring of effluent, the unit shall install web camera with night vision capability and flow meters in the channel/drain carrying effluent within the premises.
- (s) CO₂ generated from the process shall be bottled/made solid ice/value added products and sold to authorized vendors.

11.1 The grant of Environmental Clearance is further subject to compliance of other generic conditions as under:-

- (i) The project authorities must strictly adhere to the stipulations made by the state Pollution Control Board (SPCB), State Government and/ or any other statutory authority.
- (ii) No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment, Forest and Climate Change. In case of deviations or alterations in the project proposal from those submitted to this Ministry for clearance, a fresh reference shall be made to the Ministry to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any.



- (iii) The locations of ambient air quality monitoring stations shall be decided in consultation with the State Pollution Control Board (SPCB) and it shall be ensured that at least one stations each is installed in the upwind and downwind direction as well as where maximum ground level concentrations are anticipated.
- (iv) The National Ambient Air Quality Emission Standards issued by the Ministry vide G.S.R. No. 826(E) dated 16th November, 2009 shall be complied with.
- (v) The overall noise levels in and around the plant area shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels shall conform to the standards prescribed under Environment (Protection) Act, 1986 Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time).
- (vi) The Company shall harvest rainwater from the roof tops of the buildings and storm water drains to recharge the ground water and utilize the same for different industrial operations within the plant.
- (vii) Training shall be imparted to all employees on safety and health aspects of chemicals handling. Pre-employment and routine periodical medical examinations for all employees shall be undertaken on regular basis. Training to all employees on handling of chemicals shall be imparted.
- (viii) The company shall comply with all the environmental protection measures and safeguards proposed in the documents submitted to the Ministry. All the recommendations made in the EIA/EMP in respect of environmental management, risk mitigation measures and public hearing shall be implemented.
- (ix) The company shall undertake all measures for improving socio-economic conditions of the surrounding area. CSR activities shall be undertaken by involving local villagers, administration and other stake holders. Also eco-developmental measures shall be undertaken for overall improvement of the environment.
- (x) A separate Environmental Management Cell equipped with full-fledged laboratory facilities shall be set up to carry out the Environmental Management and Monitoring functions.
- (xi) The company shall earmark sufficient funds towards capital cost and recurring cost per annum to implement the conditions stipulated by the Ministry of Environment, Forest and Climate Change as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so earmarked for environment management/ pollution control measures shall not be diverted for any other purpose.
- (xii) A copy of the clearance letter shall be sent by the project proponent to concerned Panchayat, Zila Parisad/ Municipal Corporation, Urban local Body and the local NGO, if any, from whom suggestions/ representations, if any, were received while processing the proposal.
- (xiii) The project proponent shall also submit six monthly reports on the status of compliance of the stipulated Environmental Clearance conditions including results of monitored data (both in hard copies as well as by e-mail) to the respective Regional Office of MoEF&CC, the respective



Zonal office of CPCB and SPCB. A copy of Environmental Clearance and six monthly compliance status report shall be posted on the website of the company.

(xiv) The environmental statement for each financial year ending 31st March in Form-V as is mandated shall be submitted to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental clearance conditions and shall also be sent to the respective Regional offices of MoEF&CC by e-mail.

(xv) The project proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB/Committee and may also be seen at Website of the Ministry at <http://moef.nic.in>. This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the concerned Regional office of the Ministry.

12. The Ministry reserves the right to stipulate additional conditions, if found necessary at subsequent stages and the project proponent shall implement all the said conditions in a time bound manner. The Ministry may revoke or suspend the environmental clearance, if implementation of any of the above conditions is not found satisfactory.

13. The above conditions will be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, the Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2016 and the Public Liability Insurance Act, 1991 read with subsequent amendments therein.


14/8/2018
(S. K. Srivastava)
Scientist E

Copy to: -

1. The Additional Principal Chief Conservator of Forests (C), Ministry of Environment, Forest and Climate Change, Regional Office (NZ), Bays No.24-25, Sector 31-A, Dakshin Marg, Chandigarh - 160030
2. The Secretary, Department of Science, Technology & Environment, Government of Punjab, **Chandigarh**
3. The Member Secretary, Central Pollution Control Board, Parivesh Bhavan, East Arjun Nagar, **Delhi** - 32
4. The Member Secretary, Punjab Pollution Control Board, Vatavaran Bhawan, Nabha Road, Patiala, 147001 (Punjab)
5. Monitoring Cell, Ministry of Environment, Forest and Climate Change, **New Delhi**
6. Guard File/Monitoring File/Record File


14/8/2018
(S. K. Srivastava)
Scientist E



Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122052, Haryana
 Branch Off: Plot No. 24 & 25, Narayan Vihar, B-Block, Jaipur - 302035, Rajasthan
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Test Report

Sample Number:	VEL/HPCL/W/01	Report No.:	VEL/W/2006/26/001
Name & Address of Party:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30° 3' 13.34" N	Party Reference No.:	NIL
Longitude:	75° 0' 41.57" E	Reporting Date:	01/07/2020
Sample Description:	Ground Water Sample	Period of Analysis:	26/06/2020 -- 01/07/2020
Sample Location:	Near Project Site	Receipt Date:	26/06/2020
Sample Collected by:	Vardan Enviro Lab Representative	Sampling Date:	22/06/2020
Parameter Required	As per work order	Sampling Quantity:	2.0 Ltr
Sampling & Analysis Protocol:	IS-10500-2012, APHA	Sampling Type:	Garb
		Preservation:	Refrigerated

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 °C)	APHA .4500-H ⁺ B Electrometric Method	7.62	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA .2120 B. Visual Comparison Method	*BDL (**DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA. 2130 B. Nephelometric Method	*BDL (**DL 1 NTU)	NTU	1	5
4.	Odour	APHA. 2150 B . Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA . 2160 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	APHA . 2340 C. EDTA Titrimetric Method	301.00	mg/l	200	600
7.	Calcium as Ca	APHA. 3500 Ca B. EDTA Titrimetric Method	73.15	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA . 2320 B. Titrimetric Method	210.34	mg/l	200	600
9.	Chloride as Cl	APHA. 4500-Cl ⁻ B. Argentometric Method	81.49	mg/l	250	1000
10.	Cyanide as CN	APHA . 4500 CN ⁻ D	*BDL (**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA . 3500 Mg B. Calculation Method	28.79	mg/l	30	100
12.	Total Dissolved Solids	APHA . 2540 C. Gravimetric Method	927.00	mg/l	500	2000
13.	Sulphate as SO ₄	APHA . 4500 E. Turbidimetric Method	48.27	mg/l	200	400
14.	Fluoride as F ⁻	APHA . 4500-F ⁻ D. SPADNS Method	0.91	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) .Chromotropic Method	10.62	mg/l	45	No Relaxation
16.	Iron as Fe	APHA . 3500-Fe B 1.10 Phenanthroline Method	0.21	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA . 3111 D Nitrous Oxide Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA. 4500B C. Carmine Method	*BDL(**DL 0.1 mg/l)	mg/l	0.5	1
19.	Total Chromium as Cr	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	No Relaxation

MEENU KAUSHIK
SR. ANALYST

ARJUN RAWAT
(Checked By)



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Branch Off: Plot No. 24 & 25, Narayan Vihar, B-Block, Jaipur - 302035, Rajasthan
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Test Report

Sample No.: VEL/HPCL/W/01				Report No.: VEL/W/2006/26/001		
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.001 mg/l)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.01mg/l)	mg/l	0.5	No Relaxation
22.	Anionic Detergents as MBAS	APHA, 5540 C MBAS Method	*BDL(**DL 0.02 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	APHA . 3111 B. Direct Air. Acetylene Flame Method	0.29	mg/l	5	15
24.	Copper as Cu	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	APHA . 3114 B. Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	APHA . 3114 B. Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	0.05
30.	Mercury as Hg	APHA . 3112 B. Cold Vapour AAS Method	*BDL (**DL 0.001 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1545	µS/cm	--	--
32.	Ammonia as NH ₃	IS 3025 (P-34) . Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA. 3500 Na B Flame Photometric Method	29.6	mg/l	--	--
34.	Potassium	APHA. 3500 Na B Flame Photometric Method	5.8	mg/l	--	--
35.	Total Coliform	IS 1622:2009 : 1987. RA:2019	< 2	MPN/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 1622:2009 : 1987. RA:2019	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note:- *BDL- Below Detection Limit. **DL- Detection Limit. These parameter are not covered in our NABL scope.

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Test Report

Sample Number:	VEL/HPCL/W/02	Report No.:	VEL/W/2006/26/002
Name & Address of Party:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30° 3' 37.63" N	Party Reference No.:	NIL
Longitude:	75° 2' 75.30" E	Reporting Date:	01/07/2020
Sample Description:	Ground Water Sample	Period of Analysis:	26/06/2020 – 01/07/2020
Sample Location:	Jiwan Singh Wala	Receipt Date:	26/06/2020
Sample Collected by:	Vardan Enviro Lab Representative	Sampling Date:	22/06/2020
Parameter Required	As per work order	Sampling Quantity:	2.0 Ltr
Sampling & Analysis Protocol:	IS-10500-2012, APHA	Sampling Type:	Garb
		Preservation:	Refrigerated

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 °C)	APHA .4500-11 B Electrometric Method	7.74	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA .2120 B. Visual Comparison Method	*BDL (**DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA .2130 B. Nephelometric Method	*BDL (**DL 1 NTU)	NTU	1	5
4.	Odour	APHA .2150 B . Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA . 2160 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	APHA . 2340 C. EDTA Titrimetric Method	265.00	mg/l	200	600
7.	Calcium as Ca	APHA. 3500 Ca B. EDTA Titrimetric Method	62.78	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA . 2320 B. Titrimetric Method	171.16	mg/l	200	600
9.	Chloride as Cl	APHA. 4500-Cl B. Argentometric Method	74.68	mg/l	250	1000
10.	Cyanide as CN	APHA . 4500 CN D	*BDL (**DL 0.05 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA . 3500 Mg B. Calculation Method	26.33	mg/l	30	100
12.	Total Dissolved Solids	APHA . 2540 C. Gravimetric Method	876.00	mg/l	500	2000
13.	Sulphate as SO ₄	APHA . 4500 E. Turbidimetric Method	31.49	mg/l	200	400
14.	Fluoride as F	APHA . 4500-F D. SPADNS Method	0.86	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) .Chromotropic Method	9.78	mg/l	45	No Relaxation
16.	Iron as Fe	APHA . 3500-Fe B 1,10 Phenanthroline Method	0.21	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA . 3111 D Nitrous Oxide Acetylene Flame Method	*BDL (**DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA. 4500B C. Carmine Method	*BDL (**DL 0.1 mg/l)	mg/l	0.5	1
19.	Total Chromium as Cr	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL (**DL 0.03 mg/l)	mg/l	0.05	No Relaxation

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Test Report

Sample No.: VEL/HPCL/W/02			Report No.: VEL/W/2006/26/002			
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.001 mg/l)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.01mg/l)	mg/l	0.5	No Relaxation
22.	Anionic Detergents as MBAS	APHA, 5540 C MBAS Method	*BDL(**DL 0.02 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	APHA . 3111 B. Direct Air. Acetylene Flame Method	0.53	mg/l	5	15
24.	Copper as Cu	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	APHA . 3114 B. Manual Hydride Generation	*BDL(**DL 0.13 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	APHA . 3114 B. Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	0.05
30.	Mercury as Hg	APHA . 3112 B. Cold Vapour AAS Method	*BDL(**DL 0.01 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1460	µS/cm	--	--
32.	Ammonia as NH ₃	IS 3025 (P-34) . Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA. 3500 Na B Flame Photometric Method	26.8	mg/l	--	--
34.	Potassium	APHA. 3500 Na B Flame Photometric Method	5.3	mg/l	--	--
35.	Total Coliform	IS 1622:2009 : 1987. RA:2019	< 2	MPN/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 1622:2009 : 1987. RA:2019	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note:- *BDL:- Below Detection Limit. **DL:- Detection Limit. *These parameter are not covered in our NABL scope.

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Test Report

Sample Number:	VEL/HPCL/W/03	Report No.:	VEL/W/2006/26/003
Name & Address of Party:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30° 2' 33.23" N	Party Reference No.:	NIL
Longitude:	75° 58' 6.88" E	Reporting Date:	01/07/2020
Sample Description:	Ground Water Sample	Period of Analysis:	26/06/2020 - 01/07/2020
Sample Location:	Maanwala	Receipt Date:	26/06/2020
Sample Collected by:	Vardan Enviro Lab Representative	Sampling Date:	22/06/2020
Parameter Required	As per Client Requirement	Sampling Quantity:	2.0 Ltr
Sampling & Analysis Protocol:	IS-10500-2012, APHA	Sampling Type:	Garb
		Preservation:	Refrigerated

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 °C)	APHA .4500-H B Electrometric Method	7.81	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA .2120 B. Visual Comparison Method	*BDL (**DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA. 2130 B. Nephelometric Method	*BDL (**DL 1 NTU)	NTU	1	5
4.	Odour	APHA. 2150 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA . 2160 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	APHA . 2340 C. EDTA Titrimetric Method	451.00	mg/l	200	600
7.	Calcium as Ca	APHA. 3500 Ca B. EDTA Titrimetric Method	83.25	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA . 2320 B. Titrimetric Method	312.57	mg/l	200	600
9.	Chloride as Cl	APHA. 4500-Cl B. Argentometric Method	205.16	mg/l	250	1000
10.	Cyanide as CN	APHA . 4500 CN D	*BDL (**DL 0.05 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA . 3500 Mg B. Calculation Method	59.11	mg/l	30	100
12.	Total Dissolved Solids	APHA . 2540 C. Gravimetric Method	989.00	mg/l	500	2000
13.	Sulphate as SO ₄	APHA . 4500 E. Turbidimetric Method	121.03	mg/l	200	400
14.	Fluoride as F	APHA . 4500-F D. SPADNS Method	1.35	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) .Chromotropic Method	13.05	mg/l	45	No Relaxation
16.	Iron as Fe	APHA . 3500-Fe B 1,10 Phenanthroline Method	0.37	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA . 3111 D Nitrous Oxide Acetylene Flame Method	*BDL (**DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA. 4500B C. Carmine Method	*BDL (**DL 0.1 mg/l)	mg/l	0.5	1
19.	Total Chromium as Cr	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL (**DL 0.03 mg/l)	mg/l	0.05	No Relaxation

MEENU KAUSHIK
SR. ANALYST
(Checked By)

ARJUN RAWAT
(Checked By)



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Test Report

Sample No.: VEL/HPCL/W/03			Report No.: VEL/W/2006/26/003			
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.001 mg/l)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.01 mg/l)	mg/l	0.5	No Relaxation
22.	Anionic Detergents as MBAS	APHA, 5540 C MBAS Method	*BDL(**DL 0.02 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	APHA . 3111 B. Direct Air. Acetylene Flame Method	0.41	mg/l	5	15
24.	Copper as Cu	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	APHA . 3114 B. Manual Hydride Generation	*BDL(**DL 0.13 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	APHA . 3114 B. Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	0.05
30.	Mercury as Hg	APHA . 3112 B. Cold Vapour AAS Method	*BDL(**DL 0.01 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1648	µS/cm	--	--
32.	Ammonia as NH ₃	IS 3025 (P-34) . Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA, 3500 Na B Flame Photometric Method	28.7	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	6.4	mg/l	--	--
35.	Total Coliform	IS 1622:2009 ; 1987. RA:2019	< 2	MPN/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 1622:2009 ; 1987. RA:2019	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note:- *BDL- Below Detection Limit. **DL- Detection Limit. These parameter are not covered in our NABL scope.

MEENU KAUSHIK
Sr. Analyst

ARJUN RAWAT
(Checked By)



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Test Report

Sample Number:	VEL/HPCL/W/04	Report No.:	VEL/W/2006/26/004
Name & Address of Party:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30° 1' 13.05" N	Party Reference No.:	NIL
Longitude:	75° 1' 3.89" E	Reporting Date:	01/07/2020
Sample Description:	Ground Water Sample	Period of Analysis:	26/06/2020 – 01/07/2020
Sample Location:	Mahi Nangal	Receipt Date:	26/06/2020
Sample Collected by:	Vardan Enviro Lab Representative	Sampling Date:	22/06/2020
Parameter Required	As per Client Requirement	Sampling Quantity:	2.0 Ltr
Sampling & Analysis Protocol:	IS-10500-2012, APHA	Sampling Type:	Garb
		Preservation:	Refrigerated

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 °C)	APHA .4500-H' B Electrometric Method	7.61	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA .2120 B. Visual Comparison Method	*BDL (**DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA. 2130 B. Nephelometric Method	*BDL (**DL 1 NTU)	NTU	1	5
4.	Odour	APHA. 2150 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA . 2160 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	APHA . 2340 C. EDTA Titrimetric Method	375.00	mg/l	200	600
7.	Calcium as Ca	APHA. 3500 Ca B. EDTA Titrimetric Method	93.86	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA . 2320 B. Titrimetric Method	287.18	mg/l	200	600
9.	Chloride as Cl	APHA. 4500-Cl' B. Argentometric Method	89.16	mg/l	250	1000
10.	Cyanide as CN	APHA . 4500 CN' D	*BDL (**DL 0.05 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA . 3500 Mg B. Calculation Method	34.21	mg/l	30	100
12.	Total Dissolved Solids	APHA . 2540 C. Gravimetric Method	936.00	mg/l	500	2000
13.	Sulphate as SO ₄	APHA . 4500 E. Turbidimetric Method	80.11	mg/l	200	400
14.	Fluoride as F ⁻	APHA . 4500-F' D. SPADNS Method	0.82	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) .Chromotropic Method	11.06	mg/l	45	No Relaxation
16.	Iron as Fe	APHA . 3500-Fe B 1.10 Phenanthroline Method	0.25	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA . 3111 D Nitrous Oxide Acetylene Flame Method	*BDL (**DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA. 4500B C. Carmine Method	*BDL (**DL 0.1 mg/l)	mg/l	0.5	1
19.	Total Chromium as Cr	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL (**DL 0.03 mg/l)	mg/l	0.05	No Relaxation

MEENU KAUSHIK

SR. ANALYST

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ARJUN RAWAT

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Test Report

Sample No.: VEL/HPCL/W/04					Report No.: VEL/W/2006/26/004	
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.001 mg/l)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.01 mg/l)	mg/l	0.5	No Relaxation
22.	Anionic Detergents as MBAS	APHA, 5540 C MBAS Method	*BDL(**DL 0.02 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	APHA . 3111 B. Direct Air. Acetylene Flame Method	0.62	mg/l	5	15
24.	Copper as Cu	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	APHA . 3114 B. Manual Hydride Generation	*BDL(**DL 0.13 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	APHA . 3114 B. Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	0.05
30.	Mercury as Hg	APHA . 3112 B. Cold Vapour AAS Method	*BDL(**DL 0.01 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1560	µS/cm	--	--
32.	Ammonia as NH ₃	IS 3025 (P-34) . Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA. 3500 Na B Flame Photometric Method	29.7	mg/l	--	--
34.	Potassium	APHA. 3500 Na B Flame Photometric Method	7.5	mg/l	--	--
35.	Total Coliform	IS 1622:2009 : 1987. RA:2019	< 2	MPN/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 1622:2009 : 1987. RA:2019	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note:- *BDL- Below Detection Limit, **DL- Detection Limit. These parameter are not covered in our NABL scope.

MEENU KAUSHIK
 SR. ANALYST
 (NABL)

ARJUN RAWAT
 (Checked By)



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Test Report

Sample Number:	VEL/HPCL/W/05	Report No.:	VEL/W/2006/26/005
Name & Address of Party:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30° 6' 34.53" N	Party Reference No.:	NIL
Longitude:	75° 0' 23.67" E	Reporting Date:	01/07/2020
Sample Description:	Ground Water Sample	Period of Analysis:	26/06/2020 -- 01/07/2020
Sample Location:	Kot Kashmir	Receipt Date:	26/06/2020
Sample Collected by:	Vardan Enviro Lab Representative	Sampling Date:	22/06/2020
Parameter Required	As per Client Requirement	Sampling Quantity:	2.0 Ltr
Sampling & Analysis Protocol:	IS-10500-2012, APHA	Sampling Type:	Garb
		Preservation:	Refrigerated

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 °C)	APHA .4500-11' B Electrometric Method	7.91	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA .2120 B. Visual Comparison Method	*BDL (**DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA. 2130 B. Nephelometric Method	*BDL (**DL 1 NTU)	NTU	1	5
4.	Odour	APHA. 2150 B . Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA . 2160 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	APHA . 2340 C. EDTA Titrimetric Method	411.00	mg/l	200	600
7.	Calcium as Ca	APHA. 3500 Ca B. EDTA Titrimetric Method	98.26	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA . 2320 B. Titrimetric Method	320.16	mg/l	200	600
9.	Chloride as Cl	APHA. 4500-Cl' B. Argentometric Method	117.07	mg/l	250	1000
10.	Cyanide as CN	APHA . 4500 CN' D	*BDL (**DL 0.05 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA . 3500 Mg B. Calculation Method	40.30	mg/l	30	100
12.	Total Dissolved Solids	APHA . 2540 C. Gravimetric Method	1024.00	mg/l	500	2000
13.	Sulphate as SO ₄	APHA . 4500 E. Turbidimetric Method	90.12	mg/l	200	400
14.	Fluoride as F ⁻	APHA . 4500-F' D. SPADNS Method	0.93	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) .Chromotropic Method	12.05	mg/l	45	No Relaxation
16.	Iron as Fe	APHA . 3500-Fe B 1.10 Phenanthroline Method	0.29	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA . 3111 D Nitrous Oxide Acetylene Flame Method	*BDL (**DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA. 4500B C. Carmine Method	*BDL (**DL 0.1 mg/l)	mg/l	0.5	1
19.	Total Chromium as Cr	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL (**DL 0.03 mg/l)	mg/l	0.05	No Relaxation

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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122052, Haryana
 Branch Off: Plot No. 24 & 25, Narayan Vihar, B-Block, Jaipur - 302035, Rajasthan
NABL Accredited | MoEF&CC Recognized | ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample No.: VEL/HPCL/W/05			Report No.: VEL/W/2006/26/005			
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.001 mg/l)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.01mg/l)	mg/l	0.5	No Relaxation
22.	Anionic Detergents as MBAS	APHA, 5540 C MBAS Method	*BDL(**DL 0.02 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	APHA . 3111 B. Direct Air. Acetylene Flame Method	0.72	mg/l	5	15
24.	Copper as Cu	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	APHA . 3114 B. Manual Hydride Generation	*BDL(**DL 0.13 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	APHA . 3114 B. Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	0.05
30.	Mercury as Hg	APHA . 3112 B. Cold Vapour AAS Method	*BDL(**DL 0.01 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1707	µS/cm	--	--
32.	Ammonia as NH ₃	IS 3025 (P-34) . Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA. 3500 Na B Flame Photometric Method	31.8	mg/l	--	--
34.	Potassium	APHA. 3500 Na B Flame Photometric Method	8.1	mg/l	--	--
35.	Total Coliform	IS 1622:2009 : 1987. RA:2019	< 2	MPN/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 1622:2009 : 1987. RA:2019	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note:- *BDL- Below Detection Limit, **DL- Detection Limit. These parameter are not covered in our NABL scope.

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SR ANALYST

(Signature)

ARJUN RAWAT

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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122052, Haryana
 Branch Off: Plot No. 24 & 25, Narayan Vihar, B-Block, Jaipur - 302035, Rajasthan
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Test Report

Sample Number:	VEL/HIPCL/W/06	Report No.:	VEL/W/2006/26/006
Name & Address of Party:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30° 4' 34.79" N	Party Reference No.:	NIL
Longitude:	74° 59' 57.45" E	Reporting Date:	01/07/2020
Sample Description:	Ground Water Sample	Period of Analysis:	26/06/2020 – 01/07/2020
Sample Location:	Nasibpura	Receipt Date:	26/06/2020
Sample Collected by:	Vardan Enviro Lab Representative	Sampling Date:	24/06/2020
Parameter Required	As per Client Requirement	Sampling Quantity:	2.0 Ltr
Sampling & Analysis Protocol:	IS-10500-2012, APHA	Sampling Type:	Garb
		Preservation:	Refrigerated

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 °C)	APHA . 4500-H ⁺ B Electrometric Method	7.88	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA . 2120 B. Visual Comparison Method	*BDL (**DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA. 2130 B. Nephelometric Method	*BDL (**DL 1 NTU)	NTU	1	5
4.	Odour	APHA. 2150 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA . 2160 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	APHA . 2340 C. EDTA Titrimetric Method	396.00	mg/l	200	600
7.	Calcium as Ca	APHA. 3500 Ca B. EDTA Titrimetric Method	104.36	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA . 2320 B. Titrimetric Method	292.47	mg/l	200	600
9.	Chloride as Cl	APHA. 4500-Cl ⁻ B. Argentometric Method	101.05	mg/l	250	1000
10.	Cyanide as CN	APHA . 4500 CN ⁻ D	*BDL (**DL 0.05 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA . 3500 Mg B. Calculation Method	32.95	mg/l	30	100
12.	Total Dissolved Solids	APHA . 2540 C. Gravimetric Method	996.00	mg/l	500	2000
13.	Sulphate as SO ₄	APHA . 4500 E. Turbidimetric Method	87.15	mg/l	200	400
14.	Fluoride as F	APHA . 4500-F ⁻ D. SPADNS Method	0.85	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) .Chromotropic Method	10.29	mg/l	45	No Relaxation
16.	Iron as Fe	APHA . 3500-Fe B 1.10 Phenanthroline Method	0.34	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA . 3111 D Nitrous Oxide Acetylene Flame Method	*BDL (**DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA. 4500B C. Carmine Method	*BDL (**DL 0.1 mg/l)	mg/l	0.5	1
19.	Total Chromium as Cr	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL (**DL 0.03 mg/l)	mg/l	0.05	No Relaxation

MEENU KAUSHIK
SR. ANALYST

APRILIN RAWAT
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Tel: 0124-4343750, 4343752, 4343753 | E-mail: lab@vardanenviro.net, bd@vardanenviro.net

Test Report

Sample No.: VEL/HPCL/W/06				Report No.: VEL/W/2006/26/006		
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL (**DL 0.001 mg/l)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL (**DL 0.01 mg/l)	mg/l	0.5	No Relaxation
22.	Anionic Detergents as MBAS	APHA, 5540 C MBAS Method	*BDL (**DL 0.02 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	APHA . 3111 B. Direct Air. Acetylene Flame Method	0.81	mg/l	5	15
24.	Copper as Cu	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL (**DL 0.03 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL (**DL 0.06 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL (**DL 0.03 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL (**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	APHA . 3114 B. Manual Hydride Generation	*BDL (**DL 0.13 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	APHA . 3114 B. Manual Hydride Generation	*BDL (**DL 0.01 mg/l)	mg/l	0.01	0.05
30.	Mercury as Hg	APHA . 3112 B. Cold Vapour AAS Method	*BDL (**DL 0.01 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1660	µS/cm	--	--
32.	Ammonia as NH ₃	IS 3025 (P-34) . Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA. 3500 Na B Flame Photometric Method	28.3	mg/l	--	--
34.	Potassium	APHA. 3500 Na B Flame Photometric Method	6.4	mg/l	--	--
35.	Total Coliform	IS 1622:2009 : 1987, RA:2019	< 2	MPN/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 1622:2009 : 1987, RA:2019	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note: *BDL- Below Detection Limit, **DL- Detection Limit. These parameter are not covered in our NABL scope.

MEENU KAUSHIK

SR. ANALYST

(Tested By)

ARJUN RAWAT

(Checked By)



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Test Report

Sample Number:	VEL/HPCL/W/07	Report No.:	VEL/W/2006/26/007
Name & Address of Party:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30° 1' 27.46" N	Party Reference No.:	NIL
Longitude:	75° 4' 8.62" E	Reporting Date:	01/07/2020
Sample Description:	Ground Water Sample	Period of Analysis:	26/06/2020 -- 01/07/2020
Sample Location:	Baghi Bandar	Receipt Date:	26/06/2020
Sample Collected by:	Vardan Enviro Lab Representative	Sampling Date:	24/06/2020
Parameter Required	As per Client Requirement	Sampling Quantity:	2.0 Ltr
Sampling & Analysis Protocol:	IS-10500-2012, APHA	Sampling Type:	Garb
		Preservation:	Refrigerated

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 °C)	APIHA .4500-H' B Electrometric Method	7.68	--	6.5 to 8.5	No Relaxation
2.	Colour	APIHA .2120 B. Visual Comparison Method	*BDL (**DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA. 2130 B. Nephelometric Method	*BDL (**DL 1 NTU)	NTU	1	5
4.	Odour	APHA. 2150 B . Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA . 2160 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	APHA . 2340 C. EDTA Titrimetric Method	430.00	mg/l	200	600
7.	Calcium as Ca	APIHA. 3500 Ca B. EDTA Titrimetric Method	98.42	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA . 2320 B. Titrimetric Method	251.04	mg/l	200	600
9.	Chloride as Cl	APIHA. 4500-Cl B. Argentometric Method	86.15	mg/l	250	1000
10.	Cyanide as CN	APHA . 4500 CN' D	*BDL (**DL 0.05 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APIHA . 3500 Mg B. Calculation Method	44.82	mg/l	30	100
12.	Total Dissolved Solids	APHA . 2540 C. Gravimetric Method	1105.00	mg/l	500	2000
13.	Sulphate as SO ₄	APIHA . 4500 E. Turbidimetric Method	90.05	mg/l	200	400
14.	Fluoride as F	APIHA . 4500-F' D. SPADNS Method	0.82	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) .Chromotropic Method	11.68	mg/l	45	No Relaxation
16.	Iron as Fe	APHA . 3500-Fe B 1.10 Phenanthroline Method	0.27	mg/l	0.3	No relaxation
17.	Aluminium as Al	APIHA . 3111 D Nitrous Oxide Acetylene Flame Method	*BDL (**DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APIHA. 4500B C. Carmine Method	*BDL (**DL 0.1 mg/l)	mg/l	0.5	1
19.	Total Chromium as Cr	APIHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL (**DL 0.03 mg/l)	mg/l	0.05	No Relaxation

MEENU KAUSHIK
SR. ANALYST

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Tel: 0124-4343750, 4343752, 4343753 | E-mail: lab@vardanenvironet.com, bd@vardanenvironet.com



Vardan EnviroLab

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Branch Off: Plot No. 24 & 25, Narayan Vihar, B-Block, Jaipur - 302035, Rajasthan
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Test Report

Sample No.: VEL/HPCL/W/07		Report No.: VEL/W/2006/26/007				
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.001 mg/l)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.01mg/l)	mg/l	0.5	No Relaxation
22.	Anionic Detergents as MBAS	APHA, 5540 C MBAS Method	*BDL(**DL 0.02 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	APHA . 3111 B. Direct Air. Acetylene Flame Method	0.67	mg/l	5	15
24.	Copper as Cu	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	APHA . 3114 B. Manual Hydride Generation	*BDL(**DL 0.13 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	APHA . 3114 B. Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	0.05
30.	Mercury as Hg	APHA . 3112 B. Cold Vapour AAS Method	*BDL(**DL 0.01 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1841	µS/cm	--	--
32.	Ammonia as NH ₃	IS 3025 (P-34) . Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA. 3500 Na B Flame Photometric Method	33.6	mg/l	--	--
34.	Potassium	APHA. 3500 Na B Flame Photometric Method	9.2	mg/l	--	--
35.	Total Coliform	IS 1622:2009 : 1987. RA:2019	< 2	MPN/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 1622:2009 : 1987. RA:2019	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note:- *BDL - Below Detection Limit. **DL.- Detection Limit. These parameter are not covered in our NABL scope.

MEENU KAUSHIK
SR. ANALYST

(Signature)

ARJUN RAWAT

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Branch Off: Plot No. 24 & 25, Narayan Vihar, B-Block, Jaipur - 302035, Rajasthan
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Test Report

Sample Number:	VEL/HIPCL/W/08	Report No.:	VEL/W/2006/26/008
Name & Address of Party:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30° 6' 48.99" N	Party Reference No.:	NIL
Longitude:	75° 4' 54.51" E	Reporting Date:	01/07/2020
Sample Description:	Surface Water Sample	Period of Analysis:	26/06/2020 – 01/07/2020
Sample Location:	Kot Fatta	Receipt Date:	26/06/2020
Sample Collected by:	Vardan Enviro Lab Representative	Sampling Date:	24/06/2020
Parameter Required:	As per Client Requirement	Sampling Quantity:	2.0 Ltr
Sampling & Analysis Protocol:	IS 2296 & CPCB, 1979, APHA	Sampling Type:	--
		Preservation:	Refrigerated
		Amendment No. 1	Dated 26/11/2020

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	APHA .4500-H ⁺ B Electrometric Method	7.86	--
2.	Colour	APHA .2120 B. Visual Comparison Method	*BDL (**DL 5Hazen)	Hazen
3.	Turbidity	APHA. 2130 B. Nephelometric Method	25	NTU
4.	Odour	APHA. 2150 B . Threshold Test Method	Agreeable	--
5.	Taste	APHA . 2160 B. Threshold Test Method	None	--
6.	Chloride as Cl	APHA. 4500-Cl ⁻ B. Argentometric Method	122.15	mg/l
7.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1301	µS/cm
8.	Nitrate as NO ₃	IS 3025 (P-34) .Chromotropic Method	18.44	mg/l
9.	Iron as Fe	APHA . 3500-Fe B 1.10 Phenanthroline Method	0.35	mg/l
10.	Total Dissolved Solids	APHA . 2540 C. Gravimetric Method	781.00	mg/l
11.	Lead as Pb	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l
12.	Boron	APHA. 4500B C. Carmine Method	0.21	mg/l
13.	Sulphate as SO ₄ ²⁻	APHA . 4500 E. Turbidimetric Method	17.02	mg/l
14.	Fluoride as F	APHA . 4500-F D. SPADNS Method	0.64	mg/l
15.	BOD (3 Days at 27°C)	APHA. 5210 C / IS 3025.P-44	4.00	mg/l
16.	COD	APHA. 5220 B. Open Reflux Method	33.07	mg/l
17.	Free Ammonia as NH ₃	IS 3025 (P-34) . Titrimetric Method	15.24	mg/l
18.	Total Coliform	IS 1622	35	MPN/100ml
19.	Arsenic as As	APHA . 3114 B. Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l

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Test Report

Sample No.: VEL/HPCL/W/08			Report No.: VEL/W/2006/26/008	
S. No.	Parameter	Test-Method	Result	Unit
20.	Total Hardness as CaCO ₃	APHA . 2340 C. EDTA Titrimetric Method	413.41	mg/l
21.	Calcium as Ca	APHA. 3500 Ca B. EDTA Titrimetric Method	98.77	mg/l
22.	Alkalinity as CaCO ₃	APHA . 2320 B. Titrimetric Method	325.16	mg/l
23.	Magnesium as Mg	APHA . 3500 Mg B. Calculation Method	40.57	mg/l
24.	Copper as Cu	APHA . 3111 B. Direct Air. Acetylene Flame Method	3.9	mg/l
25.	Sodium	APHA. 3500 Na B Flame Photometric Method	118.70	mg/l
26.	Potassium	APHA. 3500 Na B Flame Photometric Method	39.61	mg/l
27.	Total Chromium as Cr	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL (**DL. 0.03 mg/l)	mg/l

Note:- *BDL:- Below Detection Limit. **DL:- Detection Limit.

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Test Report

Sample Number:	VEL/HPCL/W/09	Report No.:	VEL/W/2006/26/009
Name & Address of Party:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30° 3' 45.41" N	Party Reference No.:	NIL
Longitude:	75° 4' 6.08" E	Reporting Date:	01/07/2020
Sample Description:	Surface Water Sample	Period of Analysis:	26/06/2020 – 01/07/2020
Sample Location:	Chathewala	Receipt Date:	26/06/2020
Sample Collected by:	Vardan Enviro Lab Representative	Sampling Date:	24/06/2020
Parameter Required:	As per Client Requirement	Sampling Quantity:	2.0 Ltr
Sampling & Analysis Protocol:	IS 2296 & CPCB, 1979, APHA	Sampling Type:	--
		Preservation:	Refrigerated

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	APHA .4500-H ⁺ B Electrometric Method	7.75	--
2.	Colour	APHA .2120 B. Visual Comparison Method	*BDL (**DL 5Hazen)	Hazen
3.	Turbidity	APHA. 2130 B. Nephelometric Method	19	NTU
4.	Odour	APHA. 2150 B. Threshold Test Method	Agreeable	--
5.	Taste	APHA . 2160 B. Threshold Test Method	None	--
6.	Chloride as Cl	APHA. 4500-Cl ⁻ B. Argentometric Method	119.10	mg/l
7.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1275	µS/cm
8.	Nitrate as NO ₃	IS 3025 (P-34) .Chromotropic Method	9.98	mg/l
9.	Iron as Fe	APHA . 3500-Fe B 1.10 Phenanthroline Method	0.45	mg/l
10.	Total Dissolved Solids	APHA . 2540 C. Gravimetric Method	765.00	mg/l
11.	Lead as Pb	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l
12.	Boron	APHA. 4500B C. Carmine Method	0.17	mg/l
13.	Sulphate as SO ₄ ²⁻	APHA . 4500 E. Turbidimetric Method	31.26	mg/l
14.	Fluoride as F	APHA . 4500-F ⁻ D. SPADNS Method	0.57	mg/l
15.	BOD (3 Days at 27°C)	APHA. 5210 C / IS 3025.P-44	8.00	mg/l
16.	COD	APHA. 5220 B. Open Reflux Method	29.50	mg/l
17.	Free Ammonia as NH ₃	IS 3025 (P-34) . Titrimetric Method	13.57	mg/l
18.	Total Coliform	IS 1622	33	MPN/100ml
19.	Arsenic as As	APHA . 3114 B. Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l

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Test Report

Sample No.: VEL/HPCL/W/09			Report No.: VEL/W/2006/26/009	
S. No.	Parameter	Test-Method	Result	Unit
20.	Total Hardness as CaCO ₃	APHA . 2340 C. EDTA Titrimetric Method	351.00	mg/l
21.	Calcium as Ca	APHA. 3500 Ca B. EDTA Titrimetric Method	81.57	mg/l
22.	Alkalinity as CaCO ₃	APHA . 2320 B. Titrimetric Method	301.35	mg/l
23.	Magnesium as Mg	APHA . 3500 Mg B. Calculation Method	35.84	mg/l
24.	Copper as Cu	APHA . 3111 B. Direct Air, Acetylene Flame Method	3.64	mg/l
25.	Sodium	APHA. 3500 Na B Flame Photometric Method	120.7	mg/l
26.	Potassium	APHA. 3500 Na B Flame Photometric Method	43.2	mg/l
27.	Total Chromium as Cr	APHA . 3111 B. Direct Air, Acetylene Flame Method	*BDL (**DL 0.03 mg/l)	mg/l

Note:- *BDL- Below Detection Limit. **DL- Detection Limit.

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Test Report

Sample Number:	VEL/HPCL/S/01	Report No.:	VEL/S/2006/26/001
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30°3'13.34"N	Party Reference No.:	NIL
Longitude:	75°0'41.57"E	Reporting Date:	01/07/2020
Sample Description:	Soil Sample	Period of Analysis :	26/06/2020-01/07/2020
Sampling Location:	Near Project Site	Receipt Date:	26/06/2020
Sample Collected by:	Vardan Enviro Lab Team	Sampling Date:	22/06/2020
Sampling & Analysis Protocol:	IS 2720 , USEPA & USDA	Type of Sampling:	Composite
		Sampling Quantity:	2.0 Kg
		Packing Status:	Temp Sealed

S. No.	Parameter	Test-Method	Result	Unit
1	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.85	--
2	Conductivity	IS:14767 by Conductivity meter	0.339	mS/cm
3	Soil Texture	IS : 2720 (P-22. RA2003)	Silt	--
4	Color	SOP . SP-78.Issue No -01& Issue Date-14/02/2013	Yellowish Red	--
5	Water holding capacity	SOP . SP-81.Issue No -01& Issue Date-14/02/2013	28.21	%
6	Bulk density	SOP . SP-80.Issue No -01& Issue Date-14/02/2013	1.69	gm/cc
7	Chloride as Cl	SOP . SP-85.Issue No -01& Issue Date-14/02/2013	58.36	mg/100g
8	Calcium as Ca	SOP . SP-82.Issue No -01& Issue Date-14/02/2013	43.21	mg/100g
9	Sodium as Na	SOP . SP-84.Issue No -01& Issue Date-14/02/2013	51.19	mg/kg
10	Potassium as K	SOP . SP-84.Issue No -01& Issue Date-14/02/2013	143.11	kg/hect
11	Iron as Fe	USDA Method. 1968	0.75	mg/100g
12	Organic Matter	IS 2720 (P-22) Titrimetric Method	0.64	%
13	Magnesium as Mg	SOP . SP-83.Issue No -01& Issue Date-14/02/2013	22.08	mg/100g
14	Available Nitrogen as N	IS:14684 Distillation Method	220.18	kg /hect
15	Available Phosphorus	SOP . SP-86.Issue No -01& Issue Date-14/02/2013	20.29	kg /hect
16	Zinc (as Zn)	SOP . SP-86.Issue No -01	12.08	mg/kg
17	Organic Carbon	USEPA 3050B	0.47	%
18	Lead (as Pb)	USEPA 3050B	0.89	mg/kg
19	Cadmium (as Cd)	USEPA 3050B	0.78	mg/kg
20	Chromium (as Cr)	USEPA 3050B	0.92	mg/kg
21	Copper (as Cu)	USEPA 3050B	6.81	mg/kg
22	Molybdenum as MO	USEPA 3050B	0.42	mg/100g
23	Nickel	USEPA 3050B	*BDL	mg/100g
24	Moisture Content	SOP . SP-79.Issue No -01& Issue Date-14/02/2013	19.1	%

Note: SOP-Standard Operating Procedure

MEENU KAUSHIK
S.P. (ANALYST)

ARJUN PAWAT
(Checked By)



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Test Report

Sample Number:	VEL/HPCI/S/02	Report No.:	VEL/S/2006/26/002
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:		Party Reference No.:	NIL
Longitude:	30°3'37.63"N 75°2'75.30"E	Reporting Date:	01/07/2020
		Period of Analysis :	26/06/2020-01/07/2020
		Receipt Date:	26/06/2020
Sample Description:	Soil Sample	Sampling Date:	22/06/2020
Sampling Location:	Jiwan Singh Wala	Type of Sampling:	Composite
Sample Collected by:	Vardan Enviro Lab Team	Sampling Quantity:	2.0 Kg
Sampling & Analysis Protocol:	IS 2720 , USEPA & USDA	Depth of Sampling:	30 cm
		Packing Status:	Temp Sealed

S. No.	Parameter	Test-Method	Result	Unit
1	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.59	--
2	Conductivity	IS 14767 by Conductivity meter	0.331	mS/cm
3	Soil Texture	IS : 2720 (P-22, RA2003)	Silt	--
4	Color	SOP . SP-78.Issue No -01& Issue Date-14/02/2013	Yellowish	--
5	Water holding capacity	SOP . SP-81.Issue No -01& Issue Date-14/02/2013	32.01	%
6	Bulk density	SOP . SP 80.Issue No -01& Issue Date-14/02/2013	1.58	gm/cc
7	Chloride as Cl	SOP . SP-85.Issue No -01& Issue Date-14/02/2013	52.14	mg/100g
8	Calcium as Ca	SOP . SP-82.Issue No -01& Issue Date-14/02/2013	43.18	mg/100g
9	Sodium as Na	SOP . SP-84.Issue No -01& Issue Date-14/02/2013	54.04	mg/kg
10	Potassium as K	SOP . SP-84.Issue No -01& Issue Date-14/02/2013	153.18	kg/hect
11	Iron as Fe	USDA Method. 1968	0.55	mg/100g
12	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.52	%
13	Magnesium as Mg	SOP . SP-83.Issue No -01& Issue Date-14/02/2013	30.29	mg/100g
14	Available Nitrogen as N	IS:14684 Distillation Method	241.00	kg./hect
15	Available Phosphorus	SOP . SP -86.Issue No -01& Issue Date-14/02/2013	21.08	kg./hect
16	Zinc (as Zn)	SOP . SP-86.Issue No -01	11.52	mg/kg
17	Organic Carbon	USEPA 3050B	0.36	%
18	Lead (as Pb)	USEPA 3050B	0.78	mg/kg
19	Cadmium (as Cd)	USEPA 3050B	0.85	mg/kg
20	Chromium (as Cr)	USEPA 3050B	0.51	mg/kg
21	Copper (as Cu)	USEPA 3050B	2.91	mg/kg
22	Molybdenum as MO	USEPA 3050B	0.45	mg/100g
23	Nickel	USEPA 3050B	*BDL	mg/100g
24	Moisture Content	SOP . SP-79.Issue No -01& Issue Date-14/02/2013	17.4	%

Note: SOP-Standard Operating Procedure

MEENU KAUSHIK
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Test Report

Sample Number:	VEL/HIPCL/S/03	Report No.:	VEL/S/2006/26/003
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:		Party Reference No.:	NIL
Longitude:	30°2'33.23"N 75°58'6.88"E	Reporting Date:	01/07/2020
Sample Description:	Soil Sample	Period of Analysis :	26/06/2020-01/07/2020
Sampling Location:	Maanwala	Receipt Date:	26/06/2020
Sample Collected by:	Vardan Enviro Lab Team	Sampling Date:	22/06/2020
Sampling & Analysis Protocol:	IS 2720 , USEPA & USDA	Type of Sampling:	Composite
		Sampling Quantity:	2.0 Kg
		Depth of Sampling:	30 cm
		Packing Status:	Temp Sealed

S. No.	Parameter	Test-Method	Result	Unit
1	pH (at 25 °C)	IS : 2720 (P-26) by pH Meter	7.68	--
2	Conductivity	IS:14767 by Conductivity meter	0.335	mS/cm
3	Soil Texture	IS : 2720 (P-22. RA2003)	Silt	--
4	Color	SOP . SP-78.Issue No -01& Issue Date-14/02/2013	Yellowish Red	--
5	Water holding capacity	SOP . SP-81.Issue No -01& Issue Date-14/02/2013	32.84	%
6	Bulk density	SOP . SP-80.Issue No -01& Issue Date-14/02/2013	1.85	gm/cc
7	Chloride as Cl	SOP . SP-85.Issue No -01& Issue Date-14/02/2013	42.36	mg/100g
8	Calcium as Ca	SOP . SP-82.Issue No -01& Issue Date-14/02/2013	63.01	mg/100g
9	Sodium as Na	SOP . SP-84.Issue No -01& Issue Date-14/02/2013	58.44	mg/kg
10	Potassium as K	SOP . SP-84.Issue No -01& Issue Date-14/02/2013	132.61	kg/hect
11	Iron as Fe	USDA Method. 1968	0.34	mg/100g
12	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.74	%
13	Magnesium as Mg	SOP . SP-83.Issue No -01& Issue Date-14/02/2013	22.18	mg/100g
14	Available Nitrogen as N	IS:14684 Distillation Method	230.00	kg /hect
15	Available Phosphorus	SOP . SP-86.Issue No -01& Issue Date-14/02/2013	31.25	kg /hect
16	Zinc (as Zn)	SOP . SP-86.Issue No -01	12.64	mg/kg
17	Organic Carbon	USEPA 3050B	0.25	%
18	Lead (as Pb)	USEPA 3050B	0.62	mg/kg
19	Cadmium (as Cd)	USEPA 3050B	0.74	mg/kg
20	Chromium (as Cr)	USEPA 3050B	1.62	mg/kg
21	Copper (as Cu)	USEPA 3050B	2.14	mg/kg
22	Molybdenum as MO	USEPA 3050B	0.45	mg/100g
23	Nickel	USEPA 3050B	*BDL	mg/100g
24	Moisture Content	SOP . SP-79.Issue No -01& Issue Date-14/02/2013	22.5	%

Note: SOP-Standard Operating Procedure

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Test Report

Sample Number: VEL/HPCL/S/04
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd.
Village Nasibpura, Bhatinda Punjab

Latitude: 30°1'13.05"N
Longitude: 75°1'3.89"E

Sample Description: Soil Sample
Sampling Location: Mahi Nangal
Sample Collected by: Vardan Enviro Lab Team
Sampling & Analysis Protocol: IS 2720, USEPA & USDA

Report No.: VEL/S/2006/26/004
Format No.: 7.8 F-01
Party Reference No.: NIL
Reporting Date: 01/07/2020
Period of Analysis: 26/06/2020-01/07/2020
Receipt Date: 26/06/2020
Sampling Date: 22/06/2020
Type of Sampling: Composite
Sampling Quantity: 2.0 Kg
Depth of Sampling: 30 cm
Packing Status: Temp Scaled

S. No.	Parameter	Test-Method	Result	Unit
1	pH (at 25 OC)	IS - 2720 (P-26) by pH Meter	7.51	--
2	Conductivity	IS 14767 by Conductivity meter	0.344	mS/cm
3	Soil Texture	IS : 2720 (P-22, RA2003)	Silt	--
4	Color	SOP . SP-78.Issue No -01& Issue Date-14/02/2013	Yellowish Red	--
5	Water holding capacity	SOP . SP-81.Issue No -01& Issue Date-14/02/2013	27.54	%
6	Bulk density	SOP . SP-80.Issue No -01& Issue Date-14/02/2013	1.28	gm/cc
7	Chloride as Cl	SOP . SP-85.Issue No -01& Issue Date-14/02/2013	52.61	mg/100g
8	Calcium as Ca	SOP . SP-82.Issue No -01& Issue Date-14/02/2013	47.22	mg/100g
9	Sodium as Na	SOP . SP-84.Issue No -01& Issue Date-14/02/2013	62.12	mg/kg
10	Potassium as K	SOP . SP-84.Issue No -01& Issue Date-14/02/2013	142.65	kg/hect
11	Iron as Fe	USDA Method, 1968	0.74	mg/100g
12	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.77	%
13	Magnesium as Mg	SOP . SP-83.Issue No -01& Issue Date-14/02/2013	30.15	mg/100g
14	Available Nitrogen as N	IS:14684 Distillation Method	234.00	kg/hect
15	Available Phosphorus	SOP . SP-86.Issue No -01& Issue Date-14/02/2013	18.32	kg/hect
16	Zinc (as Zn)	SOP . SP-86.Issue No -01	8.14	mg/kg
17	Organic Carbon	USEPA 3050B	0.22	%
18	Lead (as Pb)	USEPA 3050B	0.65	mg/kg
19	Cadmium (as Cd)	USEPA 3050B	0.70	mg/kg
20	Chromium (as Cr)	USEPA 3050B	1.41	mg/kg
21	Copper (as Cu)	USEPA 3050B	2.80	mg/kg
22	Molybdenum as MO	USEPA 3050B	0.84	mg/100g
23	Nickel	USEPA 3050B	*BDL	mg/100g
24	Moisture Content	SOP . SP-79.Issue No -01& Issue Date-14/02/2013	19.6	%

Note: SOP-Standard Operating Procedure

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SR. ANALYST
(Signature)

ARJUN RAWAT
Checked By
(Signature)



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Test Report

Sample Number:	VEL/HPC/L/S/05	Report No.:	VEL/S/2006/26/005
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:		Party Reference No.:	NIL
Longitude:	29°59'40.64"N 75°1'17.61"E	Reporting Date:	01/07/2020
Sample Description:	Soil Sample	Period of Analysis :	26/06/2020-01/07/2020
Sampling Location:	Leleana	Receipt Date:	26/06/2020
Sample Collected by:	Vardan Enviro Lab Team	Sampling Date:	22/06/2020
Sampling & Analysis Protocol:	IS 2720 , USEPA & USDA	Type of Sampling:	Composite
		Sampling Quantity:	2.0 Kg
		Depth of Sampling:	30 cm
		Packing Status:	Temp Sealed

S. No.	Parameter	Test-Method	Result	Unit
1	pH (at 25 OC)	IS : 2720 (P-26) by pH Meter	7.73	--
2	Conductivity	IS:14767 by Conductivity meter	0.345	mS/cm
3	Soil Texture	IS : 2720 (P-22. RA:2003)	Silt	--
4	Color	SOP : SP-78.Issue No -01& Issue Date-14/02/2013	Yellowish	--
5	Water holding capacity	SOP : SP-81.Issue No -01& Issue Date-14/02/2013	35.04	%
6	Bulk density	SOP : SP-80.Issue No -01& Issue Date-14/02/2013	1.87	gm/cc
7	Chloride as Cl	SOP : SP-85.Issue No -01& Issue Date 14/02/2013	65.12	mg/100g
8	Calcium as Ca	SOP : SP-82.Issue No -01& Issue Date 14/02/2013	53.11	mg/100g
9	Sodium as Na	SOP : SP-84.Issue No -01& Issue Date 14/02/2013	60.15	mg/kg
10	Potassium as K	SOP : SP-84.Issue No -01& Issue Date 14/02/2013	159.47	kg/hect
11	Iron as Fe	USDA Method 1968	0.82	mg/100g
12	Organic Matter	IS 2720 (P-22) Titrimetric Method	0.75	%
13	Magnesium as Mg	SOP : SP-83.Issue No -01& Issue Date 14/02/2013	27.05	mg/100g
14	Available Nitrogen as N	IS:14684 Distillation Method	237.04	kg /hect
15	Available Phosphorus	SOP : SP-86.Issue No -01& Issue Date-14/02/2013	25.12	kg /hect
16	Zinc (as Zn)	SOP : SP-86.Issue No -01	8.86	mg/kg
17	Organic Carbon	USEPA 3050B	0.25	%
18	Lead (as Pb)	USEPA 3050B	0.95	mg/kg
19	Cadmium (as Cd)	USEPA 3050B	0.82	mg/kg
20	Chromium (as Cr)	USEPA 3050B	0.91	mg/kg
21	Copper (as Cu)	USEPA 3050B	7.27	mg/kg
22	Molybdenum as MO	USEPA 3050B	0.53	mg/100g
23	Nickel	USEPA 3050B	*BDL	mg/100g
24	Moisture Content	SOP : SP-79.Issue No -01& Issue Date 14/02/2013	17.1	%

Note: SOP-Standard Operating Procedure

MEENU KAUSHIK
 Sr. Analyst



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Test Report

Sample Number:	VEL/HPCL/S/06	Report No.:	VEL/S/2006/26/006
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:		Party Reference No.:	NIL
Longitude:	30°1'27.46"N 75°4'8.62"E	Reporting Date:	01/07/2020
Sample Description:	Soil Sample	Period of Analysis :	26/06/2020-01/07/2020
Sampling Location:	Baghi Bandar	Receipt Date:	26/06/2020
Sample Collected by:	Vardan Enviro Lab Team	Sampling Date:	22/06/2020
Sampling & Analysis Protocol:	IS 2720 , USEPA & USDA	Type of Sampling:	Composite
		Sampling Quantity:	2.0 Kg
		Depth of Sampling:	30 cm
		Packing Status:	Temp Scaled

S. No.	Parameter	Test-Method	Result	Unit
1	pH (at 25 0C)	IS 2720 (P-26) by pH Meter	7.57	--
2	Conductivity	IS:14767 by Conductivity meter	0.349	mS/cm
3	Soil Texture	IS : 2720 (P-22, RA2003)	Silt	--
4	Color	SOP . SP-78.Issue No -01& Issue Date-14/02/2013	Yellowish	--
5	Water holding capacity	SOP . SP-81.Issue No -01& Issue Date-14/02/2013	42.40	%
6	Bulk density	SOP . SP-80.Issue No -01& Issue Date-14/02/2013	1.75	gm/cc
7	Chloride as Cl	SOP . SP-85.Issue No -01& Issue Date-14/02/2013	57.36	mg/100g
8	Calcium as Ca	SOP . SP-82.Issue No -01& Issue Date-14/02/2013	46.81	mg/100g
9	Sodium as Na	SOP . SP-84.Issue No -01& Issue Date-14/02/2013	56.73	mg/kg
10	Potassium as K	SOP . SP-84.Issue No -01& Issue Date-14/02/2013	165.18	kg/hect
11	Iron as Fe	USDA Method. 1968	0.66	mg/100g
12	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.75	%
13	Magnesium as Mg	SOP . SP-83.Issue No -01& Issue Date-14/02/2013	36.18	mg/100g
14	Available Nitrogen as N	IS:14684 Distillation Method	251.05	kg /hect
15	Available Phosphorus	SOP . SP-86.Issue No -01& Issue Date-14/02/2013	21.54	kg /hect
16	Zinc (as Zn)	SOP . SP-86.Issue No -01	9.81	mg/kg
17	Organic Carbon	USEPA 3050B	0.35	%
18	Lead (as Pb)	USEPA 3050B	0.76	mg/kg
19	Cadmium (as Cd)	USEPA 3050B	0.82	mg/kg
20	Chromium (as Cr)	USEPA 3050B	0.51	mg/kg
21	Copper (as Cu)	USEPA 3050B	2.82	mg/kg
22	Molybdenum as MO	USEPA 3050B	0.44	mg/100g
23	Nickel	USEPA 3050B	*BDL	mg/100g
24	Moisture Content	SOP . SP-79.Issue No -01& Issue Date-14/02/2013	18.8	%

Note: SOP-Standard Operating Procedure

MEENU KAUSHIK
Sr Analyst

ARIJUN RAWAT
(Checked By)



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Test Report

Sample Number:	VEL/HPCL/S/07	Report No.:	VEL/S/2006/26/007
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:		Party Reference No.:	NIL
Longitude:	30°4'34.79"N 74°59'57.45"E	Reporting Date:	01/07/2020
Sample Description:	Soil Sample	Period of Analysis :	26/06/2020-01/07/2020
Sampling Location:	Nasibpura	Receipt Date:	26/06/2020
Sample Collected by:	Vardan Enviro Lab Team	Sampling Date:	23/06/2020
Sampling & Analysis Protocol:	IS 2720 , USEPA & USDA	Type of Sampling:	Composite
		Sampling Quantity:	2.0 Kg
		Depth of Sampling:	30 cm
		Packing Status:	Temp Scaled

S. No.	Parameter	Test-Method	Result	Unit
1	pH (at 25 °C)	IS : 2720 (P-26) by pH Meter	7.84	--
2	Conductivity	IS:14767 by Conductivity meter	0.368	mS/cm
3	Soil Texture	IS : 2720 (P-22, RA2003)	Silty Loam	--
4	Color	SOP : SP-78, Issue No -01 & Issue Date -14/02/2013	Yellowish Red	--
5	Water holding capacity	SOP : SP-81, Issue No -01 & Issue Date -14/02/2013	43.12	%
6	Bulk density	SOP : SP-80, Issue No -01 & Issue Date -14/02/2013	1.89	gm/cc
7	Chloride as Cl	SOP : SP-85, Issue No -01 & Issue Date -14/02/2013	55.12	mg/100g
8	Calcium as Ca	SOP : SP-82, Issue No -01 & Issue Date -14/02/2013	72.26	mg/100g
9	Sodium as Na	SOP : SP-84, Issue No -01 & Issue Date -14/02/2013	64.87	mg/kg
10	Potassium as K	SOP : SP-84, Issue No -01 & Issue Date -14/02/2013	132.12	kg/hect
11	Iron as Fe	USDA Method, 1968	0.57	mg/100g
12	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.75	%
13	Magnesium as Mg	SOP : SP-83, Issue No -01 & Issue Date -14/02/2013	25.17	mg/100g
14	Available Nitrogen as N	IS:14684 Distillation Method	245.32	kg /hect
15	Available Phosphorus	SOP : SP-86, Issue No -01 & Issue Date -14/02/2013	37.19	kg /hect
16	Zinc (as Zn)	SOP : SP-86, Issue No -01	19.54	mg/kg
17	Organic Carbon	USEPA 3050B	0.45	%
18	Lead (as Pb)	USEPA 3050B	0.65	mg/kg
19	Cadmium (as Cd)	USEPA 3050B	0.78	mg/kg
20	Chromium (as Cr)	USEPA 3050B	1.86	mg/kg
21	Copper (as Cu)	USEPA 3050B	2.24	mg/kg
22	Molybdenum as MO	USEPA 3050B	0.63	mg/100g
23	Nickel	USEPA 3050B	*BDL	mg/100g
24	Moisture Content	SOP : SP-79, Issue No -01 & Issue Date -14/02/2013	21.2	%

Note: SOP-Standard Operating Procedure

MEENU KAUSHIK
Sr. ANALYST
(Signature)

ARJUN RAWAT
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Test Report

Sample Number:	VEL/IOCL/S/08	Report No.:	VEL/S/2006/26/008
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:		Party Reference No.:	NIL
Longitude:	30°5'40.22"N 75°4'5.30"E	Reporting Date:	01/07/2020
Sample Description:	Soil Sample	Period of Analysis :	26/06/2020-01/07/2020
Sampling Location:	Kotbhara	Receipt Date:	26/06/2020
Sample Collected by:	Vardan Enviro Lab Team	Sampling Date:	23/06/2020
Sampling & Analysis Protocol:	IS 2720 , USEPA & USDA	Type of Sampling:	Composite
		Sampling Quantity:	2.0 Kg
		Depth of Sampling:	30 cm
		Packing Status:	Temp Sealed

S. No.	Parameter	Test-Method	Result	Unit
1	pH (at 25 OC)	IS : 2720 (P-26) by pH Meter	7.45	--
2	Conductivity	IS:14767 by Conductivity meter	0.328	mS/cm
3	Soil Texture	IS : 2720 (P-22. RA2003)	Silt	--
4	Color	SOP . SP-78.Issue No -01& Issue Date-14/02/2013	Yellowish	--
5	Water holding capacity	SOP . SP-81.Issue No -01& Issue Date-14/02/2013	24.01	%
6	Bulk density	SOP . SP-80.Issue No -01& Issue Date-14/02/2013	1.18	gm/cc
7	Chloride as Cl	SOP . SP-85.Issue No -01& Issue Date-14/02/2013	39.57	mg/100g
8	Calcium as Ca	SOP . SP-82.Issue No -01& Issue Date-14/02/2013	42.00	mg/100g
9	Sodium as Na	SOP . SP-84.Issue No -01& Issue Date-14/02/2013	49.11	mg/kg
10	Potassium as K	SOP . SP-84.Issue No -01& Issue Date-14/02/2013	142.39	kg/hect
11	Iron as Fe	USDA Method. 1968	0.59	mg/100g
12	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.67	%
13	Magnesium as Mg	SOP . SP-83.Issue No -01& Issue Date-14/02/2013	37.12	mg/100g
14	Available Nitrogen as N	IS:14684 Distillation Method	219.00	kg /hect
15	Available Phosphorus	SOP . SP-86.Issue No -01& Issue Date-14/02/2013	17.05	kg /hect
16	Zinc (as Zn)	SOP . SP-86.Issue No -01	79.13	mg/kg
17	Organic Carbon	USEPA 3050B	0.47	%
18	Lead (as Pb)	USEPA 3050B	0.58	mg/kg
19	Cadmium (as Cd)	USEPA 3050B	0.72	mg/kg
20	Chromium (as Cr)	USEPA 3050B	1.43	mg/kg
21	Copper (as Cu)	USEPA 3050B	2.31	mg/kg
22	Molybdenum as MO	USEPA 3050B	0.89	mg/100g
23	Nickel	USEPA 3050B	*BDL	mg/100g
24	Moisture Content	SOP . SP-79.Issue No -01& Issue Date-14/02/2013	16.2	%

Note: SOP-Standard Operating Procedure

MEENU KAUSHIK
ANALYST

ARJUN RAWAT
(Checked By)



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Test Report

Sample Number:	VEL/IIPCL/S/09	Report No.:	VEL/S/2006/26/009
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30°6'34.53"N	Party Reference No.:	NIL
Longitude:	75°0'23.67"E	Reporting Date:	01/07/2020
Sample Description:	Soil Sample	Period of Analysis :	26/06/2020-01/07/2020
Sampling Location:	Kot Kashmir	Receipt Date:	26/06/2020
Sample Collected by:	Vardan Enviro Lab Team	Sampling Date:	23/06/2020
Sampling & Analysis Protocol:	IS 2720 , USEPA & USDA	Type of Sampling:	Composite
		Sampling Quantity:	2.0 Kg
		Depth of Sampling:	30 cm
		Packing Status:	Temp Sealed

S. No.	Parameter	Test-Method	Result	Unit
1	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.79	--
2	Conductivity	IS:14767 by Conductivity meter	0.327	mS/cm
3	Soil Texture	IS : 2720 (P-22, RA2003)	Silt	--
4	Color	SOP . SP-78.Issue No -01& Issue Date-14/02/2013	Yellowish Red	--
5	Water holding capacity	SOP . SP-81.Issue No -01& Issue Date-14/02/2013	27.57	%
6	Bulk density	SOP . SP-80.Issue No -01& Issue Date-14/02/2013	1.64	gm/cc
7	Chloride as Cl	SOP . SP-85.Issue No -01& Issue Date-14/02/2013	58.74	mg/100g
8	Calcium as Ca	SOP . SP-82.Issue No -01& Issue Date-14/02/2013	43.29	mg/100g
9	Sodium as Na	SOP . SP-84.Issue No -01& Issue Date-14/02/2013	51.18	mg/kg
10	Potassium as K	SOP . SP-84.Issue No -01& Issue Date-14/02/2013	155.00	kg/hect
11	Iron as Fe	USDA Method. 1968	0.79	mg/100g
12	Organic Matter	IS 2720 (P.22) Titrimetric Method	0.67	%
13	Magnesium as Mg	SOP . SP-83.Issue No -01& Issue Date-14/02/2013	21.98	mg/100g
14	Available Nitrogen as N	IS:14684 Distillation Method	226.00	kg /hect
15	Available Phosphorus	SOP . SP-86.Issue No -01& Issue Date-14/02/2013	23.18	kg /hect
16	Zinc (as Zn)	SOP . SP-86.Issue No. 01	8.35	mg/kg
17	Organic Carbon	USEPA 3050B	0.48	%
18	Lead (as Pb)	USEPA 3050B	0.87	mg/kg
19	Cadmium (as Cd)	USEPA 3050B	0.76	mg/kg
20	Chromium (as Cr)	USEPA 3050B	0.91	mg/kg
21	Copper (as Cu)	USEPA 3050B	6.46	mg/kg
22	Molybdenum as MO	USEPA 3050B	0.38	mg/100g
23	Nickel	USEPA 3050B	*BDL	mg/100g
24	Moisture Content	SOP . SP-79.Issue No -01& Issue Date-14/02/2013	20.4	%

Note: SOP-Standard Operating Procedure

MEENU KAUSHIK

SR ANALYST
(M.R.SY)

ARJUN RAWAT
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Test Report

Sample Number:	VEL/HPCL/S/10	Report No.:	VEL/S/2006/26/010
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:		Party Reference No.:	NIL
Longitude:	30°6'44.02"N 74°57'21.06"E	Reporting Date:	01/07/2020
Sample Description:	Soil Sample	Period of Analysis :	26/06/2020-01/07/2020
Sampling Location:	Gehri Boghi	Receipt Date:	26/06/2020
Sample Collected by:	Vardan Enviro Lab Team	Sampling Date:	23/06/2020
Sampling & Analysis Protocol:	IS 2720 , USEPA & USDA	Type of Sampling:	Composite
		Sampling Quantity:	2.0 Kg
		Depth of Sampling:	30 cm
		Packing Status:	Temp Sealed

S. No.	Parameter	Test-Method	Result	Unit
1	pH (at 25 OC)	IS : 2720 (P-26) by pH Meter	7.56	--
2	Conductivity	IS:14767 by Conductivity meter	0.329	mS/cm
3	Soil Texture	IS : 2720 (P-22, RA2003)	Silty Loam	--
4	Color	SOP : SP-78.Issue No -01& Issue Date-14/02/2013	Yellowish Red	--
5	Water holding capacity	SOP : SP-81.Issue No -01& Issue Date-14/02/2013	36.18	%
6	Bulk density	SOP : SP-80.Issue No -01& Issue Date-14/02/2013	1.59	gm/cc
7	Chloride as Cl	SOP : SP-85.Issue No -01& Issue Date-14/02/2013	59.35	mg/100g
8	Calcium as Ca	SOP : SP-82.Issue No -01& Issue Date-14/02/2013	49.12	mg/100g
9	Sodium as Na	SOP : SP-84.Issue No -01& Issue Date-14/02/2013	60.76	mg/kg
10	Potassium as K	SOP : SP-84.Issue No -01& Issue Date-14/02/2013	165.01	kg/hect
11	Iron as Fe	USDA Method. 1968	0.78	mg/100g
12	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.86	%
13	Magnesium as Mg	SOP : SP-83.Issue No -01& Issue Date-14/02/2013	37.08	mg/100g
14	Available Nitrogen as N	IS:14684 Distillation Method	267.36	kg/hect
15	Available Phosphorus	SOP : SP-86.Issue No -01& Issue Date-14/02/2013	23.18	kg/hect
16	Zinc (as Zn)	SOP : SP-86.Issue No -01	13.29	mg/kg
17	Organic Carbon	USEPA 3050B	0.39	%
18	Lead (as Pb)	USEPA 3050B	0.79	mg/kg
19	Cadmium (as Cd)	USEPA 3050B	0.88	mg/kg
20	Chromium (as Cr)	USEPA 3050B	0.67	mg/kg
21	Copper (as Cu)	USEPA 3050B	3.01	mg/kg
22	Molybdenum as MO	USEPA 3050B	0.38	mg/100g
23	Nickel	USEPA 3050B	*BDL	mg/100g
24	Moisture Content	SOP : SP-79.Issue No -01& Issue Date-14/02/2013	21.7	%

Note: SOP-Standard Operating Procedure

MEENU KAUSHIK
ANALYST

ARJUN RAWAT
(Checked By)



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Test Report

Sample Number:	VEL/HPCL/S/11	Report No.:	VEL/S/2006/26/011
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:		Party Reference No.:	NIL
Longitude:	30°3'45.41"N 75°4'6.08"E	Reporting Date:	01/07/2020
Sample Description:	Soil Sample	Period of Analysis :	26/06/2020-01/07/2020
Sampling Location:	Chathewala	Receipt Date:	26/06/2020
Sample Collected by:	Vardan Enviro Lab Team	Sampling Date:	23/06/2020
Sampling & Analysis Protocol:	IS 2720 , USEPA & USDA	Type of Sampling:	Composite
		Sampling Quantity:	2.0 Kg
		Depth of Sampling:	30 cm
		Packing Status:	Temp Sealed

S. No.	Parameter	Test-Method	Result	Unit
1	pH (at 25 °C)	IS : 2720 (P-26) by pH Meter	7.84	--
2	Conductivity	IS:14767 by Conductivity meter	0.325	mS/cm
3	Soil Texture	IS : 2720 (P-22. RA2003)	Silty Loam	--
4	Color	SOP : SP-78.Issue No -01& Issue Date-14/02/2013	Yellowish Red	--
5	Water holding capacity	SOP : SP-81.Issue No -01& Issue Date-14/02/2013	34.16	%
6	Bulk density	SOP : SP-80.Issue No -01& Issue Date-14/02/2013	1.89	gm/cc
7	Chloride as Cl	SOP : SP-85.Issue No -01& Issue Date-14/02/2013	67.05	mg/100g
8	Calcium as Ca	SOP : SP-82.Issue No -01& Issue Date-14/02/2013	50.36	mg/100g
9	Sodium as Na	SOP : SP-84.Issue No -01& Issue Date-14/02/2013	52.18	mg/kg
10	Potassium as K	SOP : SP-84.Issue No -01& Issue Date-14/02/2013	143.19	kg/hect
11	Iron as Fe	USDA Method. 1968	0.77	mg/100g
12	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.62	%
13	Magnesium as Mg	SOP : SP-83.Issue No -01& Issue Date-14/02/2013	24.12	mg/100g
14	Available Nitrogen as N	IS:14684 Distillation Method	215.00	kg/hect
15	Available Phosphorus	SOP : SP-86.Issue No -01& Issue Date-14/02/2013	28.16	kg/hect
16	Zinc (as Zn)	SOP : SP-86.Issue No -01	8.87	mg/kg
17	Organic Carbon	USEPA 3050B	0.52	%
18	Lead (as Pb)	USEPA 3050B	1.13	mg/kg
19	Cadmium (as Cd)	USEPA 3050B	0.85	mg/kg
20	Chromium (as Cr)	USEPA 3050B	0.93	mg/kg
21	Copper (as Cu)	USEPA 3050B	6.51	mg/kg
22	Molybdenum as MO	USEPA 3050B	0.45	mg/100g
23	Nickel	USEPA 3050B	*BDL	mg/100g
24	Moisture Content	SOP : SP-79.Issue No -01& Issue Date-14/02/2013	16.9	%

Note: SOP-Standard Operating Procedure

MEENU KAUSHIK

SR. ANALYST

(Signature)

ARJUN RAWAT

(Checked By)

(Signature)



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Branch Off: Plot No. 24 & 25, Narayan Vihar, B-Block, Jaipur - 302035, Rajasthan
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Test Report

Sample Number:	VEL/HPCL/S/12	Report No.:	VEL/S/2006/26/012
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30°6'48.99"N	Party Reference No.:	NIL
Longitude:	75°4'54.51"E	Reporting Date:	01/07/2020
Sample Description:	Soil Sample	Period of Analysis :	26/06/2020-01/07/2020
Sampling Location:	Kot Fatta	Receipt Date:	26/06/2020
Sample Collected by:	Vardan Enviro Lab Team	Sampling Date:	23/06/2020
Sampling & Analysis Protocol:	IS 2720 , USEPA & USDA	Type of Sampling:	Composite
		Sampling Quantity:	2.0 Kg
		Depth of Sampling:	30 cm
		Packing Status:	Temp Sealed

S. No.	Parameter	Test-Method	Result	Unit
1	pH (at 25 0C)	IS 2720 (P-26) by pH Meter	7.88	--
2	Conductivity	IS:14767 by Conductivity meter	0.354	mS/cm
3	Soil Texture	IS 2720 (P-22, RA2003)	Silt	--
4	Color	SOP . SP-78.Issue No -01& Issue Date-14/02/2013	Yellowish Red	--
5	Water holding capacity	SOP . SP-81.Issue No -01& Issue Date-14/02/2013	36.19	%
6	Bulk density	SOP . SP-80.Issue No -01& Issue Date-14/02/2013	1.95	gm/cc
7	Chloride as Cl	SOP . SP-85.Issue No -01& Issue Date-14/02/2013	62.34	mg/100g
8	Calcium as Ca	SOP . SP-82.Issue No -01& Issue Date-14/02/2013	72.48	mg/100g
9	Sodium as Na	SOP . SP-84.Issue No -01& Issue Date-14/02/2013	52.14	mg/kg
10	Potassium as K	SOP . SP-84.Issue No -01& Issue Date-14/02/2013	117.00	kg/hect
11	Iron as Fe	USDA Method. 1968	0.39	mg/100g
12	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.87	%
13	Magnesium as Mg	SOP . SP-83.Issue No -01& Issue Date-14/02/2013	25.39	mg/100g
14	Available Nitrogen as N	IS:14684 Distillation Method	212.16	kg/hect
15	Available Phosphorus	SOP . SP-86.Issue No -01& Issue Date-14/02/2013	57.46	kg/hect
16	Zinc (as Zn)	SOP . SP-86.Issue No -01	16.25	mg/kg
17	Organic Carbon	USEPA 3050B	0.49	%
18	Lead (as Pb)	USEPA 3050B	0.72	mg/kg
19	Cadmium (as Cd)	USEPA 3050B	0.83	mg/kg
20	Chromium (as Cr)	USEPA 3050B	1.81	mg/kg
21	Copper (as Cu)	USEPA 3050B	2.78	mg/kg
22	Molybdenum as MO	USEPA 3050B	0.49	mg/100g
23	Nickel	USEPA 3050B	*BDL	mg/100g
24	Moisture Content	SOP . SP-79.Issue No -01& Issue Date-14/02/2013	20.5	%

Note: SOP-Standard Operating Procedure

MEENU KAUSHIK

SR ANALYST

(Checked By)

ARJUN RAWAT

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Test Report

Sample Number:	VEL/HPCL/AA/01	Report No.:	VEL/AA/2006/26/001
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30°3'13.34"N	Party Reference No.:	NIL
Longitude:	75°0'41.57"E	Reporting Date:	01/07/2020
		Period of Analysis:	26/06/2020 - 01/07/2020
		Receipt Date:	26/06/2020

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample collected by	: Vardan Enviro Lab Representative
Sampling Location	: Near Project Site
Instrument Used	: RDS & FPS sampler with all Accessories
Instrument Code	: VEL/RDS/01 & VEL/FPS/01
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 22/06/2020 to 23/06/2020
Time of Monitoring	: 10:15 AM – 10:15 AM
Ambient Temperature (°C)	: Min. 35°C Max. 47°C
Surrounding Activity	: Human & Vehicular Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No
Sampling & Analysis Protocol	: IS-5182
Parameter Required	: As per client requirement.

S. No.	Parameter	Protocol	Result	Unit	NAAQS ^{at} Limit
1.	Particulate Matter (PM _{2.5})	#SOP No. VEL/SOP/01, Section No. SP 63	54.76	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	95.17	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	21.82	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	12.40	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.95	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS:11255(P-6) Indo Phenol Blue Method	14.31	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene(C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	19.50	µg/m ³	180
11.	^Arsenic As, ng/ m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	6
12.	Nickel Ni, ng/ m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	20
13.	#Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	#Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	**BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

Note :- @ NAAQS – National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec-3(i)]18.11.2009.

SOP- Laboratory Standard Operating Procedure., ^ This parameter is not Covered in our NABL scope. **BDL- Below Detection Limit. *DL- Detection Limit

MEENAKSHI
SRI ANALYST

ARJUN RAWAT
(Checked By)



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Test Report

Sample Number: VEL/HPCL/AA/02 Report No.: VEL/AA/2006/26/002
 Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Format No.: 7.8 F-01
 Village Nasibpura, Bhatinda Punjab Party Reference No.: NIL
 Reporting Date: 01/07/2020
 Latitude: 30°3'37.63"N Period of Analysis: 26/06/2020 - 01/07/2020
 Longitude: 75°2'75.30"E Receipt Date: 26/06/2020

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample collected by : Vardan Enviro Lab Representative
 Sampling Location : Jiwan Singh Wala
 Instrument Used : RDS & FPS sampler with all Accessories
 Instrument Code : VEL/RDS/03& VEL/FPS/03
 Instrument Calibration Status : Calibrated
 Meteorological condition during monitoring : Clear Sky
 Date of Monitoring : 22/06/2020 to 23/06/2020
 Time of Monitoring : 10:30 AM – 10:30 AM
 Ambient Temperature (°C) : Min. 35°C Max. 47°C
 Surrounding Activity : Human & Vehicular Activities
 Scope of Monitoring : Regulatory Requirement
 Control measure if Any : No
 Sampling & Analysis Protocol : IS-5182
 Parameter Required : As per client requirement.

S. No.	Parameter	Protocol	Result	Unit	NAAQS [®] Limit
1.	Particulate Matter (PM _{2.5})	*SOP No. VEL/SOP/01, Section No. SP 63	50.64	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	91.63	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	18.44	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	9.92	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	1.34	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS:11255(P-6) Indo Phenol Blue Method	9.56	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene (C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	16.53	µg/m ³	180
11.	Arsenic As, ng/ m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	6
12.	Nickel Ni, ng/ m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	20
13.	#Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	#Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	**BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

Note :-@ NAAQS – National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)]18.11.2009

SOP- Laboratory Standard Operating Procedure, ^ This parameter is not Covered in our NABL scope, **BDL- Below Detection Limit, *DL- Detection Limit

MEENDRA KAUSHIK
 SR. ANALYST

(Checked By)-

ARJUN RAHAT



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Test Report

Sample Number:	VEL/HPCL/AA/03	Report No.:	VEL/AA/2006/26/003
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30°2'33.23"N	Party Reference No.:	NIL
Longitude:	75°58'6.88"E	Reporting Date:	01/07/2020
		Period of Analysis:	26/06/2020 - 01/07/2020
		Receipt Date:	26/06/2020

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample collected by	: Vardan Enviro Lab Representative
Sampling Location	: Maanwala
Instrument Used	: RDS & FPS sampler with all Accessories
Instrument Code	: VEL/RDS/04& VEL/FPS/04
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 22/06/2020 to 23/06/2020
Time of Monitoring	: 09:15 AM – 09:15 AM
Ambient Temperature (°C)	: Min. 35°C Max. 47°C
Surrounding Activity	: Human & Vehicular Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No
Sampling & Analysis Protocol	: IS-5182
Parameter Required	: As per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS [®] Limit
1.	Particulate Matter (PM _{2.5})	#SOP No. VEL/SOP/01, Section No. SP 63	51.33	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	92.49	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	17.55	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	12.51	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.88	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS:11255(P-6) Indo Phenol Blue Method	10.69	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene (C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	20.56	µg/m ³	180
11.	Arsenic As, ng/ m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	6
12.	Nickel Ni, ng/ m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	20
13.	#Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	#Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	**BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

Note :-@ NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)]18.11.2009.

SOP- Laboratory Standard Operating Procedure, ~ This parameter is not Covered in our NABL scope. **BDL- Below Detection Limit, *DL- Detection Limit

MEENKAUSHIK
SRINIVAS
(Tested By)

ARJUN RAWAT
(Checked By)

Approved By
Dr. Shiv
Prakash
Singh
Authorised Laboratory

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Test Report

Sample Number:	VEL/HPCL/AA/04	Report No.:	VEL/AA/2006/26/004
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30°1'13.05"N	Party Reference No.:	NIL
Longitude:	75°1'3.89"E	Reporting Date:	01/07/2020
		Period of Analysis:	26/06/2020 - 01/07/2020
		Receipt Date:	26/06/2020

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample collected by	: Vardan Enviro Lab Representative
Sampling Location	: Mahi Nangal
Instrument Used	: RDS & FPS sampler with all Accessories
Instrument Code	: VEL/RDS/02& VEL/FPS/02
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 22/06/2020 to 23/06/2020
Time of Monitoring	: 09:30 AM – 09:30 AM
Ambient Temperature (°C)	: Min. 35°C Max. 47°C
Surrounding Activity	: Human & Vehicular Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No
Sampling & Analysis Protocol	: IS-5182
Parameter Required	: As per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS [®] Limit
1.	Particulate Matter (PM _{2.5})	#SOP No. VEL/SOP/01, Section No. SP 63	53.88	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	94.79	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	15.67	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	10.66	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.98	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS:11255(P-6) Indo Phenol Blue Method	13.61	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene(C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	22.15	µg/m ³	180
11.	Arsenic As, ng/ m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	6
12.	Nickel Ni, ng/ m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	20
13.	#Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	#Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	*BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

Note :- @ NAAQS – National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)]18.11.2009.

SOP- Laboratory Standard Operating Procedure, ~ This parameter is not Covered in our NABL scope, **BDL- Below Detection Limit, *DL- Detection Limit

MEENU KAUSHIK
 (Checked By)
 SR. ANALYST

ARJUN RAWAT
 (Checked By)



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Test Report

Sample Number: VEL/NMDCL/AA/05 Report No.: VEL/AA/2006/26/005
 Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Format No.: 7.8 F-01
 Village Nasibpura, Bhatinda Punjab Party Reference No.: NIL
 Reporting Date: 01/07/2020
 Latitude: 29°59'40.64"N Period of Analysis: 26/06/2020 - 01/07/2020
 Longitude: 75°1'17.61"E Receipt Date: 26/06/2020

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample collected by : Vardan Enviro Lab Representative
 Sampling Location : Leleana
 Instrument Used : RDS & FPS sampler with all Accessories
 Instrument Code : VEL/RDS/06 & VEL/FPS/06
 Instrument Calibration Status : Calibrated
 Meteorological condition during monitoring : Clear Sky
 Date of Monitoring : 22/06/2020 to 23/06/2020
 Time of Monitoring : 10:45 AM – 10:45 AM
 Ambient Temperature (°C) : Min. 35°C Max. 47°C
 Surrounding Activity : Human & Vehicular Activities
 Scope of Monitoring : Regulatory Requirement
 Control measure if Any : No
 Sampling & Analysis Protocol : IS-5182
 Parameter Required : As per Work Order

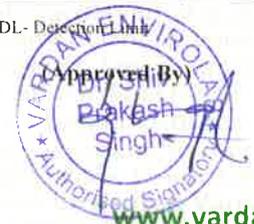
S. No.	Parameter	Protocol	Result	Unit	NAAQS ^{reg} Limit
1.	Particulate Matter (PM _{2.5})	#SOP No. VEL/SOP/01, Section No. SP 63	50.64	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	92.83	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	25.33	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	12.16	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	1.10	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS:11255(P-6) Indo Phenol Blue Method	14.56	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene (C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	24.77	µg/m ³	180
11.	Arsenic As, ng/m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/m ³)	ng/m ³	6
12.	Nickel Ni, ng/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/m ³)	ng/m ³	20
13.	#Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	#Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	*BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

Note :- @ NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)]18.11.2009

#SOP- Laboratory Standard Operating Procedure. ~ This parameter is not Covered in our NABL scope, **BDL- Below Detection Limit, *DL- Detection Limit

MEENU KAUSHIK
SR. (Checked By)

ARJUN RAWAT
(Checked By)



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Vardan EnviroLab

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 Branch Off: Plot No. 24 & 25, Narayan Vihar, B-Block, Jaipur - 302035, Rajasthan
 NABL Accredited | MoEF&CC Recognized | ISO 9001|ISO 14001|ISO 45001

Test Report

Sample Number:	VEL/HPCL/AA/06	Report No.:	VEL/AA/2006/26/006
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30°1'27.46"N	Party Reference No.:	NIL
Longitude:	75°4'8.62"E	Reporting Date:	01/07/2020
		Period of Analysis:	26/06/2020 - 01/07/2020
		Receipt Date:	26/06/2020

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample collected by	: Vardan Enviro Lab Representative
Sampling Location	: Baghi Bandar
Instrument Used	: RDS & FPS sampler with all Accessories
Instrument Code	: VEL/RDS/05& VEL/FPS/05
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 22/06/2020 to 23/06/2020
Time of Monitoring	: 11:15 AM – 11:15 AM
Ambient Temperature (°C)	: Min. 35°C Max. 47°C
Surrounding Activity	: Human & Vehicular Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No
Sampling & Analysis Protocol	: IS-5182
Parameter Required	: As per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS [®] Limit
1.	Particulate Matter (PM _{2.5})	[#] SOP No. VEL/SOP/01, Section No. SP 63	49.16	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	90.08	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	21.07	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	11.60	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	1.18	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS:11255(P-6) Indo Phenol Blue Method	17.11	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene (C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	25.66	µg/m ³	180
11.	^Arsenic As, ng/ m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	6
12.	Nickel Ni, ng/ m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	20
13.	#Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	#Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	*BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

Note :- @ NAAQS – National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)]18.11.2009.

SOP- Laboratory Standard Operating Procedure. ^ This parameter is not Covered in our NABL scope, **BDL- Below Detection Limit, *DL- Detection Limit

MEENU KUSHIK
SR. ANALYST

ARUN KUMAR
(Checked By)



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Branch Off: Plot No. 24 & 25, Narayan Vihar, B-Block, Jaipur - 302035, Rajasthan
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Test Report

Sample Number:	VEL/HPCL/AA/07	Report No.:	VEL/AA/2006/26/007
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30°4'34.79"N	Party Reference No.:	NIL
Longitude:	74°59'57.45"E	Reporting Date:	01/07/2020
		Period of Analysis:	26/06/2020 - 01/07/2020
		Receipt Date:	26/06/2020

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample collected by	: Vardan Enviro Lab Representative
Sampling Location	: Nasibpura
Instrument Used	: RDS & FPS sampler with all Accessories
Instrument Code	: VEL/RDS/03& VEL/FPS/03
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 23/06/2020 to 24/06/2020
Time of Monitoring	: 09:15 AM – 09:15 AM
Ambient Temperature (°C)	: Min. 36°C Max. 47°C
Surrounding Activity	: Human & Vehicular Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No
Sampling & Analysis Protocol	: IS-5182
Parameter Required	: As per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS ² Limit
1.	Particulate Matter (PM _{2.5})	² SOP No. VEL/SOP/01, Section No. SP 63	51.94	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	92.63	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	24.72	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	13.48	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.91	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS:11255(P-6) Indo Phenol Blue Method	10.84	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene(C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	26.18	µg/m ³	180
11.	Arsenic As, ng/m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	6
12.	Nickel Ni, ng/ m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	20
13.	#Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	#Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	*BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

Note :-@ NAAQS – National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)]18.11.2009.

SOP- Laboratory Standard Operating Procedure, ~ This parameter is not Covered in our NABL scope, **BDL- Below Detection Limit, *DL- Detection Limit

MEENU KAUSHIK
SR. ANALYST
(Tested By)

Checked By
Dr. Shiv Prakash Singh



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Test Report

Sample Number:	VEL/HPCL/AA/08	Report No.:	VEL/AA/2006/26/008
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30°5'40.22"N	Party Reference No.:	NIL
Longitude:	75°4'5.30"E	Reporting Date:	01/07/2020
		Period of Analysis:	26/06/2020 - 01/07/2020
		Receipt Date:	26/06/2020

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample collected by	: Vardan Enviro Lab Representative
Sampling Location	: Kotbhara
Instrument Used	: RDS & FPS sampler with all Accessories
Instrument Code	: VEL/RDS/02& VEL/FPS/02
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 23/06/2020 to 24/06/2020
Time of Monitoring	: 10:00 AM – 10:00 AM
Ambient Temperature (°C)	: Min. 36°C Max. 47°C
Surrounding Activity	: Human & Vehicular Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No
Sampling & Analysis Protocol	: IS-5182
Parameter Required	: As per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS ^g Limit
1.	Particulate Matter (PM _{2.5})	^h SOP No. VEL/SOP/01, Section No. SP 63	49.76	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	88.77	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	23.11	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	15.98	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	1.05	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS:11255(P-6) Indo Phenol Blue Method	12.04	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene(C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	18.96	µg/m ³	180
11.	^Arsenic As, ng/ m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	6
12.	Nickel Ni, ng/ m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	20
13.	#Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	#Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	*BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

Note :-^a NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)]18.11.2009.

[#] SOP- Laboratory Standard Operating Procedure. [^]- This parameter is not Covered in our NABL scope, ****BDL**- Below Detection Limit, ***DL**- Detection Limit.

MEENKAUSHIK
(Tested By)
Sr. Analyst

ARJUN SAWAT
(Checked By)
Rond

Approved By
Dr. Shiv
Prakashy
Singh
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Test Report

Sample Number: VEL/HPCL/AA/09 Report No.: VEL/AA/2006/26/009
 Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Format No.: 7.8 F-01
 Village Nasibpura, Bhatinda Punjab Party Reference No.: NIL
 Reporting Date: 01/07/2020
 Latitude: 30°6'34.53"N Period of Analysis: 26/06/2020 - 01/07/2020
 Longitude: 75°0'23.67"E Receipt Date: 26/06/2020

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample collected by : Vardan Enviro Lab Representative
 Sampling Location : Kot Kashmir
 Instrument Used : RDS & FPS sampler with all Accessories
 Instrument Code : VEL/RDS/01 & VEL/FPS/01
 Instrument Calibration Status : Calibrated
 Meteorological condition during monitoring : Clear Sky
 Date of Monitoring : 23/06/2020 to 24/06/2020
 Time of Monitoring : 10:30 AM – 10:30 AM
 Ambient Temperature (°C) : Min. 36°C Max. 47°C
 Surrounding Activity : Human & Vehicular Activities
 Scope of Monitoring : Regulatory Requirement
 Control measure if Any : No
 Sampling & Analysis Protocol : IS-5182
 Parameter Required : As per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS ² Limit
1.	Particulate Matter (PM _{2.5})	#SOP No. VEL/SOP/01, Section No. SP 63	53.44	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	91.67	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	24.08	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	9.07	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	1.06	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS:11255(P-6) Indo Phenol Blue Method	9.48	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene(C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	21.04	µg/m ³	180
11.	Arsenic As, ng/ m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	6
12.	Nickel Ni, ng/ m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	20
13.	#Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	#Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	*BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

Note :-@ NAAQS – National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)]18.11.2009.

SOP- Laboratory Standard Operating Procedure, ^- This parameter is not Covered in our NABL scope, **BDL- Below Detection Limit, *DL- Detection Limit

Checked By
 MEEHU KAUSHIK
 ANALYST

Checked By
 ANURAG RAO
 ANALYST



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Test Report

Sample Number: VEL/HPCL/AA/10 Report No.: VEL/AA/2006/26/010
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Format No.: 7.8 F-01
Village Nasibpura, Bhatinda Punjab Party Reference No.: NIL
Reporting Date: 01/07/2020
Latitude: 30°6'44.02"N Period of Analysis: 26/06/2020 - 01/07/2020
Longitude: 74°57'21.06"E Receipt Date: 26/06/2020

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample collected by : Vardan Enviro Lab Representative
Sampling Location : Gehri Boghi
Instrument Used : RDS & FPS sampler with all Accessories
Instrument Code : VEL/RDS/04& VEL/FPS/04
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 23/06/2020 to 24/06/2020
Time of Monitoring : 10:45 AM – 10:45 AM
Ambient Temperature (°C) : Min. 36°C Max. 47°C
Surrounding Activity : Human & Vehicular Activities
Scope of Monitoring : Regulatory Requirement
Control measure if Any : No
Sampling & Analysis Protocol : IS-5182
Parameter Required : As per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS ^a Limit
1.	Particulate Matter (PM _{2.5})	[#] SOP No. VEL/SOP/01, Section No. SP 63	54.08	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	93.46	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	21.74	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	10.84	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.95	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS:11255(P-6) Indo Phenol Blue Method	15.16	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene (C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	25.76	µg/m ³	180
11.	^ Arsenic As, ng/ m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	6
12.	Nickel Ni, ng/ m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	20
13.	#Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	#Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	*BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

Note :-@ NAAQS – National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)]18.11.2009.

[#] SOP- Laboratory Standard Operating Procedure, ^- This parameter is not Covered in our NABL scope, **BDL- Below Detection Limit, *DL- Detection Limit

MEEND KAUSHIK
(Tested By)

ARIJUN RAWAT
(Checked By)



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Test Report

Sample Number:	VEL/HPCL/AA/11	Report No.:	VEL/AA/2006/26/011
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30°3'45.41"N	Party Reference No.:	NIL
Longitude:	75°4'6.08"E	Reporting Date:	01/07/2020
		Period of Analysis:	26/06/2020 - 01/07/2020
		Receipt Date:	26/06/2020

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample collected by	: Vardan Enviro Lab Representative
Sampling Location	: Chathewala
Instrument Used	: RDS & FPS sampler with all Accessories
Instrument Code	: VEL/RDS/05& VEL/FPS/05
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 23/06/2020 to 24/06/2020
Time of Monitoring	: 11:15 AM – 11:15 AM
Ambient Temperature (°C)	: Min. 36°C Max. 47°C
Surrounding Activity	: Human & Vehicular Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No
Sampling & Analysis Protocol	: IS-5182
Parameter Required	: As per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS [®] Limit
1.	Particulate Matter (PM _{2.5})	[#] SOP No. VEL/SOP/01, Section No. SP 63	50.10	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	91.33	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	21.05	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	13.87	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	1.19	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS:11255(P-6) Indo Phenol Blue Method	18.16	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene(C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	18.89	µg/m ³	180
11.	^ Arsenic As, ng/ m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	6
12.	Nickel Ni, ng/ m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	20
13.	#Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	#Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	*BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

Note :- @ NAAQS – National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec-3(i)]18.11.2009.

SOP- Laboratory Standard Operating Procedure, ^- This parameter is not Covered in our NABL scope, **BDL- Below Detection Limit, *DL- Detection Limit

MEENIKKAUSHIK
SR ANALYST

(Checked By)
ADHIN RAYAT



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Test Report

Sample Number:	VEL/HPDCL/AA/12	Report No.:	VEL/AA/2006/26/012
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30°6'48.99"N	Party Reference No.:	NIL
Longitude:	75°4'54.51"E	Reporting Date:	01/07/2020
		Period of Analysis:	26/06/2020 - 01/07/2020
		Receipt Date:	26/06/2020

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample collected by	: Vardan Enviro Lab Representative
Sampling Location	: Kot Fatta
Instrument Used	: RDS & FPS sampler with all Accessories
Instrument Code	: VEL/RDS/06& VEL/FPS/06
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 23/06/2020 to 24/06/2020
Time of Monitoring	: 11:40 AM – 11:40 AM
Ambient Temperature (°C)	: Min. 36°C Max. 47°C
Surrounding Activity	: Human & Vehicular Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No
Sampling & Analysis Protocol	: IS-5182
Parameter Required	: As per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS [®] Limit
1.	Particulate Matter (PM _{2.5})	[#] SOP No. VEL/SOP/01, Section No. SP 63	52.62	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	94.16	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	25.12	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	11.04	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	1.06	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS:11255(P-6) Indo Phenol Blue Method	14.09	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene (C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	23.13	µg/m ³	180
11.	^Arsenic As, ng/ m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	6
12.	Nickel Ni, ng/ m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	20
13.	#Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	#Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	*BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

Note :- @ NAAQS – National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec -3(i)]18.11.2009.

SOP- Laboratory Standard Operating Procedure. ^- This parameter is not Covered in our NABL scope, **BDL- Below Detection Limit, *DL- Detection Limit

MEENKAUSHIK
 (Checked By)
 SENIOR ANALYST

ARJUN RAJAT
 (Checked By)

Approved By
 Dr. Shrivastava
 Singh
 VARDAN ENVIROLAB
 100% QUALITY FIRST

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Test Report

Sample Number:	VEL/HPCL/AN/01	Report No.:	VEL/AN/2006/26/001
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	01/07/2020
		Receipt Date:	26/06/2020

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by	: Vardan EnviroLab Representative
Sampling Location	: Near Project Site
Latitude	: 30°3'13.34"N
Longitude	: 75°0'41.57"E
Instrument Used	: Sound Level Meter
Instrument Code	: VEL/S/SLM/01
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 22/06/2020 to 23/06/2020
Time of Monitoring	: 06:00 AM to 06:00AM
Surrounding Activity	: Human, Vehicular and Cement plant Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No any
Sampling & Analysis Protocol	: IS-9989 R-2003
Sampling Duration	: 24 Hours
Parameter Required	: As per Work Order

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	Lmax	IS 9989 R-2003	74.1	64.3	dB(A)
2.	Lmin	IS 9989 R-2003	52.4	37.9	dB(A)
3.	Leq	IS 9989 R-2003	64.52	48.75	dB(A)
4.	CPCB Limits in dB(A*) Leq (Industrial Area)	-	75.00	70.00	dB(A)

Note * A "decibel" is a unit in which noise is measured.

MEENU KAUSHIK

SR. ANALYST

(Tested By)

ARJUN RAWAT

(Checked By)



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Test Report

Sample Number: VEL/HPCL/AN/02 Report No.: VEL/AN/2006/26/002
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Format No.: 7.8 F-01
Village Nasibpura, Bhatinda Punjab Party Reference No.: NIL
Reporting Date: 01/07/2020
Receipt Date: 26/06/2020

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by : Vardan EnviroLab Representative
Sampling Location : Jiwan Singh Wala
Latitude : 30°3'37.63"N
Longitude : 75°0'75.30"E
Instrument Used : Sound Level Meter
Instrument Code : VEL/S/SLM/03
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 22/06/2020 to 23/06/2020
Time of Monitoring : 06:00 AM to 06:00AM
Surrounding Activity : Human, Vehicular and Cement plant Activities
Scope of Monitoring : Regulatory Requirement
Control measure if Any : No any
Sampling & Analysis Protocol : IS-9989 R-2003
Sampling Duration : 24 Hours
Parameter Required : As per Work Order

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	Lmax	IS 9989 R-2003	62.4	51.4	dB(A)
2.	Lmin	IS 9989 R-2003	44.7	33.9	dB(A)
3.	Leq	IS 9989 R-2003	51.12	42.67	dB(A)
4.	CPCB Limits in dB(A*) Leq (Residential Area)	-	55.00	45.00	dB(A)

Note * A "decibel" is a unit in which noise is measured.

MEENU KAUSHIK
SPECIALIST
(Tested By)

ARJUN RAWAT
(Checked By)



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Test Report

Sample Number: VEL/HPCL/AN/03 Report No.: VEL/AN/2006/26/003
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Format No.: 7.8 F-01
Village Nasibpura, Bhatinda Punjab Party Reference No.: NIL
Reporting Date: 01/07/2020
Receipt Date: 26/06/2020

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by : Vardan EnviroLab Representative
Sampling Location : Maanwala
Latitude : 30°2'33.23"N
Longitude : 75°58'6.88"E
Instrument Used : Sound Level Meter
Instrument Code : VEL/S/SLM/04
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 22/06/2020 to 23/06/2020
Time of Monitoring : 06:00 AM to 06:00AM
Surrounding Activity : Human, Vehicular and Cement plant Activities
Scope of Monitoring : Regulatory Requirement
Control measure if Any : No any
Sampling & Analysis Protocol : IS-9989 R-2003
Sampling Duration : 24 Hours
Parameter Required : As per Work Order

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	Lmax	IS 9989 R-2003	66.3	56.5	dB(A)
2.	Lmin	IS 9989 R-2003	45.2	35.8	dB(A)
3.	Leq	IS 9989 R-2003	53.10	42.50	dB(A)
4.	CPCB Limits in dB(A*) Leq (Residential Area)	-	55.00	45.00	dB(A)

Note * A "decibel" is a unit in which noise is measured.

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Test Report

Sample Number: VEL/HPCL/AN/04 Report No.: VEL/AN/2006/26/004
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Format No.: 7.8 F-01
Village Nasibpura, Bhatinda Punjab Party Reference No.: NIL
Reporting Date: 01/07/2020
Receipt Date: 26/06/2020

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by : Vardan EnviroLab Representative
Sampling Location : Mahi Nangal
Latitude : 30°1'13.05"N
Longitude : 75°0'13.89"E
Instrument Used : Sound Level Meter
Instrument Code : VEL/S/SLM/02
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 22/06/2020 to 23/06/2020
Time of Monitoring : 06:00 AM to 06:00AM
Surrounding Activity : Human, Vehicular and Cement plant Activities
Scope of Monitoring : Regulatory Requirement
Control measure if Any : No any
Sampling & Analysis Protocol : IS-9989 R-2003
Sampling Duration : 24 Hours
Parameter Required : As per Work Order

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	Lmax	IS 9989 R-2003	62.3	52.5	dB(A)
2.	Lmin	IS 9989 R-2003	40.2	32.7	dB(A)
3.	Leq	IS 9989 R-2003	51.19	40.24	dB(A)
4.	CPCB Limits in dB(A*) Leq (Residential Area)	-	55.00	45.00	dB(A)

Note * A "decibel" is a unit in which noise is measured.

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SPECIALIST

ARJUN RAWAT
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Test Report

Sample Number:	VEL/HPCL/AN/05	Report No.:	VEL/AN/2006/26/005
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	01/07/2020
		Receipt Date:	26/06/2020

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by	: Vardan EnviroLab Representative
Sampling Location	: Leleana
Latitude	: 29°59'40.64"N
Longitude	: 75°1'17.61"E
Instrument Used	: Sound Level Meter
Instrument Code	: VEL/S/SLM/06
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 22/06/2020 to 23/06/2020
Time of Monitoring	: 06:00 AM to 06:00AM
Surrounding Activity	: Human, Vehicular and Rail Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No any
Sampling & Analysis Protocol	: IS-9989 R-2003
Sampling Duration	: 24 Hours
Parameter Required	: As per Work Order

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	Lmax	IS 9989 R-2003	63.8	50.6	dB(A)
2.	Lmin	IS 9989 R-2003	41.2	31.5	dB(A)
3.	Leq	IS 9989 R-2003	49.20	39.60	dB(A)
4.	CPCB Limits in dB(A)* Leq (Residential Area)	-	55.00	45.00	dB(A)

Note * A "decibel" is a unit in which noise is measured.

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(Tested By)

ARJUN RAJAT
(Checked By)



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Test Report

Sample Number:	VEL/HPCL/AN/06	Report No.:	VEL/AN/2006/26/006
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	01/07/2020
		Receipt Date:	26/06/2020

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by	: Vardan EnviroLab Representative
Sampling Location	: Baghi Bandar
Latitude	: 30°1'27.46"N
Longitude	: 75°4'8.62"E
Instrument Used	: Sound Level Meter
Instrument Code	: VEL/S/SLM/05
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 23/06/2020 to 24/06/2020
Time of Monitoring	: 06:00 AM to 06:00AM
Surrounding Activity	: Human, Vehicular and Rail Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No any
Sampling & Analysis Protocol	: IS-9989 R-2003
Sampling Duration	: 24 Hours
Parameter Required	: As per Work Order

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	Lmax	IS 9989 R-2003	60.2	48.9	dB(A)
2.	Lmin	IS 9989 R-2003	40.6	30.8	dB(A)
3.	Leq	IS 9989 R-2003	51.30	41.32	dB(A)
4.	CPCB Limits in dB(A)* Leq (Residential Area)	-	55.00	45.00	dB(A)

Note * A "decibel" is a unit in which noise is measured.

MEENKA KAUSHIK
SR. (Checked By)

ARJUN RAWAT
(Checked By)



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Test Report

Sample Number: VEL/HPCL/AN/07 Report No.: VEL/AN/2006/26/007
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Format No.: 7.8 F-01
Village Nasibpura, Bhatinda Punjab Party Reference No.: NIL
Reporting Date: 01/07/2020
Receipt Date: 26/06/2020

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by : Vardan EnviroLab Representative
Sampling Location : Nasibpura
Latitude : 30°4'34.79"N
Longitude : 74°59'57.45"E
Instrument Used : Sound Level Meter
Instrument Code : VEL/S/SLM/05
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 23/06/2020 to 24/06/2020
Time of Monitoring : 06:00 AM to 06:00AM
Surrounding Activity : Human, Vehicular and Cement plant Activities
Scope of Monitoring : Regulatory Requirement
Control measure if Any : No any
Sampling & Analysis Protocol : IS-9989 R-2003
Sampling Duration : 24 Hours
Parameter Required : As per Work Order

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	Lmax	IS 9989 R-2003	63.5	53.6	dB(A)
2.	Lmin	IS 9989 R-2003	42.1	32.3	dB(A)
3.	Leq	IS 9989 R-2003	51.50	41.34	dB(A)
4.	CPCB Limits in dB(A*) Leq (Residential Area)	-	55.00	45.00	dB(A)

Note * A "decibel" is a unit in which noise is measured.

MEENU KAUSHIK
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ARUN RAJAT
(Checked By)



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Test Report

Sample Number:	VEL/HPCL/AN/08	Report No.:	VEL/AN/2006/26/008
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	01/07/2020
		Receipt Date:	26/06/2020

Sample Description: **AMBIENT NOISE LEVEL MONITORING**

General Information:-

Sample collected by	: Vardan EnviroLab Representative
Sampling Location	: Kotbhara
Latitude	: 30°5'40.22"N
Longitude	: 75°4'5.30"E
Instrument Used	: Sound Level Meter
Instrument Code	: VEL/S/SLM/06
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 23/06/2020 to 24/06/2020
Time of Monitoring	: 06:00 AM to 06:00AM
Surrounding Activity	: Human, Vehicular and Cement plant Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No any
Sampling & Analysis Protocol	: IS-9989 R-2003
Sampling Duration	: 24 Hours
Parameter Required	: As per Work Order

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	Lmax	IS 9989 R-2003	60.4	49.9	dB(A)
2.	Lmin	IS 9989 R-2003	37.7	30.6	dB(A)
3.	Leq	IS 9989 R-2003	49.57	38.68	dB(A)
4.	CPCB Limits in dB(A*) Leq (Residential Area)	-	55.00	45.00	dB(A)

Note * A "decibel" is a unit in which noise is measured.

MEENU KAUSHIK
S.R. (Checked By)

ARJUN RAWAT
(Checked By)



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122052, Haryana
Branch Off: Plot No. 24 & 25, Narayan Vihar, B-Block, Jaipur - 302035, Rajasthan
NABL Accredited | MoEF&CC Recognized | ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: VEL/HPCL/AN/09 Report No.: VEL/AN/2006/26/009
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Format No.: 7.8 F-01
Village Nasibpura, Bhatinda Punjab Party Reference No.: NIL
Reporting Date: 01/07/2020
Receipt Date: 26/06/2020

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by : Vardan EnviroLab Representative
Sampling Location : Kot Kashmir
Latitude : 30°6'34.53"N
Longitude : 75°0'23.67"E
Instrument Used : Sound Level Meter
Instrument Code : VEL/S/SLM/02
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 23/06/2020 to 24/06/2020
Time of Monitoring : 06:00 AM to 06:00AM
Surrounding Activity : Human, Vehicular and Cement plant Activities
Scope of Monitoring : Regulatory Requirement
Control measure if Any : No any
Sampling & Analysis Protocol : IS-9989 R-2003
Sampling Duration : 24 Hours
Parameter Required : As per Work Order

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	Lmax	IS 9989 R-2003	58.2	49.5	dB(A)
2.	Lmin	IS 9989 R-2003	43.1	35.2	dB(A)
3.	Leq	IS 9989 R-2003	52.70	41.78	dB(A)
4.	CPCB Limits in dB(A*) Leq (Residential Area)	-	55.00	45.00	dB(A)

Note * A "decibel" is a unit in which noise is measured.

MEENU KAUSHIK
(Checked By)

ARIJUN RAWAT
(Checked By)



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Tel: 0124-4343750, 4343752, 4343753 | E-mail: lab@vardanenviromet.com, bd@vardanenviromet.com



Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122052, Haryana
Branch Off: Plot No. 24 & 25, Narayan Vihar, B-Block, Jaipur - 302035, Rajasthan
NABL Accredited | MoEF&CC Recognized | ISO 9001|ISO 14001|ISO 45001

Test Report

Sample Number: VEL/HPCL/AN/10
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd.
Village Nasibpura, Bhatinda Punjab

Report No.: VEL/AN/2006/26/010
Format No.: 7.8 F-01
Party Reference No.: NIL
Reporting Date: 01/07/2020
Receipt Date: 26/06/2020

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by : Vardan EnviroLab Representative
Sampling Location : Gehri Boghi
Latitude : 30°6'44.02"N
Longitude : 74°57'21.06"E
Instrument Used : Sound Level Meter
Instrument Code : VEL/S/SLM/01
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 23/06/2020 to 24/06/2020
Time of Monitoring : 06:00 AM to 06:00AM
Surrounding Activity : Human, Vehicular and Cement plant Activities
Scope of Monitoring : Regulatory Requirement
Control measure if Any : No any
Sampling & Analysis Protocol : IS-9989 R-2003
Sampling Duration : 24 Hours
Parameter Required : As per Work Order

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	Lmax	IS 9989 R-2003	64.2	56.9	dB(A)
2.	Lmin	IS 9989 R-2003	46.5	35.4	dB(A)
3.	Leq	IS 9989 R-2003	53.63	43.80	dB(A)
4.	CPCB Limits in dB(A)* Leq (Residential Area)	-	55.00	45.00	dB(A)

Note * A "decibel" is a unit in which noise is measured.

MEENU KAUSHIK
SR. ANALYST
(Tested By)

ARJUN RAWAT
(Checked By)



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Test Report

Sample Number:	VEL/HPCL/AN/11	Report No.:	VEL/AN/2006/26/011
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	01/07/2020
		Receipt Date:	26/06/2020

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by	: Vardan EnviroLab Representative
Sampling Location	: Chathewala
Latitude	: 30 ⁰³ '45.41"N
Longitude	: 75 ⁰⁴ '6.08"E
Instrument Used	: Sound Level Meter
Instrument Code	: VEL/S/SLM/04
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 23/06/2020 to 24/06/2020
Time of Monitoring	: 06:00 AM to 06:00AM
Surrounding Activity	: Human, Vehicular and Cement plant Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No any
Sampling & Analysis Protocol	: IS-9989 R-2003
Sampling Duration	: 24 Hours
Parameter Required	: As per Work Order

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	Lmax	IS 9989 R-2003	56.8	51.6	dB(A)
2.	Lmin	IS 9989 R-2003	44.3	30.5	dB(A)
3.	Leq	IS 9989 R-2003	50.45	42.11	dB(A)
4.	CPCB Limits in dB(A) Leq (Residential Area)	-	55.00	45.00	dB(A)

Note * A "decibel" is a unit in which noise is measured.

MEENU KAUSHIK
SR (Tested By)

ARJUN DAWAT
(Checked By)



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Test Report

Sample Number:	VEL/HPCL/AN/12	Report No.:	VEL/AN/2006/26/012
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	01/07/2020
		Receipt Date:	26/06/2020

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by	: Vardan EnviroLab Representative
Sampling Location	: Kot Fatta
Latitude	: 30°6'48.99"N
Longitude	: 75°4'54.51"E
Instrument Used	: Sound Level Meter
Instrument Code	: VEL/S/SLM/03
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 23/06/2020 to 24/06/2020
Time of Monitoring	: 06:00 AM to 06:00AM
Surrounding Activity	: Human, Vehicular and Cement plant Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No any
Sampling & Analysis Protocol	: IS-9989 R-2003
Sampling Duration	: 24 Hours
Parameter Required	: As per Work Order

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	Lmax	IS 9989 R-2003	61.8	52.3	dB(A)
2.	Lmin	IS 9989 R-2003	42.6	33.7	dB(A)
3.	Leq	IS 9989 R-2003	52.21	41.26	dB(A)
4.	CPCB Limits in dB(A*) Leq (Residential Area)	-	55.00	45.00	dB(A)

Note * A "decibel" is a unit in which noise is measured.

MEENU KAUSHIK
(Tested By)

ARJUN RAWAT
(Checked By)



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
NABL Accredited | MoEF&CC Recognized | ISO 9001|ISO 14001|ISO 45001

Test Report

Sample Number:	VEL/HPCL/W/01	Report No.:	VEL/W/2009/22/001
Name & Address of Party:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30° 3' 13.34" N	Party Reference No.:	NIL
Longitude:	75° 0' 41.57" E	Reporting Date:	26/11/2020
Sample Description:	Ground Water Sample	Period of Analysis:	22/09/2020 - 28/09/2020
Sample Location:	Near Project Site	Receipt Date:	22/09/2020
Sample Collected by:	Vardan Enviro Lab Representative	Sampling Date:	18/09/2020
Parameter Required	As per work order	Sampling Quantity:	2.0 Ltr
Sampling & Analysis Protocol:	IS-10500-2012, APHA	Sampling Type:	Carb
		Preservation:	Refrigerated
		Amendment No. 1	Dated 26/11/2020

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 °C)	APHA .4500-H ⁻ B Electrometric Method	7.57	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA .2120 B. Visual Comparison Method	*BDL (**DL 5Hazen)	Hazen	5	15
3.	Turbidity	APIIA. 2130 B. Nephelometric Method	*BDL (**DL 1 NTU)	NTU	1	5
4.	Odour	APIIA. 2150 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA . 2160 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	APHA . 2340 C. EDTA Titrimetric Method	298.00	mg/l	200	600
7.	Calcium as Ca	APIIA. 3500 Ca B. EDTA Titrimetric Method	78.86	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA . 2320 B. Titrimetric Method	205.47	mg/l	200	600
9.	Chloride as Cl	APIIA. 4500-Cl ⁻ B. Argentometric Method	85.36	mg/l	250	1000
10.	Cyanide as CN	APHA . 4500 CN ⁻ D	*BDL (**DL 0.05 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA . 3500 Mg B. Calculation Method	24.60	mg/l	30	100
12.	Total Dissolved Solids	APHA . 2540 C. Gravimetric Method	896.00	mg/l	500	2000
13.	Sulphate as SO ₄	APHA . 4500 E. Turbidimetric Method	46.71	mg/l	200	400
14.	Fluoride as F	APHA . 4500-F ⁻ D. SPADNS Method	0.89	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) .Chromotropic Method	9.97	mg/l	45	No Relaxation
16.	Iron as Fe	APHA . 3500-Fe B 1.10 Phenanthroline Method	0.20	mg/l	0.3	No relaxation
17.	Aluminium as Al	APIIA . 3111 D Nitrous Oxide Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA. 4500B C. Carmine Method	*BDL(**DL 0.1 mg/l)	mg/l	0.5	1
19.	Total Chromium as Cr	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	No Relaxation

ANKITA SINGH
ANALYST

(Checked By)

ARJUN RAWAT

(Checked By)



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
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Test Report

Sample No.: VEL/HPCL/W/01			Report No.: VEL/W/2009/22/001			
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.001 mg/l)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.01mg/l)	mg/l	0.5	No Relaxation
22.	Anionic Detergents as MBAS	APHA, 5540 C MBAS Method	*BDL(**DL 0.02 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	APHA . 3111 B. Direct Air. Acetylene Flame Method	0.25	mg/l	5	15
24.	Copper as Cu	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	APHA . 3114 B. Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	APHA . 3114 B. Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	0.05
30.	Mercury as Hg	APHA . 3112 B. Cold Vapour AAS Method	*BDL (**DL 0.001 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1493	µS/cm	--	--
32.	Ammonia as NH ₃	IS 3025 (P-34) . Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA. 3500 Na B Flame Photometric Method	27.5	mg/l	--	--
34.	Potassium	APHA. 3500 Na B Flame Photometric Method	5.6	mg/l	--	--
35.	Total Coliform	IS 1622:2009 : 1987. RA:2019	< 2	MPN/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 1622:2009 : 1987. RA:2019	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note:- *BDL- Below Detection Limit. **DL- Detection Limit. ^These parameter are not covered in our NABL scope. ^Due to Additional Parameter

ANKITA SINGH
ANALYST

ANKITA SINGH

ARJUN RAWAT

(Checked By)
ARJUN RAWAT



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Test Report

Sample Number:	VEL/HPCL/W/02	Report No.:	VEL/W/2009/22/002
Name & Address of Party:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30° 3' 37.63" N	Party Reference No.:	NIL
Longitude:	75° 2' 75.30" E	Reporting Date:	26/11/2020
Sample Description:	Ground Water Sample	Period of Analysis:	22/09/2020 – 28/09/2020
Sample Location:	Jiwan Singh Wala	Receipt Date:	22/09/2020
Sample Collected by:	Vardan Enviro Lab Representative	Sampling Date:	18/09/2020
Parameter Required	As per work order	Sampling Quantity:	2.0 Ltr
Sampling & Analysis Protocol:	IS-10500-2012, APHA	Preservation:	Refrigerated
		Amendment No. 1	Dated 26/11/2020

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 °C)	APHA .4500-II' B Electrometric Method	7.68	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA .2120 B. Visual Comparison Method	*BDL (**DL 5 Hazen)	Hazen	5	15
3.	Turbidity	APHA. 2130 B. Nephelometric Method	*BDL (**DL 1 NTU)	NTU	1	5
4.	Odour	APHA. 2150 B . Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA . 2160 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	APHA . 2340 C. EDTA Titrimetric Method	257.00	mg/l	200	600
7.	Calcium as Ca	APHA. 3500 Ca B. EDTA Titrimetric Method	66.23	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA . 2320 B. Titrimetric Method	183.16	mg/l	200	600
9.	Chloride as Cl	APHA. 4500-Cl' B. Argentometric Method	76.15	mg/l	250	1000
10.	Cyanide as CN	APHA . 4500 CN' D	*BDL (**DL 0.05 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA . 3500 Mg B. Calculation Method	22.29	mg/l	30	100
12.	Total Dissolved Solids	APHA . 2540 C. Gravimetric Method	852.00	mg/l	500	2000
13.	Sulphate as SO ₄	APHA . 4500 E. Turbidimetric Method	29.07	mg/l	200	400
14.	Fluoride as F	APHA . 4500-F' D. SPADNS Method	0.82	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) .Chromotropic Method	9.71	mg/l	45	No Relaxation
16.	Iron as Fe	APHA . 3500-Fe B 1.10 Phenanthroline Method	0.23	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA . 3111 D Nitrous Oxide Acetylene Flame Method	*BDL (**DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA. 4500B C. Carmine Method	*BDL (**DL 0.1 mg/l)	mg/l	0.5	1
19.	Total Chromium as Cr	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL (**DL 0.03 mg/l)	mg/l	0.05	No Relaxation

ANKITA SINGH
 ANALYST
(Signature)

ARJUN RAWAT
 (Checked By)
(Signature)



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Vardan EnviroLab

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Test Report

Sample No.: VEL/HPCL/W/02			Report No.: VEL/W/2009/22/002			
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.001 mg/l)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.01mg/l)	mg/l	0.5	No Relaxation
22.	Anionic Detergents as MBAS	APHA, 5540 C MBAS Method	*BDL(**DL 0.02 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	APHA . 3111 B. Direct Air. Acetylene Flame Method	0.49	mg/l	5	15
24.	Copper as Cu	APIA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	APIA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	APIA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	APHA . 3114 B. Manual Hydride Generation	*BDL(**DL 0.13 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	APIA . 3114 B. Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	0.05
30.	Mercury as Hg	APIA . 3112 B. Cold Vapour AAS Method	*BDL(**DL 0.01 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1420	µS/cm	--	--
32.	Ammonia as NH ₃	IS 3025 (P-34) . Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APIA. 3500 Na B Flame Photometric Method	30.6	mg/l	--	--
34.	Potassium	APIA. 3500 Na B Flame Photometric Method	7.3	mg/l	--	--
35.	Total Coliform	IS 1622:2009 : 1987. RA:2019	< 2	MPN/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 1622:2009 : 1987. RA:2019	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note:- *BDL- Below Detection Limit. **DL- Detection Limit. #These parameter are not covered in our NABL scope, ^Due to Additional Parameter

ANKITA SINGH
ANALYST
Asimply

ARJUN RAWAT
(Checked By)
Arjun



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Test Report

Sample Number:	VEL/HIPCL/W/03	Report No.:	VEL/W/2009/22/003
Name & Address of Party:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30° 2' 33.23" N	Party Reference No.:	NIL
Longitude:	75° 58' 6.88" E	Reporting Date:	26/11/2020
Sample Description:	Ground Water Sample	Period of Analysis:	22/09/2020 -- 28/09/2020
Sample Location:	Maanwala	Receipt Date:	22/09/2020
Sample Collected by:	Vardan Enviro Lab Representative	Sampling Date:	18/09/2020
Parameter Required	As per Client Requirement	Sampling Quantity:	2.0 Ltr
Sampling & Analysis Protocol:	IS-10500-2012, APHA	Sampling Type:	Garb
		Preservation:	Refrigerated
		Amendment No. 1	Dated 26/11/2020

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 °C)	APHA .4500-11 B Electrometric Method	7.85	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA .2120 B. Visual Comparison Method	*BDL (**DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA. 2130 B. Nephelometric Method	*BDL (**DL 1 NTU)	NTU	1	5
4.	Odour	APHA. 2150 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA . 2160 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	APHA . 2340 C. EDTA Titrimetric Method	415.00	mg/l	200	600
7.	Calcium as Ca	APHA. 3500 Ca B. EDTA Titrimetric Method	86.54	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA . 2320 B. Titrimetric Method	304.19	mg/l	200	600
9.	Chloride as Cl	APHA. 4500-Cl B. Argentometric Method	153.12	mg/l	250	1000
10.	Cyanide as CN	APHA . 4500 CN D	*BDL (**DL 0.05 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA . 3500 Mg B. Calculation Method	48.37	mg/l	30	100
12.	Total Dissolved Solids	APHA . 2540 C. Gravimetric Method	950.00	mg/l	500	2000
13.	Sulphate as SO ₄	APHA . 4500 E. Turbidimetric Method	112.65	mg/l	200	400
14.	Fluoride as F	APHA . 4500-F D. SPADNS Method	1.12	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) .Chromotropic Method	11.86	mg/l	45	No Relaxation
16.	Iron as Fe	APHA . 3500-Fe B 1.10 Phenanthroline Method	0.28	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA . 3111 D Nitrous Oxide Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA. 4500B C. Carmine Method	*BDL(**DL 0.1 mg/l)	mg/l	0.5	1
19.	Total Chromium as Cr	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	No Relaxation

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ANALYST

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ARJUN RAWAT

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Test Report

Sample No.: VEL/HPCL/W/03

Report No.: VEL/W/2009/22/003

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.001 mg/l)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.01mg/l)	mg/l	0.5	No Relaxation
22.	Anionic Detergents as MBAS	APHA, 5540 C MBAS Method	*BDL(**DL 0.02 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	APIHA . 3111 B. Direct Air. Acetylene Flame Method	0.38	mg/l	5	15
24.	Copper as Cu	APIHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	APIHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	APIHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	APIHA . 3114 B. Manual Hydride Generation	*BDL(**DL 0.13 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	APIHA . 3114 B. Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	0.05
30.	Mercury as Hg	APIHA . 3112 B. Cold Vapour AAS Method	*BDL(**DL 0.01 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1583	μS/cm	--	--
32.	Ammonia as NH ₃	IS 3025 (P-34) . Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APIHA. 3500 Na B Flame Photometric Method	26.1	mg/l	--	--
34.	Potassium	APHA. 3500 Na B Flame Photometric Method	3.7	mg/l	--	--
35.	Total Coliform	IS 1622:2009 : 1987. RA:2019	< 2	MPN/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 1622:2009 : 1987. RA:2019	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note:- *BDL- Below Detection Limit. **DL- Detection Limit. [#]These parameter are not covered in our NABL scope. [^]Due to Additional Parameter.

ANKITA SINGH
ANALYST
[Signature]

ARJUN RAWAT
Checked By
[Signature]



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Vardan EnviroLab

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Test Report

Sample Number:	VEL/HPCL/W/04	Report No.:	VEL/W/2009/22/004
Name & Address of Party:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30° 1' 13.05" N	Party Reference No.:	NIL
Longitude:	75° 1' 3.89" E	Reporting Date:	26/11/2020
Sample Description:	Ground Water Sample	Period of Analysis:	22/09/2020 -- 28/09/2020
Sample Location:	Mahi Nangal	Receipt Date:	22/09/2020
Sample Collected by:	Vardan Enviro Lab Representative	Sampling Date:	18/09/2020
Parameter Required	As per Client Requirement	Sampling Quantity:	2.0 Ltr
Sampling & Analysis Protocol:	IS-10500-2012, APHA	Sampling Type:	Garb
		Preservation:	Refrigerated
		Amendment No. 1	Dated 26/11/2020

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 °C)	APHA .4500-H ¹ B Electrometric Method	7.53	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA .2120 B. Visual Comparison Method	*BDL (**DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA. 2130 B. Nephelometric Method	*BDL (**DL 1 NTU)	NTU	1	5
4.	Odour	APHA. 2150 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA . 2160 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	APHA . 2340 C. EDTA Titrimetric Method	337.00	mg/l	200	600
7.	Calcium as Ca	APHA. 3500 Ca B. EDTA Titrimetric Method	91.75	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA . 2320 B. Titrimetric Method	253.18	mg/l	200	600
9.	Chloride as Cl	APHA. 4500-Cl ⁻ B. Argentometric Method	81.31	mg/l	250	1000
10.	Cyanide as CN	APHA . 4500 CN ⁻ D	*BDL (**DL 0.05 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA . 3500 Mg B. Calculation Method	26.26	mg/l	30	100
12.	Total Dissolved Solids	APHA . 2540 C. Gravimetric Method	910.00	mg/l	500	2000
13.	Sulphate as SO ₄	APHA . 4500 E. Turbidimetric Method	62.49	mg/l	200	400
14.	Fluoride as F	APHA . 4500-F ⁻ D. SPADNS Method	0.80	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) .Chromotropic Method	10.50	mg/l	45	No Relaxation
16.	Iron as Fe	APHA . 3500-Fe B 1.10 Phenanthroline Method	0.26	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA . 3111 D Nitrous Oxide Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA. 4500B C. Carmine Method	*BDL(**DL 0.1 mg/l)	mg/l	0.5	1
19.	Total Chromium as Cr	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	No Relaxation

ANKITA SINGH
ANALYST

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ARJUN RAWAT
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Vardan EnviroLab

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Test Report

Sample No.: VEL/HPCL/W/04				Report No.: VEL/W/2009/22/004		
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.001 mg/l)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.01 mg/l)	mg/l	0.5	No Relaxation
22.	Anionic Detergents as MBAS	APHA, 5540 C MBAS Method	*BDL(**DL 0.02 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	APIIA . 3111 B. Direct Air. Acetylene Flame Method	0.59	mg/l	5	15
24.	Copper as Cu	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	APHA . 3114 B. Manual Hydride Generation	*BDL(**DL 0.13 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	APIIA . 3114 B. Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	0.05
30.	Mercury as Hg	APHA . 3112 B. Cold Vapour AAS Method	*BDL(**DL 0.01 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1493	µS/cm	--	--
32.	Ammonia as NH ₃	IS 3025 (P-34) . Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA. 3500 Na B Flame Photometric Method	32.8	mg/l	--	--
34.	Potassium	APHA. 3500 Na B Flame Photometric Method	8.3	mg/l	--	--
35.	Total Coliform	IS 1622:2009 : 1987. RA:2019	< 2	MPN/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 1622:2009 : 1987. RA:2019	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note:- *BDL- Below Detection Limit. **DL- Detection Limit. #These parameter are not covered in our NABL scope. ^Due to Additional Parameter

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Vardan EnviroLab

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Test Report

Sample Number:	VEL/HIPCL/W/05	Report No.:	VEL/W/2009/22/005
Name & Address of Party:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30° 6' 34.53" N	Party Reference No.:	NIL
Longitude:	75° 0' 23.67" E	Reporting Date:	26/11/2020
Sample Description:	Ground Water Sample	Period of Analysis:	22/09/2020 -- 28/09/2020
Sample Location:	Kot Kashmir	Receipt Date:	22/09/2020
Sample Collected by:	Vardan Enviro Lab Representative	Sampling Date:	19/09/2020
Parameter Required	As per Client Requirement	Sampling Quantity:	2.0 Ltr
Sampling & Analysis Protocol:	IS-10500-2012, APHA	Sampling Type:	Garb
		Preservation:	Refrigerated
		Amendment No. 1	Dated 26/11/2020

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 °C)	APHA .4500-IT B Electrometric Method	7.88	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA .2120 B. Visual Comparison Method	*BDL (**DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA. 2130 B. Nephelometric Method	*BDL (**DL 1 NTU)	NTU	1	5
4.	Odour	APHA. 2150 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA . 2160 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	APHA . 2340 C. EDTA Titrimetric Method	391.00	mg/l	200	600
7.	Calcium as Ca	APHA. 3500 Ca B. EDTA Titrimetric Method	96.88	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA . 2320 B. Titrimetric Method	269.18	mg/l	200	600
9.	Chloride as Cl	APHA. 4500-Cl B. Argentometric Method	101.66	mg/l	250	1000
10.	Cyanide as CN	APHA . 4500 CN D	*BDL (**DL 0.05 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA . 3500 Mg B. Calculation Method	36.27	mg/l	30	100
12.	Total Dissolved Solids	APHA . 2540 C. Gravimetric Method	998.00	mg/l	500	2000
13.	Sulphate as SO ₄	APHA . 4500 E. Turbidimetric Method	86.10	mg/l	200	400
14.	Fluoride as F	APHA . 4500-F D. SPADNS Method	0.89	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) .Chromotropic Method	11.76	mg/l	45	No Relaxation
16.	Iron as Fe	APHA . 3500-Fe B 1.10 Phenanthroline Method	0.27	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA . 3111 D Nitrous Oxide Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA. 4500B C. Carmine Method	*BDL(**DL 0.1 mg/l)	mg/l	0.5	1
19.	Total Chromium as Cr	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	No Relaxation

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Test Report

Sample No.: VEL/HPCL/W/05				Report No.: VEL/W/2009/22/005		
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.001 mg/l)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.01mg/l)	mg/l	0.5	No Relaxation
22.	Anionic Detergents as MBAS	APHA, 5540 C MBAS Method	*BDL(**DL 0.02 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	APHA . 3111 B. Direct Air. Acetylene Flame Method	0.63	mg/l	5	15
24.	Copper as Cu	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	APIIA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	APHA . 3114 B. Manual Hydride Generation	*BDL(**DL 0.13 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	APHA . 3114 B. Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	0.05
30.	Mercury as Hg	APHA . 3112 B. Cold Vapour AAS Method	*BDL(**DL 0.01 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1663	µS/cm	--	--
32.	Ammonia as NH ₃	IS 3025 (P-34) . Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA. 3500 Na B Flame Photometric Method	29.5	mg/l	--	--
34.	Potassium	APIIA. 3500 Na B Flame Photometric Method	7.9	mg/l	--	--
35.	Total Coliform	IS 1622:2009 : 1987. RA:2019	< 2	MPN/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 1622:2009 : 1987. RA:2019	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note:- *BDL - Below Detection Limit. **DL- Detection Limit. These parameter are not covered in our NABL scope.

ANKITA SINGH

ANALYST
[Signature]

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11/11/2019 10:30 AM



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Test Report

Sample Number:	VEL/HPCL/W/06	Report No.:	VEL/W/2009/22/006
Name & Address of Party:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30° 4' 34.79" N	Party Reference No.:	NIL
Longitude:	74° 59' 57.45" E	Reporting Date:	26/11/2020
Sample Description:	Ground Water Sample	Period of Analysis:	22/09/2020 – 28/09/2020
Sample Location:	Nasibpura	Receipt Date:	22/09/2020
Sample Collected by:	Vardan Enviro Lab Representative	Sampling Date:	19/09/2020
Parameter Required	As per Client Requirement	Sampling Quantity:	2.0 Ltr
Sampling & Analysis Protocol:	IS-10500-2012, APHA	Sampling Type:	Garb
		Preservation:	Refrigerated
		Amendment No. 1	Dated 26/11/2020

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 °C)	APHA .4500-II B Electrometric Method	7.74	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA .2120 B. Visual Comparison Method	*BDL (**DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA. 2130 B. Nephelometric Method	*BDL (**DL 1 NTU)	NTU	1	5
4.	Odour	APHA. 2150 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA . 2160 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	APHA . 2340 C. EDTA Titrimetric Method	379.00	mg/l	200	600
7.	Calcium as Ca	APHA. 3500 Ca B. EDTA Titrimetric Method	99.82	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA . 2320 B. Titrimetric Method	267.13	mg/l	200	600
9.	Chloride as Cl	APHA. 4500-Cl B. Argentometric Method	86.44	mg/l	250	1000
10.	Cyanide as CN	APHA . 4500 CN D	*BDL (**DL 0.05 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA . 3500 Mg B. Calculation Method	31.58	mg/l	30	100
12.	Total Dissolved Solids	APHA . 2540 C. Gravimetric Method	980.00	mg/l	500	2000
13.	Sulphate as SO ₄	APHA . 4500 E. Turbidimetric Method	80.61	mg/l	200	400
14.	Fluoride as F	APHA . 4500-F D. SPADNS Method	0.82	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) .Chromotropic Method	9.68	mg/l	45	No Relaxation
16.	Iron as Fe	APHA . 3500-Fe B 1.10 Phenanthroline Method	0.29	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA . 3111 D Nitrous Oxide Acetylene Flame Method	*BDL (**DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA. 4500B C. Carmine Method	*BDL (**DL 0.1 mg/l)	mg/l	0.5	1
19.	Total Chromium as Cr	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL (**DL 0.03 mg/l)	mg/l	0.05	No Relaxation

ANKITA SINGH

ANALYST
(Asst. Lab. In-charge)

ARJUN RAWAT

(Checked By)
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Test Report

Sample No.: VEL/HPCL/W/06			Report No.: VEL/W/2009/22/006			
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.001 mg/l)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.01mg/l)	mg/l	0.5	No Relaxation
22.	Anionic Detergents as MBAS	APHA, 5540 C MBAS Method	*BDL(**DL 0.02 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	APHA . 3111 B. Direct Air. Acetylene Flame Method	0.73	mg/l	5	15
24.	Copper as Cu	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	APHA . 3114 B. Manual Hydride Generation	*BDL(**DL 0.13 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	APHA . 3114 B. Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	0.05
30.	Mercury as Hg	APHA . 3112 B. Cold Vapour AAS Method	*BDL(**DL 0.01 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1493	µS/cm	--	--
32.	Ammonia as NH ₃	IS 3025 (P-34) . Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA. 3500 Na B Flame Photometric Method	30.1	mg/l	--	--
34.	Potassium	APHA. 3500 Na B Flame Photometric Method	6.9	mg/l	--	--
35.	Total Coliform	IS 1622:2009 : 1987, RA:2019	< 2	MPN/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 1622:2009 : 1987, RA:2019	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note:- *BDL:- Below Detection Limit, **DL:- Detection Limit. *These parameter are not covered in our NABL scope. ^Due to Additional Parameter

ANKITA SINGH
ANALYST
(Signature)

ARJUN RAWAT
Checked By
(Signature)



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Ph: 0124-4343750/752/753, 9310355669, 9351147263 E-mail: lab@vardanenviro.net.com, bd@vardanenviro.net.co



Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
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Test Report

Sample Number:	VEL/HPCL/W/07	Report No.:	VEL/W/2009/22/007
Name & Address of Party:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30° 1' 27.46" N	Party Reference No.:	NIL
Longitude:	75° 4' 8.62" E	Reporting Date:	26/11/2020
Sample Description:	Ground Water Sample	Period of Analysis:	22/09/2020 – 28/09/2020
Sample Location:	Baghi Bandar	Receipt Date:	22/09/2020
Sample Collected by:	Vardan Enviro Lab Representative	Sampling Date:	19/09/2020
Parameter Required	As per Client Requirement	Sampling Quantity:	2.0 Ltr
Sampling & Analysis Protocol:	IS-10500-2012, APHA	Sampling Type:	Garb
		Preservation:	Refrigerated
		Amendment No. 1	Dated 26/11/2020

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 °C)	APHA .4500-H B Electrometric Method	7.57	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA .2120 B. Visual Comparison Method	*BDL (**DL 5 Hazen)	Hazen	5	15
3.	Turbidity	APHA. 2130 B. Nephelometric Method	*BDL (**DL 1 NTU)	NTU	1	5
4.	Odour	APIIA . 2150 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APIIA . 2160 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	APHA . 2340 C. EDTA Titrimetric Method	412.00	mg/l	200	600
7.	Calcium as Ca	APHA. 3500 Ca B. EDTA Titrimetric Method	112.56	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA . 2320 B. Titrimetric Method	238.87	mg/l	200	600
9.	Chloride as Cl	APHA. 4500-Cl B. Argentometric Method	90.54	mg/l	250	1000
10.	Cyanide as CN	APHA . 4500 CN D	*BDL (**DL 0.05 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APIIA . 3500 Mg B. Calculation Method	31.87	mg/l	30	100
12.	Total Dissolved Solids	APHA . 2540 C. Gravimetric Method	1086.00	mg/l	500	2000
13.	Sulphate as SO ₄	APIIA . 4500 E. Turbidimetric Method	83.14	mg/l	200	400
14.	Fluoride as F	APIIA . 4500-F D. SPADNS Method	0.87	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) .Chromotropic Method	12.53	mg/l	45	No Relaxation
16.	Iron as Fe	APIIA . 3500-Fe B 1.10 Phenanthroline Method	0.25	mg/l	0.3	No relaxation
17.	Aluminium as Al	APIIA . 3111 D Nitrous Oxide Acetylene Flame Method	*BDL (**DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APIIA. 4500B C. Carmine Method	*BDL (**DL 0.1 mg/l)	mg/l	0.5	1
19.	Total Chromium as Cr	APIIA . 3111 B. Direct Air. Acetylene Flame Method	*BDL (**DL 0.03 mg/l)	mg/l	0.05	No Relaxation

ANKITA SINGH
ANALYST

Signature of Ankita Singh

ARJUN RAWAT

(Checked By)
Signature of Arjun Rawat



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Test Report

Sample No.: VEL/HPCL/W/07				Report No.: VEL/W/2009/22/007		
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.001 mg/l)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.01mg/l)	mg/l	0.5	No Relaxation
22.	Anionic Detergents as MBAS	APHA, 5540 C MBAS Method	*BDL(**DL 0.02 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	APIIA . 3111 B. Direct Air. Acetylene Flame Method	0.65	mg/l	5	15
24.	Copper as Cu	APIIA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	APIIA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	APIIA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	APIIA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	APHA . 3114 B. Manual Hydride Generation	*BDL(**DL 0.13 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	APIIA . 3114 B. Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	0.05
30.	Mercury as Hg	APIIA . 3112 B. Cold Vapour AAS Method	*BDL(**DL 0.01 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1810	µS/cm	--	--
32.	Ammonia as NH ₄	IS 3025 (P-34) . Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APIIA. 3500 Na B Flame Photometric Method	32.5	mg/l	--	--
34.	Potassium	APIIA. 3500 Na B Flame Photometric Method	8.7	mg/l	--	--
35.	Total Coliform	IS 1622:2009 : 1987. RA:2019	<2	MPN/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 1622:2009 : 1987. RA:2019	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note:- *BDL.- Below Detection Limit. **DL.- Detection Limit. These parameter are not covered in our NABL scope. ^Due to Additional Parameter

ANKITA SINGH
ANALYST
Asst. Analyst

ARJUN RAWAT
(Checked By)
Arjun Rawat



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Test Report

Sample Number:	VEL/HPCL/W/08	Report No.:	VEL/W/2009/22/008
Name & Address of Party:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30° 6' 48.99" N	Party Reference No.:	NIL
Longitude:	75° 4' 54.51" E	Reporting Date:	26/11/2020
Sample Description:	Surface Water Sample	Period of Analysis:	22/09/2020 -- 28/09/2020
Sample Location:	Kot Fatta	Receipt Date:	22/09/2020
Sample Collected by:	Vardan Enviro Lab Representative	Sampling Date:	19/09/2020
Parameter Required	As per Client Requirement	Sampling Quantity:	2.0 Ltr
Sampling & Analysis Protocol:	IS 2296 & CPCB, 1979, APHA	Sampling Type:	--
		Preservation:	Refrigerated
		Amendment No. 1	Dated 26/11/2020

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	APHA .4500-H ⁺ B Electrometric Method	7.78	--
2.	Colour	APHA .2120 B. Visual Comparison Method	*BDL (**DL 5Hazen)	Hazen
3.	Turbidity	APHA. 2130 B. Nephelometric Method	24	NTU
4.	Odour	APHA. 2150 B . Threshold Test Method	Agreeable	--
5.	Taste	APHA . 2160 B. Threshold Test Method	None	--
6.	Chloride as Cl	APHA. 4500-Cl ⁻ B. Argentometric Method	118.50	mg/l
7.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1280	μS/cm
8.	Nitrate as NO ₃	IS 3025 (P-34) .Chromotropic Method	17.64	mg/l
9.	Iron as Fe	APHA . 3500-Fe B 1.10 Phenanthroline Method	0.32	mg/l
10.	Total Dissolved Solids	APHA . 2540 C. Gravimetric Method	768.00	mg/l
11.	Lead as Pb	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l
12.	Boron	APHA. 4500B C. Carmine Method	0.20	mg/l
13.	Sulphate as SO ₄ ²⁻	APHA . 4500 E. Turbidimetric Method	16.21	mg/l
14.	Fluoride as F	APHA . 4500-F ⁻ D. SPADNS Method	0.62	mg/l
15.	BOD (3 Days at 27°C)	APHA. 5210 C / IS 3025.P-44	5.00	mg/l
16.	COD	APHA. 5220 B. Open Reflux Method	35.60	mg/l
17.	Free Ammonia as NH ₃	IS 3025 (P-34) . Titrimetric Method	16.35	mg/l
18.	Total Coliform	IS 1622	37	MPN/100ml
19.	Arsenic as As	APHA . 3114 B. Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l

ANKITA SINGH
ANALYST

(Signature)

ARJUN RAWAT
(Checked By)
(Signature)



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Test Report

Sample No.: VEL/HPCL/W/08			Report No.: VEL/W/2009/22/008	
S. No.	Parameter	Test-Method	Result	Unit
20.	Total Hardness as CaCO ₃	APHA . 2340 C. EDTA Titrimetric Method	460.35	mg/l
21.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	105.84	mg/l
22.	Alkalinity as CaCO ₃	APHA . 2320 B, Titrimetric Method	343.81	mg/l
23.	Magnesium as Mg	APHA . 3500 Mg B. Calculation Method	47.69	mg/l
24.	Copper as Cu	APHA . 3111 B. Direct Air, Acetylene Flame Method	4.1	mg/l
25.	Sodium	APHA, 3500 Na B Flame Photometric Method	122.50	mg/l
26.	Potassium	APHA, 3500 Na B Flame Photometric Method	43.72	mg/l
27.	Total Chromium as Cr	APHA . 3111 B. Direct Air, Acetylene Flame Method	*BDL (**DL 0.03 mg/l)	mg/l

Note:- *BDL- Below Detection Limit. **DL- Detection Limit. ^Due to Additional Parameter

ANKITA SINGH
ANALYST
Ankita Singh

ARJUN RAWAT
(Checked By)
Arjun Rawat



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Test Report

Sample Number:	VEL/HPCL/W/09	Report No.:	VEL/W/2009/22/009
Name & Address of Party:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30° 3' 45.41" N	Party Reference No.:	NIL
Longitude:	75° 4' 6.08" E	Reporting Date:	26/11/2020
Sample Description:	Surface Water Sample	Period of Analysis:	22/09/2020 - 28/09/2020
Sample Location:	Chathewala	Receipt Date:	22/09/2020
Sample Collected by:	Vardan Enviro Lab Representative	Sampling Date:	19/09/2020
Parameter Required	As per Client Requirement	Sampling Quantity:	2.0 Ltr
Sampling & Analysis Protocol:	IS 2296 & CPCB, 1979, APHA	Sampling Type:	--
		Preservation:	Refrigerated
		Amendment No. 1	Dated 26/11/2020

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 ⁰ C)	APHA .4500-II ⁷ B Electrometric Method	7.67	--
2.	Colour	APHA .2120 B. Visual Comparison Method	*BDL (**DL 5Hazen)	Hazen
3.	Turbidity	APHA. 2130 B. Nephelometric Method	21	NTU
4.	Odour	APHA. 2150 B. Threshold Test Method	Agreeable	--
5.	Taste	APHA . 2160 B. Threshold Test Method	None	--
6.	Chloride as Cl	APHA. 4500-Cl ⁻ B. Argentometric Method	115.64	mg/l
7.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1257	µS/cm
8.	Nitrate as NO ₃	IS 3025 (P-34) .Chromotropic Method	9.79	mg/l
9.	Iron as Fe	APHA . 3500-Fe B I.10 Phenanthroline Method	0.42	mg/l
10.	Total Dissolved Solids	APHA . 2540 C. Gravimetric Method	754.00	mg/l
11.	Lead as Pb	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l
12.	Boron	APHA. 4500B C. Carmine Method	0.16	mg/l
13.	Sulphate as SO ₄ ⁻²	APHA . 4500 E. Turbidimetric Method	30.84	mg/l
14.	Fluoride as F	APHA . 4500-F ⁻ D. SPADNS Method	0.55	mg/l
15.	BOD (3 Days at 27 ⁰ C)	APHA. 5210 C / IS 3025.P-44	7.00	mg/l
16.	COD	APHA. 5220 B. Open Reflux Method	26.10	mg/l
17.	Free Ammonia as NH ₃	IS 3025 (P-34) . Titrimetric Method	12.88	mg/l
18.	Total Coliform	IS 1622	29	MPN/100ml
19.	Arsenic as As	APHA . 3114 B. Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l

ANKITA SINGH

ANALYST

(Signature)

ARJUN RAWAT

Checked By
(Signature)



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Test Report

Sample No.: VEL/HPCL/W/09			Report No.: VEL/W/2009/22/009	
S. No.	Parameter	Test-Method	Result	Unit
20.	Total Hardness as CaCO ₃	APHA . 2340 C. EDTA Titrimetric Method	336.52	mg/l
21.	Calcium as Ca	APHA. 3500 Ca B. EDTA Titrimetric Method	77.28	mg/l
22.	Alkalinity as CaCO ₃	APHA . 2320 B. Titrimetric Method	296.34	mg/l
23.	Magnesium as Mg	APHA . 3500 Mg B. Calculation Method	34.92	mg/l
24.	Copper as Cu	APHA . 3111 B. Direct Air. Acetylene Flame Method	3.46	mg/l
25.	Sodium	APHA. 3500 Na B Flame Photometric Method	118.2	mg/l
26.	Potassium	APHA. 3500 Na B Flame Photometric Method	40.4	mg/l
27.	Total Chromium as Cr	APHA . 3111 B. Direct Air. Acetylene Flame Method	*BDL (**DL. 0.03 mg/l)	mg/l

Note:- *BDL- Below Detection Limit. **DL- Detection Limit. ^Due to Additional Parameter

ANKITA SINGH

ANALYST
Signature

ARJUN RAWAT

(Checked By)

Signature



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Test Report

Sample Number:	VEL/HPCL/S/01	Report No.:	VEL/S/2009/22/001
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	26/11/2020
Latitude:	30°3'13.34"N	Period of Analysis :	22/09/2020-28/09/2020
Longitude:	75°0'41.57"E	Receipt Date:	22/09/2020
Sample Description:	Soil Sample	Sampling Date:	18/09/2020
Sampling Location:	Near Project Site	Type of Sampling:	Composite
Sample Collected by:	Vardan Enviro Lab Team	Sampling Quantity:	2.0 Kg
Sampling & Analysis Protocol:	IS 2720 , USEPA & USDA	Packing Status:	Temp Sealed
		Amendment No. 1	Dated 26/11/2020

S. No.	Parameter	Test-Method	Result	Unit
1	pH (at 25 °C)	IS : 2720 (P-26) by pH Meter	7.81	--
2	Conductivity	IS:14767 by Conductivity meter	0.324	mS/cm
3	Soil Texture	IS : 2720 (P-22. RA2003)	Silt	--
4	Color	SOP . SP-78.Issue No -01& Issue Date-14/02/2013	Yellowish Red	--
5	Water holding capacity	SOP . SP-81.Issue No -01& Issue Date-14/02/2013	25.32	%
6	Bulk density	SOP . SP-80.Issue No -01& Issue Date-14/02/2013	1.58	gm/cc
7	Chloride as Cl	SOP . SP-85.Issue No -01& Issue Date-14/02/2013	55.29	mg/100g
8	Calcium as Ca	SOP . SP-82.Issue No -01& Issue Date-14/02/2013	41.52	mg/100g
9	Sodium as Na	SOP . SP-84.Issue No -01& Issue Date-14/02/2013	49.33	mg/kg
10	Potassium as K	SOP . SP-84.Issue No -01& Issue Date-14/02/2013	140.24	kg/hect
11	Iron as Fe	USDA Method. 1968	0.72	mg/100g
12	Organic Matter	IS 2720 (P-22) Titrimetric Method	0.61	%
13	Magnesium as Mg	SOP . SP-83.Issue No -01& Issue Date-14/02/2013	21.63	mg/100g
14	Available Nitrogen as N	IS:14684 Distillation Method	215.44	kg /hect
15	Available Phosphorus	SOP . SP-86.Issue No -01& Issue Date-14/02/2013	18.65	kg /hect
16	Zinc (as Zn)	SOP . SP-86.Issue No -01	11.25	mg/kg
17	Organic Carbon	USEPA 3050B	0.42	%
18	Lead (as Pb)	USEPA 3050B	0.86	mg/kg
19	Cadmium (as Cd)	USEPA 3050B	0.75	mg/kg
20	Chromium (as Cr)	USEPA 3050B	0.91	mg/kg
21	Copper (as Cu)	USEPA 3050B	6.77	mg/kg
22	Molybdenum as MO	USEPA 3050B	0.39	mg/100g
23	Nickel	USEPA 3050B	*BDL	mg/100g
24	Moisture Content	SOP . SP-79.Issue No -01& Issue Date-14/02/2013	16.5	%

Note: SOP-Standard Operating Procedure. ^Due to Additional Parameter.

MANITA NAYAK
SR. ANALYST

ARJUN RAWAT
(Checked By)



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Test Report

Sample Number:	VEL/IIPCL/S/02	Report No.:	VEL/S/2009/22/002
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
		Party Reference No.:	NIL
Latitude:	30°3'37.63"N	Reporting Date:	26/11/2020
Longitude:	75°2'75.30"E	Period of Analysis :	22/09/2020-28/09/2020
Sample Description:	Soil Sample	Receipt Date:	22/09/2020
Sampling Location:	Jiwan Singh Wala	Sampling Date:	18/09/2020
Sample Collected by:	Vardan Enviro Lab Team	Type of Sampling:	Composite
Sampling & Analysis Protocol:	IS 2720 , USEPA & USDA	Sampling Quantity:	2.0 Kg
Packing Status:	Temp Sealed	Depth of Sampling:	30 cm
		^Amendment No. 1	Dated 26/11/2020

S. No.	Parameter	Test-Method	Result	Unit
1	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.62	--
2	Conductivity	IS:14767 by Conductivity meter	0.337	mS/cm
3	Soil Texture	IS : 2720 (P-22. RA2003)	Silt	--
4	Color	SOP : SP-78.Issue No -01& Issue Date-14/02/2013	Yellowish	--
5	Water holding capacity	SOP : SP-81.Issue No -01& Issue Date-14/02/2013	33.51	%
6	Bulk density	SOP : SP-80.Issue No -01& Issue Date-14/02/2013	1.52	gm/cc
7	Chloride as Cl	SOP : SP-85.Issue No -01& Issue Date-14/02/2013	50.22	mg/100g
8	Calcium as Ca	SOP : SP-82.Issue No -01& Issue Date-14/02/2013	41.39	mg/100g
9	Sodium as Na	SOP : SP-84.Issue No -01& Issue Date-14/02/2013	52.31	mg/kg
10	Potassium as K	SOP : SP-84.Issue No -01& Issue Date-14/02/2013	151.18	kg/hect
11	Iron as Fe	USDA Method. 1968	0.53	mg/100g
12	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.51	%
13	Magnesium as Mg	SOP : SP-83.Issue No -01& Issue Date-14/02/2013	29.54	mg/100g
14	Available Nitrogen as N	IS:14684 Distillation Method	237.00	kg /hect
15	Available Phosphorus	SOP : SP-86.Issue No -01& Issue Date-14/02/2013	20.16	kg /hect
16	Zinc (as Zn)	SOP : SP-86.Issue No -01	11.43	mg/kg
17	Organic Carbon	USEPA 3050B	0.34	%
18	Lead (as Pb)	USEPA 3050B	0.75	mg/kg
19	Cadmium (as Cd)	USEPA 3050B	0.83	mg/kg
20	Chromium (as Cr)	USEPA 3050B	0.49	mg/kg
21	Copper (as Cu)	USEPA 3050B	2.88	mg/kg
22	Molybdenum as MO	USEPA 3050B	0.43	mg/100g
23	Nickel	USEPA 3050B	*BDL	mg/100g
24	Moisture Content	SOP : SP-79.Issue No -01& Issue Date-14/02/2013	17.1	%

Note: SOP-Standard Operating Procedure ^Due to Additional Parameter

MAMTA NAYAK
 CR. ANALYST
 (Checked By)

ARJUN RAWAT
 (Checked By)



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
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Test Report

Sample Number:	VEL/IIPCL/S/03	Report No.:	VEL/S/2009/22/003
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
		Party Reference No.:	NIL
Latitude:	30°2'33.23"N	Reporting Date:	26/11/2020
Longitude:	75°58'6.88"E	Period of Analysis :	22/09/2020-28/09/2020
Sample Description:	Soil Sample	Receipt Date:	22/09/2020
Sampling Location:	Maanwala	Sampling Date:	18/09/2020
Sample Collected by:	Vardan Enviro Lab Team	Type of Sampling:	Composite
Sampling & Analysis Protocol:	IS 2720 , USEPA & USDA	Sampling Quantity:	2.0 Kg
Packing Status:	Temp Sealed	Depth of Sampling:	30 cm
		Amendment No. 1	Dated 26/11/2020

S. No.	Parameter	Test-Method	Result	Unit
1	pH (at 25 OC)	IS : 2720 (P-26) by pH Meter	7.65	--
2	Conductivity	IS:14767 by Conductivity meter	0.329	mS/cm
3	Soil Texture	IS : 2720 (P-22, RA:2003)	Silt	--
4	Color	SOP . SP-78.Issue No -01& Issue Date-14/02/2013	Yellowish Red	--
5	Water holding capacity	SOP . SP-81.Issue No -01& Issue Date-14/02/2013	31.05	%
6	Bulk density	SOP . SP-80.Issue No -01& Issue Date-14/02/2013	1.80	gm/cc
7	Chloride as Cl	SOP . SP-85.Issue No -01& Issue Date-14/02/2013	41.66	mg/100g
8	Calcium as Ca	SOP . SP-82.Issue No -01& Issue Date-14/02/2013	62.10	mg/100g
9	Sodium as Na	SOP . SP-84.Issue No -01& Issue Date-14/02/2013	57.24	mg/kg
10	Potassium as K	SOP . SP-84.Issue No -01& Issue Date-14/02/2013	131.65	kg/hect
11	Iron as Fe	USDA Method, 1968	0.33	mg/100g
12	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.72	%
13	Magnesium as Mg	SOP . SP-83.Issue No -01& Issue Date-14/02/2013	21.88	mg/100g
14	Available Nitrogen as N	IS:14684 Distillation Method	227.00	kg/hect
15	Available Phosphorus	SOP . SP-86.Issue No -01& Issue Date-14/02/2013	30.24	kg/hect
16	Zinc (as Zn)	SOP . SP-86.Issue No -01	11.93	mg/kg
17	Organic Carbon	USEPA 3050B	0.24	%
18	Lead (as Pb)	USEPA 3050B	0.61	mg/kg
19	Cadmium (as Cd)	USEPA 3050B	0.73	mg/kg
20	Chromium (as Cr)	USEPA 3050B	1.59	mg/kg
21	Copper (as Cu)	USEPA 3050B	2.10	mg/kg
22	Molybdenum as MO	USEPA 3050B	0.43	mg/100g
23	Nickel	USEPA 3050B	*BDL	mg/100g
24	Moisture Content	SOP . SP-79.Issue No -01& Issue Date-14/02/2013	20.6	%

Note: SOP-Standard Operating Procedure. *Due to Additional Parameter.

MANITA NAYAK
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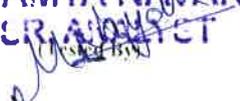
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Test Report

Sample Number:	VEL/HPC/L/S/04	Report No.:	VEL/S/2009/22/004
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
		Party Reference No.:	NIL
Latitude:	30°1'13.05"N	Reporting Date:	26/11/2020
Longitude:	75°1'3.89"E	Period of Analysis :	22/09/2020-28/09/2020
Sample Description:	Soil Sample	Receipt Date:	22/09/2020
Sampling Location:	Mahi Nangal	Sampling Date:	18/09/2020
Sample Collected by:	Vardan Enviro Lab Team	Type of Sampling:	Composite
Sampling & Analysis Protocol:	IS 2720 , USEPA & USDA	Sampling Quantity:	2.0 Kg
Packing Status:	Temp Sealed	Depth of Sampling:	30 cm
		Amendment No. 1	Dated 26/11/2020

S. No.	Parameter	Test-Method	Result	Unit
1	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.54	--
2	Conductivity	IS:14767 by Conductivity meter	0.338	mS/cm
3	Soil Texture	IS : 2720 (P-22, RA2003)	Silt	--
4	Color	SOP . SP-78.Issue No -01& Issue Date-14/02/2013	Yellowish Red	--
5	Water holding capacity	SOP . SP-81.Issue No -01& Issue Date-14/02/2013	26.31	%
6	Bulk density	SOP . SP-80.Issue No -01& Issue Date-14/02/2013	1.26	gm/cc
7	Chloride as Cl	SOP . SP-85.Issue No -01& Issue Date-14/02/2013	51.62	mg/100g
8	Calcium as Ca	SOP . SP-82.Issue No -01& Issue Date-14/02/2013	46.18	mg/100g
9	Sodium as Na	SOP . SP-84.Issue No -01& Issue Date-14/02/2013	61.54	mg/kg
10	Potassium as K	SOP . SP-84.Issue No -01& Issue Date-14/02/2013	141.75	kg/hect
11	Iron as Fe	USDA Method. 1968	0.72	mg/100g
12	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.75	%
13	Magnesium as Mg	SOP . SP-83.Issue No -01& Issue Date-14/02/2013	31.06	mg/100g
14	Available Nitrogen as N	IS:14684 Distillation Method	232.00	kg /hect
15	Available Phosphorus	SOP . SP-86.Issue No -01& Issue Date-14/02/2013	17.21	kg /hect
16	Zinc (as Zn)	SOP . SP-86.Issue No -01	8.06	mg/kg
17	Organic Carbon	USEPA 3050B	0.21	%
18	Lead (as Pb)	USEPA 3050B	0.62	mg/kg
19	Cadmium (as Cd)	USEPA 3050B	0.68	mg/kg
20	Chromium (as Cr)	USEPA 3050B	1.37	mg/kg
21	Copper (as Cu)	USEPA 3050B	2.68	mg/kg
22	Molybdenum as MO	USEPA 3050B	0.82	mg/100g
23	Nickel	USEPA 3050B	*BDL	mg/100g
24	Moisture Content	SOP . SP-79.Issue No -01& Issue Date-14/02/2013	18.7	%

Note: SOP-Standard Operating Procedure. ^Due to Additional Parameter

MAMTA NAKAK
 CR. ANALYST


ARJUN RAWAT
 (Checked By)




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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
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Test Report

Sample Number:	VEL/HPCL/S/05	Report No.:	VEL/S/2009/22/005
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
		Party Reference No.:	NIL
Latitude:	29°59'40.64"N	Reporting Date:	26/11/2020
Longitude:	75°1'17.61"E	Period of Analysis :	22/09/2020-28/09/2020
Sample Description:	Soil Sample	Receipt Date:	22/09/2020
Sampling Location:	Leleana	Sampling Date:	18/09/2020
Sample Collected by:	Vardan Enviro Lab Team	Type of Sampling:	Composite
Sampling & Analysis Protocol:	IS 2720 , USEPA & USDA	Sampling Quantity:	2.0 Kg
Packing Status:	Temp Sealed	Depth of Sampling:	30 cm
		Amendment No. 1	Dated 26/11/2020

S. No.	Parameter	Test-Method	Result	Unit
1	pH (at 25 0C)	IS 2720 (P-26) by pH Meter	7.69	--
2	Conductivity	IS:14767 by Conductivity meter	0.342	mS/cm
3	Soil Texture	IS 2720 (P-22. RA2003)	Silt	--
4	Color	SOP . SP-78.Issue No -01& Issue Date-14/02/2013	Yellowish	--
5	Water holding capacity	SOP . SP-81.Issue No -01& Issue Date-14/02/2013	34.79	%
6	Bulk density	SOP . SP-80.Issue No -01& Issue Date-14/02/2013	1.81	gm/cc
7	Chloride as Cl	SOP . SP-85.Issue No -01& Issue Date-14/02/2013	64.25	mg/100g
8	Calcium as Ca	SOP . SP-82.Issue No -01& Issue Date-14/02/2013	52.16	mg/100g
9	Sodium as Na	SOP . SP-84.Issue No -01& Issue Date-14/02/2013	59.04	mg/kg
10	Potassium as K	SOP . SP-84.Issue No -01& Issue Date-14/02/2013	156.84	kg/hect
11	Iron as Fe	USDA Method. 1968	0.83	mg/100g
12	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.74	%
13	Magnesium as Mg	SOP . SP-83.Issue No -01& Issue Date-14/02/2013	26.15	mg/100g
14	Available Nitrogen as N	IS:14684 Distillation Method	236.27	kg /hect
15	Available Phosphorus	SOP . SP-86.Issue No -01& Issue Date-14/02/2013	24.38	kg /hect
16	Zinc (as Zn)	SOP . SP 86.Issue No -01	8.82	mg/kg
17	Organic Carbon	USEPA 3050B	0.24	%
18	Lead (as Pb)	USEPA 3050B	0.93	mg/kg
19	Cadmium (as Cd)	USEPA 3050B	0.81	mg/kg
20	Chromium (as Cr)	USEPA 3050B	0.89	mg/kg
21	Copper (as Cu)	USEPA 3050B	7.21	mg/kg
22	Molybdenum as MO	USEPA 3050B	0.51	mg/100g
23	Nickel	USEPA 3050B	*BDL	mg/100g
24	Moisture Content	SOP . SP-79.Issue No -01& Issue Date -14/02/2013	16.9	%

Note: SOP-Standard Operating Procedure. ^Due to Additional Parameter.

MAMTA NAYAK
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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
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Test Report

Sample Number:	VEL/HPC/L/S/06	Report No.:	VEL/S/2009/22/006
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
		Party Reference No.:	NIL
Latitude:	30°1'27.46"N	Reporting Date:	26/11/2020
Longitude:	75°4'8.62"E	Period of Analysis :	22/09/2020-28/09/2020
Sample Description:	Soil Sample	Receipt Date:	22/09/2020
Sampling Location:	Baghi Bandar	Sampling Date:	18/09/2020
Sample Collected by:	Vardan Enviro Lab Team	Type of Sampling:	Composite
Sampling & Analysis Protocol:	IS 2720 , USEPA & USDA	Sampling Quantity:	2.0 Kg
Packing Status:	Temp Sealed	Depth of Sampling:	30 cm
		^Amendment No. 1	Dated 26/11/2020

S. No.	Parameter	Test-Method	Result	Unit
1	pH (at 25 0C)	IS - 2720 (P-26) by pH Meter	7.59	--
2	Conductivity	IS:14767 by Conductivity meter	0.344	mS/cm
3	Soil Texture	IS : 2720 (P-22, RA2003)	Silt	--
4	Color	SOP . SP-78.Issue No -01& Issue Date-14/02/2013	Yellowish	--
5	Water holding capacity	SOP . SP-81.Issue No -01& Issue Date-14/02/2013	41.26	%
6	Bulk density	SOP . SP-80.Issue No -01& Issue Date-14/02/2013	1.72	gm/cc
7	Chloride as Cl	SOP . SP-85.Issue No -01& Issue Date-14/02/2013	56.21	mg/100g
8	Calcium as Ca	SOP . SP-82.Issue No -01& Issue Date-14/02/2013	45.46	mg/100g
9	Sodium as Na	SOP . SP-84.Issue No -01& Issue Date-14/02/2013	55.81	mg/kg
10	Potassium as K	SOP . SP-84.Issue No -01& Issue Date-14/02/2013	164.62	kg/hect
11	Iron as Fe	USDA Method, 1968	0.63	mg/100g
12	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.74	%
13	Magnesium as Mg	SOP . SP-83.Issue No -01& Issue Date-14/02/2013	35.92	mg/100g
14	Available Nitrogen as N	IS:14684 Distillation Method	248.74	kg /hect
15	Available Phosphorus	SOP . SP-86.Issue No -01& Issue Date-14/02/2013	20.31	kg /hect
16	Zinc (as Zn)	SOP . SP-86.Issue No -01	9.75	mg/kg
17	Organic Carbon	USEPA 3050B	0.32	%
18	Lead (as Pb)	USEPA 3050B	0.74	mg/kg
19	Cadmium (as Cd)	USEPA 3050B	0.79	mg/kg
20	Chromium (as Cr)	USEPA 3050B	0.50	mg/kg
21	Copper (as Cu)	USEPA 3050B	2.76	mg/kg
22	Molybdenum as MO	USEPA 3050B	0.43	mg/100g
23	Nickel	USEPA 3050B	*BDL	mg/100g
24	Moisture Content	SOP . SP-79.Issue No -01& Issue Date-14/02/2013	19.4	%

Note: SOP-Standard Operating Procedure ^Due to Additional Parameter

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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
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Test Report

Sample Number:	VEL/HPCL/S/07	Report No.:	VEL/S/2009/22/007
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
		Party Reference No.:	NIL
Latitude:	30°4'34.79"N	Reporting Date:	26/11/2020
Longitude:	74°59'57.45"E	Period of Analysis :	22/09/2020-28/09/2020
Sample Description:	Soil Sample	Receipt Date:	22/09/2020
Sampling Location:	Nasibpura	Sampling Date:	19/09/2020
Sample Collected by:	Vardan Enviro Lab Team	Type of Sampling:	Composite
Sampling & Analysis Protocol:	IS 2720 , USEPA & USDA	Sampling Quantity:	2.0 Kg
Packing Status:	Temp Sealed	Depth of Sampling:	30 cm
		^Amendment No. 1	Dated 26/11/2020

S. No.	Parameter	Test-Method	Result	Unit
1	pH (at 25.0C)	IS : 2720 (P-26) by pH Meter	7.80	--
2	Conductivity	IS:14767 by Conductivity meter	0.359	mS/cm
3	Soil Texture	IS : 2720 (P-22, RA2003)	Silty Loam	--
4	Color	SOP . SP-78.Issue No -01& Issue Date -14/02/2013	Yellowish Red	--
5	Water holding capacity	SOP . SP-81.Issue No -01& Issue Date-14/02/2013	44.01	%
6	Bulk density	SOP . SP-80.Issue No -01& Issue Date-14/02/2013	1.87	gm/cc
7	Chloride as Cl	SOP . SP-85.Issue No -01& Issue Date -14/02/2013	56.31	mg/100g
8	Calcium as Ca	SOP . SP-82.Issue No -01& Issue Date -14/02/2013	71.22	mg/100g
9	Sodium as Na	SOP . SP-84.Issue No -01& Issue Date -14/02/2013	63.48	mg/kg
10	Potassium as K	SOP . SP-84.Issue No -01& Issue Date -14/02/2013	130.29	kg/hect
11	Iron as Fe	USDA Method, 1968	0.58	mg/100g
12	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.76	%
13	Magnesium as Mg	SOP . SP-83.Issue No -01& Issue Date -14/02/2013	26.62	mg/100g
14	Available Nitrogen as N	IS:14684 Distillation Method	241.00	kg /hect
15	Available Phosphorus	SOP . SP-86.Issue No -01& Issue Date -14/02/2013	35.19	kg /hect
16	Zinc (as Zn)	SOP . SP-86.Issue No -01	18.23	mg/kg
17	Organic Carbon	USEPA 3050B	0.44	%
18	Lead (as Pb)	USEPA 3050B	0.63	mg/kg
19	Cadmium (as Cd)	USEPA 3050B	0.76	mg/kg
20	Chromium (as Cr)	USEPA 3050B	1.82	mg/kg
21	Copper (as Cu)	USEPA 3050B	2.21	mg/kg
22	Molybdenum as MO	USEPA 3050B	0.62	mg/100g
23	Nickel	USEPA 3050B	*BDL	mg/100g
24	Moisture Content	SOP . SP-79.Issue No -01& Issue Date-14/02/2013	20.7	%

Note: SOP Stands for Operating Procedure. ^Due to Additional Parameter.

MAMTA KAYAK
S.P. ANALYST
[Signature]

ARJUN RAWAT
(Checked By)
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Test Report

Sample Number:	VEL/IOCL/S/08	Report No.:	VEL/S/2009/22/008
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
		Party Reference No.:	NIL
Latitude:	30°5'40.22"N	Reporting Date:	26/11/2020
Longitude:	75°4'5.30"E	Period of Analysis :	22/09/2020-28/09/2020
Sample Description:	Soil Sample	Receipt Date:	22/09/2020
Sampling Location:	Kotbhara	Sampling Date:	19/09/2020
Sample Collected by:	Vardan Enviro Lab Team	Type of Sampling:	Composite
Sampling & Analysis Protocol:	IS 2720 , USEPA & USDA	Sampling Quantity:	2.0 Kg
Packing Status:	Temp Sealed	Depth of Sampling:	30 cm
		^Amendment No. 1	Dated 26/11/2020

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS : 2720 (P-26) by pH Meter	7.48	--
2.	Conductivity	IS:14767 by Conductivity meter	0.335	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silt	--
4.	Color	SOP : SP-78.Issue No -01& Issue Date-14/02/2013	Yellowish	--
5.	Water holding capacity	SOP : SP-81.Issue No -01& Issue Date-14/02/2013	24.45	%
6.	Bulk density	SOP : SP-80.Issue No -01& Issue Date-14/02/2013	1.21	gm/cc
7.	Chloride as Cl	SOP : SP-85.Issue No -01& Issue Date-14/02/2013	40.32	mg/100g
8.	Calcium as Ca	SOP : SP-82.Issue No -01& Issue Date-14/02/2013	43.10	mg/100g
9.	Sodium as Na	SOP : SP-84.Issue No -01& Issue Date-14/02/2013	49.51	mg/kg
10.	Potassium as K	SOP : SP-84.Issue No -01& Issue Date-14/02/2013	143.62	kg/hect
11.	Iron as Fe	USDA Method. 1968	0.62	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.69	%
13.	Magnesium as Mg	SOP : SP-83.Issue No -01& Issue Date-14/02/2013	38.05	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	221.00	kg /hect
15.	Available Phosphorus	SOP : SP-86.Issue No -01& Issue Date-14/02/2013	18.41	kg /hect
16.	Zinc (as Zn)	SOP : SP-86.Issue No. 01	80.32	mg/kg
17.	Organic Carbon	USEPA 3050B	0.49	%
18.	Lead (as Pb)	USEPA 3050B	0.60	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.74	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.49	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.40	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.91	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP : SP-79.Issue No -01& Issue Date-14/02/2013	21.6	%

Note: SOP-Standard Operating Procedure ^Due to Additional Parameter

MANITA NAYAK
 CRJ
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ARJUN RAWAT
 (Checked By)



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Test Report

Sample Number:	VEL/HPCL/S/09	Report No.:	VEL/S/2009/22/009
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
		Party Reference No.:	NIL
Latitude:	30°6'34.53"N	Reporting Date:	26/11/2020
Longitude:	75°0'23.67"E	Period of Analysis :	22/09/2020-28/09/2020
Sample Description:	Soil Sample	Receipt Date:	22/09/2020
Sampling Location:	Kot Kashmir	Sampling Date:	19/09/2020
Sample Collected by:	Vardan Enviro Lab Team	Type of Sampling:	Composite
Sampling & Analysis Protocol:	IS 2720 , USEPA & USDA	Sampling Quantity:	2.0 Kg
Packing Status:	Temp Sealed	Depth of Sampling:	30 cm
		Amendment No. 1	Dated 26/11/2020

S. No.	Parameter	Test-Method	Result	Unit
1	pH (at 25 OC)	IS : 2720 (P-26) by pH Meter	7.83	--
2	Conductivity	IS:14767 by Conductivity meter	0.334	mS/cm
3	Soil Texture	IS : 2720 (P-22. RA2003)	Silt	--
4	Color	SOP . SP-78.Issue No -01& Issue Date-14/02/2013	Yellowish Red	--
5	Water holding capacity	SOP . SP-81.Issue No -01& Issue Date-14/02/2013	26.76	%
6	Bulk density	SOP . SP-80.Issue No -01& Issue Date-14/02/2013	1.61	gm/cc
7	Chloride as Cl	SOP . SP-85.Issue No -01& Issue Date-14/02/2013	57.15	mg/100g
8	Calcium as Ca	SOP . SP-82.Issue No -01& Issue Date-14/02/2013	42.93	mg/100g
9	Sodium as Na	SOP . SP-84.Issue No -01& Issue Date-14/02/2013	50.82	mg/kg
10	Potassium as K	SOP . SP-84.Issue No -01& Issue Date-14/02/2013	153.50	kg/hect
11	Iron as Fe	USDA Method. 1968	0.76	mg/100g
12	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.68	%
13	Magnesium as Mg	SOP . SP-83.Issue No -01& Issue Date-14/02/2013	22.54	mg/100g
14	Available Nitrogen as N	IS:14684 Distillation Method	227.00	kg /hect
15	Available Phosphorus	SOP . SP-86.Issue No -01& Issue Date-14/02/2013	24.37	kg /hect
16	Zinc (as Zn)	SOP , SP-86.Issue No -01	8.38	mg/kg
17	Organic Carbon	USEPA 3050B	0.51	%
18	Lead (as Pb)	USEPA 3050B	0.89	mg/kg
19	Cadmium (as Cd)	USEPA 3050B	0.78	mg/kg
20	Chromium (as Cr)	USEPA 3050B	0.92	mg/kg
21	Copper (as Cu)	USEPA 3050B	6.53	mg/kg
22	Molybdenum as MO	USEPA 3050B	0.39	mg/100g
23	Nickel	USEPA 3050B	*BDL	mg/100g
24	Moisture Content	SOP . SP-79.Issue No -01& Issue Date-14/02/2013	21.2	%

Note: SOP-Standard Operating Procedure. ^Due to Additional Parameter.

MANJANVIK
ANALYST

ARJUN RAO



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
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Test Report

Sample Number:	VEL/IIPCL/S/10	Report No.:	VEL/S/2009/22/010
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
		Party Reference No.:	NIL
Latitude:	30°6'44.02"N	Reporting Date:	26/11/2020
Longitude:	74°57'21.06"E	Period of Analysis :	22/09/2020-28/09/2020
Sample Description:	Soil Sample	Receipt Date:	22/09/2020
Sampling Location:	Gehri Boghi	Sampling Date:	19/09/2020
Sample Collected by:	Vardan Enviro Lab Team	Type of Sampling:	Composite
Sampling & Analysis Protocol:	IS 2720 , USEPA & USDA	Sampling Quantity:	2.0 Kg
Packing Status:	Temp Sealed	Depth of Sampling:	30 cm
		^Amendment No. 1	Dated 26/11/2020

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 0C)	IS - 2720 (P-26) by pH Meter	7.55	--
2.	Conductivity	IS:14767 by Conductivity meter	0.327	mS/cm
3.	Soil Texture	IS : 2720 (P-22. RA2003)	Silty Loam	--
4.	Color	SOP . SP-78.Issue No -01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP . SP-81.Issue No -01& Issue Date-14/02/2013	37.46	%
6.	Bulk density	SOP . SP-80.Issue No -01& Issue Date-14/02/2013	1.57	gm/cc
7.	Chloride as Cl	SOP . SP-85.Issue No -01& Issue Date-14/02/2013	58.34	mg/100g
8.	Calcium as Ca	SOP . SP-82.Issue No -01& Issue Date-14/02/2013	48.15	mg/100g
9.	Sodium as Na	SOP . SP-84.Issue No -01& Issue Date-14/02/2013	58.31	mg/kg
10.	Potassium as K	SOP . SP-84.Issue No -01& Issue Date-14/02/2013	164.80	kg/hect
11.	Iron as Fe	USDA Method. 1968	0.77	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.85	%
13.	Magnesium as Mg	SOP . SP-83.Issue No -01& Issue Date-14/02/2013	35.63	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	261.05	kg /hect
15.	Available Phosphorus	SOP . SP-86.Issue No -01& Issue Date-14/02/2013	24.51	kg /hect
16.	Zinc (as Zn)	SOP . SP-86.Issue No -01	14.50	mg/kg
17.	Organic Carbon	USEPA 3050B	0.41	%
18.	Lead (as Pb)	USEPA 3050B	0.78	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.84	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.65	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.89	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.35	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP . SP-79.Issue No -01& Issue Date-14/02/2013	17.9	%

Note: SOP-Standard Operating Procedure. *Due to Additional Parameter.

MANITA NAYAK
ANALYST

ARJUN RAWAT
(Checked By)



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Test Report

Sample Number:	VEL/HPCL/S/11	Report No.:	VEL/S/2009/22/011
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
		Party Reference No.:	NIL
Latitude:	30°3'45.41"N	Reporting Date:	26/11/2020
Longitude:	75°4'6.08"E	Period of Analysis :	22/09/2020-28/09/2020
Sample Description:	Soil Sample	Receipt Date:	22/09/2020
Sampling Location:	Chathewala	Sampling Date:	18/09/2020
Sample Collected by:	Vardan Enviro Lab Team	Type of Sampling:	Composite
Sampling & Analysis Protocol:	IS 2720 , USEPA & USDA	Sampling Quantity:	2.0 Kg
Packing Status:	Temp Sealed	Depth of Sampling:	30 cm
		^Amendment No. 1	Dated 26/11/2020

S. No.	Parameter	Test-Method	Result	Unit
1	pH (at 25 °C)	IS 2720 (P-26) by pH Meter	7.74	--
2	Conductivity	IS:14767 by Conductivity meter	0.321	mS/cm
3	Soil Texture	IS - 2720 (P-22, RA2003)	Silty Loam	--
4	Color	SOP . SP-78.Issue No -01& Issue Date -14/02/2013	Yellowish Red	--
5	Water holding capacity	SOP . SP-81.Issue No -01& Issue Date-14/02/2013	33.52	%
6	Bulk density	SOP . SP-80.Issue No -01& Issue Date-14/02/2013	1.83	gm/cc
7	Chloride as Cl	SOP . SP-85.Issue No -01& Issue Date-14/02/2013	65.84	mg/100g
8	Calcium as Ca	SOP . SP-82.Issue No -01& Issue Date-14/02/2013	49.26	mg/100g
9	Sodium as Na	SOP . SP-84 Issue No -01& Issue Date-14/02/2013	51.06	mg/kg
10	Potassium as K	SOP . SP-84.Issue No -01& Issue Date-14/02/2013	141.24	kg/hect
11	Iron as Fe	USDA Method. 1968	0.76	mg/100g
12	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.61	%
13	Magnesium as Mg	SOP . SP-83.Issue No -01& Issue Date-14/02/2013	23.54	mg/100g
14	Available Nitrogen as N	IS:14684 Distillation Method	212.00	kg /hect
15	Available Phosphorus	SOP . SP-86.Issue No -01& Issue Date -14/02/2013	27.58	kg /hect
16	Zinc (as Zn)	SOP . SP-86.Issue No -01	8.79	mg/kg
17	Organic Carbon	USEPA 3050B	0.50	%
18	Lead (as Pb)	USEPA 3050B	1.11	mg/kg
19	Cadmium (as Cd)	USEPA 3050B	0.83	mg/kg
20	Chromium (as Cr)	USEPA 3050B	0.91	mg/kg
21	Copper (as Cu)	USEPA 3050B	6.45	mg/kg
22	Molybdenum as MO	USEPA 3050B	0.41	mg/100g
23	Nickel	USEPA 3050B	*BDL	mg/100g
24	Moisture Content	SOP . SP-79.Issue No -01& Issue Date-14/02/2013	23.5	%

Note: SOP-Standard Operating Procedure ^Due to Additional Parameter

ANAMTA NAYAK
 (Checked By)

ARJUN RAWAT
 (Checked By)



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Test Report

Sample Number:	VEL/HPCL/S/12	Report No.:	VEL/S/2009/22/012
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
		Party Reference No.:	NIL
Latitude:	30°6'48.99"N	Reporting Date:	26/11/2020
Longitude:	75°4'54.51"E	Period of Analysis :	22/09/2020-28/09/2020
Sample Description:	Soil Sample	Receipt Date:	22/09/2020
Sampling Location:	Kot Fatta	Sampling Date:	18/09/2020
Sample Collected by:	Vardan Enviro Lab Team	Type of Sampling:	Composite
Sampling & Analysis Protocol:	IS 2720 , USEPA & USDA	Sampling Quantity:	2.0 Kg
Packing Status:	Temp Sealed	Depth of Sampling:	30 cm
		^Amendment No. 1	Dated 26/11/2020

S. No.	Parameter	Test-Method	Result	Unit
1	pH (at 25 °C)	IS : 2720 (P-26) by pH Meter	7.85	--
2	Conductivity	IS:14767 by Conductivity meter	0.351	mS/cm
3	Soil Texture	IS : 2720 (P-22, RA2003)	Silt	--
4	Color	SOP . SP-78.Issue No -01 & Issue Date-14/02/2013	Yellowish Red	--
5	Water holding capacity	SOP . SP-81.Issue No -01 & Issue Date-14/02/2013	34.59	%
6	Bulk density	SOP . SP-80.Issue No -01 & Issue Date-14/02/2013	1.91	gm/cc
7	Chloride as Cl	SOP . SP-85.Issue No -01 & Issue Date-14/02/2013	61.24	mg/100g
8	Calcium as Ca	SOP . SP-82.Issue No -01 & Issue Date-14/02/2013	70.49	mg/100g
9	Sodium as Na	SOP . SP-84.Issue No -01 & Issue Date-14/02/2013	53.05	mg/kg
10	Potassium as K	SOP . SP-84.Issue No -01 & Issue Date-14/02/2013	120.00	kg/hect
11	Iron as Fe	USDA Method. 1968	0.42	mg/100g
12	Organic Matter	IS 2720 (P-22) Titrimetric Method	0.89	%
13	Magnesium as Mg	SOP . SP-83.Issue No -01 & Issue Date-14/02/2013	26.18	mg/100g
14	Available Nitrogen as N	IS:14684 Distillation Method	214.19	kg /hect
15	Available Phosphorus	SOP . SP-86.Issue No -01 & Issue Date-14/02/2013	59.20	kg /hect
16	Zinc (as Zn)	SOP . SP-86.Issue No -01	17.31	mg/kg
17	Organic Carbon	USEPA 3050B	0.52	%
18	Lead (as Pb)	USEPA 3050B	0.75	mg/kg
19	Cadmium (as Cd)	USEPA 3050B	0.84	mg/kg
20	Chromium (as Cr)	USEPA 3050B	1.88	mg/kg
21	Copper (as Cu)	USEPA 3050B	2.82	mg/kg
22	Molybdenum as MO	USEPA 3050B	0.51	mg/100g
23	Nickel	USEPA 3050B	*BDL	mg/100g
24	Moisture Content	SOP . SP-79.Issue No -01 & Issue Date-14/02/2013	16.1	%

Note -SOP-Standard Operating Procedure ^Due to Additional Parameter.

MAMTA NAYAK
 Analyst

ABIJUN RAWAT
 Checked By



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
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Test Report

Sample Number:	VEL/HPCL/AA/01	Report No.:	VEL/AA/2009/22/001
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasihpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30°3'13.34"N	Party Reference No.:	NIL
Longitude:	75°0'41.57"E	Reporting Date:	28/09/2020
		Period of Analysis:	22/09/2020 - 28/09/2020
		Receipt Date:	22/09/2020

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample collected by	: Vardan Enviro Lab Representative
Sampling Location	: Near Project Site
Instrument Used	: RDS & FPS sampler with all Accessories
Instrument Code	: VEL/RDS/01 & VEL/FPS/01
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 18/09/2020 to 19/09/2020
Time of Monitoring	: 10:15 AM – 10:15 AM
Ambient Temperature (°C)	: Min. 25°C Max. 36°C
Surrounding Activity	: Human & Vehicular Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No
Sampling & Analysis Protocol	: IS-5182
Parameter Required	: As per client requirement.

S. No.	Parameter	Protocol	Result	Unit	NAAQS nd Limit
1.	Particulate Matter (PM _{2.5})	nd SOP No. VEL/SOP/01, Section No. SP 63	55.73	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	94.18	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	23.65	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	13.45	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.97	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS:11255(P-6) Indo Phenol Blue Method	15.31	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene(C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	22.43	µg/m ³	180
11.	Arsenic As, ng/m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	6
12.	Nickel Ni, ng/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	20
13.	Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	**BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

Note :-nd NAAQS – National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)]18.11.2009
SOP- Laboratory Standard Operating Procedure., **BDL- Below Detection Limit. *DL- Detection Limit

KOMAL SINGH
(Tested By)
ANALYST

ARJUN RAWAT
(Checked By)
[Signature]



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
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Test Report

Sample Number:	VEL/HPCL/AA/02	Report No.:	VEL/AA/2009/22/002
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30°3'37.63"N	Party Reference No.:	NIL
Longitude:	75°2'75.30"E	Reporting Date:	28/09/2020
		Period of Analysis:	22/09/2020 - 28/09/2020
		Receipt Date:	22/09/2020

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample collected by	: Vardan Enviro Lab Representative
Sampling Location	: Jiwan Singh Wala
Instrument Used	: RDS & FPS sampler with all Accessories
Instrument Code	: VEL/RDS/03& VEL/FPS/03
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 18/09/2020 to 19/09/2020
Time of Monitoring	: 10:30 AM – 10:30 AM
Ambient Temperature (°C)	: Min. 25°C Max. 36°C
Surrounding Activity	: Human & Vehicular Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No
Sampling & Analysis Protocol	: IS-5182
Parameter Required	: As per client requirement.

S. No.	Parameter	Protocol	Result	Unit	NAAQS [®] Limit
1.	Particulate Matter (PM _{2.5})	[#] SOP No. VEL/SOP/01, Section No. SP 63	49.71	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	90.28	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	17.15	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	9.83	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.86	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS:11255(P-6) Indo Phenol Blue Method	9.12	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene(C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	15.18	µg/m ³	180
11.	Arsenic As, ng/ m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	6
12.	Nickel Ni, ng/ m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	20
13.	Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	**BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

Note :- @ NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)]18.11.2009.
P.L. Laboratory Standard Operating Procedure. **BDL- Below Detection Limit. *DL- Detection Limit

KOMAL SINGH
(Tested By)
ANALYST

ARJUN RAWAT



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
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Test Report

Sample Number: VEL/HPCL/AA/03
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd.
Village Nasibpura, Bhatinda Punjab
Latitude: 30°2'33.23"N
Longitude: 75°58'6.88"E
Report No.: VEL/AA/2009/22/003
Format No.: 7.8 F-01
Party Reference No.: NIL
Reporting Date: 28/09/2020
Period of Analysis: 22/09/2020 - 28/09/2020
Receipt Date: 22/09/2020

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample collected by : Vardan Enviro Lab Representative
Sampling Location : Maanwala
Instrument Used : RDS & FPS sampler with all Accessories
Instrument Code : VEL/RDS/04& VEL/FPS/04
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 18/09/2020 to 19/09/2020
Time of Monitoring : 09:15 AM – 09:15 AM
Ambient Temperature (°C) : Min. 25°C Max. 36°C
Surrounding Activity : Human & Vehicular Activities
Scope of Monitoring : Regulatory Requirement
Control measure if Any : No
Sampling & Analysis Protocol : IS-5182
Parameter Required : As per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS ^(m) Limit
1.	Particulate Matter (PM _{2.5})	#SOP No. VEL/SOP/01, Section No. SP 63	51.74	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	90.66	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	16.78	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	11.87	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.89	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS: 11255(P-6) Indo Phenol Blue Method	11.73	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene (C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	21.27	µg/m ³	180
11.	Arsenic As, ng/m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/m ³)	ng/m ³	6
12.	Nickel Ni, ng/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/m ³)	ng/m ³	20
13.	Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	**BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

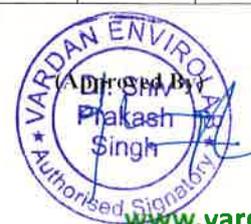
Note :- a) NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec -3(i)]18.11.2009.
SOP - Laboratory Standard Operating Procedure., **BDL- Below Detection Limit, *DL- Detection Limit

KOMAL SINGH

(Tested By)

ARJUN RAWAT

(Checked By)



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
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Test Report

Sample Number: VEL/HPCL/AA/04
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd.
Village Nasibpura, Bhatinda Punjab
Latitude: 30°1'13.05"N
Longitude: 75°0'1'3.89"E
Report No.: VEL/AA/2009/22/004
Format No.: 7.8 F-01
Party Reference No.: NIL
Reporting Date: 28/09/2020
Period of Analysis: 22/09/2020 - 28/09/2020
Receipt Date: 22/09/2020

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample collected by : Vardan Enviro Lab Representative
Sampling Location : Mahi Nangal
Instrument Used : RDS & FPS sampler with all Accessories
Instrument Code : VEL/RDS/02 & VEL/FPS/02
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 18/09/2020 to 19/09/2020
Time of Monitoring : 09:30 AM – 09:30 AM
Ambient Temperature (°C) : Min. 25°C Max. 36°C
Surrounding Activity : Human & Vehicular Activities
Scope of Monitoring : Regulatory Requirement
Control measure if Any : No
Sampling & Analysis Protocol : IS-5182
Parameter Required : As per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS [®] Limit
1.	Particulate Matter (PM _{2.5})	[#] SOP No. VEL/SOP/01. Section No. SP 63	52.61	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	91.78	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	14.23	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	10.41	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.92	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS: 11255(P-6) Indo Phenol Blue Method	12.37	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene (C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	19.63	µg/m ³	180
11.	Arsenic As, ng/m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/m ³)	ng/m ³	6
12.	Nickel Ni, ng/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/m ³)	ng/m ³	20
13.	Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	*BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

Note :- a) NAAQS - National Ambient Air Quality Standards: Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)]18.11.2009.
SOP- Laboratory Standard Operating Procedure.. **BDL- Below Detection Limit, *DL- Detection Limit

KOMAL SINGH
(Checked By)
ANALYST

ARIJUN BAWAT
(Checked By)



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Test Report

Sample Number: VEL/NMDCL/AA/05 Report No.: VEL/AA/2009/22/005
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Format No.: 7.8 F-01
Village Nasibpura, Bhatinda Punjab Party Reference No.: NIL
Reporting Date: 28/09/2020
Latitude: 29°59'40.64"N Period of Analysis: 22/09/2020 - 28/09/2020
Longitude: 75°1'17.61"E Receipt Date: 22/09/2020

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample collected by : Vardan Enviro Lab Representative
Sampling Location : Leleana
Instrument Used : RDS & FPS sampler with all Accessories
Instrument Code : VEL/RDS/06 & VEL/FPS/06
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 18/09/2020 to 19/09/2020
Time of Monitoring : 10:45 AM – 10:45 AM
Ambient Temperature (°C) : Min. 25°C Max. 36°C
Surrounding Activity : Human & Vehicular Activities
Scope of Monitoring : Regulatory Requirement
Control measure if Any : No
Sampling & Analysis Protocol : IS-5182
Parameter Required : As per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS ⁶⁰ Limit
1.	Particulate Matter (PM _{2.5})	#SOP No. VEL/SOP/01, Section No. SP 63	48.25	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	89.12	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	21.75	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	10.33	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	1.01	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS:11255(P-6) Indo Phenol Blue Method	13.26	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene (C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	23.64	µg/m ³	180
11.	Arsenic As, ng/ m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	6
12.	Nickel Ni, ng/ m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	20
13.	Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	*BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

Note :-@ NAAQS – National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)]18.11.2009.
SOP- Laboratory Standard Operating Procedure. **BDL- Below Detection Limit, *DL- Detection Limit

KOMAL SINGH
(Tested By)
ANALYST

ARIJIN RAWAT
(Checked By)
[Signature]



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Test Report

Sample Number:	VEL/HPCL/AA/06	Report No.:	VEL/AA/2009/22/006
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30°1'27.46"N	Party Reference No.:	NIL
Longitude:	75°4'8.62"E	Reporting Date:	28/09/2020
		Period of Analysis:	22/09/2020 - 28/09/2020
		Receipt Date:	22/09/2020

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample collected by	: Vardan Enviro Lab Representative
Sampling Location	: Baghi Bandar
Instrument Used	: RDS & FPS sampler with all Accessories
Instrument Code	: VEL/RDS/05& VEL/FPS/05
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 18/09/2020 to 19/09/2020
Time of Monitoring	: 11:15 AM – 11:15 AM
Ambient Temperature (°C)	: Min. 25°C Max. 36°C
Surrounding Activity	: Human & Vehicular Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No
Sampling & Analysis Protocol	: IS-5182
Parameter Required	: As per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS ^(a) Limit
1.	Particulate Matter (PM _{2.5})	[#] SOP No. VEL/SOP/01. Section No. SP 63	47.15	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	86.21	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	17.30	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	9.87	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.91	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS:11255(P-6) Indo Phenol Blue Method	14.01	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene(C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	22.16	µg/m ³	180
11.	Arsenic As, ng/ m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	6
12.	Nickel Ni, ng/ m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	20
13.	Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	*BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

Note :- (a) NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)]18.11.2009
SOP - Laboratory Standard Operating Procedure. **BDL- Below Detection Limit, *DL- Detection Limit

KOMAL SINGH
Analyst

ARJIIN RAWAT
(Checked By)



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Test Report

Sample Number:	VEL/HPCL/AA/07	Report No.:	VEL/AA/2009/22/007
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
		Party Reference No.:	NIL
Latitude:	30°4'34.79"N	Reporting Date:	28/09/2020
Longitude:	74°59'57.45"E	Period of Analysis:	22/09/2020 - 28/09/2020
		Receipt Date:	22/09/2020

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample collected by	: Vardan Enviro Lab Representative
Sampling Location	: Nasibpura
Instrument Used	: RDS & FPS sampler with all Accessories
Instrument Code	: VEL/RDS/03& VEL/FPS/03
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 19/09/2020 to 20/09/2020
Time of Monitoring	: 09:15 AM – 09:15 AM
Ambient Temperature (°C)	: Min. 24°C Max. 35°C
Surrounding Activity	: Human & Vehicular Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No
Sampling & Analysis Protocol	: IS-5182
Parameter Required	: As per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS ^{am} Limit
1.	Particulate Matter (PM _{2.5})	² SOP No. VEL/SOP/01. Section No. SP 63	50.21	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	89.67	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	20.55	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	12.37	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.88	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS: 11255(P-6) Indo Phenol Blue Method	13.07	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene(C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	24.66	µg/m ³	180
11.	Arsenic As, ng/ m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	6
12.	Nickel Ni, ng/ m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	20
13.	Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	*BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

Note :- @ NAAQS – National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(r)]18.11.2009.

Method used :- Gravimetric Method, Operating Procedure. ; **BDL- Below Detection Limit; *DL- Detection Limit

KOMAL SINGH
ANALYST

ARJUN RAWAT
(Checked By)



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Ph: 0124-4343750/752/753, 9810355569, 9953147268 E-mail: lab@vardanenviromet.com, bd@vardanenviromet.com



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Test Report

Sample Number: VEL/HPCL/AA/08 Report No.: VEL/AA/2009/22/008
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Format No.: 7.8 F-01
Village Nasibpura, Bhatinda Punjab Party Reference No.: NIL
Reporting Date: 28/09/2020
Latitude: 30°5'40.22"N Period of Analysis: 22/09/2020 - 28/09/2020
Longitude: 75°4'5.30"E Receipt Date: 22/09/2020

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample collected by : Vardan Enviro Lab Representative
Sampling Location : Kotbhara
Instrument Used : RDS & FPS sampler with all Accessories
Instrument Code : VEL/RDS/02& VEL/FPS/02
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 19/09/2020 to 20/09/2020
Time of Monitoring : 10:00 AM – 10:00 AM
Ambient Temperature (°C) : Min. 24°C Max. 35°C
Surrounding Activity : Human & Vehicular Activities
Scope of Monitoring : Regulatory Requirement
Control measure if Any : No
Sampling & Analysis Protocol : IS-5182
Parameter Required : As per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS ^(m) Limit
1.	Particulate Matter (PM _{2.5})	² SOP No. VEL/SOP/01. Section No. SP 63	48.16	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	87.95	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	21.73	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	13.15	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.98	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS: 11255(P-6) Indo Phenol Blue Method	11.04	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene (C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	17.38	µg/m ³	180
11.	Arsenic As, ng/m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	6
12.	Nickel Ni, ng/ m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	20
13.	Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	*BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

Note :- a) NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec -3(i)]18.11.2009.
SOP- Laboratory Standard Operating Procedure. **BDL- Below Detection Limit. *DL- Detection Limit

KOMAL SINGH
(Tested By)
ANALYST

ARJUN RAWAT
(Checked By)



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Test Report

Sample Number:	VEL/HPCL/AA/09	Report No.:	VEL/AA/2009/22/009
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30°6'34.53"N	Party Reference No.:	NIL
Longitude:	75°0'23.67"E	Reporting Date:	28/09/2020
		Period of Analysis:	22/09/2020 - 28/09/2020
		Receipt Date:	22/09/2020

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample collected by	: Vardan Enviro Lab Representative
Sampling Location	: Kot Kashmir
Instrument Used	: RDS & FPS sampler with all Accessories
Instrument Code	: VEL/RDS/01 & VEL/FPS/01
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 19/09/2020 to 20/09/2020
Time of Monitoring	: 10:30 AM – 10:30 AM
Ambient Temperature (°C)	: Min. 24°C Max. 35°C
Surrounding Activity	: Human & Vehicular Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No
Sampling & Analysis Protocol	: IS-5182
Parameter Required	: As per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS ^(a) Limit
1.	Particulate Matter (PM _{2.5})	^z SOP No. VEL/SOP/01, Section No. SP 63	51.75	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	90.22	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	20.63	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	9.12	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.97	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS:11255(P-6) Indo Phenol Blue Method	9.05	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene(C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	21.75	µg/m ³	180
11.	Arsenic As, ng/ m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	6
12.	Nickel Ni, ng/ m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	20
13.	Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	*BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

Note :- (a) NAAQS – National Ambient Air Quality Standards: Schedule-VII, [Rule 3 (3B)], [Part-II-sec-3(i)]18.11.2009

SOP- Laboratory Standard Operating Procedure. **BDL- Below Detection Limit. *DL- Detection Limit

KOMAL SINGH
(Tested By)

ANALYST

ARJUN RAWAT
(Checked By)



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Test Report

Sample Number: VEL/HPCL/AA/10 Report No.: VEL/AA/2009/22/010
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Format No.: 7.8 F-01
Village Nasibpura, Bhatinda Punjab Party Reference No.: NIL
Reporting Date: 28/09/2020
Latitude: 30°6'44.02"N Period of Analysis: 22/09/2020 - 28/09/2020
Longitude: 74°57'21.06"E Receipt Date: 22/09/2020

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample collected by : Vardan Enviro Lab Representative
Sampling Location : Gehri Boghi
Instrument Used : RDS & FPS sampler with all Accessories
Instrument Code : VEL/RDS/04& VEL/FPS/04
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 19/09/2020 to 20/09/2020
Time of Monitoring : 10:45 AM – 10:45 AM
Ambient Temperature (°C) : Min. 24°C Max. 35°C
Surrounding Activity : Human & Vehicular Activities
Scope of Monitoring : Regulatory Requirement
Control measure if Any : No
Sampling & Analysis Protocol : IS-5182
Parameter Required : As per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS ^a Limit
1.	Particulate Matter (PM _{2.5})	[#] SOP No. VEL/SOP/01, Section No. SP 63	50.31	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	88.94	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	18.25	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	9.88	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.91	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS:11255(P-6) Indo Phenol Blue Method	11.34	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene(C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	21.52	µg/m ³	180
11.	Arsenic As, ng/ m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	6
12.	Nickel Ni, ng/ m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	20
13.	Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	*BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

Note :- a) NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3(3B)], [Part-II-sec-3(i)]18.11.2009.
SOP- Laboratory Standard Operating Procedure, **BDL- Below Detection Limit, *DL- Detection Limit

KOMAL SINGH
(Tested By)
ANALYST

ARJUN RAWAT
(Checked By)
[Signature]



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Test Report

Sample Number: VEL/HPCL/AA/11 Report No.: VEL/AA/2009/22/011
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Format No.: 7.8 F-01
Village Nasibpura, Bhatinda Punjab Party Reference No.: NIL
Reporting Date: 28/09/2020
Latitude: 30°3'45.41"N Period of Analysis: 22/09/2020 - 28/09/2020
Longitude: 75°4'6.08"E Receipt Date: 22/09/2020

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample collected by : Vardan Enviro Lab Representative
Sampling Location : Chathewala
Instrument Used : RDS & FPS sampler with all Accessories
Instrument Code : VEL/RDS/05& VEL/FPS/05
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 19/09/2020 to 20/09/2020
Time of Monitoring : 11:15 AM – 11:15 AM
Ambient Temperature (°C) : Min. 24°C Max. 35°C
Surrounding Activity : Human & Vehicular Activities
Scope of Monitoring : Regulatory Requirement
Control measure if Any : No
Sampling & Analysis Protocol : IS-5182
Parameter Required : As per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS ^{mp} Limit
1.	Particulate Matter (PM _{2.5})	SOP No. VEL/SOP/01. Section No. SP 63	49.40	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	89.35	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	18.27	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	11.68	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	1.02	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS:11255(P-6) Indo Phenol Blue Method	12.63	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene (C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	17.56	µg/m ³	180
11.	Arsenic As, ng/ m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	6
12.	Nickel Ni, ng/ m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	20
13.	Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	**BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

Note :- a) NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec-3(r)]18.11.2009.

SOP- Laboratory Standard Operating Procedure. **BDL- Below Detection Limit, *DL- Detection Limit

KOMAL SINGH
ANALYST

ARJUN RAWAT
(Checked By)



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Test Report

Sample Number:	VEL/HPDCL/AA/12	Report No.:	VEL/AA/2009/22/012
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30°6'48.99"N	Party Reference No.:	NIL
Longitude:	75°4'54.51"E	Reporting Date:	28/09/2020
		Period of Analysis:	22/09/2020 - 28/09/2020
		Receipt Date:	22/09/2020

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample collected by	: Vardan Enviro Lab Representative
Sampling Location	: Kot Fatta
Instrument Used	: RDS & FPS sampler with all Accessories
Instrument Code	: VEL/RDS/06& VEL/FPS/06
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 19/09/2020 to 20/09/2020
Time of Monitoring	: 11:40 AM – 11:40 AM
Ambient Temperature (°C)	: Min. 24°C Max. 35°C
Surrounding Activity	: Human & Vehicular Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No
Sampling & Analysis Protocol	: IS-5182
Parameter Required	: As per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS ^{am} Limit
1.	Particulate Matter (PM _{2.5})	*SOP No. VEL/SOP/01. Section No. SP 63	50.88	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	89.37	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	21.05	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	12.44	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.98	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS:11255(P-6) Indo Phenol Blue Method	13.54	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene (C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	22.18	µg/m ³	180
11.	Arsenic As, ng/ m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	6
12.	Nickel Ni, ng/ m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	20
13.	Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	*BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

Note :- a) NAAQS – National Ambient Air Quality Standards: Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)]18.11.2009.
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KOMAL SINGH
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ANALYST

ARJUN RAWAT
(Checked By)
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Test Report

Sample Number: VEL/HPCL/AN/01 Report No.: VEL/AN/2009/22/001
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Format No.: 7.8 F-01
Village Nasibpura, Bhatinda Punjab Party Reference No.: NIL
Reporting Date: 28/09/2020
Receipt Date: 22/09/2020

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

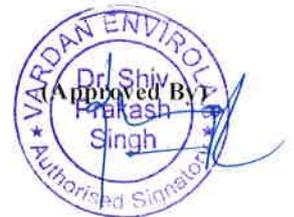
Sample collected by : Vardan EnviroLab Representative
Sampling Location : Near Project Site
Latitude : 30°3'13.34"N
Longitude : 75°0'41.57"E
Instrument Used : Sound Level Meter
Instrument Code : VEL/S/SLM/01
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 18/09/2020 to 19/09/2020
Time of Monitoring : 06:00 AM to 06:00AM
Surrounding Activity : Human, Vehicular and Cement plant Activities
Scope of Monitoring : Regulatory Requirement
Control measure if Any : No any
Sampling & Analysis Protocol : IS-9989 R-2003
Sampling Duration : 24 Hours
Parameter Required : As per Work Order

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	Lmax	IS 9989 R-2003	73.5	61.2	dB(A)
2.	Lmin	IS 9989 R-2003	54.7	43.3	dB(A)
3.	Leq	IS 9989 R-2003	62.50	53.10	dB(A)
4.	CPCB Limits in dB(A*) Leq (Industrial Area)	-	75.00	70.00	dB(A)

Note * A "decibel" is a unit in which noise is measured.

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Test Report

Sample Number: VEL/HPCL/AN/02 Report No.: VEL/AN/2009/22/002
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Format No.: 7.8 F-01
Village Nasibpura, Bhatinda Punjab Party Reference No.: NIL
Reporting Date: 28/09/2020
Receipt Date: 22/09/2020

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by : Vardan EnviroLab Representative
Sampling Location : Jiwan Singh Wala
Latitude : 30°3'37.63"N
Longitude : 75°2'75.30"E
Instrument Used : Sound Level Meter
Instrument Code : VEL/S/SLM/03
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 18/09/2020 to 19/09/2020
Time of Monitoring : 06:00 AM to 06:00AM
Surrounding Activity : Human, Vehicular and Cement plant Activities
Scope of Monitoring : Regulatory Requirement
Control measure if Any : No any
Sampling & Analysis Protocol : IS-9989 R-2003
Sampling Duration : 24 Hours
Parameter Required : As per Work Order

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	Lmax	IS 9989 R-2003	52.9	44.3	dB(A)
2.	Lmin	IS 9989 R-2003	37.6	28.3	dB(A)
3.	Leq	IS 9989 R-2003	41.60	35.20	dB(A)
4.	CPCB Limits in dB(A*) Leq (Residential Area)	-	55.00	45.00	dB(A)

Note *A "decibel" is a unit in which noise is measured.

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ARJUN RAWAT
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Test Report

Sample Number: VEL/HPCL/AN/03 Report No.: VEL/AN/2009/22/003
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Format No.: 7.8 F-01
Village Nasibpura, Bhatinda Punjab Party Reference No.: NIL
Reporting Date: 28/09/2020
Receipt Date: 22/09/2020

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

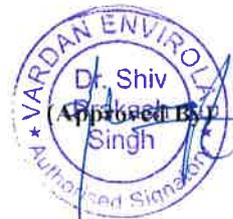
Sample collected by : Vardan EnviroLab Representative
Sampling Location : Maanwala
Latitude : 30°2'33.23"N
Longitude : 75°58'6.88"E
Instrument Used : Sound Level Meter
Instrument Code : VEL/S/SLM/04
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 18/09/2020 to 19/09/2020
Time of Monitoring : 06:00 AM to 06:00AM
Surrounding Activity : Human, Vehicular and Cement plant Activities
Scope of Monitoring : Regulatory Requirement
Control measure if Any : No any
Sampling & Analysis Protocol : IS-9989 R-2003
Sampling Duration : 24 Hours
Parameter Required : As per Work Order

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	Lmax	IS 9989 R-2003	59.2	45.3	dB(A)
2.	Lmin	IS 9989 R-2003	39.9	25.7	dB(A)
3.	Leq	IS 9989 R-2003	48.10	34.50	dB(A)
4.	CPCB Limits in dB(A*) Leq (Residential Area)	-	55.00	45.00	dB(A)

Note: * A "decibel" is a unit in which noise is measured.

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ANALYST
(Tested By)

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(Checked By)



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Test Report

Sample Number: VEL/HPCL/AN/04 Report No.: VEL/AN/2009/22/004
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Format No.: 7.8 F-01
Village Nasibpura, Bhatinda Punjab Party Reference No.: NIL
Reporting Date: 28/09/2020
Receipt Date: 22/09/2020

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by : Vardan EnviroLab Representative
Sampling Location : Mahi Nangal
Latitude : 30°1'13.05"N
Longitude : 75°1'3.89"E
Instrument Used : Sound Level Meter
Instrument Code : VEL/S/SLM/02
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 18/09/2020 to 19/09/2020
Time of Monitoring : 06:00 AM to 06:00AM
Surrounding Activity : Human, Vehicular and Cement plant Activities
Scope of Monitoring : Regulatory Requirement
Control measure if Any : No any
Sampling & Analysis Protocol : IS-9989 R-2003
Sampling Duration : 24 Hours
Parameter Required : As per Work Order

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	Lmax	IS 9989 R-2003	57.7	47.5	dB(A)
2.	Lmin	IS 9989 R-2003	37.6	29.3	dB(A)
3.	Leq	IS 9989 R-2003	48.60	36.40	dB(A)
4.	CPCB Limits in dB(A) Leq (Residential Area)	-	55.00	45.00	dB(A)

Note * A "decibel" is a unit in which noise is measured.

KOMAL SINGH
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Test Report

Sample Number:	VEL/HPCL/AN/05	Report No.:	VEL/AN/2009/22/005
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	28/09/2020
		Receipt Date:	22/09/2020

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by	: Vardan EnviroLab Representative
Sampling Location	: Leleana
Latitude	: 29°59'40.64"N
Longitude	: 75°1'17.61"E
Instrument Used	: Sound Level Meter
Instrument Code	: VEL/S/SLM/06
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 18/09/2020 to 19/09/2020
Time of Monitoring	: 06:00 AM to 06:00AM
Surrounding Activity	: Human, Vehicular and Rail Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No any
Sampling & Analysis Protocol	: IS-9989 R-2003
Sampling Duration	: 24 Hours
Parameter Required	: As per Work Order

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	Lmax	IS 9989 R-2003	58.3	45.3	dB(A)
2.	Lmin	IS 9989 R-2003	35.1	27.8	dB(A)
3.	Leq	IS 9989 R-2003	46.70	34.50	dB(A)
4.	CPCB Limits in dB(A)* Leq (Residential Area)	-	55.00	45.00	dB(A)

Note * A "decibel" is a unit in which noise is measured.

KOMAL SINGH
ANALYST

(Tested By)

ARJUN RAWAT

(Checked By)



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Test Report

Sample Number:	VEL/HPCL/AN/06	Report No.:	VEL/AN/2009/22/006
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	28/09/2020
		Receipt Date:	22/09/2020

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

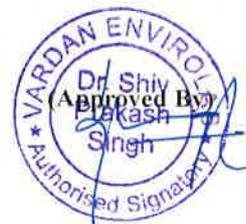
Sample collected by	: Vardan EnviroLab Representative
Sampling Location	: Baghi Bandar
Latitude	: 30°1'27.46"N
Longitude	: 75°4'8.62"E
Instrument Used	: Sound Level Meter
Instrument Code	: VEL/S/SLM/05
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 18/09/2020 to 19/09/2020
Time of Monitoring	: 06:00 AM to 06:00AM
Surrounding Activity	: Human, Vehicular and Rail Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No any
Sampling & Analysis Protocol	: IS-9989 R-2003
Sampling Duration	: 24 Hours
Parameter Required	: As per Work Order

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	Lmax	IS 9989 R-2003	58.3	45.3	dB(A)
2.	Lmin	IS 9989 R-2003	35.1	27.8	dB(A)
3.	Leq	IS 9989 R-2003	46.70	34.50	dB(A)
4.	CPCB Limits in dB(A) [*] Leq (Residential Area)	-	55.00	45.00	dB(A)

Note * A "decibel" is a unit in which noise is measured.

KOMAL SINGH
ANALYST
(Tested By)

ARJUN RAWAT
(Checked By)



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051, Haryana
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Test Report

Sample Number: VEL/HPCL/AN/07 Report No.: VEL/AN/2009/22/007
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Format No.: 7.8 F-01
Village Nasibpura, Bhatinda Punjab Party Reference No.: NIL
Reporting Date: 28/09/2020
Receipt Date: 22/09/2020

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by : Vardan EnviroLab Representative
Sampling Location : Nasibpura
Latitude : 30°4'34.79"N
Longitude : 74°59'57.45"E
Instrument Used : Sound Level Meter
Instrument Code : VEL/S/SLM/05
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 19/09/2020 to 20/09/2020
Time of Monitoring : 06:00 AM to 06:00AM
Surrounding Activity : Human, Vehicular and Cement plant Activities
Scope of Monitoring : Regulatory Requirement
Control measure if Any : No any
Sampling & Analysis Protocol : IS-9989 R-2003
Sampling Duration : 24 Hours
Parameter Required : As per Work Order

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	Lmax	IS 9989 R-2003	57.8	47.7	dB(A)
2.	Lmin	IS 9989 R-2003	39.6	28.3	dB(A)
3.	Leq	IS 9989 R-2003	49.60	38.30	dB(A)
4.	CPCB Limits in dB(A*) Leq (Residential Area)	-	55.00	45.00	dB(A)

Note * A "decibel" is a unit in which noise is measured.

KOMAL SINGH

ANALYST

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Test Report

Sample Number: VEL/HPCL/AN/08 Report No.: VEL/AN/2009/22/008
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Format No.: 7.8 F-01
Village Nasibpura, Bhatinda Punjab Party Reference No.: NIL
Reporting Date: 28/09/2020
Receipt Date: 22/09/2020

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by : Vardan EnviroLab Representative
Sampling Location : Kotbhara
Latitude : 30°5'40.22"N
Longitude : 75°4'5.30"E
Instrument Used : Sound Level Meter
Instrument Code : VEL/S/SLM/06
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 19/09/2020 to 20/09/2020
Time of Monitoring : 06:00 AM to 06:00AM
Surrounding Activity : Human, Vehicular and Cement plant Activities
Scope of Monitoring : Regulatory Requirement
Control measure if Any : No any
Sampling & Analysis Protocol : IS-9989 R-2003
Sampling Duration : 24 Hours
Parameter Required : As per Work Order

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	Lmax	IS 9989 R-2003	67.5	59.8	dB(A)
2.	Lmin	IS 9989 R-2003	45.2	33.6	dB(A)
3.	Leq	IS 9989 R-2003	51.40	41.20	dB(A)
4.	CPCB Limits in dB(A) [*] Leq (Residential Area)	-	55.00	45.00	dB(A)

Note * A "decibel" is a unit in which noise is measured.

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Test Report

Sample Number: VEL/HPCL/AN/09 Report No.: VEL/AN/2009/22/009
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Format No.: 7.8 F-01
Village Nasibpura, Bhatinda Punjab Party Reference No.: NIL
Reporting Date: 28/09/2020
Receipt Date: 22/09/2020

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by : Vardan EnviroLab Representative
Sampling Location : Kot Kashmir
Latitude : 30°6'34.53"N
Longitude : 75°0'23.67"E
Instrument Used : Sound Level Meter
Instrument Code : VEL/S/SLM/02
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 19/09/2020 to 20/09/2020
Time of Monitoring : 06:00 AM to 06:00AM
Surrounding Activity : Human, Vehicular and Cement plant Activities
Scope of Monitoring : Regulatory Requirement
Control measure if Any : No any
Sampling & Analysis Protocol : IS-9989 R-2003
Sampling Duration : 24 Hours
Parameter Required : As per Work Order

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	Lmax	IS 9989 R-2003	59.4	55.6	dB(A)
2.	Lmin	IS 9989 R-2003	41.3	32.2	dB(A)
3.	Leq	IS 9989 R-2003	50.30	42.60	dB(A)
4.	CPCB Limits in dB(A*) Leq (Residential Area)	-	55.00	45.00	dB(A)

Note * A "decibel" is a unit in which noise is measured.

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Test Report

Sample Number: VEL/HPCL/AN/10 Report No.: VEL/AN/2009/22/010
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Format No.: 7.8 F-01
Village Nasibpura, Bhatinda Punjab Party Reference No.: NIL
Reporting Date: 28/09/2020
Receipt Date: 22/09/2020

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by : Vardan EnviroLab Representative
Sampling Location : Gehri Boghi
Latitude : 30°6'44.02"N
Longitude : 74°57'21.06"E
Instrument Used : Sound Level Meter
Instrument Code : VEL/S/SLM/01
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 19/09/2020 to 20/09/2020
Time of Monitoring : 06:00 AM to 06:00AM
Surrounding Activity : Human, Vehicular and Cement plant Activities
Scope of Monitoring : Regulatory Requirement
Control measure if Any : No any
Sampling & Analysis Protocol : IS-9989 R-2003
Sampling Duration : 24 Hours
Parameter Required : As per Work Order

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	Lmax	IS 9989 R-2003	61.9	52.7	dB(A)
2.	Lmin	IS 9989 R-2003	43.2	33.5	dB(A)
3.	Leq	IS 9989 R-2003	52.40	42.80	dB(A)
4.	CPCB Limits in dB(A) [*] Leq (Residential Area)	-	55.00	45.00	dB(A)

Note * A "decibel" is a unit in which noise is measured.

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Test Report

Sample Number: VEL/HPCL/AN/11 Report No.: VEL/AN/2009/22/011
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Format No.: 7.8 F-01
Village Nasibpura, Bhatinda Punjab Party Reference No.: NIL
Reporting Date: 28/09/2020
Receipt Date: 22/09/2020

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by : Vardan EnviroLab Representative
Sampling Location : Chathewala
Latitude : 30°3'45.41"N
Longitude : 75°4'6.08"E
Instrument Used : Sound Level Meter
Instrument Code : VEL/S/SLM/04
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 19/09/2020 to 20/09/2020
Time of Monitoring : 06:00 AM to 06:00AM
Surrounding Activity : Human, Vehicular and Cement plant Activities
Scope of Monitoring : Regulatory Requirement
Control measure if Any : No any
Sampling & Analysis Protocol : IS-9989 R-2003
Sampling Duration : 24 Hours
Parameter Required : As per Work Order

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	Lmax	IS 9989 R-2003	56.2	46.3	dB(A)
2.	Lmin	IS 9989 R-2003	35.3	30.5	dB(A)
3.	Leq	IS 9989 R-2003	48.10	37.50	dB(A)
4.	CPCB Limits in dB(A*) Leq (Residential Area)	-	55.00	45.00	dB(A)

Note * A "decibel" is a unit in which noise is measured.

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Test Report

Sample Number:	VEL/HPCL/AN/12	Report No.:	VEL/AN/2009/22/012
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	28/09/2020
		Receipt Date:	22/09/2020

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by	: Vardan EnviroLab Representative
Sampling Location	: Kot Fatta
Latitude	: 30°6'48.99"N
Longitude	: 75°4'54.51"E
Instrument Used	: Sound Level Meter
Instrument Code	: VEL/S/SLM/03
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 19/09/2020 to 20/09/2020
Time of Monitoring	: 06:00 AM to 06:00AM
Surrounding Activity	: Human, Vehicular and Cement plant Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No any
Sampling & Analysis Protocol	: IS-9989 R-2003
Sampling Duration	: 24 Hours
Parameter Required	: As per Work Order

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	Lmax	IS 9989 R-2003	62.1	53.5	dB(A)
2.	Lmin	IS 9989 R-2003	43.7	32.8	dB(A)
3.	Leq	IS 9989 R-2003	51.20	41.50	dB(A)
4.	CPCB Limits in dB(A)* Leq (Residential Area)	-	55.00	45.00	dB(A)

Note * A "decibel" is a unit in which noise is measured.

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