1

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, 2018fpr 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 / HSPCB. 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.

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.

2

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.	*Noted.*
[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.	*Consent to Establish (CTE) was obtained from PPCB valid till 31.12.2021 as per the amended EC.*
[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	*As proposed zero discharge of waste water will be met during operational phase.*
[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.	*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.*
[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	*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.*
[F]	Total fresh water requirement shall not exceed 2280 cum/day, proposed to be met from canal supply.	*Prescribed water requirement will not be exceeded.*
[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.	*We will ensure that process water is not mixed with storm water.*
[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.	*Noted.*

[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.	*We will comply with the condition as per the requirement to minimize waste generation in the plant-* *i. Metering and control of quantities of active ingredients will be done regularly.* *ii. By products will be reused as raw material as much as possible according to requirement.* *iii. Automated filling will be carried out to minimize spillage* *iv. Close feed system will be used into batch reactors.* *v. Water scrubber, vent bottle & flame arrestors will be provided as per requirement.* *vi. High pressure hoses for equipment clearing will be used to reduce waste water 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.	*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.*
[K]	All the commitments made regarding issues raised during the public hearing/ consultation meeting shall be satisfactorily implemented.	*Noted.*
[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.	*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. .*
[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.	*Acoustically enclosed DG sets will be installed and Stack height will be kept as per the CPCB guidelines.*
[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.	*Fire Fighting system will be installed as per the condition.*
[O]	Occupational health surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.	*Regular Health Check-up arrangement will be provided for the workers A qualified doctor will be appointed.*
[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.	*No parking will be done outside on public places. Plan in this regard has already been submitted to authority.*
[Q]	Storage of raw materials shall be either stored in silos or in covered areas to prevent dust pollution and other fugitive emissions.	*During operation phase, raw materials will be stored properly in covered areas*
[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	*We will comply.*

	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.	*Noted.*

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.	*We ensure to follow the guidelines strictly.*
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.	*Noted.*
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	*Noted and same will be complied.*
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.	*Noted.*
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).	*We will ensure to keep the noise levels within the standards.*
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.	*Noted.*
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.	*Regular training of health & safety will be provided to the employees for chemical handling.*

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.	*Noted and will be complied as per the requirement.*
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.	*CSR activities will be undertaken as per the proposed plan.*
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.	*Noted.*
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.	*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.*
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.	*Noted.*
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.	*Noted. We are complying with the condition.*
xiv.	The environmental statement for each financial year ending 31st 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 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.	*Noted.*
xv.	The project proponent shall inform the public that the	*Copy of advertisements attached.*

	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.	
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.	*Noted.*
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.	*Noted.*

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 2021	September 2021
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 (SO_2)
- Oxides of Nitrogen (NO_2)
- Carbon Monoxide (CO)
- Ammonia (NH_3)
- Lead (Pb)
- Benzene (C_6H_6)
- Benzo(a)pyrene
- Ozone (O_3)

- 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 (PM2.5 i.e. <2.5 microns), and Respirable Dust Sampler was used for sampling Repairable fraction (<10 microns), gaseous pollutants like SO2, and NO_2. 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

3.1.3 Ambient Air Quality Monitoring Results (June-2021)

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/m³	**44.36**	**48.25**	**47.61**	**43.29**	60
2	Particulate Matter (PM_{10}), µg/m³	**85.24**	**81.54**	**86.20**	**81.40**	100
3	Nitrogen Dioxide (NO_2), µg/m³	**22.65**	**20.47**	**24.69**	**21.86**	80
4	Sulphur Dioxide (SO_2), µg/m³	**6.59**	**7.59**	**8.16**	**9.51**	80
5	Carbon Monoxide (CO) mg/m³	**0.72**	**0.74**	**0.78**	**0.73**	4
6	Ammonia (NH_3), µg/m³	**5.62**	**6.50**	**8.62**	**8.54**	400
7	Lead (Pb), µg/m³	****BDL(*DL 0.05 µg/m³)**	****BDL(*DL0.05 µg/m³)**	****BDL (*DL 0.05 µg/m³)**	****BDL(*DL0.05 µg/m³)**	1
8	Benzene(C_6H_6), µg/m³	****BDL (*DL 0.1 µg/m³)**	****BDL (*DL 0.1 µg/m³)**	****BDL (*DL 0.1**	****BDL (*DL 0.1 µg/m³)**	05
9	Benzo(a)pyrene, ng/m³	****BDL (*DL 1.0 ng/m³)**	****BDL (*DL 1.0 ng/m³)**	****BDL (*DL 1.0**	****BDL (*DL 1.0 ng/m³)**	01
10	Ozone (O_3),µg/m³	**16.58**	**18.47**	**20.68**	**19.67**	180
11	Arsenic As, ng/ m³	****BDL (*DL 5.0ng/ m³)**	****BDL (*DL 5.0ng/ m³)**	****BDL (*DL 5.0ng/**	****BDL (*DL 5.0ng/ m³)**	6
12	Nickel Ni, ng/ m³	****BDL (*DL 5.0ng/ m³)**	****BDL (*DL 5.0ng/ m³)**	****BDL (*DL 5.0ng/**	****BDL (*DL 5.0ng/ m³)**	20
13	Volatile Organic Carbon (VOCs)	****BDL (*DL 5.0 µg/m³)**	****BDL (*DL 5.0 µg/m³)**	****BDL (*DL 5.0 µg/m³)**	****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 3.7 Ambient Air Quality Monitoring Results (5-8 Location)

S. No.	Parameter	Test Result				NAAQS*
		AAQ5	AAQ6	AAQ7	AAQ8	
1	Particulate Matter ($PM_{2.5}$), µg/m³	**45.29**	**47.06**	**50.49**	**52.49**	60
2	Particulate Matter (PM_{10}), µg/m³	**81.92**	**78.24**	**88.62**	**89.74**	100
3	Nitrogen Dioxide (NO_2), µg/m³	**25.94**	**18.62**	**26.58**	**25.49**	80
4	Sulphur Dioxide (SO_2), µg/m³	**7.46**	**8.24**	**9.86**	**7.99**	80
5	Carbon Monoxide (CO) mg/m³	**0.78**	**0.79**	**0.81**	**0.79**	4
6	Ammonia (NH_3), µg/m³	**8.26**	**7.41**	**10.52**	**6.86**	400

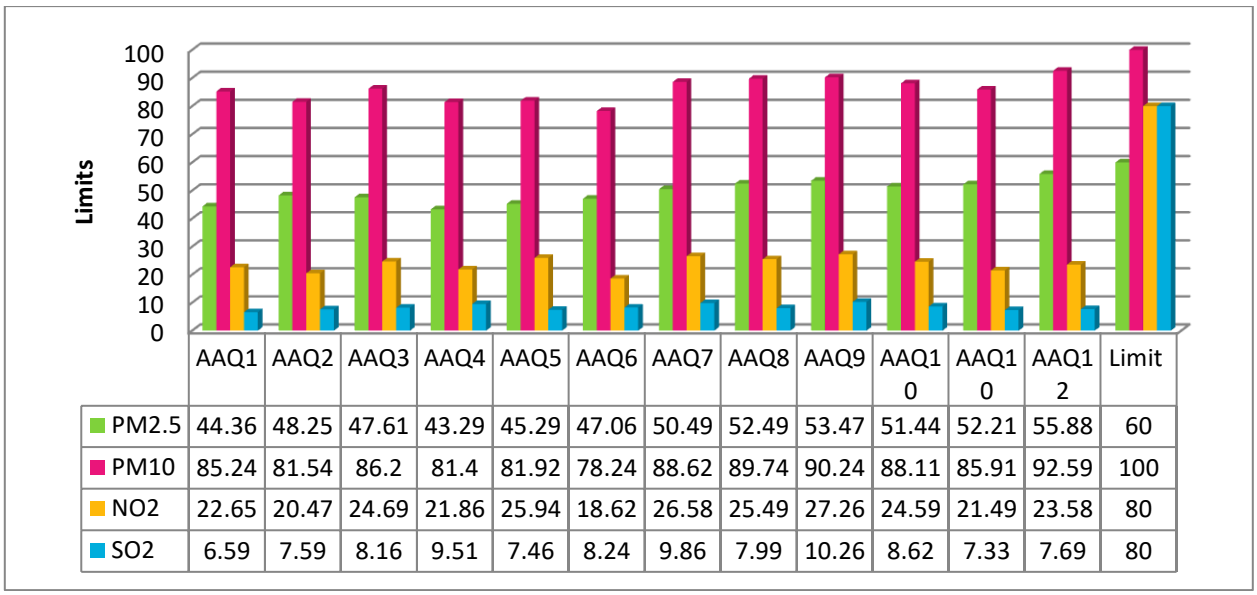
7	Lead (Pb), µg/m³	**BDL (*DL 0.05 µg/m³)	**BDL (*DL 0.05 µg/m3)	**BDL(*DL0.05µg/m3)	**BDL(*DL0.05µg/m³)	1
8	Benzene(C_6H_6), µg/m³	**BDL (*DL 0.1 µg/m³)	**BDL (*DL 0.1 µg/m3)	**BDL(*DL 0.1 µg/m3)	**BDL(*DL0.1 µg/m³)	05
9	Benzo(a)pyrene, ng/m³	**BDL (*DL 1.0 ng/m³)	**BDL (*DL 1.0 ng/m3)	**BDL(*DL 1.0 ng/m3)	**BDL(*DL1.0 ng/m³)	01
10	Ozone (O_3),µg/m³	21.59	16.29	22.49	23.56	180
11	Arsenic As, ng/ m³	**BDL (*DL 5.0ng/ m³)	**BDL (*DL 5.0ng/ m³)	**BDL (*DL 5.0ng/ m³)	**BDL (*DL 5.0ng/	6
12	Nickel Ni, ng/ m³	**BDL (*DL 5.0ng/ m³)	**BDL (*DL 5.0ng/ m³)	**BDL (*DL 5.0ng/ m³)	**BDL (*DL 5.0ng/	20
13	Volatile Organic Carbon	**BDL (*DL 5.0 µg/m³)	**BDL (*DL 5.0 µg/m³)	**BDL (*DL 5.0 µg/m³)	**BDL (*DL 5.0	--
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 3.8 Ambient Air Quality Monitoring Results (9-12 Location)

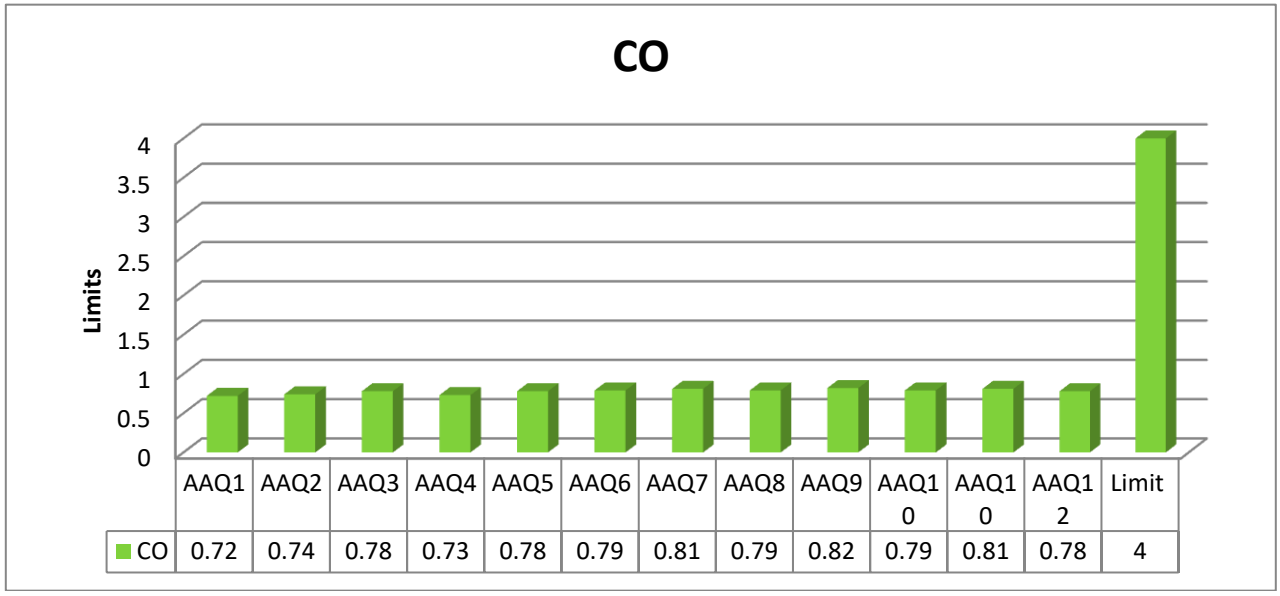
S. No.	Parameter	Test Result				NAAQS*
		AAQ9	AAQ10	AAQ11	AAQ12	
1	Particulate Matter ($PM_{2.5}$) µg/m³	53.47	51.44	52.21	55.88	60
2	Particulate Matter (PM_{10}), µg/m³	90.24	88.11	85.91	92.59	100
3	Nitrogen Dioxide (NO_2), µg/m³	27.26	24.59	21.49	23.58	80
4	Sulphur Dioxide (SO_2), µg/m³	10.26	8.62	7.33	7.69	80
5	Carbon Monoxide (CO) mg/m³	0.82	0.79	0.81	0.78	4
6	Ammonia (NH_3), µg/m³	9.87	10.26	6.49	6.59	400
7	Lead (Pb), µg/m³	**BDL (*DL 0.05 µg/m3)	**BDL (*DL 0.05 µg/m³)	**BDL(*DL0.05µg/m³)	**BDL(*DL0.05µg/m3)	1
8	Benzene(C_6H_6), µg/m³	**BDL (*DL 0.1 µg/m3)	**BDL (*DL 0.1 µg/m³)	**BDL(*DL 0.1 µg/m³)	**BDL (*DL 0.1 µg/m3)	05
9	Benzo(a)pyrene, ng/m³	**BDL (*DL 1.0 ng/m3)	**BDL (*DL 1.0 ng/m³)	**BDL (*DL 1.0 ng/m³)	**BDL(*DL 1.0 ng/m3)	01
10	Ozone (O_3),µg/m³	22.46	19.58	18.49	19.58	180
11	Arsenic As, ng/ m³	**BDL (*DL 5.0ng/ m³)	**BDL (*DL 5.0ng/ m³)	**BDL (*DL 5.0ng/ m³)	**BDL (*DL 5.0ng/ m³)	6
12	Nickel Ni, ng/ m³	**BDL (*DL 5.0ng/ m³)	**BDL (*DL 5.0ng/ m³)	**BDL (*DL 5.0ng/ m³)	**BDL (*DL 5.0ng/ m³)	20
13	Volatile Organic	**BDL (*DL 5.0 µg/m³)	**BDL (*DL 5.0 µg/m³)	**BDL (*DL 5.0 µg/m³)	**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



	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5	AAQ6	AAQ7	AAQ8	AAQ9	AAQ10	AAQ10	AAQ12	Limit
PM2.5	44.36	48.25	47.61	43.29	45.29	47.06	50.49	52.49	53.47	51.44	52.21	55.88	60
PM10	85.24	81.54	86.2	81.4	81.92	78.24	88.62	89.74	90.24	88.11	85.91	92.59	100
NO2	22.65	20.47	24.69	21.86	25.94	18.62	26.58	25.49	27.26	24.59	21.49	23.58	80
SO2	6.59	7.59	8.16	9.51	7.46	8.24	9.86	7.99	10.26	8.62	7.33	7.69	80

Figure 3.3 Location-wise Variation of Ambient Air Quality (June 2021)



	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5	AAQ6	AAQ7	AAQ8	AAQ9	AAQ10	AAQ10	AAQ12	Limit
CO	0.72	0.74	0.78	0.73	0.78	0.79	0.81	0.79	0.82	0.79	0.81	0.78	4

Figure 3.4 Location-wise Variation of CO in Ambient Air Quality (June 2021)

3.1.4 Discussion on Ambient Air Quality in the Study Area

PM_{10} and $PM_{2.5}$ levels at the project site are within the permissible limit of 100µg/m^3 and 60 µg/m^3 respectively (for residential, rural and other areas as stipulated in the National Ambient Air Quality Standards). SO_2, NOx and CO was observed within the corresponding stipulated limits (Limit for SO_2 and NOx: 80 µg/m^3 and limit for CO: 4.0 mg/m^3) 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.**

3.1.5 Ambient Air Quality Monitoring Results (September-2021)

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/m³	**49.71**	**46.04**	**49.05**	**44.63**	60
2	Particulate Matter (PM_{10}), µg/m³	**90.12**	**83.51**	**88.65**	**85.72**	100
3	Nitrogen Dioxide (NO_2), µg/m³	**21.68**	**18.07**	**22.19**	**20.15**	80
4	Sulphur Dioxide (SO_2), µg/m³	**6.71**	**7.60**	**8.46**	**9.62**	80
5	Carbon Monoxide (CO) mg/m³	**0.76**	**0.71**	**0.81**	**0.74**	4
6	Ammonia (NH_3), µg/m³	**5.82**	**6.59**	**8.93**	**8.86**	400
7	Lead (Pb), µg/m³	****BDL (*DL 0.05 µg/m³)**	****BDL (*DL 0.05 µg/m³)**	****BDL (*DL 0.05 µg/m³)**	****BDL (*DL 0.05 µg/m³)**	1
8	Benzene(C_6H_6), µg/m³	****BDL (*DL 0.1 µg/m³)**	****BDL (*DL 0.1 µg/m³)**	****BDL (*DL 0.1 µg/m³)**	****BDL (*DL 0.1 µg/m³)**	05
9	Benzo(a)pyrene, ng/m³	****BDL (*DL 1.0 ng/m³)**	****BDL (*DL 1.0 ng/m³)**	****BDL (*DL 1.0 ng/m³)**	****BDL (*DL 1.0 ng/m³)**	01
10	Ozone (O_3),µg/m³	**17.32**	**17.04**	**19.74**	**17.66**	180
11	Arsenic As, ng/ m³	****BDL (*DL 5.0ng/ m³)**	****BDL (*DL 5.0ng/ m³)**	****BDL (*DL 5.0ng/ m³)**	****BDL (*DL 5.0ng/ m³)**	6
12	Nickel Ni, ng/ m³	****BDL (*DL 5.0ng/ m³)**	****BDL (*DL 5.0ng/ m³)**	****BDL (*DL 5.0ng/ m³)**	****BDL (*DL 5.0ng/ m³)**	20
13	Volatile Organic Carbon	****BDL (*DL 5.0 µg/m³)**	****BDL (*DL 5.0**	****BDL (*DL 5.0 µg/m³)**	****BDL (*DL 5.0**	--
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/m³	**46.11**	**43.15**	**47.36**	**46.01**	60
2	Particulate Matter (PM_{10}), µg/m³	**85.22**	**81.24**	**82.74**	**83.94**	100
3	Nitrogen Dioxide (NO_2), µg/m³	**21.60**	**16.37**	**22.18**	**23.05**	80
4	Sulphur Dioxide (SO_2), µg/m³	**7.55**	**8.32**	**9.52**	**7.71**	80

5	Carbon Monoxide (CO) mg/m³	**0.82**	**0.81**	**0.78**	**0.75**	4
6	Ammonia (NH_3), µg/m³	**8.16**	**7.50**	**10.05**	**6.91**	400
7	Lead (Pb), µg/m³	****BDL (*DL 0.05 µg/m³)**	****BDL (*DL 0.05 µg/m3)**	****BDL (*DL 0.05 µg/m3)**	****BDL (*DL 0.05 µg/m³)**	1
8	Benzene(C_6H_6), µg/m³	****BDL (*DL 0.1**	****BDL (*DL 0.1 µg/m3)**	****BDL (*DL 0.1 µg/m3)**	****BDL (*DL 0.1 µg/m³)**	05
9	Benzo(a)pyrene, ng/m³	****BDL (*DL 1.0**	****BDL (*DL 1.0 ng/m3)**	****BDL (*DL 1.0 ng/m3)**	****BDL (*DL 1.0 ng/m³)**	01
10	Ozone (O_3),µg/m³	**20.26**	**17.20**	**20.68**	**21.62**	180
11	Arsenic As, ng/ m³	****BDL (*DL 5.0ng/**	****BDL (*DL 5.0ng/ m³)**	****BDL (*DL 5.0ng/ m³)**	****BDL (*DL 5.0ng/ m³)**	6
12	Nickel Ni, ng/ m³	****BDL (*DL 5.0ng/**	****BDL (*DL 5.0ng/ m³)**	****BDL (*DL 5.0ng/ m³)**	****BDL (*DL 5.0ng/ m³)**	20
13	Volatile Organic	****BDL (*DL 5.0**	****BDL (*DL 5.0 µg/m³)**	****BDL (*DL 5.0 µg/m³)**	****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))**	--

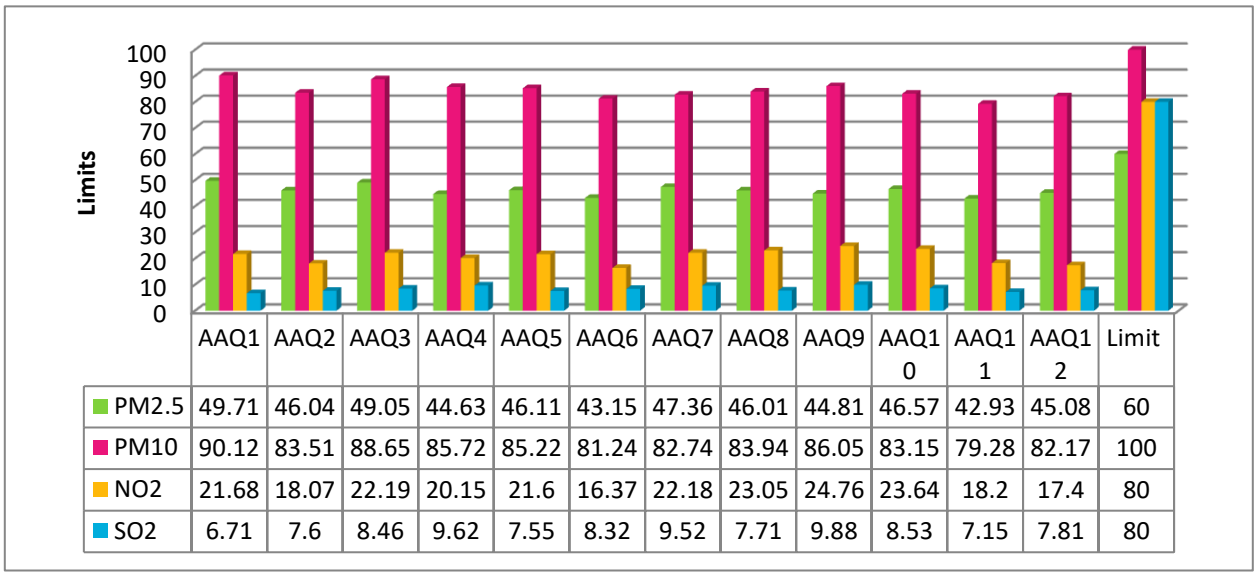
*NAAQS – National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 18.11.2009

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/m³	**44.81**	**46.57**	**42.93**	**45.08**	60
2	Particulate Matter (PM_{10}), µg/m³	**86.05**	**83.15**	**79.28**	**82.17**	100
3	Nitrogen Dioxide (NO_2), µg/m³	**24.76**	**23.64**	**18.20**	**17.40**	80
4	Sulphur Dioxide (SO_2), µg/m³	**9.88**	**8.53**	**7.15**	**7.81**	80

5	Carbon Monoxide (CO) mg/m³	**0.74**	**0.74**	**0.76**	**0.76**	4
6	Ammonia (NH_3), µg/m³	**9.11**	**9.85**	**6.23**	**6.43**	400
7	Lead (Pb), µg/m³	****BDL (*DL 0.05 µg/m3)**	****BDL (*DL 0.05 µg/m³)**	****BDL (*DL 0.05 µg/m³)**	****BDL(*DL 0.05 µg/m3)**	1
8	Benzene(C_6H_6), µg/m³	****BDL (*DL 0.1 µg/m3)**	****BDL (*DL 0.1 µg/m³)**	****BDL (*DL 0.1 µg/m³)**	****BDL (*DL 0.1 µg/m3)**	05
9	Benzo(a)pyrene, ng/m³	****BDL (*DL 1.0 ng/m3)**	****BDL (*DL 1.0 ng/m³)**	****BDL (*DL 1.0 ng/m³)**	****BDL (*DL 1.0 ng/m3)**	01
10	Ozone (O_3),µg/m³	**21.35**	**17.21**	**16.51**	**16.02**	180
11	Arsenic As, ng/ m³	****BDL (*DL 5.0ng/ m³)**	****BDL (*DL 5.0ng/ m³)**	****BDL (*DL 5.0ng/ m³)**	****BDL (*DL 5.0ng/ m³)**	6
12	Nickel Ni, ng/ m³	****BDL (*DL 5.0ng/ m³)**	****BDL (*DL 5.0ng/ m³)**	****BDL (*DL 5.0ng/ m³)**	****BDL (*DL 5.0ng/ m³)**	20
13	Volatile Organic	****BDL (*DL 5.0 µg/m³)**	****BDL (*DL 5.0 µg/m³)**	****BDL (*DL 5.0 µg/m³)**	****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



	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5	AAQ6	AAQ7	AAQ8	AAQ9	AAQ10	AAQ11	AAQ12	Limit
PM2.5	49.71	46.04	49.05	44.63	46.11	43.15	47.36	46.01	44.81	46.57	42.93	45.08	60
PM10	90.12	83.51	88.65	85.72	85.22	81.24	82.74	83.94	86.05	83.15	79.28	82.17	100
NO2	21.68	18.07	22.19	20.15	21.6	16.37	22.18	23.05	24.76	23.64	18.2	17.4	80
SO2	6.71	7.6	8.46	9.62	7.55	8.32	9.52	7.71	9.88	8.53	7.15	7.81	80

Figure 3.1 Location-wise Variation of Ambient Air Quality (September 2021)

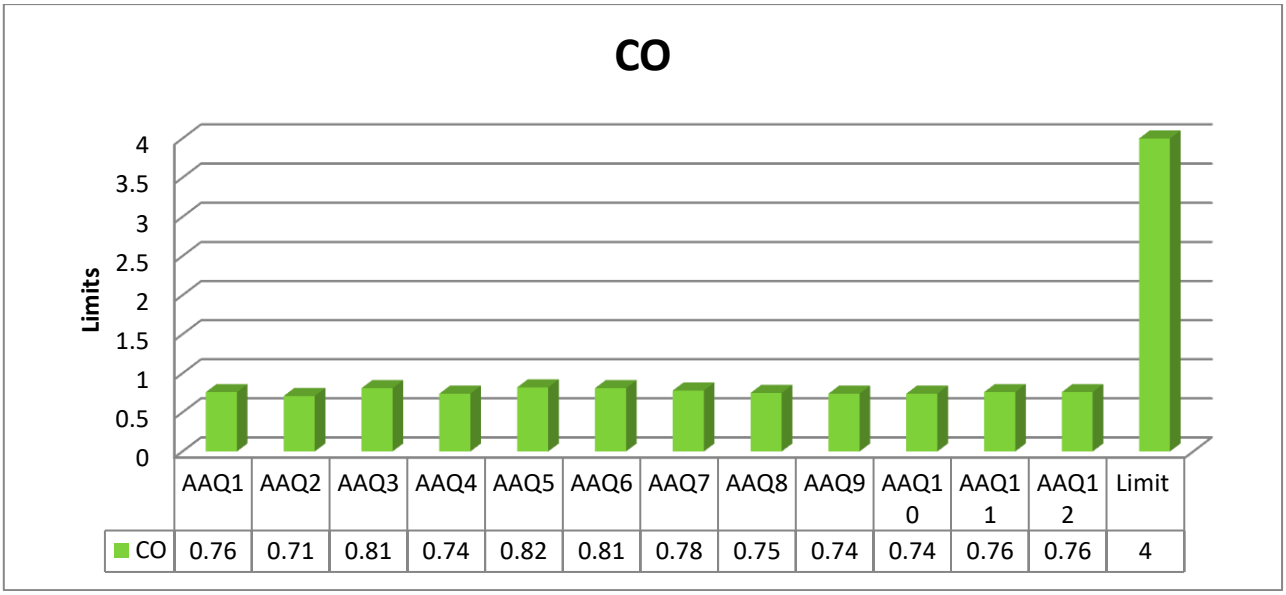


Figure 3.2 Location-wise Variation of CO in Ambient Air Quality (September 2021)

3.1.6 Discussion on Ambient Air Quality in the Study Area

PM_{10} and $PM_{2.5}$ levels at the project site are within the permissible limit of 100µg/m^3 and 60 µg/m^3 respectively (for residential, rural and other areas as stipulated in the National Ambient Air Quality Standards). SO_2, NOx and CO was observed within the corresponding stipulated limits (Limit for SO_2 and NOx: 80 µg/m^3 and limit for CO: 4.0 mg/m^3) 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.**

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 2021	September 2021	
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.

3.2.3 Ambient Noise Monitoring Results (June-2021)

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	Day Time	Night Time	Day Time	Night Time	Day Time	Night Time
Lmax	75.9	62.4	63.4	51.8	66.8	54.2	59.4	48.7
Lmin	52.6	47.8	42.8	37.8	43.8	35.7	41.8	36.1
Leq	61.58	53.80	52.71	43.14	53.74	42.13	47.88	40.89
CPCB Limit (Leq in dB(A) Industrial Limit & Residential Limit)	75.00	70.00	55.00	45.00	55.00	45.00	55.00	45.00

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

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

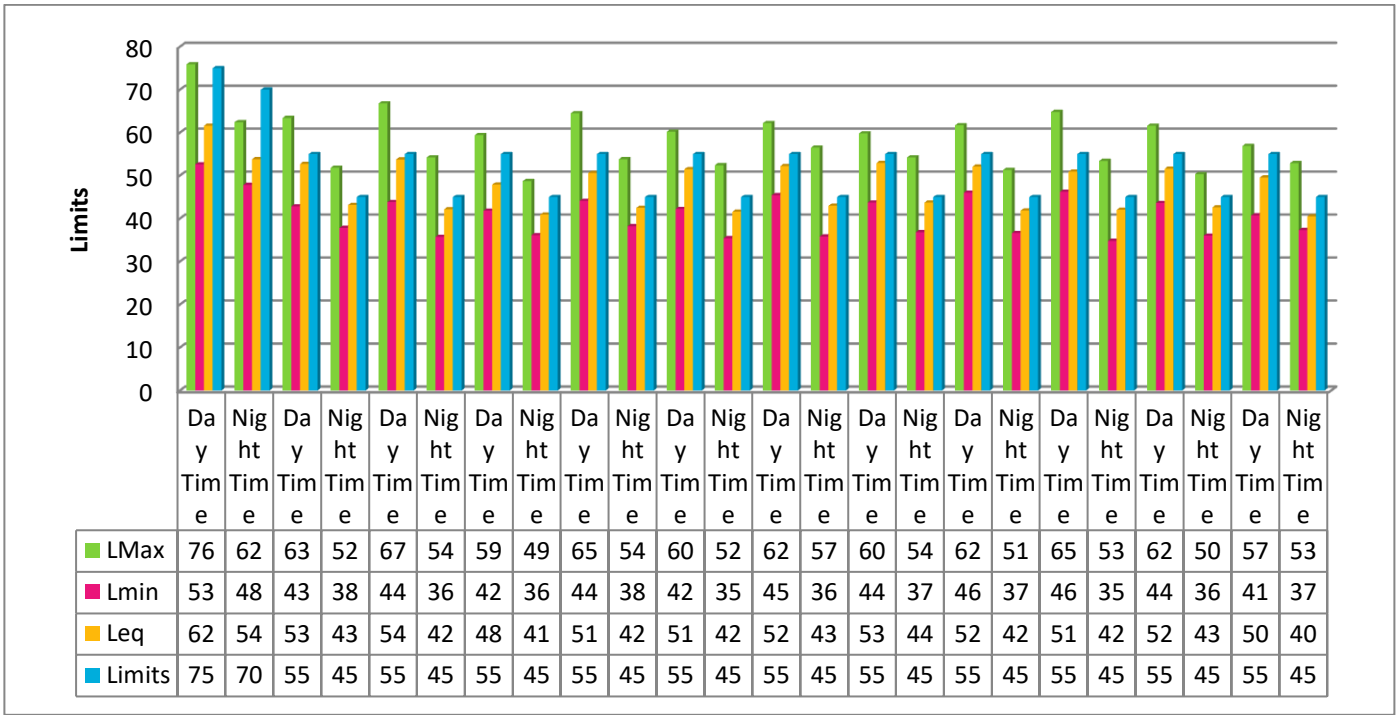
Parameter	N5		N6		N7		N8	
	Day Time	Night Time	Day Time	Night Time	Day Time	Night Time	Day Time	Night Time
Lmax	64.5	53.8	60.2	52.4	62.2	56.5	59.8	54.2
Lmin	44.1	38.2	42.2	35.4	45.4	35.8	43.7	36.8
Leq	50.58	42.47	51.48	41.57	52.20	42.96	52.94	43.7
CPCB Limit (Leq in dB(A) Residential Limit)	55.00	45.00	55.00	45.00	55.00	45.00	55.00	45.00

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

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

Parameter	N9		N10		N11		N12	
	Day Time	Night Time	Day Time	Night Time	Day Time	Night Time	Day Time	Night Time
Lmax	61.7	51.3	64.8	53.4	61.6	50.3	56.9	52.9
Lmin	46.0	36.6	46.2	34.8	43.6	36.0	40.7	37.3
Leq	52.07	41.84	50.9	42.01	51.59	42.59	49.54	40.49
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



	Day Time	Night Time	Day Time	Night Time	Day Time	Night Time	Day Time	Night Time	Day Time	Night Time	Day Time	Night Time	Day Time	Night Time	Day Time	Night Time	Day Time	Night Time	Day Time	Night Time	Day Time	Night Time	Day Time	Night Time
LMax	76	62	63	52	67	54	59	49	65	54	60	52	62	57	60	54	62	51	65	53	62	50	57	53
Lmin	53	48	43	38	44	36	42	36	44	38	42	35	45	36	44	37	46	37	46	35	44	36	41	37
Leq	62	54	53	43	54	42	48	41	51	42	51	42	52	43	53	44	52	42	51	42	52	43	50	40
Limits	75	70	55	45	55	45	55	45	55	45	55	45	55	45	55	45	55	45	55	45	55	45	55	45

Figure 3.6 Location-wise Variation of Ambient Noise Levels (June 2021)

3.2.4 Ambient Noise Monitoring Results (Septemberr-2021)

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	Day Time	Night Time	Day Time	Night Time	Day Time	Night Time
Lmax	71.6	62.4	61.4	51.9	60.3	53.7	58.2	49.5
Lmin	55.3	45.8	43.7	33.6	41.2	34.9	43.1	35.2
Leq	65.93	49.60	52.57	42.68	51.10	42.18	52.70	44.78
CPCB Limit (Leq in dB(A) Industrial Limit & Residential Limit)	75.00	70.00	55.00	45.00	55.00	45.00	55.00	45.00

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

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

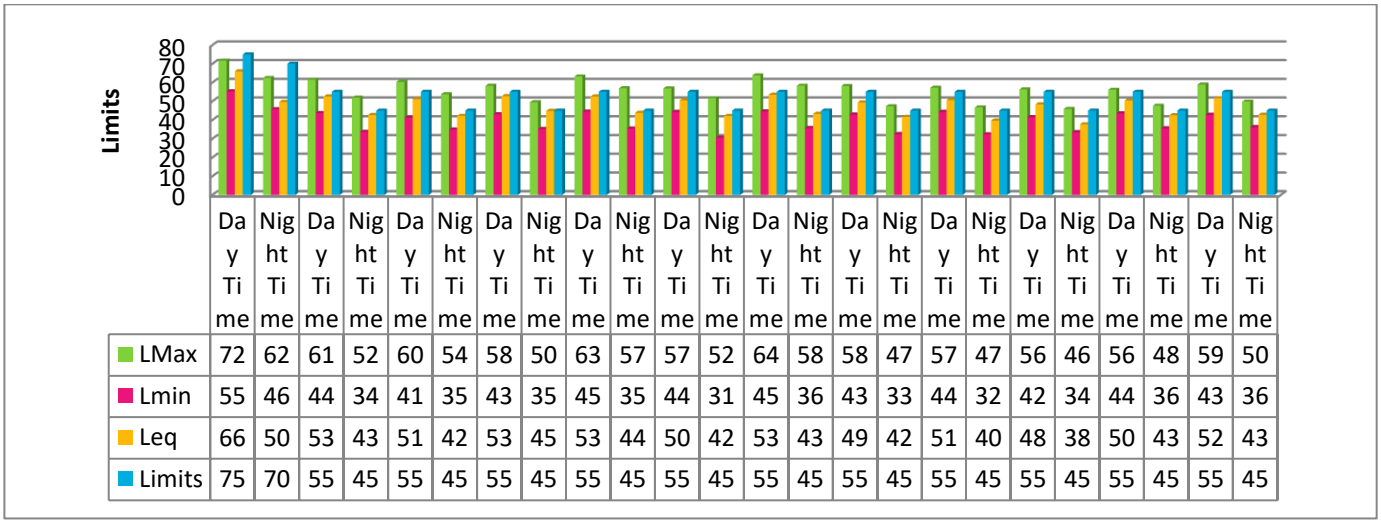
Parameter	N5		N6		N7		N8	
	Day Time	Night Time	Day Time	Night Time	Day Time	Night Time	Day Time	Night Time
Lmax	63.2	56.9	56.8	51.6	63.8	58.3	58.1	47.3
Lmin	44.5	35.4	44.3	30.5	44.6	35.7	42.9	32.5
Leq	52.60	43.80	50.45	42.11	53.41	43.26	49.30	41.60
CPCB Limit (Leq in dB(A) Residential Limit)	55.00	45.00	55.00	45.00	55.00	45.00	55.00	45.00

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

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

Parameter	N9		N10		N11		N12	
	Day Time	Night Time	Day Time	Night Time	Day Time	Night Time	Day Time	Night Time
Lmax	57.2	46.7	56.3	45.9	56.1	47.6	58.9	49.8
Lmin	44.3	32.4	41.5	33.5	43.5	35.5	42.8	36.2
Leq	50.61	39.70	48.30	37.69	50.31	42.50	51.60	42.80
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



	Day Time	Night Time	Day Time	Night Time	Day Time	Night Time	Day Time	Night Time	Day Time	Night Time	Day Time	Night Time	Day Time	Night Time	Day Time	Night Time	Day Time	Night Time	Day Time	Night Time	Day Time	Night Time	Day Time	Night Time	Day Time	Night Time
LMax	72	62	61	52	60	54	58	50	63	57	57	52	64	58	58	47	57	47	56	46	56	48	59	50		
Lmin	55	46	44	34	41	35	43	35	45	35	44	31	45	36	43	33	44	32	42	34	44	36	43	36		
Leq	66	50	53	43	51	42	53	45	53	44	50	42	53	43	49	42	51	40	48	38	50	43	52	43		
Limits	75	70	55	45	55	45	55	45	55	45	55	45	55	45	55	45	55	45	55	45	55	45	55	45		

Figure 3.6 Location-wise Variation of Ambient Noise Levels (September 2021)

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

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 2021	September 2021
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 2021** & **September 2021**. 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 HNO_3. 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**.

3.3.3 Ground Water & Surface Water Quality Monitoring Results (June-2021)

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 ^{0}C)	APHA ,4500-H^+ B Electrometric	7.52	--	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 $CaCO_3$	APHA , 2340 C, EDTA Titrimetric Method	301.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	76.59	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	238.2	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl^- B, Argentometric Method	54.1	mg/l	250	1000
10.	#Cyanide as CN	APHA , 4500 CN^- D	*BDL (**DL 0.05 mg/l)	mg/l	0.05	No
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	26.70	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	689.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA , 4500 E, Turbidimetric Method	32.48	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F^- D, SPADNS Method	0.75	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	7.02	mg/l	45	No Relaxation
16.	Iron as Fe	APHA , 3500-Fe B 1,10 Phenanthroline Method	0.15	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 as	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	0.21	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	1558	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	24.23	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	5.0	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 ^{0}C)	APHA ,4500-H^+ B Electrometric	7.42	--	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 $CaCO_3$	APHA , 2340 C, EDTA Titrimetric Method	191.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	55.26	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	206.3	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl^- B, Argentometric Method	46.59	mg/l	250	1000
10.	#Cyanide as CN	APHA , 4500 CN^- D	*BDL (**DL 0.05 mg/l)	mg/l	0.05	No

11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	12.84	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	456.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA , 4500 E, Turbidimetric Method	19.23	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F^- D, SPADNS Method	0.76	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	9.02	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)	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 as	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	920	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	20.1	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	4.5	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

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 ^{0}C)	APHA ,4500-H^+ B Electrometric	7.35	--	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 $CaCO_3$	APHA , 2340 C, EDTA Titrimetric Method	262.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	76.23	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	265.2	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl^- B, Argentometric Method	68.26	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	17.35	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	612.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA , 4500 E, Turbidimetric Method	74.26	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F^- D, SPADNS Method	0.92	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	8.26	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 Relaxation
22.	#Anionic Detergents as	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	0.26	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	1020	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	23.2	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	3.2	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 3.29 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 ^{0}C)	APHA ,4500-H^+ B Electrometric	7.73	--	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 $CaCO_3$	APHA , 2340 C, EDTA Titrimetric Method	222.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	70.24	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	223.26	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl^- B, Argentometric Method	48.62	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	11.27	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	521.26	mg/l	500	2000

13.	Sulphate as SO_4	APHA , 4500 E, Turbidimetric Method	41.22	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F^- D, SPADNS Method	0.68	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	7.26	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)	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 as	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	0.43	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	993	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	27.1	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	7.0	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 3.30 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 ^{0}C)	APHA ,4500-H^+ B Electrometric	7.73	--	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 $CaCO_3$	APHA , 2340 C, EDTA Titrimetric Method	289.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	76.25	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	272.56	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl^- B, Argentometric Method	81.59	mg/l	250	1000
10.	#Cyanide as CN	APHA , 4500 CN^- D	*BDL (**DL 0.05 mg/l)	mg/l	0.05	No
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	23.90	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	704.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA , 4500 E, Turbidimetric Method	62.47	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F^- D, SPADNS Method	0.79	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	8.69	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
22.	#Anionic Detergents as	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	0.55	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	1258	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	24.1	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	6.7	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 3.31 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 ^{0}C)	APHA ,4500-H^+ B Electrometric	7.23	--	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 $CaCO_3$	APHA , 2340 C, EDTA Titrimetric Method	202.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	66.25	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	212.45	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl^- B, Argentometric Method	58.62	mg/l	250	1000
10.	#Cyanide as CN	APHA , 4500 CN^- D	*BDL (**DL 0.05 mg/l)	mg/l	0.05	No
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	8.83	mg/l	30	100

12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	631.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA , 4500 E, Turbidimetric Method	48.23	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F^- D, SPADNS Method	0.68	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	8.03	mg/l	45	No Relaxation
16.	Iron as Fe	APHA , 3500-Fe B 1,10 Phenanthroline Method	0.18	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 as	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	0.58	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	1080	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	26.4	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	6.1	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 3.32 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 ^{0}C)	APHA ,4500-H^+ B Electrometric	7.29	--	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 $CaCO_3$	APHA , 2340 C, EDTA Titrimetric Method	386.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	106.02	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	342.35	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl^- B, Argentometric Method	82.26	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	29.39	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	890.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA , 4500 E, Turbidimetric Method	72.26	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	9.23	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 as	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	1686	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	32.4	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	8.6	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 3.33 Surface water Quality Monitoring Result (KotFatta)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 ^{0}C)	APHA ,4500-H^+ B Electrometric Method	7.62	--
2.	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**DL 1Hazen)	Hazen
3.	Turbidity	APHA, 2130 B, Nephlelometric 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	68.26	mg/l
7.	Conductivity	APHA, 2510 B, Conductivity Meter Method	788	µS/cm
8.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	13.01	mg/l
9.	Iron as Fe	APHA , 3500-Fe B 1,10 Phenanthroline Method	0.22	mg/l
10.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	473.00	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	0.15	mg/l
13.	Sulphate as SO^4	APHA , 4500 E, Turbidimetric Method	14.02	mg/l
14.	Fluoride as F	APHA , 4500-F^- D, SPADNS Method	0.53	mg/l
15.	BOD (3 Days at 27^{0}C)	APHA, 5210 C / IS 3025,P-44	6.00	mg/l
16.	COD	APHA, 5220 B, Open Reflux Method	26.00	mg/l

17.	Free Ammonia as NH_3	IS 3025 (P-34) , Titrimetric Method	11.95	mg/l
18.	Total Coliform	IS 1622	28	MPN/100ml
19.	Arsenic as As	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l
20.	Total Hardness as $CaCO_3$	APHA , 2340 C, EDTA Titrimetric Method	162.00	mg/l
21.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	48.26	mg/l
22.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	160.14	mg/l
23.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	10.04	mg/l
24.	Copper as Cu	APHA , 3111 B, Direct Air, Acetylene Flame Method	2.9	mg/l
25.	Sodium	APHA, 3500 Na B Flame Photometric Method	75.12	mg/l
26.	Potassium	APHA, 3500 Na B Flame Photometric Method	28.24	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 ^{0}C)	APHA ,4500-H^+ B Electrometric Method	7.88	--
2	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**DL 1Hazen)	Hazen
3	Turbidity	APHA, 2130 B, Nephlelometric 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	65.23	mg/l
7	Conductivity	APHA, 2510 B, Conductivity Meter Method	902	µS/cm
8	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	7.03	mg/l
9	Iron as Fe	APHA , 3500-Fe B 1,10 Phenanthroline Method	0.28	mg/l
10	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	541.2	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	0.13	mg/l
13	Sulphate as SO^4	APHA , 4500 E, Turbidimetric Method	22.14	mg/l
14	Fluoride as F	APHA , 4500-F^- D, SPADNS Method	0.42	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	27.00	mg/l
17	Free Ammonia as NH_3	IS 3025 (P-34) , Titrimetric Method	8.96	mg/l
18	Total Coliform	IS 1622	26	MPN/100ml

19	Arsenic as As	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l
20	Total Hardness as $CaCO_3$	APHA , 2340 C, EDTA Titrimetric Method	176.00	mg/l
21	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	62.14	mg/l
22	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	219.25	mg/l
23	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	5.01	mg/l
24	Copper as Cu	APHA , 3111 B, Direct Air, Acetylene Flame Method	3.12	mg/l
25	Sodium	APHA, 3500 Na B Flame Photometric Method	85.14	mg/l
26	Potassium	APHA, 3500 Na B Flame Photometric Method	28.26	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

3.3.4 Ground Water & Surface Water Quality Monitoring Results (September 2021)

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 ^{0}C)	APHA ,4500-H^+ B Electrometric	7.48	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison	*BDL (**DL 1.0 Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephlelometric	*BDL (**DL 1.0 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	275.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	69.12	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	225.35	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl^- B, Argentometric Method	49.05	mg/l	250	1000
10.	#Cyanide as CN	IS:3025 (P-27)	*BDL (**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	24.92	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	651.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA , 4500 E, Turbidimetric Method	27.31	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F^- D, SPADNS Method	0.69	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	6.87	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	1.0@	No relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.5	2.4@
19.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	No Relaxation
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction	*BDL(**DL 0.0004 mg/l)	mg/l	0.001	0.002
21.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05mg/l)	mg/l	0.5	No Relaxation
22.	#Anionic Detergents as	Annex K, IS 13428/IS 3025 (P-68)	*BDL(**DL 0.05 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	0.28	mg/l	5	15
24.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.1	0.3

26.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation[@]
30.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1002	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	19.37	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	5.0	mg/l	--	--
35.	Total Coliform	IS 15185:2016	< 2	/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100 ml sample	

Note: - This Report Complies as per IS 10500:2012 (RA: 2018)
*BDL-Below Detection Limit, **DL- Detection Limit. [#]These parameter are not covered in our NABL scope.
[@]Amendment No.1 in June .2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept. 2018(Limit of Boron & IS method of Total Coliform & E.Coli)

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 ^{0}C)	APHA ,4500-H^+ B Electrometric	7.36	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison	*BDL (**DL 1.0 Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephlelometric	*BDL (**DL 1.0 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	153.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	43.15	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	168.31	mg/l	200	600

9.	Chloride as Cl	APHA, 4500-Cl^- B, Argentometric Method	32.66	mg/l	250	1000
10.	#Cyanide as CN	IS:3025 (P-27)	*BDL (**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	11.02	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	403.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA , 4500 E, Turbidimetric Method	13.87	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F^- D, SPADNS Method	0.72	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	8.96	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	1.0@	No relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.5	2.4@
19.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	No Relaxation
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction	*BDL(**DL 0.0004 mg/l)	mg/l	0.001	0.002
21.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05mg/l)	mg/l	0.5	No Relaxation
22.	#Anionic Detergents as	Annex K, IS 13428/IS 3025 (P-68)	*BDL(**DL 0.05 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	0.37	mg/l	5	15
24.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation@
30.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	620	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	18.3	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	4.2	mg/l	--	--
35.	Total Coliform	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100ml sample	

36.	E. Coli	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100 ml sample

Note: - This Report Complies as per IS 10500:2012 (RA: 2018)
*BDL-Below Detection Limit, **DL- Detection Limit. #These parameter are not covered in our NABL scope.
@Amendment No.1 in June .2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept. 2018(Limit of Boron & IS method of Total Coliform & E.Coli)

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 ^{0}C)	APHA ,4500-H^+ B Electrometric	7.31	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison	*BDL (**DL 1.0 Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephlelometric	*BDL (**DL 1.0 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	210.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	72.65	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	212.37	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl^- B, Argentometric Method	61.82	mg/l	250	1000
10.	#Cyanide as CN	IS:3025 (P-27)	*BDL (**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	6.98	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	539.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA , 4500 E, Turbidimetric Method	59.05	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F^- D, SPADNS Method	0.81	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	8.10	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	1.0@	No relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.5	2.4@
19.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	No Relaxation
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction	*BDL(**DL 0.0004 mg/l)	mg/l	0.001	0.002
21.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05mg/l)	mg/l	0.5	No Relaxation
22.	#Anionic Detergents as	Annex K, IS 13428/IS 3025 (P-68)	*BDL(**DL 0.05 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	0.31	mg/l	5	15
24.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	1.5

25.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation[@]
30.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	8.29	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	19.3	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	3.5	mg/l	--	--
35.	Total Coliform	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100 ml sample	

Note: - This Report Complies as per IS 10500:2012 (RA: 2018)
*BDL-Below Detection Limit, **DL- Detection Limit. [#]These parameter are not covered in our NABL scope.
[@]Amendment No.1 in June .2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept. 2018(Limit of Boron & IS method of Total Coliform & E.Coli)

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 ^{0}C)	APHA ,4500-H^+ B Electrometric	7.63	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison	*BDL (**DL 1.0 Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephlelometric	*BDL (**DL 1.0 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	211.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	59.68	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	198.37	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl^- B, Argentometric Method	41.28	mg/l	250	1000
10.	#Cyanide as CN	IS:3025 (P-27)	*BDL (**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	15.09	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	498.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA , 4500 E, Turbidimetric Method	28.34	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F^- D, SPADNS Method	0.58	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	7.15	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	1.0@	No relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.5	2.4@
19.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	No Relaxation
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction	*BDL(**DL 0.0004 mg/l)	mg/l	0.001	0.002
21.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05mg/l)	mg/l	0.5	No Relaxation
22.	#Anionic Detergents as	Annex K, IS 13428/IS 3025 (P-68)	*BDL(**DL 0.05 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	0.37	mg/l	5	15
24.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.003	No Relaxation

27.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation[@]
30.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	830	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	23.6	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	6.3	mg/l	--	--
35.	Total Coliform	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100 ml sample	

Note: - This Report Complies as per IS 10500:2012 (RA: 2018)
*BDL-Below Detection Limit, **DL- Detection Limit. [#]These parameter are not covered in our NABL scope.
[@]Amendment No.1 in June .2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept. 2018(Limit of Boron & IS method of Total Coliform & E.Coli)

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 ^{0}C)	APHA ,4500-H^+ B Electrometric	7.61	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison	*BDL (**DL 1.0 Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephlelometric	*BDL (**DL 1.0 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	249.60	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	74.89	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	251.87	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl^- B, Argentometric Method	62.34	mg/l	250	1000
10.	[#]Cyanide as CN	IS:3025 (P-27)	*BDL (**DL 0.02 mg/l)	mg/l	0.05	No

11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	15.25	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	613.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA , 4500 E, Turbidimetric Method	56.02	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F^- D, SPADNS Method	0.74	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	8.41	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	1.0[@]	No relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.5	2.4[@]
19.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	No Relaxation
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction	*BDL(**DL 0.0004 mg/l)	mg/l	0.001	0.002
21.	[#]Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05mg/l)	mg/l	0.5	No
22.	[#]Anionic Detergents as	Annex K, IS 13428/IS 3025 (P-68)	*BDL(**DL 0.05 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	0.48	mg/l	5	15
24.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation[@]
30.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	943	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	22.8	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	6.1	mg/l	--	--
35.	Total Coliform	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100 ml sample	

Note: - This Report Complies as per IS 10500:2012 (RA: 2018)
*BDL-Below Detection Limit, **DL- Detection Limit. [#]These parameter are not covered in our NABL scope.
[@]Amendment No.1 in June .2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept. 2018(Limit of Boron & IS method of Total Coliform & E.Coli

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 ^{0}C)	APHA ,4500-H^+ B Electrometric	7.29	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison	*BDL (**DL 1.0 Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephlelometric	*BDL (**DL 1.0 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	215.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	71.63	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	226.87	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl^- B, Argentometric Method	63.04	mg/l	250	1000
10.	#Cyanide as CN	IS:3025 (P-27)	*BDL (**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	8.82	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	586.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA , 4500 E, Turbidimetric Method	43.08	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F^- D, SPADNS Method	0.62	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	7.93	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	1.0@	No relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.5	2.4@
19.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	No Relaxation
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction	*BDL(**DL 0.0004 mg/l)	mg/l	0.001	0.002
21.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05mg/l)	mg/l	0.5	No Relaxation
22.	#Anionic Detergents as	Annex K, IS 13428/IS 3025 (P-68)	*BDL(**DL 0.05 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	0.43	mg/l	5	15
24.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.003	No Relaxation

27.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation[@]
30.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	901	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	24.1	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	5.7	mg/l	--	--
35.	Total Coliform	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100 ml sample	

Note: - This Report Complies as per IS 10500:2012 (RA: 2018)
*BDL-Below Detection Limit, **DL- Detection Limit. [#]These parameter are not covered in our NABL scope.
[@]Amendment No.1 in June .2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept. 2018(Limit of Boron & IS method of Total Coliform & E.Coli)

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 ^{0}C)	APHA ,4500-H^+ B Electrometric	7.37	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison	*BDL (**DL 1.0 Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephlelometric	*BDL (**DL 1.0 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	314.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	99.86	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	326.51	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl^- B, Argentometric Method	86.08	mg/l	250	1000
10.	#Cyanide as CN	IS:3025 (P-27)	*BDL (**DL 0.02 mg/l)	mg/l	0.05	No
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	15.76	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	734.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA , 4500 E, Turbidimetric Method	61.27	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F^- D, SPADNS Method	0.78	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	8.63	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	1.0@	No relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.5	2.4@
19.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	No Relaxation
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction	*BDL(**DL 0.0004 mg/l)	mg/l	0.001	0.002
21.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05mg/l)	mg/l	0.5	No
22.	#Anionic Detergents as	Annex K, IS 13428/IS 3025 (P-68)	*BDL(**DL 0.05 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	0.51	mg/l	5	15
24.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.003	No Relaxation

27.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation[@]
30.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1129	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	29.3	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	8.2	mg/l	--	--
35.	Total Coliform	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100 ml sample	

Note: - This Report Complies as per IS 10500:2012 (RA: 2018)
*BDL-Below Detection Limit, **DL- Detection Limit. [#]These parameter are not covered in our NABL scope.
[@]Amendment No.1 in June .2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept. 2018(Limit of Boron & IS method of Total Coliform & E.Coli)

Table 3.24 Surface water Quality Monitoring Result (KotFatta)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 ^{0}C)	APHA ,4500-H^+ B Electrometric Method	7.53	--
2.	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**DL 1.0Hazen)	Hazen
3.	Turbidity	APHA, 2130 B, Nephlelometric Method	23	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	62.15	mg/l
7.	Conductivity	APHA, 2510 B, Conductivity Meter Method	634	µS/cm
8.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	11.51	mg/l
9.	Iron as Fe	APHA , 3500-Fe B 1,10 Phenanthroline Method	0.19	mg/l
10.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	412.00	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	0.13	mg/l
13.	Sulphate as SO^4	APHA , 4500 E, Turbidimetric Method	12.54	mg/l
14.	Fluoride as F	APHA , 4500-F^- D, SPADNS Method	0.49	mg/l
15.	BOD (3 Days at 27^{0}C)	APHA, 5210 C / IS 3025,P-44	5.60	mg/l
16.	COD	APHA, 5220 B, Open Reflux Method	23.00	mg/l
17.	Free Ammonia as NH_3	IS 3025 (P-34) , Titrimetric Method	9.86	mg/l
18.	Total Coliform	IS 1622	23	MPN/100ml
19.	Arsenic as As	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l
20.	Total Hardness as $CaCO_3$	APHA , 2340 C, EDTA Titrimetric Method	154.00	mg/l
21.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	53.88	mg/l
22.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	168.19	mg/l
23.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	4.75	mg/l
24.	Copper as Cu	APHA , 3111 B, Direct Air, Acetylene Flame Method	2.5	mg/l
25.	Sodium	APHA, 3500 Na B Flame Photometric Method	69.07	mg/l
26.	Potassium	APHA, 3500 Na B Flame Photometric Method	25.44	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 ^{0}C)	APHA ,4500-H^+ B Electrometric Method	7.75	--
2	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**DL 1.0Hazen)	Hazen
3	Turbidity	APHA, 2130 B, Nephlelometric Method	18	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	52.31	mg/l
7	Conductivity	APHA, 2510 B, Conductivity Meter Method	784	µS/cm
8	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	6.86	mg/l
9	Iron as Fe	APHA , 3500-Fe B 1,10 Phenanthroline Method	0.23	mg/l
10	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	510.00	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	0.11	mg/l
13	Sulphate as SO^4	APHA , 4500 E, Turbidimetric Method	21.08	mg/l
14	Fluoride as F	APHA , 4500-F^- D, SPADNS Method	0.39	mg/l
15	BOD (3 Days at 27^{0}C)	APHA, 5210 C / IS 3025,P-44	5.40	mg/l
16	COD	APHA, 5220 B, Open Reflux Method	26.00	mg/l
17	Free Ammonia as NH_3	IS 3025 (P-34) , Titrimetric Method	8.58	mg/l
18	Total Coliform	IS 1622	23	MPN/100ml
19	Arsenic as As	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l
20	Total Hardness as $CaCO_3$	APHA , 2340 C, EDTA Titrimetric Method	161.00	mg/l
21	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	52.36	mg/l
22	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	186.05	mg/l
23	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	7.38	mg/l
24	Copper as Cu	APHA , 3111 B, Direct Air, Acetylene Flame Method	2.96	mg/l
25	Sodium	APHA, 3500 Na B Flame Photometric Method	74.62	mg/l
26	Potassium	APHA, 3500 Na B Flame Photometric Method	21.09	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

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 2021	September 2021
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 **December 2020 & March 2021.**

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

3.4.3 Soil Monitoring Results (June 2021)

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	7.86	--
2.	Conductivity	IS:14767 by Conductivity meter	0.302	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
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	33.24	%
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	53.01	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	39.21	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	41.21	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	132.26	kg/hec.
11.	Iron as Fe	USEPA 3050B	3.02	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	19.24	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	201.26	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	18.40	kg./hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	10.12	mg/kg
17.	Organic Carbon	USEPA 3050B	0.52	%
18.	Lead (as Pb)	USEPA 3050B	0.80	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.72	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.81	mg/kg
21.	Copper (as Cu)	USEPA 3050B	6.01	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	14.5	%

*SOP-Laboratory Standard Operating Procedure.

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	7.69	--
2.	Conductivity	IS:14767 by Conductivity meter	0.321	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
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	34.11	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.24	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	49.25	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	39.21	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	51.02	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	149.68	kg/hec.
11.	Iron as Fe	USEPA 3050B	2.52	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.93	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	26.24	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	232.00	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	19.62	kg./hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	10.14	mg/kg
17.	Organic Carbon	USEPA 3050B	0.54	%
18.	Lead (as Pb)	USEPA 3050B	0.72	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.80	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.43	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.71	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	13.9	%

*SOP-Laboratory Standard Operating Procedure.

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	7.81	--
2.	Conductivity	IS:14767 by Conductivity meter	0.314	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
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	33.26	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.35	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	42.15	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	63.62	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	58.46	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	138.14	kg/hec.
11.	Iron as Fe	USEPA 3050B	2.26	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	21.14	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	219.14	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	29.54	kg./hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	11.06	mg/kg
17.	Organic Carbon	USEPA 3050B	0.37	%
18.	Lead (as Pb)	USEPA 3050B	0.58	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.71	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.41	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.03	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	15.7	%

*SOP-Laboratory Standard Operating Procedure.

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	7.63	--
2.	Conductivity	IS:14767 by Conductivity meter	0.356	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
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	31.25	%
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	50.14	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	42.59	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	60.16	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	138.26	kg/hec.
11.	Iron as Fe	USEPA 3050B	2.83	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.71	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	31.03	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	225.00	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	20.18	kg./hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	7.29	mg/kg
17.	Organic Carbon	USEPA 3050B	0.41	%
18.	Lead (as Pb)	USEPA 3050B	0.64	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.70	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.45	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.50	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.83	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	17.8	%

*SOP-Laboratory Standard Operating Procedure.

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	7.83	--
2.	Conductivity	IS:14767 by Conductivity meter	0.356	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
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	31.58	%
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	65.29	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	45.47	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	52.49	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	156.89	kg/hec.
11.	Iron as Fe	USEPA 3050B	2.62	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.84	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	28.10	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	242.00	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	26.23	kg./hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	8.51	mg/kg
17.	Organic Carbon	USEPA 3050B	0.48	%
18.	Lead (as Pb)	USEPA 3050B	0.90	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.83	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.76	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.15	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	15.8	%

*SOP-Laboratory Standard Operating Procedure.

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	7.63	--
2.	Conductivity	IS:14767 by Conductivity meter	0.328	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
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	40.15	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.24	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	50.26	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	41.34	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	48.62	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	158.14	kg/hec.
11.	Iron as Fe	USEPA 3050B	2.12	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.71	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	32.14	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	232.69	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	19.25	kg./hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	9.36	mg/kg
17.	Organic Carbon	USEPA 3050B	0.41	%
18.	Lead (as Pb)	USEPA 3050B	0.62	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.70	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.41	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.23	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.32	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	%

*SOP-Laboratory Standard Operating Procedure.

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	7.55	--
2.	Conductivity	IS:14767 by Conductivity meter	0.332	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	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	45.26	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.12	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	47.26	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	65.95	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	51.49	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	119.26	kg/hec.
11.	Iron as Fe	USEPA 3050B	3.52	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.80	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	22.56	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	245.00	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	26.59	kg./hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	15.47	mg/kg
17.	Organic Carbon	USEPA 3050B	0.46	%
18.	Lead (as Pb)	USEPA 3050B	0.54	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.68	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.62	mg/kg
21.	Copper (as Cu)	USEPA 3050B	1.96	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.52	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.

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	7.71	--
2.	Conductivity	IS:14767 by Conductivity meter	0.347	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
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	34.68	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.46	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	38.6	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	44.29	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	53.96	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	138.57	kg/hec.
11.	Iron as Fe	USEPA 3050B	1.99	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.63	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	33.55	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	202.8	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	15.47	kg./hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	8.23	mg/kg
17.	Organic Carbon	USEPA 3050B	0.36	%
18.	Lead (as Pb)	USEPA 3050B	0.55	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.63	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.44	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.32	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	15.7	%

*SOP-Laboratory Standard Operating Procedure.

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	7.64	--
2.	Conductivity	IS:14767 by Conductivity meter	0.386	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
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	26.58	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.62	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	52.47	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	38.26	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	45.14	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	145.26	kg/hec.
11.	Iron as Fe	USEPA 3050B	2.47	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	22.00	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	212.56	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	22.15	kg./hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	8.36	mg/kg
17.	Organic Carbon	USEPA 3050B	0.29	%
18.	Lead (as Pb)	USEPA 3050B	0.82	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.71	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.86	mg/kg
21.	Copper (as Cu)	USEPA 3050B	6.52	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.36	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	14.6	%

*SOP-Laboratory Standard Operating Procedure.

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	7.69	--
2.	Conductivity	IS:14767 by Conductivity meter	0.303	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	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	31.48	%
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	50.89	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	41.47	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	49.62	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	142.14	kg/hec.
11.	Iron as Fe	USEPA 3050B	2.25	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	28.62	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	232.75	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	24.78	kg./hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	10.62	mg/kg
17.	Organic Carbon	USEPA 3050B	0.44	%
18.	Lead (as Pb)	USEPA 3050B	0.68	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.75	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.53	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.20	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.24	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	12.8	%

*SOP-Laboratory Standard Operating Procedure.

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	0.2.86	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	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	28.62	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.14	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	61.03	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	42.16	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	42.96	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	112.56	kg/hec.
11.	Iron as Fe	USEPA 3050B	2.35	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	18.62	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	186.59	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	25.62	kg./hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	9.68	mg/kg
17.	Organic Carbon	USEPA 3050B	0.37	%
18.	Lead (as Pb)	USEPA 3050B	0.92	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.70	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.76	mg/kg
21.	Copper (as Cu)	USEPA 3050B	6.02	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.32	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	11.9	%

*SOP-Laboratory Standard Operating Procedure.

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	7.59	--
2.	Conductivity	IS:14767 by Conductivity meter	0.312	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
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	33.26	%
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	52.15	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	62.69	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	52.49	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	110.21	kg/hec.
11.	Iron as Fe	USEPA 3050B	3.25	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	20.02	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	198.26	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	15.46	kg./hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	11.56	mg/kg
17.	Organic Carbon	USEPA 3050B	0.43	%
18.	Lead (as Pb)	USEPA 3050B	0.54	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.72	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.70	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.21	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	14.6	%

*SOP-Laboratory Standard Operating Procedure.

3.4.3 Soil Monitoring Results (September 2021)

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	7.73	--
2.	Conductivity	IS:14767 by Conductivity meter	0.315	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
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	31.54	%
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	50.64	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	37.63	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	39.87	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	128.64	kg/hec.
11.	Iron as Fe	USEPA 3050B	2.89	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	17.16	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	198.34	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	16.51	kg./hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	9.86	mg/kg
17.	Organic Carbon	USEPA 3050B	0.51	%
18.	Lead (as Pb)	USEPA 3050B	0.78	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.69	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.80	mg/kg
21.	Copper (as Cu)	USEPA 3050B	6.12	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.34	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	14.2	%

*SOP-Laboratory Standard Operating Procedure.

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	7.65	--
2.	Conductivity	IS:14767 by Conductivity meter	0.319	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
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	31.95	%
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	45.97	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	37.05	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	49.03	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	144.12	kg/hec.
11.	Iron as Fe	USEPA 3050B	2.43	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	24.13	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	224.00	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	17.06	kg./hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	10.09	mg/kg
17.	Organic Carbon	USEPA 3050B	0.53	%
18.	Lead (as Pb)	USEPA 3050B	0.71	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.76	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.41	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.62	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	11.6	%

*SOP-Laboratory Standard Operating Procedure.

Table 3.38 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	7.76	--
2.	Conductivity	IS:14767 by Conductivity meter	0.322	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
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	31.88	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.36	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	43.81	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	64.19	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	56.17	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	140.15	kg/hec.
11.	Iron as Fe	USEPA 3050B	2.34	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	22.37	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	222.05	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	26.18	kg./hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	12.69	mg/kg
17.	Organic Carbon	USEPA 3050B	0.39	%
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	1.48	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.11	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	16.4	%

*SOP-Laboratory Standard Operating Procedure.

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 0C)	IS : 2720 (P-26) by pH Meter	7.69	--
2.	Conductivity	IS:14767 by Conductivity meter	0.348	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
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	33.05	%
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	53.04	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	43.67	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	63.18	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	141.75	kg/hec.
11.	Iron as Fe	USEPA 3050B	2.89	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	32.05	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	216.00	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	21.75	kg./hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	7.39	mg/kg
17.	Organic Carbon	USEPA 3050B	0.45	%
18.	Lead (as Pb)	USEPA 3050B	0.67	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.73	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.47	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.53	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	18.3	%

*SOP-Laboratory Standard Operating Procedure.

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	7.75	--
2.	Conductivity	IS:14767 by Conductivity meter	0.350	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
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	29.34	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.25	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	66.08	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	48.17	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	53.96	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	159.57	kg/hec.
11.	Iron as Fe	USEPA 3050B	2.72	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	29.55	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	248.00	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	27.96	kg./hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	8.68	mg/kg
17.	Organic Carbon	USEPA 3050B	0.49	%
18.	Lead (as Pb)	USEPA 3050B	0.92	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.84	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.79	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.21	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.46	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.

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	7.68	--
2.	Conductivity	IS:14767 by Conductivity meter	0.319	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
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	42.96	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.27	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	53.05	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	44.87	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	51.75	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	161.27	kg/hec.
11.	Iron as Fe	USEPA 3050B	2.23	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	35.08	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	238.00	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	21.34	kg./hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	9.46	mg/kg
17.	Organic Carbon	USEPA 3050B	0.45	%
18.	Lead (as Pb)	USEPA 3050B	0.68	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.76	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.45	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.30	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.34	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	17.3	%

*SOP-Laboratory Standard Operating Procedure.

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	7.62	--
2.	Conductivity	IS:14767 by Conductivity meter	0.338	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	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	47.15	%
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	45.67	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	68.51	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	53.26	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	121.18	kg/hec.
11.	Iron as Fe	USEPA 3050B	3.61	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.84	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	24.57	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	247.00	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	28.56	kg./hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	16.81	mg/kg
17.	Organic Carbon	USEPA 3050B	0.49	%
18.	Lead (as Pb)	USEPA 3050B	0.57	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.71	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.68	mg/kg
21.	Copper (as Cu)	USEPA 3050B	1.92	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	17.5	%

*SOP-Laboratory Standard Operating Procedure.

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	7.76	--
2.	Conductivity	IS:14767 by Conductivity meter	0.352	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
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	35.47	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.45	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	39.31	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	46.12	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	54.18	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	137.05	kg/hec.
11.	Iron as Fe	USEPA 3050B	1.91	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.59	%
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	208.64	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	16.43	kg./hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	8.38	mg/kg
17.	Organic Carbon	USEPA 3050B	0.37	%
18.	Lead (as Pb)	USEPA 3050B	0.51	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.66	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.42	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.26	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.81	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	14.6	%

*SOP-Laboratory Standard Operating Procedure.

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	7.67	--
2.	Conductivity	IS:14767 by Conductivity meter	0.362	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
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	27.31	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.65	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	54.16	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	37.26	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	42.91	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	142.51	kg/hec.
11.	Iron as Fe	USEPA 3050B	2.42	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.45	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	21.80	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	210.35	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	23.19	kg./hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	8.42	mg/kg
17.	Organic Carbon	USEPA 3050B	0.31	%
18.	Lead (as Pb)	USEPA 3050B	0.85	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.74	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.83	mg/kg
21.	Copper (as Cu)	USEPA 3050B	6.71	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	15.7	%

*SOP-Laboratory Standard Operating Procedure.

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	7.65	--
2.	Conductivity	IS:14767 by Conductivity meter	0.312	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	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	33.06	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.84	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	48.23	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	39.54	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	47.26	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	140.84	kg/hec.
11.	Iron as Fe	USEPA 3050B	2.22	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	26.49	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	243.06	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	25.18	kg./hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	11.54	mg/kg
17.	Organic Carbon	USEPA 3050B	0.48	%
18.	Lead (as Pb)	USEPA 3050B	0.67	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.72	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.51	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.16	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.23	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	13.7	%

*SOP-Laboratory Standard Operating Procedure.

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	7.82	--
2.	Conductivity	IS:14767 by Conductivity meter	0.298	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	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	24.12	%
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	62.34	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	44.61	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	47.66	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	110.78	kg/hec.
11.	Iron as Fe	USEPA 3050B	2.94	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	17.49	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	188.15	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	26.37	kg./hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	9.77	mg/kg
17.	Organic Carbon	USEPA 3050B	0.39	%
18.	Lead (as Pb)	USEPA 3050B	0.94	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.73	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.79	mg/kg
21.	Copper (as Cu)	USEPA 3050B	6.11	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.37	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	12.8	%

*SOP-Laboratory Standard Operating Procedure.

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	7.66	--
2.	Conductivity	IS:14767 by Conductivity meter	0.325	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
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	31.68	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.22	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	48.37	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	61.05	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	50.34	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	102.61	kg/hec.
11.	Iron as Fe	USEPA 3050B	3.18	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.71	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	19.35	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	191.63	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	14.18	kg./hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	10.27	mg/kg
17.	Organic Carbon	USEPA 3050B	0.41	%
18.	Lead (as Pb)	USEPA 3050B	0.52	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.69	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.63	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.14	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	14.2	%

*SOP-Laboratory Standard Operating Procedure.

3.4.5 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


M/s HPCL Bio Refinery
Ltd. Nasibpura (PB)
Ambient Air/Noise
Kot Fatta


Decimal
DMS
Latitude
30.054716
30°3'16" N
Longitude
75.010031
75°0'36" E
2021-09-29(Wed)
11:39
34°C
93°F
Google


M/S HPCL Bio Ref
Ltd. Nasibpura(PB)
Soil Sample
New Project Site


2021-09-29(Wed) 11:07

PUNJAB POLLUTION CONTROL BOARD

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

Website:- www.ppcb.gov.in

Office Dispatch No :	**Registered/Speed Post**	**Date:**

Industry Registration ID:	*R19BTI356560*	**Application No :**	*14320137*

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.

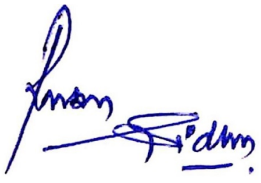
1. Particulars of Consent to Establish (NOC) granted to the Industry

Certificate No.	*CTE/Fresh/BTI/2021/14320137*
Date of issue :	*04/01/2021*
Date of expiry :	*31/12/2021*
Certificate Type :	*Fresh*

2. Particulars of the Industry

Name & Designation of the Applicant	*Sanjay Kumar, (Cheif Manager Bio Fuels)*
Address of Industrial premises	*Hindustan Petroleum Corporation Limited, Vill - Nasibpura,taluka - Talwandi Sabo, Distt - Bathinda, Talwandi Sabo,Bathinda-151001*
Capital Investment of the Industry	*109625.0 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. 10,80,000/- vide R.No. 362293229 dt. 14.12.2020.
Raw Materials (Name with quantity per day)	• *Bio-mass @ 500 TPD.* • *Yeast @ .05 TPD* • *Acid @ 10 TPD* • *Enzymes @ 3.5 TPD* • *Nutrients @ 4 TPD* • *Chemicals @ 23 TPD*

Products (Name with quantity per day)	*Ethanol @ 100 KLD*
By-Products, if any,(Name with quantity per day)	*• CO2 @ 75 TPD.* *• Fuel Oil @ 0.3 TPD.* *• Technical Alcohol @ 2.0 TPD.* *• Ash @ 125 TPD.*
Details of the machinery and processes	*2G ethanol generation from lingo-cellulosic biomass*
Details of the Effluent Treatment Plant	*• Stream I – Trade Effluent @ 512 KLD to be generated from boiler blow down, DM plant and cooling tower blow down will be treated through reverse osmosis followed by MEE treatment. The treated effluent will be utilized as cooling tower makeup water.* *• Stream II – Effluent generated from process condensate is proposed to be treated through anaerobic followed by aerobic biological process and thereafter the effluent will be utilized as utility makeup water.* *• Domestic Effluent @ 10 KLD to be treated in the sewage treatment plant based on MBR technology.*
Mode of Disposal of Effluent	*• Trade Effluent – It has been proposed to achieve Zero Liquid discharge.* *• Domestic Effluent @ 10 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	*• Two boilers of capacity 42 TPH each has been proposed.* *• Two DG sets of capacity 2000 KVA each has been proposed.*
Mode of disposal of emissions with stack height	*• Separate stacks of adequate height have been proposed with boiler furnaces.* *• Separate stacks of adequate height have been proposed with DG sets.*
Quantity of fuel required in TPD	*• Paddy Straw / Wet Cake as fuel proposed to be used in both the boilers of capacity 42 TPH each.* *• HSD for DG sets.*
Type of Air Pollution Control Devices to be installed	*• Separate Electrostatic Precipitators (ESP) as APCD with both the boilers of capacity 42 TPH each.* *• Separate Canopies with both the DG sets of capacity 2000 KVA each.*
Standars to be achieved under Air (Prevention & Control of Pollution) Act, 1981	*As prescribed by the PPCB/CPCB/MOEF.*



04/01/2021

(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.

04/01/2021

(Ruby Sidhu)
Asstt Environmental Engineer
For & on behalf
of
(Punjab Pollution Control Board)

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 which ever 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 Qg0.3or H = 74 (Qp)0.24 Where Qg = Quantity of SO2 in Kg/hr. Qp = 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:

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.

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

04/01/2021

(Ruby Sidhu)
Asstt Environmental Engineer

For & on behalf

of

(Punjab Pollution Control Board)

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 & further amendment issued vide letter dated 23.09.2020.
2. The industry will ensure to achieve zero liquid discharge and it shall be further ensured that no waste / treated water is discharged, without prior permission of the Board.
3. The industry shall develop thick green belt all along the boundary wall covering 33% of the total project area as per the karnal technology in compliance to the conditions of the Environmental Clearance.
4. The industry shall manage and transport the fuel ash to be generated from its boilers in a scientific manner.
5. The industry will install pollution control devices as proposed simultaneously with the commissioning of the main project.

04/01/2021

(Ruby Sidhu)
Asstt Environmental Engineer

For & on behalf

of

(Punjab Pollution Control Board)

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/AA/01**	**Report No.:**	**VEL/AA/2107/02/001**
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:	**06/07/2021**
Latitude:	**30° 3' 13.34"N**	**Period of Analysis:**	**02/07/2021 - 06/07/2021**
Longitude:	**75° 0' 41.57"E**	**Receipt Date:**	**02/07/2021**

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	:	**28/06/2021 to 29/06/2021**
Time of Monitoring	:	10:25 AM – 10:25 AM
Ambient Temperature (°C)	:	Min. 34°C Max. 45°C
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Control measure if Any	:	No
Sampling & Analysis Protocol	:	IS-5182 & CPCB Guideline
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	**44.36**	$\mu g/m^3$	60
2.	**Particulate Matter (PM_{10})**	IS: 5182 (P-23) Gravimetric Method	**85.24**	$\mu g/m^3$	100
3.	**Nitrogen Dioxide (NO_2)**	IS: 5182 (P-6) Jacob & Hochheiser	**22.65**	$\mu g/m^3$	80
4.	**Sulphur Dioxide (SO_2)**	IS: 5182 (P-2) Modified West and Gaeke	**6.59**	$\mu g/m^3$	80
5.	**Carbon Monoxide (CO)**	IS: 5182 (P-10) Gas Chromatography	**0.72**	mg/m^3	4
6.	**Ammonia (NH3), µg/m3**	IS:5182(P-25) Indo Phenol Blue Method	**5.62**	$\mu g/m^3$	400
7.	**Lead (Pb), $\mu g/m^3$**	IS: 5182 (P-22) Air Acetylene Method	****BDL (*DL 0.05 $\mu g/m^3$)**	$\mu g/m^3$	1
8.	**Benzene(C_6H_6) , $\mu g/m^3$**	IS: 5182 (P-11)	****BDL (*DL 0.1 $\mu g/m^3$)**	$\mu g/m^3$	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) , $\mu g/m^3$**	IS: 5182 (P-9) Colorimetric Method	**16.58**	$\mu g/m^3$	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 $\mu g/m^3$)**	$\mu g/m^3$	--
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

ARJUN RAWAT (Checked By)

(Approved By) Partap Singh Authorised Signatory

VEL/E/N/TR/PN2267

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/AA/02**	**Report No.:**	**VEL/AA/2107/02/002**
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**
		Reporting Date:	**06/07/2021**
Latitude:	**30° 3' 37.63"N**	**Period of Analysis:**	**02/07/2021 - 06/07/2021**
Longitude:	**75° 2' 75.30"E**	**Receipt Date:**	**02/07/2021**

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	:	**28/06/2021 to 29/06/2021**
Time of Monitoring	:	10:50 AM – 10:50 AM
Ambient Temperature (°C)	:	Min. 34°C Max. 45°C
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Control measure if Any	:	No
Sampling & Analysis Protocol	:	IS-5182 & CPCB Guideline
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	**48.25**	$\mu g/m^3$	60
2.	**Particulate Matter (PM_{10})**	IS: 5182 (P-23) Gravimetric Method	**81.54**	$\mu g/m^3$	100
3.	**Nitrogen Dioxide (NO_2)**	IS: 5182 (P-6) Jacob & Hochheiser	**20.47**	$\mu g/m^3$	80
4.	**Sulphur Dioxide (SO_2)**	IS: 5182 (P-2) Modified West and Gaeke	**7.59**	$\mu g/m^3$	80
5.	**Carbon Monoxide (CO)**	IS: 5182 (P-10) Gas Chromatography	**0.74**	mg/m^3	4
6.	**Ammonia (NH3), µg/m3**	IS:5182(P-25) Indo Phenol Blue Method	**6.50**	$\mu g/m^3$	400
7.	**Lead (Pb), $\mu g/m^3$**	IS: 5182 (P-22) Air Acetylene Method	****BDL (*DL 0.05 $\mu g/m^3$)**	$\mu g/m^3$	1
8.	**Benzene(C_6H_6) , $\mu g/m^3$**	IS: 5182 (P-11)	****BDL (*DL 0.1 $\mu g/m^3$)**	$\mu g/m^3$	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) , $\mu g/m^3$**	IS: 5182 (P-9) Colorimetric Method	**18.47**	$\mu g/m^3$	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 $\mu g/m^3$)**	$\mu g/m^3$	--
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

(Tested By) KOMAL SINGH ANALYST

(Checked By) ARJUN RAWAT

(Approved By) Gaurav Pratap Singh — Authorized Signatory

VEL/E/N/TR/PN2288

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/AA/03**	**Report No.:**	**VEL/AA/2107/02/003**
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**
		Reporting Date:	**06/07/2021**
Latitude:	**30° 2' 33.23"N**	**Period of Analysis:**	**02/07/2021 - 06/07/2021**
Longitude:	**75° 58' 6.88"E**	**Receipt Date:**	**02/07/2021**

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	:	**28/06/2021 to 29/06/2021**
Time of Monitoring	:	11:30 AM – 11:30 AM
Ambient Temperature (°C)	:	Min. 34°C Max. 45°C
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Control measure if Any	:	No
Sampling & Analysis Protocol	:	IS-5182 & CPCB Guideline
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	**47.61**	$\mu g/m^3$	60
2.	**Particulate Matter (PM_{10})**	IS: 5182 (P-23) Gravimetric Method	**86.20**	$\mu g/m^3$	100
3.	**Nitrogen Dioxide (NO_2)**	IS: 5182 (P-6) Jacob & Hochheiser	**24.69**	$\mu g/m^3$	80
4.	**Sulphur Dioxide (SO_2)**	IS: 5182 (P-2) Modified West and Gaeke	**8.16**	$\mu g/m^3$	80
5.	**Carbon Monoxide (CO)**	IS: 5182 (P-10) Gas Chromatography	**0.78**	mg/m^3	4
6.	**Ammonia (NH3), µg/m3**	IS:5182(P-25) Indo Phenol Blue Method	**8.62**	$\mu g/m^3$	400
7.	**Lead (Pb), $\mu g/m^3$**	IS: 5182 (P-22) Air Acetylene Method	****BDL (*DL 0.05 $\mu g/m^3$)**	$\mu g/m^3$	1
8.	**Benzene(C_6H_6) , $\mu g/m^3$**	IS: 5182 (P-11)	****BDL (*DL 0.1 $\mu g/m^3$)**	$\mu g/m^3$	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) , $\mu g/m^3$**	IS: 5182 (P-9) Colorimetric Method	**20.68**	$\mu g/m^3$	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 $\mu g/m^3$)**	$\mu g/m^3$	--
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 ANALYST
(Tested By)

ARJUN RAWAT
(Checked By)

VARDAN ENVIROLAB Saurav Pratap Singh Authorised Signatory
(Approved By)

VEL/E/N/TR/PN2289

www.vardan.co.in

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/AA/04**	**Report No.:**	**VEL/AA/2107/02/004**
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**
		Reporting Date:	**06/07/2021**
Latitude:	**30° 1' 13.05"N**	**Period of Analysis:**	**02/07/2021 - 06/07/2021**
Longitude:	**75° 1' 3.89"E**	**Receipt Date:**	**02/07/2021**

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	:	**28/06/2021 to 29/06/2021**
Time of Monitoring	:	11:50 AM – 11:50 AM
Ambient Temperature (°C)	:	Min. 34°C Max. 45°C
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Control measure if Any	:	No
Sampling & Analysis Protocol	:	IS-5182 & CPCB Guideline
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	**43.29**	$\mu g/m^3$	60
2.	**Particulate Matter (PM_{10})**	IS: 5182 (P-23) Gravimetric Method	**81.40**	$\mu g/m^3$	100
3.	**Nitrogen Dioxide (NO_2)**	IS: 5182 (P-6) Jacob & Hochheiser	**21.86**	$\mu g/m^3$	80
4.	**Sulphur Dioxide (SO_2)**	IS: 5182 (P-2) Modified West and Gaeke	**9.51**	$\mu g/m^3$	80
5.	**Carbon Monoxide (CO)**	IS: 5182 (P-10) Gas Chromatography	**0.73**	mg/m^3	4
6.	**Ammonia (NH3), µg/m3**	IS:5182(P-25) Indo Phenol Blue Method	**8.54**	$\mu g/m^3$	400
7.	**Lead (Pb), $\mu g/m^3$**	IS: 5182 (P-22) Air Acetylene Method	****BDL (*DL 0.05 $\mu g/m^3$)**	$\mu g/m^3$	1
8.	**Benzene(C_6H_6) , $\mu g/m^3$**	IS: 5182 (P-11)	****BDL (*DL 0.1 $\mu g/m^3$)**	$\mu g/m^3$	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) , $\mu g/m^3$**	IS: 5182 (P-9) Colorimetric Method	**19.67**	$\mu g/m^3$	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 $\mu g/m^3$)**	$\mu g/m^3$	--
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)

ARJUN RAWAT
(Checked By)

VARDAN ENVIRO LAB Gurgaon Pratap Singh Authorized Signatory
(Approved By)

VEL/E/N/TR/PN2290

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/AA/05**	**Report No.:**	**VEL/AA/2107/02/005**
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:	**06/07/2021**
Latitude:	**29° 59' 40.64"N**	**Period of Analysis:**	**02/07/2021 - 06/07/2021**
Longitude:	**75° 1' 17.61"E**	**Receipt Date:**	**02/07/2021**

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/02 & VEL/FPS/02
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	**29/06/2021 to 30/06/2021**
Time of Monitoring	:	09:20 AM – 09:20 AM
Ambient Temperature (°C)	:	Min. 38°C Max. 47°C
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Control measure if Any	:	No
Sampling & Analysis Protocol	:	IS-5182 & CPCB Guideline
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	**45.29**	$\mu g/m^3$	60
2.	**Particulate Matter (PM_{10})**	IS: 5182 (P-23) Gravimetric Method	**81.92**	$\mu g/m^3$	100
3.	**Nitrogen Dioxide (NO_2)**	IS: 5182 (P-6) Jacob & Hochheiser	**25.94**	$\mu g/m^3$	80
4.	**Sulphur Dioxide (SO_2)**	IS: 5182 (P-2) Modified West and Gaeke	**7.46**	$\mu g/m^3$	80
5.	**Carbon Monoxide (CO)**	IS: 5182 (P-10) Gas Chromatography	**0.78**	mg/m^3	4
6.	**Ammonia (NH3), µg/m3**	IS:5182(P-25) Indo Phenol Blue Method	**8.26**	$\mu g/m^3$	400
7.	**Lead (Pb), $\mu g/m^3$**	IS: 5182 (P-22) Air Acetylene Method	****BDL (*DL 0.05 $\mu g/m^3$)**	$\mu g/m^3$	1
8.	**Benzene(C_6H_6) , $\mu g/m^3$**	IS: 5182 (P-11)	****BDL (*DL 0.1 $\mu g/m^3$)**	$\mu g/m^3$	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) , $\mu g/m^3$**	IS: 5182 (P-9) Colorimetric Method	**21.59**	$\mu g/m^3$	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 $\mu g/m^3$)**	$\mu g/m^3$	--
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

ARJUN RAWAT
(Checked By)

(Approved By)
VARDAN ENVIRO LAB Gaurav Pratap Singh Authorized Signatory

VEL/E/N/TR/PN2291

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/AA/06**	**Report No.:**	**VEL/AA/2107/02/006**
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:	**06/07/2021**
Latitude:	**30° 1' 27.46"N**	**Period of Analysis:**	**02/07/2021 - 06/07/2021**
Longitude:	**75° 4' 8.62"E**	**Receipt Date:**	**02/07/2021**

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/01& VEL/FPS/01
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	**29/06/2021 to 30/06/2021**
Time of Monitoring	:	10:21 AM – 10:21 AM
Ambient Temperature (°C)	:	Min. 38°C Max. 47°C
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Control measure if Any	:	No
Sampling & Analysis Protocol	:	IS-5182 & CPCB Guideline
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	**47.06**	$\mu g/m^3$	60
2.	**Particulate Matter (PM_{10})**	IS: 5182 (P-23) Gravimetric Method	**78.24**	$\mu g/m^3$	100
3.	**Nitrogen Dioxide (NO_2)**	IS: 5182 (P-6) Jacob & Hochheiser	**18.62**	$\mu g/m^3$	80
4.	**Sulphur Dioxide (SO_2)**	IS: 5182 (P-2) Modified West and Gaeke	**8.24**	$\mu g/m^3$	80
5.	**Carbon Monoxide (CO)**	IS: 5182 (P-10) Gas Chromatography	**0.79**	mg/m^3	4
6.	**Ammonia (NH3), µg/m3**	IS:5182(P-25)) Indo Phenol Blue Method	**7.41**	$\mu g/m^3$	400
7.	**Lead (Pb), $\mu g/m^3$**	IS: 5182 (P-22) Air Acetylene Method	****BDL (*DL 0.05 µg/m3)**	$\mu g/m^3$	1
8.	**Benzene(C_6H_6) , $\mu g/m^3$**	IS: 5182 (P-11)	****BDL (*DL 0.1 µg/m3)**	$\mu g/m^3$	05
9.	**Benzo(a)pyrene, ng/m^3**	IS: 5182 (P-12)	****BDL (*DL 1.0 ng/m3)**	ng/m^3	01
10.	**Ozone (O_3) , $\mu g/m^3$**	IS: 5182 (P-9) Colorimetric Method	**16.29**	$\mu g/m^3$	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)**	$\mu g/m^3$	--
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

ARJUN RAWAT
(Checked By)

(Approved By) Pratap Singh

VEL/E/N/TR/PN2292

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/AA/07**	**Report No.:**	**VEL/AA/2107/02/007**
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**
		Reporting Date:	**06/07/2021**
Latitude:	**30° 4' 34.79"N**	**Period of Analysis:**	**02/07/2021 - 06/07/2021**
Longitude:	**74° 59' 57.45"E**	**Receipt Date:**	**02/07/2021**

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	:	**29/06/2021 to 30/06/2021**
Time of Monitoring	:	10:47AM – 10:47 AM
Ambient Temperature (°C)	:	Min. 38°C Max. 47°C
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Control measure if Any	:	No
Sampling & Analysis Protocol	:	IS-5182 & CPCB Guideline
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	**50.49**	$\mu g/m^3$	60
2.	**Particulate Matter (PM_{10})**	IS: 5182 (P-23) Gravimetric Method	**88.62**	$\mu g/m^3$	100
3.	**Nitrogen Dioxide (NO_2)**	IS: 5182 (P-6) Jacob & Hochheiser	**26.58**	$\mu g/m^3$	80
4.	**Sulphur Dioxide (SO_2)**	IS: 5182 (P-2) Modified West and Gaeke	**9.86**	$\mu g/m^3$	80
5.	**Carbon Monoxide (CO)**	IS: 5182 (P-10) Gas Chromatography	**0.81**	mg/m^3	4
6.	**Ammonia (NH3), µg/m3**	IS:5182(P-25) Indo Phenol Blue Method	**10.52**	$\mu g/m^3$	400
7.	**Lead (Pb), $\mu g/m^3$**	IS: 5182 (P-22) Air Acetylene Method	****BDL (*DL 0.05 µg/m3)**	$\mu g/m^3$	1
8.	**Benzene(C_6H_6) , $\mu g/m^3$**	IS: 5182 (P-11)	****BDL (*DL 0.1 µg/m3)**	$\mu g/m^3$	05
9.	**Benzo(a)pyrene, ng/m^3**	IS: 5182 (P-12)	****BDL (*DL 1.0 ng/m3)**	ng/m^3	01
10.	**Ozone (O_3) , $\mu g/m^3$**	IS: 5182 (P-9) Colorimetric Method	**22.49**	$\mu g/m^3$	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 $\mu g/m^3$)**	$\mu g/m^3$	--
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)

ARJUN RAWAT
(Checked By)

(Approved By)
Gaurav Pratap Singh
Authorized Signatory

VEL/E/N/TR/PN2293

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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/08**	**Report No.:**	**VEL/AA/2107/02/008**
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:	**06/07/2021**
Latitude:	**30° 5' 40.22"N**	**Period of Analysis:**	**02/07/2021 - 06/07/2021**
Longitude:	**75° 4' 5.30"E**	**Receipt Date:**	**02/07/2021**

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/04& VEL/FPS/04
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	**29/06/2021 to 30/06/2021**
Time of Monitoring	:	11:03 AM – 11:03AM
Ambient Temperature (°C)	:	Min. 38°C Max. 47°C
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Control measure if Any	:	No
Sampling & Analysis Protocol	:	IS-5182 & CPCB Guideline
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	**52.49**	$\mu g/m^3$	60
2.	**Particulate Matter (PM_{10})**	IS: 5182 (P-23) Gravimetric Method	**89.74**	$\mu g/m^3$	100
3.	**Nitrogen Dioxide (NO_2)**	IS: 5182 (P-6) Jacob & Hochheiser	**25.49**	$\mu g/m^3$	80
4.	**Sulphur Dioxide (SO_2)**	IS: 5182 (P-2) Modified West and Gaeke	**7.99**	$\mu g/m^3$	80
5.	**Carbon Monoxide (CO)**	IS: 5182 (P-10) Gas Chromatography	**0.79**	mg/m^3	4
6.	**Ammonia (NH3), µg/m3**	IS:5182(P-25) Indo Phenol Blue Method	**6.86**	$\mu g/m^3$	400
7.	**Lead (Pb), $\mu g/m^3$**	IS: 5182 (P-22) Air Acetylene Method	****BDL (*DL 0.05 $\mu g/m^3$)**	$\mu g/m^3$	1
8.	**Benzene(C_6H_6) , $\mu g/m^3$**	IS: 5182 (P-11)	****BDL (*DL 0.1 $\mu g/m^3$)**	$\mu g/m^3$	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) , $\mu g/m^3$**	IS: 5182 (P-9) Colorimetric Method	**23.56**	$\mu g/m^3$	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 $\mu g/m^3$)**	$\mu g/m^3$	--
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)

ARJUN RAWAT
(Checked By)

(Approved By)

VARDAN ENVIRO LAB Gaurav Pratap Singh Authorised Signatory

VEL/E/N/TR/PN2294

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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/09**	**Report No.:**	**VEL/AA/2107/02/009**
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**
		Reporting Date:	**06/07/2021**
Latitude:	**30° 6' 34.53"N**	**Period of Analysis:**	**02/07/2021 - 06/07/2021**
Longitude:	**75° 0' 23.67"E**	**Receipt Date:**	**02/07/2021**

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	:	**30/06/2021 to 01/07/2021**
Time of Monitoring	:	10:04 AM – 10:04 AM
Ambient Temperature (°C)	:	Min. 37°C Max. 47°C
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Control measure if Any	:	No
Sampling & Analysis Protocol	:	IS-5182 & CPCB Guideline
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	**53.47**	$\mu g/m^3$	60
2.	**Particulate Matter (PM_{10})**	IS: 5182 (P-23) Gravimetric Method	**90.24**	$\mu g/m^3$	100
3.	**Nitrogen Dioxide (NO_2)**	IS: 5182 (P-6) Jacob & Hochheiser	**27.26**	$\mu g/m^3$	80
4.	**Sulphur Dioxide (SO_2)**	IS: 5182 (P-2) Modified West and Gaeke	**10.26**	$\mu g/m^3$	80
5.	**Carbon Monoxide (CO)**	IS: 5182 (P-10) Gas Chromatography	**0.82**	mg/m^3	4
6.	**Ammonia (NH3), µg/m3**	IS:5182(P-25) Indo Phenol Blue Method	**9.87**	$\mu g/m^3$	400
7.	**Lead (Pb), $\mu g/m^3$**	IS: 5182 (P-22) Air Acetylene Method	****BDL (*DL 0.05 µg/m3)**	$\mu g/m^3$	1
8.	**Benzene(C_6H_6) , $\mu g/m^3$**	IS: 5182 (P-11)	****BDL (*DL 0.1 µg/m3)**	$\mu g/m^3$	05
9.	**Benzo(a)pyrene, ng/m^3**	IS: 5182 (P-12)	****BDL (*DL 1.0 ng/m3)**	ng/m^3	01
10.	**Ozone (O_3) , $\mu g/m^3$**	IS: 5182 (P-9) Colorimetric Method	**22.46**	$\mu g/m^3$	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)**	$\mu g/m^3$	--
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)

ARJUN RAWAT (Checked By)

(Approved By)

VEL/E/N/TR/PN2295

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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/10**	**Report No.:**	**VEL/AA/2107/02/010**
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**
		Reporting Date:	**06/07/2021**
Latitude:	**30° 6' 44.02"N**	**Period of Analysis:**	**02/07/2021 - 06/07/2021**
Longitude:	**74° 57' 21.06"E**	**Receipt Date:**	**02/07/2021**

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	:	**30/06/2021 to 01/07/2021**
Time of Monitoring	:	10:33 AM – 10:33 AM
Ambient Temperature (°C)	:	Min. 37°C Max. 47°C
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Control measure if Any	:	No
Sampling & Analysis Protocol	:	IS-5182 & CPCB Guideline
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	**51.44**	$\mu g/m^3$	60
2.	**Particulate Matter (PM_{10})**	IS: 5182 (P-23) Gravimetric Method	**88.11**	$\mu g/m^3$	100
3.	**Nitrogen Dioxide (NO_2)**	IS: 5182 (P-6) Jacob & Hochheiser	**24.59**	$\mu g/m^3$	80
4.	**Sulphur Dioxide (SO_2)**	IS: 5182 (P-2) Modified West and Gaeke	**8.62**	$\mu g/m^3$	80
5.	**Carbon Monoxide (CO)**	IS: 5182 (P-10) Gas Chromatography	**0.79**	mg/m^3	4
6.	**Ammonia (NH3), µg/m3**	IS:5182(P-25) Indo Phenol Blue Method	**10.26**	$\mu g/m^3$	400
7.	**Lead (Pb), $\mu g/m^3$**	IS: 5182 (P-22) Air Acetylene Method	****BDL (*DL 0.05 $\mu g/m^3$)**	$\mu g/m^3$	1
8.	**Benzene(C_6H_6) , $\mu g/m^3$**	IS: 5182 (P-11)	****BDL (*DL 0.1 $\mu g/m^3$)**	$\mu g/m^3$	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) , $\mu g/m^3$**	IS: 5182 (P-9) Colorimetric Method	**19.58**	$\mu g/m^3$	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 $\mu g/m^3$)**	$\mu g/m^3$	--
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

ARJUN RAWAT
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(Approved By)
VARDAN ENVIRO LAB
Gaurav Pratap Singh
Authorized Signatory

VEL/E/N/TR/PN2296

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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/AA/11**	**Report No.:**	**VEL/AA/2107/02/011**
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:	**06/07/2021**
Latitude:	**30° 3' 45.41"N**	**Period of Analysis:**	**02/07/2021 - 06/07/2021**
Longitude:	**75° 4' 6.08"E**	**Receipt Date:**	**02/07/2021**

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/03& VEL/FPS/03
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	**30/06/2021 to 01/07/2021**
Time of Monitoring	:	10:45 AM – 10:45 AM
Ambient Temperature (°C)	:	Min. 37°C Max. 47°C
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Control measure if Any	:	No
Sampling & Analysis Protocol	:	IS-5182 & CPCB Guideline
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	**52.21**	$\mu g/m^3$	60
2.	**Particulate Matter (PM_{10})**	IS: 5182 (P-23) Gravimetric Method	**85.91**	$\mu g/m^3$	100
3.	**Nitrogen Dioxide (NO_2)**	IS: 5182 (P-6) Jacob & Hochheiser	**21.49**	$\mu g/m^3$	80
4.	**Sulphur Dioxide (SO_2)**	IS: 5182 (P-2) Modified West and Gaeke	**7.33**	$\mu g/m^3$	80
5.	**Carbon Monoxide (CO)**	IS: 5182 (P-10) Gas Chromatography	**0.81**	mg/m^3	4
6.	**Ammonia (NH3), µg/m3**	IS:5182(P-25) Indo Phenol Blue Method	**6.49**	$\mu g/m^3$	400
7.	**Lead (Pb), $\mu g/m^3$**	IS: 5182 (P-22) Air Acetylene Method	****BDL (*DL 0.05 $\mu g/m^3$)**	$\mu g/m^3$	1
8.	**Benzene(C_6H_6) , $\mu g/m^3$**	IS: 5182 (P-11)	****BDL (*DL 0.1 $\mu g/m^3$)**	$\mu g/m^3$	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) , $\mu g/m^3$**	IS: 5182 (P-9) Colorimetric Method	**18.49**	$\mu g/m^3$	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 $\mu g/m^3$)**	$\mu g/m^3$	--
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

ARJUN RAWAT (Checked By)

(Approved By) Pratap Singh

VEL/E/N/TR/PN2297

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/AA/12**	**Report No.:**	**VEL/AA/2107/02/012**
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:	**06/07/2021**
Latitude:	**30° 6' 48.99"N**	**Period of Analysis:**	**02/07/2021 - 06/07/2021**
Longitude:	**75° 4' 54.51"E**	**Receipt Date:**	**02/07/2021**

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/02& VEL/FPS/02
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	**30/06/2021 to 01/07/2021**
Time of Monitoring	:	10:58 AM – 10:58AM
Ambient Temperature (°C)	:	Min. 37°C Max. 47°C
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Control measure if Any	:	No
Sampling & Analysis Protocol	:	IS-5182 & CPCB Guideline
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	**55.88**	$\mu g/m^3$	60
2.	**Particulate Matter (PM_{10})**	IS: 5182 (P-23) Gravimetric Method	**92.59**	$\mu g/m^3$	100
3.	**Nitrogen Dioxide (NO_2)**	IS: 5182 (P-6) Jacob & Hochheiser	**23.58**	$\mu g/m^3$	80
4.	**Sulphur Dioxide (SO_2)**	IS: 5182 (P-2) Modified West and Gaeke	**7.69**	$\mu g/m^3$	80
5.	**Carbon Monoxide (CO)**	IS: 5182 (P-10) Gas Chromatography	**0.78**	mg/m^3	4
6.	**Ammonia (NH3), µg/m3**	IS:11255(P-6) Indo Phenol Blue Method	**6.59**	$\mu g/m^3$	400
7.	**Lead (Pb), $\mu g/m^3$**	IS: 5182 (P-22) Air Acetylene Method	****BDL (*DL 0.05 µg/m3)**	$\mu g/m^3$	1
8.	**Benzene(C_6H_6) , $\mu g/m^3$**	IS: 5182 (P-11)	****BDL (*DL 0.1 µg/m3)**	$\mu g/m^3$	05
9.	**Benzo(a)pyrene, ng/m^3**	IS: 5182 (P-12)	****BDL (*DL 1.0 ng/m3)**	ng/m^3	01
10.	**Ozone (O_3) , $\mu g/m^3$**	IS: 5182 (P-9) Colorimetric Method	**19.58**	$\mu g/m^3$	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)**	$\mu g/m^3$	--
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)

ARJUN RAWAT
(Checked By)

(Approved By)
Gaurav Pratap Singh

VEL/E/N/TR/PN2298

www.vardan.co.in

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/AN/01**	**Report No.:**	**VEL/AN/2107/02/001**
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:	**06/07/2021**
		Receipt Date:	**02/07/2021**

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	:	**28/06/2021 to 29/06/2021**
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-2014 & CPCB Guideline
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-2014	75.9	62.4	dB(A)
2.	Lmin	IS 9989 R-2014	52.6	47.8	dB(A)
3.	Leq	IS 9989 R-2014	61.58	53.80	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.

KOMAL SINGH
ANALYST
(Tested By)

ARJUN RAWAT
(Checked By)

(Approved By)
Gaurav Pratap Singh

VEL/E/N/TR/PN2317

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/AN/02**	**Report No.:**	**VEL/AN/2107/02/002**
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**
		Reporting Date:	**06/07/2021**
		Receipt Date:	**02/07/2021**

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/02
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	**28/06/2021 to 29/06/2021**
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-2014 & CPCB Guideline
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-2014	63.4	51.8	dB(A)
2.	Lmin	IS 9989 R-2014	42.8	37.8	dB(A)
3.	Leq	IS 9989 R-2014	52.71	43.14	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 (Checked By)

ARJUN RAWAT (Checked By)

(Approved By) Pratap Singh

VEL/E/N/TR/PN2318

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/AN/03**	**Report No.:**	**VEL/AN/2107/02/003**
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**
		Reporting Date:	**06/07/2021**
		Receipt Date:	**02/07/2021**

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	:	**28/06/2021 to 29/06/2021**
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-2014 & CPCB Guideline
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-2014	66.8	54.2	dB(A)
2.	Lmin	IS 9989 R-2014	43.8	35.7	dB(A)
3.	Leq	IS 9989 R-2014	53.74	42.13	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)

VARDAN ENVIROLAB
Pratap Singh
Authorised Signatory
(Approved By)

VEL/E/N/TR/PN2319

Vardan EnviroLab

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

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Test Report

Sample Number:	**VEL/HPCL/AN/04**	**Report No.:**	**VEL/AN/2107/02/004**
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**
		Reporting Date:	**06/07/2021**
		Receipt Date:	**02/07/2021**

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/03
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	**28/06/2021 to 29/06/2021**
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-2014 & CPCB Guideline
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-2014	59.4	48.7	dB(A)
2.	Lmin	IS 9989 R-2014	41.8	36.1	dB(A)
3.	Leq	IS 9989 R-2014	47.88	40.89	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)

(Approved By)
Gaurav Pratap Singh
Authorised Signatory

VEL/E/N/TR/PN2320

Vardan EnviroLab

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

Sample Number:	**VEL/HPCL/AN/05**	**Report No.:**	**VEL/AN/2107/02/005**
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:	**06/07/2021**
		Receipt Date:	**02/07/2021**

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/02
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	**29/06/2021 to 30/06/2021**
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-2014 & CPCB Guideline
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-2014	64.5	53.8	dB(A)
2.	Lmin	IS 9989 R-2014	44.1	38.2	dB(A)
3.	Leq	IS 9989 R-2014	50.58	42.47	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)

(Approved By)

VEL/E/N/TR/PN2321

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/AN/06**	**Report No.:**	**VEL/AN/2107/02/006**
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:	**06/07/2021**
		Receipt Date:	**02/07/2021**

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/03
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	**29/06/2021 to 30/06/2021**
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-2014 & CPCB Guideline
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-2014	60.2	52.4	dB(A)
2.	Lmin	IS 9989 R-2014	42.2	35.4	dB(A)
3.	Leq	IS 9989 R-2014	51.48	41.57	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 (Tested By)

ARJUN RAWAT (Checked By)

(Approved By)

VEL/E/N/TR/PN2322

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/AN/07**	**Report No.:**	**VEL/AN/2107/02/007**
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**
		Reporting Date:	**06/07/2021**
		Receipt Date:	**02/07/2021**

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/01
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	**29/06/2021 to 30/06/2021**
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-2014 & CPCB Guideline
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-2014	62.2	56.5	dB(A)
2.	Lmin	IS 9989 R-2014	45.4	35.8	dB(A)
3.	Leq	IS 9989 R-2014	52.20	42.96	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)

(Approved By)
Pratap Singh

VEL/E/N/TR/PN2323

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/AN/08**	**Report No.:**	**VEL/AN/2107/02/008**
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:	**06/07/2021**
		Receipt Date:	**02/07/2021**

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/04
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	**29/06/2021 to 30/06/2021**
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-2014 & CPCB Guideline
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-2014	59.8	54.2	dB(A)
2.	Lmin	IS 9989 R-2014	43.7	36.8	dB(A)
3.	Leq	IS 9989 R-2014	52.94	43.7	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
(Tested By)

ARJUN RAWAT
(Checked By)

(Approved By)
Pratap Singh

VEL/E/N/TR/PN2324

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/AN/09**	**Report No.:**	**VEL/AN/2107/02/009**
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**
		Reporting Date:	**06/07/2021**
		Receipt Date:	**02/07/2021**

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	:	**30/06/2021 to 01/07/2021**
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-2014 & CPCB Guideline
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-2014	61.7	51.3	dB(A)
2.	Lmin	IS 9989 R-2014	46.0	36.6	dB(A)
3.	Leq	IS 9989 R-2014	52.07	41.84	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)

(Approved By)
Gaurav Pratap Singh

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/AN/10**	**Report No.:**	**VEL/AN/2107/02/010**
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**
		Reporting Date:	**06/07/2021**
		Receipt Date:	**02/07/2021**

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	:	**30/06/2021 to 01/07/2021**
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-2014 & CPCB Guideline
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-2014	64.8	53.4	dB(A)
2.	Lmin	IS 9989 R-2014	46.2	34.8	dB(A)
3.	Leq	IS 9989 R-2014	50.9	42.01	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)

(Approved By)

VEL/E/N/TR/PN2326

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

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/AN/11**	**Report No.:**	**VEL/AN/2107/02/011**
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:	**06/07/2021**
		Receipt Date:	**02/07/2021**

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	:	**30/06/2021 to 01/07/2021**
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-2014 & CPCB Guideline
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-2014	61.6	50.3	dB(A)
2.	Lmin	IS 9989 R-2014	43.6	36.0	dB(A)
3.	Leq	IS 9989 R-2014	51.59	42.59	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
(Analysed By)

ARJUN RAWAT
(Checked By)

(Approved By)

VEL/E/N/TR/PN2327

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/AN/12**	**Report No.:**	**VEL/AN/2107/02/012**
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:	**06/07/2021**
		Receipt Date:	**02/07/2021**

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	:	**30/06/2021 to 01/07/2021**
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-2014 & CPCB Guideline
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-2014	56.9	52.9	dB(A)
2.	Lmin	IS 9989 R-2014	40.7	37.3	dB(A)
3.	Leq	IS 9989 R-2014	49.54	40.49	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)

(Approved By)
VARDAN ENVIROLAB
Pratap Singh
Authorised Signatory

VEL/E/N/TR/PN2328

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

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/2107/02/001
Name & Address of Party:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	**Format No.:**	7.8 F-01
		Party Reference No.:	NIL
Latitude:	30° 3' 13.34" N	**Reporting Date:**	06/07/2021
Longitude:	75° 0' 41.57" E	**Period of Analysis:**	02/07/2021 – 06/07/2021
Sample Description:	Ground Water Sample	**Receipt Date:**	02/07/2021
Sample Location:	Near Project Site	**Sampling Date:**	29/06/2021
Sample Collected by:	Vardan Enviro Lab Representative	**Sampling Quantity:**	2.0 Ltr + 200 ml
Parameter Required	As per work order	**Sampling Type:**	Garb
Sampling & Analysis Protocol:	IS-3025, APHA	**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	7.52	--	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, Nephlelometric 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	76.59	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	238.2	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl^- B, Argentometric Method	54.1	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	26.70	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	689.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA , 4500 E, Turbidimetric Method	32.48	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F^- D, SPADNS Method	0.75	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	7.02	mg/l	45	No Relaxation
16.	Iron as Fe	APHA , 3500-Fe B 1,10 Phenanthroline Method	0.15	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

KANCHAN SHARMA
Jr. Lab Analyst
(Tested By)

ARJUN RAWAT
(Checked By)

VARDAN ENVIROLAB
Gaurav
(Approved By) Singh
Authorised Signatory

VEL/E/N/TR/PN2299

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 No.: VEL/HPCL/W/01			Report No.: VEL/W/2107/02/001			
					Limits of IS:10500 -2012	
S. No.	Parameter	Test-Method	Result	Unit	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	0.21	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	1558	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	24.23	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	5.0	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.

KANHAIYA SHARMA
(Tested By)
Jr. Lab Analyst

ARJUN RAWAT
(Checked By)

VARDAN ENVIROLAB
Gaurav
(Approved By)
Authorized Signatory

VEL/E/N/TR/PN2300

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/02	**Report No.:**	VEL/W/2107/02/002
Name & Address of Party:	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:**	06/07/2021
Longitude:	75° 2' 75.30" E	**Period of Analysis:**	02/07/2021 – 06/07/2021
Sample Description:	Ground Water Sample	**Receipt Date:**	02/07/2021
Sample Location:	Jiwan Singh Wala	**Sampling Date:**	29/06/2021
Sample Collected by:	Vardan Enviro Lab Representative	**Sampling Quantity:**	2.0 Ltr + 200 ml
Parameter Required	As per work order	**Sampling Type:**	Garb
Sampling & Analysis Protocol:	IS-3025, APHA	**Preservation:**	Refrigerated
			VEL/W/2107/02/001

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	7.42	--	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, Nephlelometric 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	191.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	55.26	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	206.3	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl^- B, Argentometric Method	46.59	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	12.84	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	456.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA , 4500 E, Turbidimetric Method	19.23	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F^- D, SPADNS Method	0.76	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	9.02	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 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

KANCHAN SHARMA
Analyst
(Tested By)

ARJUN RAWAT
(Checked By)

(Approved By)
Pratap Singh
Authorised Signatory

VEL/E/N/TR/PN2301

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 No.: **VEL/HPCL/W/02** | Report No.: **VEL/W/2107/02/002**

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	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	920	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	20.1	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	4.5	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.

KANCHAN SHARMA
Analyst
(Tested By)

ARJUN RAWAT
(Checked By)

Gaurav
(Approved By)
Authorized Signatory

VEL/E/N/TR/PN2302

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/03	**Report No.:**	VEL/W/2107/02/003
Name & Address of Party:	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:**	06/07/2021
Longitude:	75° 58' 6.88" E	**Period of Analysis:**	02/07/2021 – 06/07/2021
Sample Description:	Ground Water Sample	**Receipt Date:**	02/07/2021
Sample Location:	Maanwala	**Sampling Date:**	29/06/2021
Sample Collected by:	Vardan Enviro Lab Representative	**Sampling Quantity:**	2.0 Ltr + 200 ml
Parameter Required	As per Client Requirement	**Sampling Type:**	Garb
Sampling & Analysis Protocol:	IS-3025, APHA	**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	7.35	--	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, Nephlelometric 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	262.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	76.23	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	265.2	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl^- B, Argentometric Method	68.26	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	17.35	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	612.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA , 4500 E, Turbidimetric Method	74.26	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F^- D, SPADNS Method	0.92	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	8.26	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

KANCHAN SHARMA
(Tested By)
Jr. Lab Analyst

ARJUN RAWAT
(Checked By)

(Approved By)
Pratap Singh
Authorized Signatory

VEL/E/N/TR/PN2303

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 No.: **VEL/HPCL/W/03** | Report No.: **VEL/W/2107/02/003**

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	APHA , 3111 B, Direct Air, Acetylene Flame Method	0.26	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	1020	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	23.2	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	3.2	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.

KANCHAN SHARMA
Jr. Lab Analyst
(Tested By)

ARJUN RAWAT
(Checked By)

(Approved By)

VEL/E/N/TR/PN2304

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/04	**Report No.:**	VEL/W/2107/02/004
Name & Address of Party:	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:**	06/07/2021
Longitude:	75° 1' 3.89" E	**Period of Analysis:**	02/07/2021 – 06/07/2021
Sample Description:	Ground Water Sample	**Receipt Date:**	02/07/2021
Sample Location:	Mahi Nangal	**Sampling Date:**	29/06/2021
Sample Collected by:	Vardan Enviro Lab Representative	**Sampling Quantity:**	2.0 Ltr + 200 ml
Parameter Required	As per Client Requirement	**Sampling Type:**	Garb
Sampling & Analysis Protocol:	IS-3025, APHA	**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	7.73	--	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, Nephlelometric 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	222.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	70.24	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	223.26	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl^- B, Argentometric Method	48.62	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	11.27	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	521.26	mg/l	500	2000
13.	Sulphate as SO_4	APHA , 4500 E, Turbidimetric Method	41.22	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F^- D, SPADNS Method	0.68	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	7.26	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 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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VEL/E/N/TR/PN2305

Test Report

Sample No.: VEL/HPCL/W/04			Report No.: VEL/W/2107/19/004			
					Limits of IS:10500 -2012	
S. No.	Parameter	Test Method	Result	Unit	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	0.43	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	993	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	27.1	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	7.0	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.

KANCHAN SHARMA
Analyst
(Tested By)

ARJUN RAWAT
(Checked By)

VARDAN ENVIRO LAB
Authorized Signatory
(Approved By)

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/05	**Report No.:**	VEL/W/2107/02/005
Name & Address of Party:	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:**	06/07/2021
Longitude:	75° 0' 23.67" E	**Period of Analysis:**	02/07/2021 – 06/07/2021
Sample Description:	Ground Water Sample	**Receipt Date:**	02/07/2021
Sample Location:	Kot Kashmir	**Sampling Date:**	30/06/2021
Sample Collected by:	Vardan Enviro Lab Representative	**Sampling Quantity:**	2.0 Ltr + 200 ml
Parameter Required	As per Client Requirement	**Sampling Type:**	Garb
Sampling & Analysis Protocol:	IS-3025, APHA	**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	7.73	--	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, Nephlelometric 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	289.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	76.25	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	272.56	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl^- B, Argentometric Method	81.59	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	23.90	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	704.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA , 4500 E, Turbidimetric Method	62.47	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F^- D, SPADNS Method	0.79	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	8.69	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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VEL/E/N/TR/PN2307

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 No.: **VEL/HPCL/W/05** Report No.: **VEL/W/2107/02/005**

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	0.55	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	1258	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	24.1	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	6.7	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.

KAM SHARMA
(Tested By)
Jr. Lab Analyst

ARJUN RAWAT
(Checked By)

VARDAN ENVIRO LABS Gaurav Partap Singh Authorized Signatory
(Approved By)

VEL/E/N/TR/PN2308

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/06	**Report No.:**	VEL/W/2107/02/006
Name & Address of Party:	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:**	06/07/2021
Longitude:	74° 59' 57.45" E	**Period of Analysis:**	02/07/2021 – 06/07/2021
Sample Description:	Ground Water Sample	**Receipt Date:**	02/07/2021
Sample Location:	Nasibpura	**Sampling Date:**	30/06/2021
Sample Collected by:	Vardan Enviro Lab Representative	**Sampling Quantity:**	2.0 Ltr + 200 ml
Parameter Required	As per Client Requirement	**Sampling Type:**	Garb
Sampling & Analysis Protocol:	IS-3025, APHA	**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	7.23	--	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, Nephlelometric 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	202.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	66.25	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	212.45	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl^- B, Argentometric Method	58.62	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	8.83	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	631.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA , 4500 E, Turbidimetric Method	48.23	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F^- D, SPADNS Method	0.68	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	8.03	mg/l	45	No Relaxation
16.	Iron as Fe	APHA , 3500-Fe B 1,10 Phenanthroline Method	0.18	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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VEL/E/N/TR/PN2309

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 No.: **VEL/HPCL/W/06** Report No.: **VEL/W/2107/02/006**

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	0.58	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	1080	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	26.4	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	6.1	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.

KANCHAN SHARMA
Jr. Lab Analyst
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VARDAN ENVIRO
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VEL/E/N/TR/PN2310

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/07	**Report No.:**	VEL/W/2107/02/007
Name & Address of Party:	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:**	06/07/2021
Longitude:	75° 4' 8.62" E	**Period of Analysis:**	02/07/2021 – 06/07/2021
Sample Description:	Ground Water Sample	**Receipt Date:**	02/07/2021
Sample Location:	Baghi Bandar	**Sampling Date:**	30/06/2021
Sample Collected by:	Vardan Enviro Lab Representative	**Sampling Quantity:**	2.0 Ltr + 200 ml
Parameter Required	As per Client Requirement	**Sampling Type:**	Garb
Sampling & Analysis Protocol:	IS-3025, APHA	**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 ^{0}C)	APHA ,4500-H^+ B Electrometric Method	7.29	--	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, Nephlelometric 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	386.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	106.02	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	342.35	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl^- B, Argentometric Method	82.26	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	29.39	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	890.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA , 4500 E, Turbidimetric Method	72.26	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	9.23	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

KANCHAN SHARMA
Jr. Lab Analyst
(Tested By)

ARJUN RAWAT
(Checked By)

VARDAN ENVIRO LAB
Authorised Signatory
(Approved By)

VEL/E/N/TR/PN2311

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 No.: **VEL/HPCL/W/07** Report No.: **VEL/W/2107/02/007**

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	0.62	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	1686	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	32.4	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	8.6	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.

KANCHAN SHARMA
Jr. Analyst
(Tested By)

ARJUN RAWAT
(Checked By)

VARDAN ENVIRO LAB
Gaurav Pratap Singh
Authorized Signatory
(Approved By)

VEL/E/N/TR/PN2312

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/08	**Report No.:**	VEL/W/2107/02/008
Name & Address of Party:	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:**	06/07/2021
Longitude:	75° 4' 54.51" E	**Period of Analysis:**	02/07/2021 – 06/07/2021
Sample Description:	Surface Water Sample	**Receipt Date:**	02/07/2021
Sample Location:	Kot Fatta	**Sampling Date:**	30/06/2021
Sample Collected by:	Vardan Enviro Lab Representative	**Sampling Quantity:**	2.0 Ltr + 200 ml
Parameter Required	As per Client Requirement	**Sampling Type:**	Garb
Sampling & Analysis Protocol:	IS 3025, APHA	**Preservation:**	Refrigerated

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 ^{0}C)	APHA ,4500-H^+ B Electrometric Method	7.62	--
2.	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**DL 1Hazen)	Hazen
3.	Turbidity	APHA, 2130 B, Nephlelometric 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	68.26	mg/l
7.	Conductivity	APHA, 2510 B, Conductivity Meter Method	788	µS/cm
8.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	13.01	mg/l
9.	Iron as Fe	APHA , 3500-Fe B 1,10 Phenanthroline Method	0.22	mg/l
10.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	473.00	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	0.15	mg/l
13.	Sulphate as SO^4	APHA , 4500 E, Turbidimetric Method	14.02	mg/l
14.	Fluoride as F	APHA , 4500-F^- D, SPADNS Method	0.53	mg/l
15.	BOD (3 Days at 27^{0}C)	APHA, 5210 C / IS 3025,P-44	6.00	mg/l
16.	COD	APHA, 5220 B, Open Reflux Method	26.00	mg/l
17.	Free Ammonia as NH_3	IS 3025 (P-34) , Titrimetric Method	11.95	mg/l
18.	Total Coliform	IS 1622	28	MPN/100ml
19.	Arsenic as As	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l

KANCHAN SHARMA
(Tested By)
Jr. Lab Analyst

ARJUN RAWAT
(Checked By)

(Approved By)
Pratap Singh
Authorized Signatory

VEL/E/N/TR/PN2313

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 No.: VEL/HPCL/W/08			Report No.: VEL/W/2107/02/008	
S. No.	**Parameter**	**Test-Method**	**Result**	**Unit**
20.	Total Hardness as $CaCO_3$	APHA , 2340 C, EDTA Titrimetric Method	162.00	mg/l
21.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	48.26	mg/l
22.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	160.14	mg/l
23.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	10.04	mg/l
24.	Copper as Cu	APHA , 3111 B, Direct Air, Acetylene Flame Method	2.9	mg/l
25.	Sodium	APHA, 3500 Na B Flame Photometric Method	75.12	mg/l
26.	Potassium	APHA, 3500 Na B Flame Photometric Method	28.24	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.

KANCHAN
Jr. Lab Analyst
(Tested By)

ARJUN RAWAT
(Checked By)

VARDAN ENVIROLAB
Authorised Signatory
(Approved By)

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/09	**Report No.:**	VEL/W/2107/02/009
Name & Address of Party:	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:**	06/07/2021
Longitude:	75° 4' 6.08" E	**Period of Analysis:**	02/07/2021 – 06/07/2021
Sample Description:	Surface Water Sample	**Receipt Date:**	02/07/2021
Sample Location:	Chathewala	**Sampling Date:**	30/06/2021
Sample Collected by:	Vardan Enviro Lab Representative	**Sampling Quantity:**	2.0 Ltr + 200 ml
Parameter Required	As per Client Requirement	**Sampling Type:**	Garb
Sampling & Analysis Protocol:	IS 3025, APHA	**Preservation:**	Refrigerated

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	APHA ,4500-H^+ B Electrometric Method	7.88	--
2.	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**DL 1Hazen)	Hazen
3.	Turbidity	APHA, 2130 B, Nephlelometric 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	65.23	mg/l
7.	Conductivity	APHA, 2510 B, Conductivity Meter Method	902	µS/cm
8.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	7.03	mg/l
9.	Iron as Fe	APHA , 3500-Fe B 1,10 Phenanthroline Method	0.28	mg/l
10.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	541.2	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	0.13	mg/l
13.	Sulphate as SO^4	APHA , 4500 E, Turbidimetric Method	22.14	mg/l
14.	Fluoride as F	APHA , 4500-F^- D, SPADNS Method	0.42	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	27.00	mg/l
17.	Free Ammonia as NH_3	IS 3025 (P-34) , Titrimetric Method	8.96	mg/l
18.	Total Coliform	IS 1622	26	MPN/100ml
19.	Arsenic as As	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l

KANCHAN SHARMA
Jr. Lab Analyst
(Tested By)

ARJUN RAWAT
(Checked By)

VARDAN ENVIRO LAB
Gaurav
Authorised Signatory
(Approved By)

VEL/E/N/TR/PN2315

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 No.: VEL/HPCL/W/09			Report No.: VEL/W/2107/02/009	
S. No.	Parameter	Test-Method	Result	Unit
20.	Total Hardness as $CaCO_3$	APHA , 2340 C, EDTA Titrimetric Method	176.00	mg/l
21.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	62.14	mg/l
22.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	219.25	mg/l
23.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	5.01	mg/l
24.	Copper as Cu	APHA , 3111 B, Direct Air, Acetylene Flame Method	3.12	mg/l
25.	Sodium	APHA, 3500 Na B Flame Photometric Method	85.14	mg/l
26.	Potassium	APHA, 3500 Na B Flame Photometric Method	28.26	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.

KANCHAN SHARMA
Jr. Lab Analyst
(Tested By)

ARJUN RAWAT
(Checked By)

(Approved By)
Authorised Signatory

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/S/01	**Report No.:**	VEL/S/2107/02/001
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:	06/07/2021
Latitude:	30° 3' 13.34"N	**Period of Analysis :**	02/07/2021 - 06/07/2021
Longitude:	75° 0' 41.57"E	**Receipt Date:**	02/07/2021
Sample Description:	Soil Sample	**Sampling Date:**	29/06/2021
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 & SOP	**Packing Status:**	Temp Sealed

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.86	--
2.	Conductivity	IS:14767 by Conductivity meter	0.302	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
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	33.24	%
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	53.01	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	39.21	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	41.21	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	132.26	kg/hec.
11.	Iron as Fe	USEPA 3050B	3.02	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	19.24	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	201.26	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	18.40	kg./hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	10.12	mg/kg
17.	Organic Carbon	USEPA 3050B	0.52	%
18.	Lead (as Pb)	USEPA 3050B	0.80	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.72	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.81	mg/kg
21.	Copper (as Cu)	USEPA 3050B	6.01	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	14.5	%

Note: SOP-Standard Operating Procedure.

(Tested By) MADHAN NAYAK SR. ANALYST

(Checked By) ARJUN RAWAT

(Approved By) Pradeep Singh, Authorized Signatory

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/S/02	**Report No.:**	VEL/S/2107/02/002
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
		Reporting Date:	06/07/2021
Latitude:	30° 3' 37.63"N	**Period of Analysis :**	02/07/2021 - 06/07/2021
Longitude:	75° 2' 75.30"E	**Receipt Date:**	02/07/2021
Sample Description:	Soil Sample	**Sampling Date:**	29/06/2021
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 & SOP	**Depth of Sampling:**	Temp Sealed
Packing Status:	Temp Sealed		

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	0.321	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
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	34.11	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.24	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	49.25	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	39.21	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	51.02	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	149.68	kg/hec.
11.	Iron as Fe	USEPA 3050B	2.52	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.93	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	26.24	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	232.00	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	19.62	kg./hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	10.14	mg/kg
17.	Organic Carbon	USEPA 3050B	0.54	%
18.	Lead (as Pb)	USEPA 3050B	0.72	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.80	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.43	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.71	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	13.9	%

Note: SOP-Standard Operating Procedure.

MAMTA NAYAK
(Tested By)
SR. ANALYST

ARJUN RAWAT
(Checked By)

(Approved By) Gaurav Pratap Singh
Authorized Signatory

VEL/E/N/TR/PN2330

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/S/03	**Report No.:**	VEL/S/2107/02/003
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
		Reporting Date:	06/07/2021
Latitude:	30° 2' 33.23"N	**Period of Analysis :**	02/07/2021 - 06/07/2021
Longitude:	75° 58' 6.88"E	**Receipt Date:**	02/07/2021
Sample Description:	Soil Sample	**Sampling Date:**	29/06/2021
Sampling Location:	Maanwala	**Type of Sampling:**	Composite
Sample Collected by:	Vardan Enviro Lab Team	**Sampling Quantity:**	2.0 Kg
Sampling & Analysis Protocol:	IS 2720 , USEPA & SOP	**Depth of Sampling:**	Temp Sealed
Packing Status:	Temp Sealed		

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	0.314	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
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	33.26	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.35	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	42.15	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	63.62	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	58.46	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	138.14	kg/hec.
11.	Iron as Fe	USEPA 3050B	2.26	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	21.14	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	219.14	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	29.54	kg./hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	11.06	mg/kg
17.	Organic Carbon	USEPA 3050B	0.37	%
18.	Lead (as Pb)	USEPA 3050B	0.58	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.71	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.41	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.03	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	15.7	%

Note: SOP-Standard Operating Procedure.

MANOJ NAYAK
(Tested By)
SR. ANALYST

ARJUN RAWAT
(Checked By)

(Approved By)
Gaurav Pratap Singh
Authorised Signatory

VEL/E/N/TR/PN2331

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/S/04	**Report No.:**	VEL/S/2107/02/004
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
		Reporting Date:	06/07/2021
Latitude:	30° 1' 13.05"N	**Period of Analysis :**	02/07/2021 - 06/07/2021
Longitude:	75° 1' 3.89"E	**Receipt Date:**	02/07/2021
Sample Description:	Soil Sample	**Sampling Date:**	29/06/2021
Sampling Location:	Mahi Nangal	**Type of Sampling:**	Composite
Sample Collected by:	Vardan Enviro Lab Team	**Sampling Quantity:**	2.0 Kg
Sampling & Analysis Protocol:	IS 2720 , USEPA & SOP	**Depth of Sampling:**	Temp Sealed
Packing Status:	Temp Sealed		VEL/S/2107/02/001

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.63	--
2.	Conductivity	IS:14767 by Conductivity meter	0.356	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
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	31.25	%
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	50.14	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	42.59	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	60.16	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	138.26	kg/hec.
11.	Iron as Fe	USEPA 3050B	2.83	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.71	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	31.03	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	225.00	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	20.18	kg /hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	7.29	mg/kg
17.	Organic Carbon	USEPA 3050B	0.41	%
18.	Lead (as Pb)	USEPA 3050B	0.64	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.70	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.45	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.50	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.83	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	17.8	%

Note: SOP-Standard Operating Procedure

MANOJ NAYAK
SR. ANALYST
(Tested By)

ARJUN RAWAT
(Checked By)

(Approved By)
Pratap Singh
Authorized Signatory

VEL/E/N/TR/PN2332

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/S/05	**Report No.:**	VEL/S/2107/02/005
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:	06/07/2021
Latitude:	29° 59' 40.64"N	**Period of Analysis :**	02/07/2021 - 06/07/2021
Longitude:	75° 1' 17.61"E	**Receipt Date:**	02/07/2021
Sample Description:	Soil Sample	**Sampling Date:**	29/06/2021
Sampling Location:	Leleana	**Type of Sampling:**	Composite
Sample Collected by:	Vardan Enviro Lab Team	**Sampling Quantity:**	2.0 Kg
Sampling & Analysis Protocol:	IS 2720 , USEPA & SOP	**Depth of Sampling:**	Temp Sealed
Packing Status:	Temp Sealed		VEL/S/2107/02/001

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	0.356	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
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	31.58	%
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	65.29	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	45.47	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	52.49	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	156.89	kg/hec.
11.	Iron as Fe	USEPA 3050B	2.62	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.84	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	28.10	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	242.00	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	26.23	kg./hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	8.51	mg/kg
17.	Organic Carbon	USEPA 3050B	0.48	%
18.	Lead (as Pb)	USEPA 3050B	0.90	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.83	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.76	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.15	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	15.8	%

Note: SOP-Standard Operating Procedure.

MAMTA NAYAK
(Tested By)
LAB ANALYST

ARJUN RAWAT
(Checked By)

(Approved By)
Pratap Singh

VEL/E/N/TR/PN2333

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/S/06	**Report No.:**	VEL/S/2107/02/006
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:	06/07/2021
Latitude:	30° 1' 27.46"N	**Period of Analysis :**	02/07/2021 - 06/07/2021
Longitude:	75° 4' 8.62"E	**Receipt Date:**	02/07/2021
Sample Description:	Soil Sample	**Sampling Date:**	30/06/2021
Sampling Location:	Baghi Bandar	**Type of Sampling:**	Composite
Sample Collected by:	Vardan Enviro Lab Team	**Sampling Quantity:**	2.0 Kg
Sampling & Analysis Protocol:	IS 2720 , USEPA & SOP	**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	7.63	--
2.	Conductivity	IS:14767 by Conductivity meter	0.328	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
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	40.15	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.24	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	50.26	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	41.34	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	48.62	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	158.14	kg/hec.
11.	Iron as Fe	USEPA 3050B	2.12	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.71	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	32.14	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	232.69	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	19.25	kg./hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	9.36	mg/kg
17.	Organic Carbon	USEPA 3050B	0.41	%
18.	Lead (as Pb)	USEPA 3050B	0.62	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.70	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.41	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.23	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.32	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.

MAMTA NAYAK
(Tested By)
SR. ANALYST

ARJUN RAWAT
(Checked By)

(Approved By)
Authorized Signatory

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/S/07	**Report No.:**	VEL/S/2107/02/007
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
		Reporting Date:	06/07/2021
Latitude:	30° 4' 34.79"N	**Period of Analysis :**	02/07/2021 - 06/07/2021
Longitude:	74° 59' 57.45"E	**Receipt Date:**	02/07/2021
Sample Description:	Soil Sample	**Sampling Date:**	30/06/2021
Sampling Location:	Nasibpura	**Type of Sampling:**	Composite
Sample Collected by:	Vardan Enviro Lab Team	**Sampling Quantity:**	2.0 Kg
Sampling & Analysis Protocol:	IS 2720 , USEPA & SOP	**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	7.55	--
2.	Conductivity	IS:14767 by Conductivity meter	0.332	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	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	45.26	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.12	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	47.26	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	65.95	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	51.49	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	119.26	kg/hec.
11.	Iron as Fe	USEPA 3050B	3.52	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.80	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	22.56	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	245.00	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	26.59	kg./hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	15.47	mg/kg
17.	Organic Carbon	USEPA 3050B	0.46	%
18.	Lead (as Pb)	USEPA 3050B	0.54	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.68	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.62	mg/kg
21.	Copper (as Cu)	USEPA 3050B	1.96	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.52	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.

MAMTA NAYAK
(Tested By)
ANALYST

ARJUN RAWAT
(Checked By)

VARDAN ENVIROLAB
Gaurav Pratap Singh
Authorised Signatory
(Approved By)

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/IOCL/S/08**	**Report No.:**	**VEL/S/2107/02/008**
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:	**06/07/2021**
Latitude:	**30° 5' 40.22"N**	**Period of Analysis :**	**02/07/2021 - 06/07/2021**
Longitude:	**75° 4' 5.30"E**	**Receipt Date:**	**02/07/2021**
Sample Description:	**Soil Sample**	**Sampling Date:**	**30/06/2021**
Sampling Location:	**Kotbhara**	**Type of Sampling:**	**Composite**
Sample Collected by:	**Vardan Enviro Lab Team**	**Sampling Quantity:**	**2.0 Kg**
Sampling & Analysis Protocol:	**IS 2720 , USEPA & SOP**	**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	7.71	--
2.	Conductivity	IS:14767 by Conductivity meter	0.347	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
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	34.68	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.46	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	38.6	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	44.29	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	53.96	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	138.57	kg/hec.
11.	Iron as Fe	USEPA 3050B	1.99	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.63	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	33.55	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	202.8	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	15.47	kg./hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	8.23	mg/kg
17.	Organic Carbon	USEPA 3050B	0.36	%
18.	Lead (as Pb)	USEPA 3050B	0.55	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.63	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.44	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.32	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	15.7	%

Note: SOP-Standard Operating Procedure.

MAMTA NAYAK
(Tested By)
ANALYST

ARJUN RAWAT
(Checked By)

(Approved By)
Pratap Singh
Authorized Signatory

VEL/E/N/TR/PN2336

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/S/09	**Report No.:**	VEL/S/2107/02/009
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
		Reporting Date:	06/07/2021
Latitude:	30° 6' 34.53"N	**Period of Analysis :**	02/07/2021 - 06/07/2021
Longitude:	75° 0' 23.67"E	**Receipt Date:**	02/07/2021
Sample Description:	Soil Sample	**Sampling Date:**	30/06/2021
Sampling Location:	Kot Kashmir	**Type of Sampling:**	Composite
Sample Collected by:	Vardan Enviro Lab Team	**Sampling Quantity:**	2.0 Kg
Sampling & Analysis Protocol:	IS 2720 , USEPA & SOP	**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	7.64	--
2.	Conductivity	IS:14767 by Conductivity meter	0.386	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
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	26.58	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.62	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	52.47	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	38.26	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	45.14	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	145.26	kg/hec.
11.	Iron as Fe	USEPA 3050B	2.47	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	22.00	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	212.56	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	22.15	kg./hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	8.36	mg/kg
17.	Organic Carbon	USEPA 3050B	0.29	%
18.	Lead (as Pb)	USEPA 3050B	0.82	mg/kg
19	Cadmium (as Cd)	USEPA 3050B	0.71	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.86	mg/kg
21.	Copper (as Cu)	USEPA 3050B	6.52	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.36	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	14.6	%

Note: SOP-Standard Operating Procedure

MAMTA NAYAK
SR. ANALYST
(Tested By)

ARJUN RAWAT
(Checked By)

VARDAN ENVIRONET
(Approved By)
Pratap Singh
Authorized Signatory

VEL/E/N/TR/PN2337

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/S/10	**Report No.:**	VEL/S/2107/02/010
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
		Reporting Date:	06/07/2021
Latitude:	30° 6' 44.02"N	**Period of Analysis :**	02/07/2021 - 06/07/2021
Longitude:	74° 57' 21.06"E	**Receipt Date:**	02/07/2021
Sample Description:	Soil Sample	**Sampling Date:**	30/06/2021
Sampling Location:	Gehri Boghi	**Type of Sampling:**	Composite
Sample Collected by:	Vardan Enviro Lab Team	**Sampling Quantity:**	2.0 Kg
Sampling & Analysis Protocol:	IS 2720 , USEPA & SOP	**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	7.69	--
2.	Conductivity	IS:14767 by Conductivity meter	0.303	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	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	31.48	%
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	50.89	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	41.47	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	49.62	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	142.14	kg/hec.
11.	Iron as Fe	USEPA 3050B	2.25	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	28.62	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	232.75	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	24.78	kg./hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	10.62	mg/kg
17.	Organic Carbon	USEPA 3050B	0.44	%
18.	Lead (as Pb)	USEPA 3050B	0.68	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.75	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.53	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.20	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.24	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	12.8	%

Note: SOP-Standard Operating Procedure.

MAMTA NAYAK
(Tested By)
ANALYST

ARJUN RAWAT
(Checked By)

(Approved By)
Authorized Signatory

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/S/11	**Report No.:**	VEL/S/2107/02/011
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:	06/07/2021
Latitude:	30° 3' 45.41"N	**Period of Analysis :**	02/07/2021 - 06/07/2021
Longitude:	75° 4' 6.08"E	**Receipt Date:**	02/07/2021
Sample Description:	Soil Sample	**Sampling Date:**	30/06/2021
Sampling Location:	Chathewala	**Type of Sampling:**	Composite
Sample Collected by:	Vardan Enviro Lab Team	**Sampling Quantity:**	2.0 Kg
Sampling & Analysis Protocol:	IS 2720 , USEPA & SOP	**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	7.74	--
2.	Conductivity	IS:14767 by Conductivity meter	0.2.86	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	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	28.62	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.14	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	61.03	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	42.16	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	42.96	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	112.56	kg/hec.
11.	Iron as Fe	USEPA 3050B	2.35	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	18.62	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	186.59	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	25.62	kg./hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	9.68	mg/kg
17.	Organic Carbon	USEPA 3050B	0.37	%
18.	Lead (as Pb)	USEPA 3050B	0.92	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.70	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.76	mg/kg
21.	Copper (as Cu)	USEPA 3050B	6.02	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.32	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	11.9	%

Note: SOP-Standard Operating Procedure.

MAMTA NAYAK
(Tested By) SR. ANALYST

ARJUN RAWAT
(Checked By)

(Approved By) Pratap Singh

VEL/E/N/TR/PN2339

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/S/12	**Report No.:**	VEL/S/2107/02/012
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:	06/07/2021
Latitude:	30° 6' 48.99"N	**Period of Analysis :**	02/07/2021 - 06/07/2021
Longitude:	75° 4' 54.51"E	**Receipt Date:**	02/07/2021
Sample Description:	Soil Sample	**Sampling Date:**	30/06/2021
Sampling Location:	Kot Fatta	**Type of Sampling:**	Composite
Sample Collected by:	Vardan Enviro Lab Team	**Sampling Quantity:**	2.0 Kg
Sampling & Analysis Protocol:	IS 2720 , USEPA & SOP	**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	0.312	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
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	33.26	%
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	52.15	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	62.69	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	52.49	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	110.21	kg/hec.
11.	Iron as Fe	USEPA 3050B	3.25	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	20.02	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	198.26	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	15.46	kg./hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	11.56	mg/kg
17.	Organic Carbon	USEPA 3050B	0.43	%
18.	Lead (as Pb)	USEPA 3050B	0.54	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.72	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.70	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.21	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	14.6	%

Note: SOP-Standard Operating Procedure.

MAMTA NAYAK
(Tested By) ANALYST

ARJUN RAWAT
(Checked By)

VARDAN ENVIRO LAB
(Approved By)
Authorized Signatory

VEL/E/N/TR/PN2340

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/AA/01	Report No.:	VEL/AA/2110/04/001
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:	08/10/2021
Latitude:	30° 3' 13.34"N	Period of Analysis:	04/10/2021 - 08/10/2021
Longitude:	75° 0' 41.57"E	Receipt Date:	04/10/2021

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	:	**28/09/2021 to 29/09/2021**
Time of Monitoring	:	10:25 AM – 10:25 AM
Ambient Temperature (°C)	:	Min. 27°C Max. 37°C
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Control measure if Any	:	No
Sampling & Analysis Protocol	:	IS-5182 & CPCB Guideline
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**	$\mu g/m^3$	60
2.	Particulate Matter (PM_{10})	IS: 5182 (P-23) Gravimetric Method	**90.12**	$\mu g/m^3$	100
3.	Nitrogen Dioxide (NO_2)	IS: 5182 (P-6) Jacob & Hochheiser	**21.68**	$\mu g/m^3$	80
4.	Sulphur Dioxide (SO_2)	IS: 5182 (P-2) Modified West and Gaeke	**6.71**	$\mu g/m^3$	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	**0.76**	mg/m^3	4
6.	Ammonia (NH3), µg/m3	IS:5182(P-25) Indo Phenol Blue Method	**5.82**	$\mu g/m^3$	400
7.	Lead (Pb), $\mu g/m^3$	IS: 5182 (P-22) Air Acetylene Method	****BDL (*DL 0.05 $\mu g/m^3$)**	$\mu g/m^3$	1
8.	Benzene(C_6H_6) , $\mu g/m^3$	IS: 5182 (P-11)	****BDL (*DL 0.1 $\mu g/m^3$)**	$\mu g/m^3$	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) , $\mu g/m^3$	IS: 5182 (P-9) Colorimetric Method	**17.32**	$\mu g/m^3$	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 $\mu g/m^3$)**	$\mu g/m^3$	--
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

AMITABH DUBEY
SR. ANALYST
(Tested By)

ARJUN RAWAT
(Checked By)

VARDAN ENVIRO LAB * Dr. Shiv Prakash Singh * Authorised Signatory
(Approved By)

VEL/E/N/TR/PN4898

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/AA/02**	**Report No.:**	**VEL/AA/2110/04/002**
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**
		Reporting Date:	**08/10/2021**
Latitude:	**30° 3' 37.63"N**	**Period of Analysis:**	**04/10/2021 - 08/10/2021**
Longitude:	**75° 2' 75.30"E**	**Receipt Date:**	**04/10/2021**

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	:	**28/09/2021 to 29/09/2021**
Time of Monitoring	:	10:50 AM – 10:50 AM
Ambient Temperature (°C)	:	Min. 27°C Max. 37°C
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Control measure if Any	:	No
Sampling & Analysis Protocol	:	IS-5182 & CPCB Guideline
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	**46.04**	$\mu g/m^3$	60
2.	**Particulate Matter (PM_{10})**	IS: 5182 (P-23) Gravimetric Method	**83.51**	$\mu g/m^3$	100
3.	**Nitrogen Dioxide (NO_2)**	IS: 5182 (P-6) Jacob & Hochheiser	**18.07**	$\mu g/m^3$	80
4.	**Sulphur Dioxide (SO_2)**	IS: 5182 (P-2) Modified West and Gaeke	**7.60**	$\mu g/m^3$	80
5.	**Carbon Monoxide (CO)**	IS: 5182 (P-10) Gas Chromatography	**0.71**	mg/m^3	4
6.	**Ammonia (NH3), µg/m3**	IS:5182(P-25) Indo Phenol Blue Method	**6.59**	$\mu g/m^3$	400
7.	**Lead (Pb), $\mu g/m^3$**	IS: 5182 (P-22) Air Acetylene Method	****BDL (*DL 0.05 $\mu g/m^3$)**	$\mu g/m^3$	1
8.	**Benzene(C_6H_6) , $\mu g/m^3$**	IS: 5182 (P-11)	****BDL (*DL 0.1 $\mu g/m^3$)**	$\mu g/m^3$	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) , $\mu g/m^3$**	IS: 5182 (P-9) Colorimetric Method	**17.04**	$\mu g/m^3$	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 $\mu g/m^3$)**	$\mu g/m^3$	--
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

AMITABH DUBEY
SR. ANALYST
(Tested By)

ARJUN RAWAT
(Checked By)

VARDAN ENVIRO LAB
Dr. Shiv Prakash Singh
Authorised Signatory
(Approved By)

VEL/E/N/TR/PN4899

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/AA/03**	**Report No.:**	**VEL/AA/2110/04/003**
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**
		Reporting Date:	**08/10/2021**
Latitude:	**30° 2' 33.23"N**	**Period of Analysis:**	**04/10/2021 - 08/10/2021**
Longitude:	**75° 58' 6.88"E**	**Receipt Date:**	**04/10/2021**

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	:	**28/09/2021 to 29/09/2021**
Time of Monitoring	:	11:30 AM – 11:30 AM
Ambient Temperature (°C)	:	Min. 27°C Max. 37°C
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Control measure if Any	:	No
Sampling & Analysis Protocol	:	IS-5182 & CPCB Guideline
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	**49.05**	$\mu g/m^3$	60
2.	**Particulate Matter (PM_{10})**	IS: 5182 (P-23) Gravimetric Method	**88.65**	$\mu g/m^3$	100
3.	**Nitrogen Dioxide (NO_2)**	IS: 5182 (P-6) Jacob & Hochheiser	**22.19**	$\mu g/m^3$	80
4.	**Sulphur Dioxide (SO_2)**	IS: 5182 (P-2) Modified West and Gaeke	**8.46**	$\mu g/m^3$	80
5.	**Carbon Monoxide (CO)**	IS: 5182 (P-10) Gas Chromatography	**0.81**	mg/m^3	4
6.	**Ammonia (NH3), µg/m3**	IS:5182(P-25) Indo Phenol Blue Method	**8.93**	$\mu g/m^3$	400
7.	**Lead (Pb), $\mu g/m^3$**	IS: 5182 (P-22) Air Acetylene Method	****BDL (*DL 0.05 $\mu g/m^3$)**	$\mu g/m^3$	1
8.	**Benzene(C_6H_6) , $\mu g/m^3$**	IS: 5182 (P-11)	****BDL (*DL 0.1 $\mu g/m^3$)**	$\mu g/m^3$	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) , $\mu g/m^3$**	IS: 5182 (P-9) Colorimetric Method	**19.74**	$\mu g/m^3$	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 $\mu g/m^3$)**	$\mu g/m^3$	--
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

AMITABH DUBEY
SR. ANALYST
(Tested By)

ARJUN RAWAT
(Checked By)

VARDAN ENVIROLAB
Dr. Shiv Prakash Singh
Authorised Signatory
(Approved By)

VEL/E/N/TR/PN4900

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/AA/04**	**Report No.:**	**VEL/AA/2110/04/004**
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**
		Reporting Date:	**08/10/2021**
Latitude:	**30° 1' 13.05"N**	**Period of Analysis:**	**04/10/2021 - 08/10/2021**
Longitude:	**75° 1' 3.89"E**	**Receipt Date:**	**04/10/2021**

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	:	**28/09/2021 to 29/09/2021**
Time of Monitoring	:	11:50 AM – 11:50 AM
Ambient Temperature (°C)	:	Min. 27°C Max. 37°C
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Control measure if Any	:	No
Sampling & Analysis Protocol	:	IS-5182 & CPCB Guideline
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	**44.63**	$\mu g/m^3$	60
2.	**Particulate Matter (PM_{10})**	IS: 5182 (P-23) Gravimetric Method	**85.72**	$\mu g/m^3$	100
3.	**Nitrogen Dioxide (NO_2)**	IS: 5182 (P-6) Jacob & Hochheiser	**20.15**	$\mu g/m^3$	80
4.	**Sulphur Dioxide (SO_2)**	IS: 5182 (P-2) Modified West and Gaeke	**9.62**	$\mu g/m^3$	80
5.	**Carbon Monoxide (CO)**	IS: 5182 (P-10) Gas Chromatography	**0.74**	mg/m^3	4
6.	**Ammonia (NH3), µg/m3**	IS:5182(P-25) Indo Phenol Blue Method	**8.86**	$\mu g/m^3$	400
7.	**Lead (Pb), $\mu g/m^3$**	IS: 5182 (P-22) Air Acetylene Method	****BDL (*DL 0.05 $\mu g/m^3$)**	$\mu g/m^3$	1
8.	**Benzene(C_6H_6) , $\mu g/m^3$**	IS: 5182 (P-11)	****BDL (*DL 0.1 $\mu g/m^3$)**	$\mu g/m^3$	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) , $\mu g/m^3$**	IS: 5182 (P-9) Colorimetric Method	**17.66**	$\mu g/m^3$	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 $\mu g/m^3$)**	$\mu g/m^3$	--
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

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ARJUN RAWAT
(Checked By)

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VEL/E/N/TR/PN4901

Vardan EnviroLab

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

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Test Report

Sample Number:	**VEL/HPCL/AA/05**	**Report No.:**	**VEL/AA/2110/04/005**
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:	**08/10/2021**
Latitude:	**29° 59' 40.64"N**	**Period of Analysis:**	**04/10/2021 - 08/10/2021**
Longitude:	**75° 1' 17.61"E**	**Receipt Date:**	**04/10/2021**

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/02 & VEL/FPS/02
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	**29/09/2021 to 30/09/2021**
Time of Monitoring	:	09:20 AM – 09:20 AM
Ambient Temperature (°C)	:	Min. 27°C Max. 38°C
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Control measure if Any	:	No
Sampling & Analysis Protocol	:	IS-5182 & CPCB Guideline
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	**46.11**	$\mu g/m^3$	60
2.	**Particulate Matter (PM_{10})**	IS: 5182 (P-23) Gravimetric Method	**85.22**	$\mu g/m^3$	100
3.	**Nitrogen Dioxide (NO_2)**	IS: 5182 (P-6) Jacob & Hochheiser	**21.60**	$\mu g/m^3$	80
4.	**Sulphur Dioxide (SO_2)**	IS: 5182 (P-2) Modified West and Gaeke	**7.55**	$\mu g/m^3$	80
5.	**Carbon Monoxide (CO)**	IS: 5182 (P-10) Gas Chromatography	**0.82**	mg/m^3	4
6.	**Ammonia (NH3), µg/m3**	IS:5182(P-25) Indo Phenol Blue Method	**8.16**	$\mu g/m^3$	400
7.	**Lead (Pb), $\mu g/m^3$**	IS: 5182 (P-22) Air Acetylene Method	****BDL (*DL 0.05 $\mu g/m^3$)**	$\mu g/m^3$	1
8.	**Benzene(C_6H_6) , $\mu g/m^3$**	IS: 5182 (P-11)	****BDL (*DL 0.1 $\mu g/m^3$)**	$\mu g/m^3$	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) , $\mu g/m^3$**	IS: 5182 (P-9) Colorimetric Method	**20.26**	$\mu g/m^3$	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 $\mu g/m^3$)**	$\mu g/m^3$	--
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

AMITABH DUBEY
SR. ANALYST
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ARJUN RAWAT
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VEL/E/N/TR/PN4902

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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/AA/06**	**Report No.:**	**VEL/AA/2110/04/006**
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:	**08/10/2021**
Latitude:	**30° 1' 27.46"N**	**Period of Analysis:**	**04/10/2021 - 08/10/2021**
Longitude:	**75° 4' 8.62"E**	**Receipt Date:**	**04/10/2021**

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/01& VEL/FPS/01
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	**29/09/2021 to 30/09/2021**
Time of Monitoring	:	10:21 AM – 10:21 AM
Ambient Temperature (°C)	:	Min. 27°C Max. 38°C
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Control measure if Any	:	No
Sampling & Analysis Protocol	:	IS-5182 & CPCB Guideline
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	**43.15**	$\mu g/m^3$	60
2.	**Particulate Matter (PM_{10})**	IS: 5182 (P-23) Gravimetric Method	**81.24**	$\mu g/m^3$	100
3.	**Nitrogen Dioxide (NO_2)**	IS: 5182 (P-6) Jacob & Hochheiser	**16.37**	$\mu g/m^3$	80
4.	**Sulphur Dioxide (SO_2)**	IS: 5182 (P-2) Modified West and Gaeke	**8.32**	$\mu g/m^3$	80
5.	**Carbon Monoxide (CO)**	IS: 5182 (P-10) Gas Chromatography	**0.81**	mg/m^3	4
6.	**Ammonia (NH3), µg/m3**	IS:5182(P-25)) Indo Phenol Blue Method	**7.50**	$\mu g/m^3$	400
7.	**Lead (Pb), $\mu g/m^3$**	IS: 5182 (P-22) Air Acetylene Method	****BDL (*DL 0.05 µg/m3)**	$\mu g/m^3$	1
8.	**Benzene(C_6H_6) , $\mu g/m^3$**	IS: 5182 (P-11)	****BDL (*DL 0.1 µg/m3)**	$\mu g/m^3$	05
9.	**Benzo(a)pyrene, ng/m^3**	IS: 5182 (P-12)	****BDL (*DL 1.0 ng/m3)**	ng/m^3	01
10.	**Ozone (O_3) , $\mu g/m^3$**	IS: 5182 (P-9) Colorimetric Method	**17.20**	$\mu g/m^3$	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 $\mu g/m^3$)**	$\mu g/m^3$	--
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

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SR ANALYST
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VEL/E/N/TR/PN4903

Vardan EnviroLab

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

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Test Report

Sample Number:	**VEL/HPCL/AA/07**	**Report No.:**	**VEL/AA/2110/04/007**
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**
		Reporting Date:	**08/10/2021**
Latitude:	**30° 4' 34.79"N**	**Period of Analysis:**	**04/10/2021 - 08/10/2021**
Longitude:	**74° 59' 57.45"E**	**Receipt Date:**	**04/10/2021**

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	:	**29/09/2021 to 30/09/2021**
Time of Monitoring	:	10:47AM – 10:47 AM
Ambient Temperature (°C)	:	Min. 27°C Max. 38°C
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Control measure if Any	:	No
Sampling & Analysis Protocol	:	IS-5182 & CPCB Guideline
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	**47.36**	$\mu g/m^3$	60
2.	**Particulate Matter (PM_{10})**	IS: 5182 (P-23) Gravimetric Method	**82.74**	$\mu g/m^3$	100
3.	**Nitrogen Dioxide (NO_2)**	IS: 5182 (P-6) Jacob & Hochheiser	**22.18**	$\mu g/m^3$	80
4.	**Sulphur Dioxide (SO_2)**	IS: 5182 (P-2) Modified West and Gaeke	**9.52**	$\mu g/m^3$	80
5.	**Carbon Monoxide (CO)**	IS: 5182 (P-10) Gas Chromatography	**0.78**	mg/m^3	4
6.	**Ammonia (NH3), µg/m3**	IS:5182(P-25) Indo Phenol Blue Method	**10.05**	$\mu g/m^3$	400
7.	**Lead (Pb), $\mu g/m^3$**	IS: 5182 (P-22) Air Acetylene Method	****BDL (*DL 0.05 µg/m3)**	$\mu g/m^3$	1
8.	**Benzene(C_6H_6) , $\mu g/m^3$**	IS: 5182 (P-11)	****BDL (*DL 0.1 µg/m3)**	$\mu g/m^3$	05
9.	**Benzo(a)pyrene, ng/m^3**	IS: 5182 (P-12)	****BDL (*DL 1.0 ng/m3)**	ng/m^3	01
10.	**Ozone (O_3) , $\mu g/m^3$**	IS: 5182 (P-9) Colorimetric Method	**20.68**	$\mu g/m^3$	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 $\mu g/m^3$)**	$\mu g/m^3$	--
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

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VEL/E/N/TR/PN4904

Vardan EnviroLab

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

Sample Number:	**VEL/HPCL/AA/08**	**Report No.:**	**VEL/AA/2110/04/008**
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:	**08/10/2021**
Latitude:	**30° 5' 40.22"N**	**Period of Analysis:**	**04/10/2021 - 08/10/2021**
Longitude:	**75° 4' 5.30"E**	**Receipt Date:**	**04/10/2021**

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/04& VEL/FPS/04
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	**29/09/2021 to 30/09/2021**
Time of Monitoring	:	11:03 AM – 11:03AM
Ambient Temperature (°C)	:	Min. 27°C Max. 38°C
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Control measure if Any	:	No
Sampling & Analysis Protocol	:	IS-5182 & CPCB Guideline
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	**46.01**	$\mu g/m^3$	60
2.	**Particulate Matter (PM_{10})**	IS: 5182 (P-23) Gravimetric Method	**83.94**	$\mu g/m^3$	100
3.	**Nitrogen Dioxide (NO_2)**	IS: 5182 (P-6) Jacob & Hochheiser	**23.05**	$\mu g/m^3$	80
4.	**Sulphur Dioxide (SO_2)**	IS: 5182 (P-2) Modified West and Gaeke	**7.71**	$\mu g/m^3$	80
5.	**Carbon Monoxide (CO)**	IS: 5182 (P-10) Gas Chromatography	**0.75**	mg/m^3	4
6.	**Ammonia (NH3), µg/m3**	IS:5182(P-25) Indo Phenol Blue Method	**6.91**	$\mu g/m^3$	400
7.	**Lead (Pb), $\mu g/m^3$**	IS: 5182 (P-22) Air Acetylene Method	****BDL (*DL 0.05 $\mu g/m^3$)**	$\mu g/m^3$	1
8.	**Benzene(C_6H_6) , $\mu g/m^3$**	IS: 5182 (P-11)	****BDL (*DL 0.1 $\mu g/m^3$)**	$\mu g/m^3$	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) , $\mu g/m^3$**	IS: 5182 (P-9) Colorimetric Method	**21.62**	$\mu g/m^3$	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 $\mu g/m^3$)**	$\mu g/m^3$	--
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
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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/09**	**Report No.:**	**VEL/AA/2110/04/009**
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**
		Reporting Date:	**08/10/2021**
Latitude:	**30° 6' 34.53"N**	**Period of Analysis:**	**04/10/2021 - 08/10/2021**
Longitude:	**75° 0' 23.67"E**	**Receipt Date:**	**04/10/2021**

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	:	**30/09/2021 to 01/10/2021**
Time of Monitoring	:	10:04 AM – 10:04 AM
Ambient Temperature (°C)	:	Min. 29°C Max. 41°C
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Control measure if Any	:	No
Sampling & Analysis Protocol	:	IS-5182 & CPCB Guideline
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	**44.81**	$\mu g/m^3$	60
2.	**Particulate Matter (PM_{10})**	IS: 5182 (P-23) Gravimetric Method	**86.05**	$\mu g/m^3$	100
3.	**Nitrogen Dioxide (NO_2)**	IS: 5182 (P-6) Jacob & Hochheiser	**24.76**	$\mu g/m^3$	80
4.	**Sulphur Dioxide (SO_2)**	IS: 5182 (P-2) Modified West and Gaeke	**9.88**	$\mu g/m^3$	80
5.	**Carbon Monoxide (CO)**	IS: 5182 (P-10) Gas Chromatography	**0.74**	mg/m^3	4
6.	**Ammonia (NH3), µg/m3**	IS:5182(P-25) Indo Phenol Blue Method	**9.11**	$\mu g/m^3$	400
7.	**Lead (Pb), $\mu g/m^3$**	IS: 5182 (P-22) Air Acetylene Method	****BDL (*DL 0.05 µg/m3)**	$\mu g/m^3$	1
8.	**Benzene(C_6H_6) , $\mu g/m^3$**	IS: 5182 (P-11)	****BDL (*DL 0.1 µg/m3)**	$\mu g/m^3$	05
9.	**Benzo(a)pyrene, ng/m^3**	IS: 5182 (P-12)	****BDL (*DL 1.0 ng/m3)**	ng/m^3	01
10.	**Ozone (O_3) , $\mu g/m^3$**	IS: 5182 (P-9) Colorimetric Method	**21.35**	$\mu g/m^3$	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 $\mu g/m^3$)**	$\mu g/m^3$	--
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

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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/10**	**Report No.:**	**VEL/AA/2110/04/010**
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**
		Reporting Date:	**08/10/2021**
Latitude:	**30° 6' 44.02"N**	**Period of Analysis:**	**04/10/2021 - 08/10/2021**
Longitude:	**74° 57' 21.06"E**	**Receipt Date:**	**04/10/2021**

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	:	**30/09/2021 to 01/10/2021**
Time of Monitoring	:	10:33 AM – 10:33 AM
Ambient Temperature (°C)	:	Min. 29°C Max. 41°C
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Control measure if Any	:	No
Sampling & Analysis Protocol	:	IS-5182 & CPCB Guideline
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	**46.57**	$\mu g/m^3$	60
2.	**Particulate Matter (PM_{10})**	IS: 5182 (P-23) Gravimetric Method	**83.15**	$\mu g/m^3$	100
3.	**Nitrogen Dioxide (NO_2)**	IS: 5182 (P-6) Jacob & Hochheiser	**23.64**	$\mu g/m^3$	80
4.	**Sulphur Dioxide (SO_2)**	IS: 5182 (P-2) Modified West and Gaeke	**8.53**	$\mu g/m^3$	80
5.	**Carbon Monoxide (CO)**	IS: 5182 (P-10) Gas Chromatography	**0.74**	mg/m^3	4
6.	**Ammonia (NH3), µg/m3**	IS:5182(P-25) Indo Phenol Blue Method	**9.85**	$\mu g/m^3$	400
7.	**Lead (Pb), $\mu g/m^3$**	IS: 5182 (P-22) Air Acetylene Method	****BDL (*DL 0.05 $\mu g/m^3$)**	$\mu g/m^3$	1
8.	**Benzene(C_6H_6) , $\mu g/m^3$**	IS: 5182 (P-11)	****BDL (*DL 0.1 $\mu g/m^3$)**	$\mu g/m^3$	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) , $\mu g/m^3$**	IS: 5182 (P-9) Colorimetric Method	**17.21**	$\mu g/m^3$	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 $\mu g/m^3$)**	$\mu g/m^3$	--
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

AMITABH DUBEY
SR ANALYST
(Tested By)

ARJUN RAWAT
(Checked By)

VARDAN ENVIROLAB
Dr. Shiv Prakash Singh
(Approved By)
Authorised Signatory

VEL/E/N/TR/PN4907

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/AA/11**	**Report No.:**	**VEL/AA/2110/04/011**
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:	**08/10/2021**
Latitude:	**30° 3' 45.41"N**	**Period of Analysis:**	**04/10/2021 - 08/10/2021**
Longitude:	**75° 4' 6.08"E**	**Receipt Date:**	**04/10/2021**

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/03& VEL/FPS/03
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	**30/09/2021 to 01/10/2021**
Time of Monitoring	:	10:45 AM – 10:45 AM
Ambient Temperature (°C)	:	Min. 29°C Max. 41°C
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Control measure if Any	:	No
Sampling & Analysis Protocol	:	IS-5182 & CPCB Guideline
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	**42.93**	$\mu g/m^3$	60
2.	**Particulate Matter (PM_{10})**	IS: 5182 (P-23) Gravimetric Method	**79.28**	$\mu g/m^3$	100
3.	**Nitrogen Dioxide (NO_2)**	IS: 5182 (P-6) Jacob & Hochheiser	**18.20**	$\mu g/m^3$	80
4.	**Sulphur Dioxide (SO_2)**	IS: 5182 (P-2) Modified West and Gaeke	**7.15**	$\mu g/m^3$	80
5.	**Carbon Monoxide (CO)**	IS: 5182 (P-10) Gas Chromatography	**0.76**	mg/m^3	4
6.	**Ammonia (NH3), µg/m3**	IS:5182(P-25) Indo Phenol Blue Method	**6.23**	$\mu g/m^3$	400
7.	**Lead (Pb), $\mu g/m^3$**	IS: 5182 (P-22) Air Acetylene Method	****BDL (*DL 0.05 $\mu g/m^3$)**	$\mu g/m^3$	1
8.	**Benzene(C_6H_6) , $\mu g/m^3$**	IS: 5182 (P-11)	****BDL (*DL 0.1 $\mu g/m^3$)**	$\mu g/m^3$	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) , $\mu g/m^3$**	IS: 5182 (P-9) Colorimetric Method	**16.51**	$\mu g/m^3$	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 $\mu g/m^3$)**	$\mu g/m^3$	--
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

AMITABH DUBEY
SR. ANALYST
(Tested By)

ARJUN RAWAT
(Checked By)

VARDAN ENVIROLAB ★ Authorised Signatory ★
Dr Shiv Prakash Singh
(Approved By)

VEL/E/N/TR/PN4908

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/AA/12	**Report No.:**	VEL/AA/2110/04/012
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:	08/10/2021
Latitude:	30° 6' 48.99"N	**Period of Analysis:**	04/10/2021 - 08/10/2021
Longitude:	75° 4' 54.51"E	**Receipt Date:**	04/10/2021

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/02& VEL/FPS/02
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	**30/09/2021 to 01/10/2021**
Time of Monitoring	:	10:58 AM – 10:58AM
Ambient Temperature (°C)	:	Min. 29°C Max. 41°C
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Control measure if Any	:	No
Sampling & Analysis Protocol	:	IS-5182 & CPCB Guideline
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	**45.08**	$\mu g/m^3$	60
2.	**Particulate Matter (PM_{10})**	IS: 5182 (P-23) Gravimetric Method	**82.17**	$\mu g/m^3$	100
3.	**Nitrogen Dioxide (NO_2)**	IS: 5182 (P-6) Jacob & Hochheiser	**17.40**	$\mu g/m^3$	80
4.	**Sulphur Dioxide (SO_2)**	IS: 5182 (P-2) Modified West and Gaeke	**7.81**	$\mu g/m^3$	80
5.	**Carbon Monoxide (CO)**	IS: 5182 (P-10) Gas Chromatography	**0.76**	mg/m^3	4
6.	**Ammonia (NH3), µg/m3**	IS:11255(P-6) Indo Phenol Blue Method	**6.43**	$\mu g/m^3$	400
7.	**Lead (Pb), $\mu g/m^3$**	IS: 5182 (P-22) Air Acetylene Method	****BDL (*DL 0.05 µg/m3)**	$\mu g/m^3$	1
8.	**Benzene(C_6H_6) , $\mu g/m^3$**	IS: 5182 (P-11)	****BDL (*DL 0.1 µg/m3)**	$\mu g/m^3$	05
9.	**Benzo(a)pyrene, ng/m^3**	IS: 5182 (P-12)	****BDL (*DL 1.0 ng/m3)**	ng/m^3	01
10.	**Ozone (O_3) , $\mu g/m^3$**	IS: 5182 (P-9) Colorimetric Method	**16.02**	$\mu g/m^3$	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)**	$\mu g/m^3$	--
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

AMITABH DUBEY
SR ANALYST
(Tested By)

ARJUN RAWAT
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VARDAN ENVIROLAB
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(Approved By)
Authorised Signatory

VEL/E/N/TR/PN4909

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/AN/01**	**Report No.:**	**VEL/AN/2110/04/001**
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:	**08/10/2021**
		Receipt Date:	**04/10/2021**

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	:	**28/09/2021 to 29/09/2021**
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-2014 & CPCB Guideline
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-2014	71.6	62.4	dB(A)
2.	Lmin	IS 9989 R-2014	55.3	45.8	dB(A)
3.	Leq	IS 9989 R-2014	65.93	49.60	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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Vardan EnviroLab

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

Sample Number:	**VEL/HPCL/AN/02**	**Report No.:**	**VEL/AN/2110/04/002**
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**
		Reporting Date:	**08/10/2021**
		Receipt Date:	**04/10/2021**

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/02
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	**28/09/2021 to 29/09/2021**
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-2014 & CPCB Guideline
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-2014	61.4	51.9	dB(A)
2.	Lmin	IS 9989 R-2014	43.7	33.6	dB(A)
3.	Leq	IS 9989 R-2014	52.57	42.68	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.

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VEL/E/N/TR/PN491

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/AN/03**	**Report No.:**	**VEL/AN/2110/04/003**
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**
		Reporting Date:	**08/10/2021**
		Receipt Date:	**04/10/2021**

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	:	**28/09/2021 to 29/09/2021**
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-2014 & CPCB Guideline
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-2014	60.3	53.7	dB(A)
2.	Lmin	IS 9989 R-2014	41.2	34.9	dB(A)
3.	Leq	IS 9989 R-2014	51.10	42.18	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/2110/04/004**
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**
		Reporting Date:	**08/10/2021**
		Receipt Date:	**04/10/2021**

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/03
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	**28/09/2021 to 29/09/2021**
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-2014 & CPCB Guideline
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-2014	58.2	49.5	dB(A)
2.	Lmin	IS 9989 R-2014	43.1	35.2	dB(A)
3.	Leq	IS 9989 R-2014	52.70	44.78	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.

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VEL/E/N/TR/PN4913

Vardan EnviroLab

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

Sample Number:	**VEL/HPCL/AN/05**	**Report No.:**	**VEL/AN/2110/04/005**
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:	**08/10/2021**
		Receipt Date:	**04/10/2021**

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/02
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	**29/09/2021 to 30/09/2021**
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-2014 & CPCB Guideline
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-2014	63.2	56.9	dB(A)
2.	Lmin	IS 9989 R-2014	44.5	35.4	dB(A)
3.	Leq	IS 9989 R-2014	52.60	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.

AMITABH DUBEY
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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/AN/06**	**Report No.:**	**VEL/AN/2110/04/006**
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:	**08/10/2021**
		Receipt Date:	**04/10/2021**

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/03
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	**29/09/2021 to 30/09/2021**
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-2014 & CPCB Guideline
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-2014	56.8	51.6	dB(A)
2.	Lmin	IS 9989 R-2014	44.3	30.5	dB(A)
3.	Leq	IS 9989 R-2014	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.

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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/AN/07**	**Report No.:**	**VEL/AN/2110/04/007**
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**
		Reporting Date:	**08/10/2021**
		Receipt Date:	**04/10/2021**

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/01
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	**29/09/2021 to 30/09/2021**
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-2014 & CPCB Guideline
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-2014	63.8	58.3	dB(A)
2.	Lmin	IS 9989 R-2014	44.6	35.7	dB(A)
3.	Leq	IS 9989 R-2014	53.41	43.26	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.

AMITABH DUBEY
SR. ANALYST
(Tested By)

ARJUN RAWAT
(Checked By)

VARDAN ENVIROLAB
Dr. Shiv Prakash Singh
(Approved By)
Authorised Signatory

VEL/E/N/TR/PN4916

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/AN/08**	**Report No.:**	**VEL/AN/2110/04/008**
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:	**08/10/2021**
		Receipt Date:	**04/10/2021**

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/04
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	**29/09/2021 to 30/09/2021**
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-2014 & CPCB Guideline
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-2014	58.1	47.3	dB(A)
2.	Lmin	IS 9989 R-2014	42.9	32.5	dB(A)
3.	Leq	IS 9989 R-2014	49.30	41.60	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.

AMITABH DUBEY
SR. ANALYST
(Tested By)

ARJUN RAWAT
(Checked By)

VARDAN ENVIROLAB Authorised Signatory
Dr. Shiv Prakash Singh
(Approved By)

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/AN/09	**Report No.:**	VEL/AN/2110/04/009
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
		Reporting Date:	08/10/2021
		Receipt Date:	04/10/2021

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	:	**30/09/2021 to 01/10/2021**
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-2014 & CPCB Guideline
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-2014	57.2	46.7	dB(A)
2.	Lmin	IS 9989 R-2014	44.3	32.4	dB(A)
3.	Leq	IS 9989 R-2014	50.61	39.70	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.

AMITABH DUBEY
SR. ANALYST
(Tested By)

ARJUN RAWAT
(Checked By)

VARDAN ENVIROLAB
Dr. Shiv Prakash Singh
Authorised Signatory
(Approved By)

VEL/E/N/TR/PN4918

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/AN/10**	**Report No.:**	**VEL/AN/2110/04/010**
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**
		Reporting Date:	**08/10/2021**
		Receipt Date:	**04/10/2021**

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	:	**30/09/2021 to 01/10/2021**
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-2014 & CPCB Guideline
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-2014	56.3	45.9	dB(A)
2.	Lmin	IS 9989 R-2014	41.5	33.5	dB(A)
3.	Leq	IS 9989 R-2014	48.30	37.69	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.

AMITABH DUBEY
SR ANALYST
(Tested By)

ARJUN RAWAT
(Checked By)

VARDAN ENVIROLAB
Dr. Shiv Prakash Singh
Authorised Signatory
(Approved By)

VEL/E/N/TR/PN4919

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/AN/11**	**Report No.:**	**VEL/AN/2110/04/011**
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:	**08/10/2021**
		Receipt Date:	**04/10/2021**

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	:	**30/09/2021 to 01/10/2021**
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-2014 & CPCB Guideline
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-2014	56.1	47.6	dB(A)
2.	Lmin	IS 9989 R-2014	43.5	35.5	dB(A)
3.	Leq	IS 9989 R-2014	50.31	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.

AMITABH DUBEY
SR ANALYST
(Tested By)

ARJUN RAWAT
(Checked By)

VARDAN ENVIROLAB Dr. Shiv Singh Authorised Signatory
(Approved By)

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/AN/12**	**Report No.:**	**VEL/AN/2110/04/012**
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:	**08/10/2021**
		Receipt Date:	**04/10/2021**

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	:	**30/09/2021 to 01/10/2021**
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-2014 & CPCB Guideline
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-2014	58.9	49.8	dB(A)
2.	Lmin	IS 9989 R-2014	42.8	36.2	dB(A)
3.	Leq	IS 9989 R-2014	51.60	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.

AMITABH DUBEY
SR. ANALYST
(Tested By)

ARJUN RAWAT
(Checked By)

VARDAN ENVIROLAB
Dr. Shiv Singh
(Approved By)
Authorised Signatory

VEL/E/N/TR/PN4921

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/2110/04/001
Name & Address of Party:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	**Format No.:**	7.8 F-01
		Party Reference No.:	NIL
Latitude:	30° 3` 13.34" N	**Reporting Date:**	08/10/2021
Longitude:	75° 0' 41.57" E	**Period of Analysis:**	04/10/2021 – 08/10/2021
Sample Description:	Ground Water Sample	**Receipt Date:**	04/10/2021
Sample Location:	Near Project Site	**Sampling Date:**	30/09/2021
Sample Collected by:	Vardan Enviro Lab Representative	**Sampling Quantity:**	2.0 Ltr + 200 ml
Parameter Required	As per work order	**Sampling Type:**	Garb
Sampling & Analysis Protocol:	IS-3025, APHA	**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 ^{0}C)	APHA ,4500-H^+ B Electrometric Method	7.48	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**DL 1.0 Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephlelometric Method	*BDL (**DL 1.0 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	275.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	69.12	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	225.35	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl^- B, Argentometric Method	49.05	mg/l	250	1000
10.	#Cyanide as CN	IS:3025 (P-27)	*BDL (**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	24.92	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	651.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA , 4500 E, Turbidimetric Method	27.31	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F^- D, SPADNS Method	0.69	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	6.87	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	1.0@	No relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.5	2.4@
19.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	No Relaxation

KANCHAN SHARMA
(Tested By)
Jr. Lab Analyst

ARJUN RAWAT
(Checked By)

VARDAN ENVIROLAB
Dr. Shiv Prasad Singh
Authorised Signatory
(Approved By)

VEL/E/N/TR/PN4922

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 No.: VEL/HPCL/W/01				Report No.: VEL/W/2110/04/001		
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 0.0004 mg/l)	mg/l	0.001	0.002
21.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05mg/l)	mg/l	0.5	No Relaxation
22.	#Anionic Detergents as MBAS	Annex K, IS 13428/IS 3025 (P-68)	*BDL(**DL 0.05 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	0.28	mg/l	5	15
24.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation@
30.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1002	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	19.37	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	5.0	mg/l	--	--
35.	Total Coliform	IS 15185:2016	< 2	/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100 ml sample	

Note: - This Report Complies as per IS 10500:2012 (RA: 2018)

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

@Amendment No.1 in June 2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept. 2018(Limit of Boron & IS method of Total Coliform & E.Coli)

KANCHAN SHARMA
RAVI KUMAR
Jr. Analyst
(Issued By)

Mohammad Shaffi
Technical Manager
(Checked By)

Mr. ROHIT TRIPATHI
Deputy Technical Manager
(Approved By)

VEL/E/N/TR/PN4923

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/02	**Report No.:**	VEL/W/2110/04/002
Name & Address of Party:	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:**	08/10/2021
Longitude:	75° 2' 75.30" E	**Period of Analysis:**	04/10/2021 – 08/10/2021
Sample Description:	Ground Water Sample	**Receipt Date:**	04/10/2021
Sample Location:	Jiwan Singh Wala	**Sampling Date:**	30/09/2021
Sample Collected by:	Vardan Enviro Lab Representative	**Sampling Quantity:**	2.0 Ltr + 200 ml
Parameter Required	As per work order	**Sampling Type:**	Garb
Sampling & Analysis Protocol:	IS-3025, APHA	**Preservation:**	Refrigerated
			VEL/W/2107/02/001

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	7.36	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**DL 1.0 Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephlelometric Method	*BDL (**DL 1.0 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	153.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	43.15	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	168.31	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl^- B, Argentometric Method	32.66	mg/l	250	1000
10.	#Cyanide as CN	IS:3025 (P-27)	*BDL (**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	11.02	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	403.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA , 4500 E, Turbidimetric Method	13.87	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F^- D, SPADNS Method	0.72	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	8.96	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	1.0[@]	No relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.5	2.4[@]
19.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	No Relaxation

KANCHAN SHARMA
(Tested By)

ARJUN RAWAT
(Checked By)

VARDAN ENVIROLAB Authorised Signatory
(Approved By)
Prakash Singh

VEL/E/N/TR/PN4924

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 No.: VEL/HPCL/W/02			Report No.: VEL/W/2110/04/002			
					Limits of IS:10500 -2012	
S. No.	Parameter	Test-Method	Result	Unit	Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.0004 mg/l)	mg/l	0.001	0.002
21.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05mg/l)	mg/l	0.5	No Relaxation
22.	#Anionic Detergents as MBAS	Annex K, IS 13428/IS 3025 (P-68)	*BDL(**DL 0.05 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	0.37	mg/l	5	15
24.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation@
30.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	620	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	18.3	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	4.2	mg/l	--	--
35.	Total Coliform	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100 ml sample	

Note: - This Report Complies as per IS 10500:2012 (RA: 2018)

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

@Amendment No.1 in June 2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept. 2018(Limit of Boron & IS method of Total Coliform & E.Coli)

RAVI KUMAR
Analyst
(Tested By)

Mohammad Shaffi
Technical Manager
(Checked By)

Mr. ROHIT TRIPATHI
Deputy Technical Manager
(Approved By)

VEL/E/N/TR/PN4925

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/03	**Report No.:**	VEL/W/2110/04/003
Name & Address of Party:	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:**	08/10/2021
Longitude:	75° 58' 6.88" E	**Period of Analysis:**	04/10/2021 – 08/10/2021
Sample Description:	Ground Water Sample	**Receipt Date:**	04/10/2021
Sample Location:	Maanwala	**Sampling Date:**	30/09/2021
Sample Collected by:	Vardan Enviro Lab Representative	**Sampling Quantity:**	2.0 Ltr + 200 ml
Parameter Required	As per Client Requirement	**Sampling Type:**	Garb
Sampling & Analysis Protocol:	IS-3025, APHA	**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	7.31	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**DL 1.0 Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephlelometric Method	*BDL (**DL 1.0 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	210.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	72.65	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	212.37	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl^- B, Argentometric Method	61.82	mg/l	250	1000
10.	#Cyanide as CN	IS:3025 (P-27)	*BDL (**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	6.98	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	539.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA , 4500 E, Turbidimetric Method	59.05	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F^- D, SPADNS Method	0.81	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	8.10	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	1.0@	No relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.5	2.4@
19.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	No Relaxation

KANCHAN SHARMA (Tested By)
Jr. Lab Analyst

ARJUN RAWAT (Checked By)

VARDAN ENVIROLAB Dr. Shiv Prakash Singh (Approved By) Authorised Signatory

VEL/E/N/TR/PN4926

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 No.: VEL/HPCL/W/03					Report No.: VEL/W/2110/04/003	
					Limits of IS:10500 -2012	
S. No.	Parameter	Test-Method	Result	Unit	Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.0004 mg/l)	mg/l	0.001	0.002
21.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05mg/l)	mg/l	0.5	No Relaxation
22.	#Anionic Detergents as MBAS	Annex K, IS 13428/IS 3025 (P-68)	*BDL(**DL 0.05 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	0.31	mg/l	5	15
24.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation[@]
30.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	8.29	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	19.3	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	3.5	mg/l	--	--
35.	Total Coliform	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100 ml sample	

Note: - This Report Complies as per IS 10500:2012 (RA: 2018)

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

[@]Amendment No.1 in June 2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept. 2018(Limit of Boron & IS method of Total Coliform & E.Coli)

RAJ KUMAR
Analyst
(Tested By)

Mohammad Shaffi
Technical Manager
(Checked By)

Mr. ROHIT TRIPATHI
Deputy Technical Manager
(Approved By)

VEL/E/N/TR/PN4927

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/04	**Report No.:**	VEL/W/2110/04/004
Name & Address of Party:	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:**	08/10/2021
Longitude:	75° 1' 3.89" E	**Period of Analysis:**	04/10/2021 – 08/10/2021
Sample Description:	Ground Water Sample	**Receipt Date:**	04/10/2021
Sample Location:	Mahi Nangal	**Sampling Date:**	30/09/2021
Sample Collected by:	Vardan Enviro Lab Representative	**Sampling Quantity:**	2.0 Ltr + 200 ml
Parameter Required	As per Client Requirement	**Sampling Type:**	Garb
Sampling & Analysis Protocol:	IS-3025, APHA	**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	7.63	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**DL 1.0 Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephlelometric Method	*BDL (**DL 1.0 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	211.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	59.68	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	198.37	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl^- B, Argentometric Method	41.28	mg/l	250	1000
10.	#Cyanide as CN	IS:3025 (P-27)	*BDL (**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	15.09	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	498.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA , 4500 E, Turbidimetric Method	28.34	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F^- D, SPADNS Method	0.58	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	7.15	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	1.0@	No relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.5	2.4@
19.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	No Relaxation

KANCHAN SHARMA (Tested By)
Jr. Lab Analyst

ARJUN RAWAT (Checked By)

VARDAN ENVIROLAB Dr. Shiv Prakash Singh (Approved By) Authorised Signatory

VEL/E/N/TR/PN4928

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 No.: VEL/HPCL/W/04				Report No.: VEL/W/2110/04/004		
					Limits of IS:10500 -2012	
S. No.	Parameter	Test-Method	Result	Unit	Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.0004 mg/l)	mg/l	0.001	0.002
21.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05mg/l)	mg/l	0.5	No Relaxation
22.	#Anionic Detergents as MBAS	Annex K, IS 13428/IS 3025 (P-68)	*BDL(**DL 0.05 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	0.37	mg/l	5	15
24.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation@
30.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	830	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	23.6	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	6.3	mg/l	--	--
35.	Total Coliform	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100 ml sample	

Note: - This Report Complies as per IS 10500:2012 (RA: 2018)

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

@Amendment No.1 in June 2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept. 2018(Limit of Boron & IS method of Total Coliform & E.Coli)

RAVI KUMAR
Analyst
(Authorized By)

Mohammad Shaffi
Technical Manager
(Checked By)

Mr. ROHIT TRIPATHI
Deputy Technical Manager
(Approved By)

VEL/E/N/TR/PN4929

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/05	**Report No.:**	VEL/W/2110/04/005
Name & Address of Party:	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:**	08/10/2021
Longitude:	75° 0' 23.67" E	**Period of Analysis:**	04/10/2021 – 08/10/2021
Sample Description:	Ground Water Sample	**Receipt Date:**	04/10/2021
Sample Location:	Kot Kashmir	**Sampling Date:**	30/09/2021
Sample Collected by:	Vardan Enviro Lab Representative	**Sampling Quantity:**	2.0 Ltr + 200 ml
Parameter Required	As per Client Requirement	**Sampling Type:**	Garb
Sampling & Analysis Protocol:	IS-3025, APHA	**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 1.0 Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephlelometric Method	*BDL (**DL 1.0 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	249.60	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	74.89	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	251.87	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl^- B, Argentometric Method	62.34	mg/l	250	1000
10.	#Cyanide as CN	IS:3025 (P-27)	*BDL (**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	15.25	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	613.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA , 4500 E, Turbidimetric Method	56.02	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F^- D, SPADNS Method	0.74	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	8.41	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	1.0@	No relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.5	2.4@
19.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	No Relaxation

KANCHAN SHARMA (Tested By) Jr. Lab Analyst

ARJUN RAWAT (Checked By)

VARDAN ENVIROLAB Dr. Shiv Singh (Approved By) Authorised Signatory

VEL/E/N/TR/PN4930

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 No.: VEL/HPCL/W/05				Report No.: VEL/W/2110/04/005		
					Limits of IS:10500 -2012	
S. No.	Parameter	Test-Method	Result	Unit	Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.0004 mg/l)	mg/l	0.001	0.002
21.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05mg/l)	mg/l	0.5	No Relaxation
22.	#Anionic Detergents as MBAS	Annex K, IS 13428/IS 3025 (P-68)	*BDL(**DL 0.05 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	0.48	mg/l	5	15
24.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation@
30.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	943	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	22.8	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	6.1	mg/l	--	--
35.	Total Coliform	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100 ml sample	

Note: - This Report Complies as per IS 10500:2012 (RA: 2018)

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

@Amendment No.1 in June 2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept. 2018(Limit of Boron & IS method of Total Coliform & E.Coli)

RAVI KUMAR
Analyst
(Tested By)

Mohammad Shaffi
Technical Manager
(Checked By)

Mr. ROHIT TRIPATHI
Deputy Technical Manager
(Approved By)

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/06	**Report No.:**	VEL/W/2110/04/006
Name & Address of Party:	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:**	08/10/2021
Longitude:	74° 59' 57.45" E	**Period of Analysis:**	04/10/2021 – 08/10/2021
Sample Description:	Ground Water Sample	**Receipt Date:**	04/10/2021
Sample Location:	Nasibpura	**Sampling Date:**	30/09/2021
Sample Collected by:	Vardan Enviro Lab Representative	**Sampling Quantity:**	2.0 Ltr + 200 ml
Parameter Required	As per Client Requirement	**Sampling Type:**	Garb
Sampling & Analysis Protocol:	IS-3025, APHA	**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	7.29	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**DL 1.0 Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephlelometric Method	*BDL (**DL 1.0 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	215.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	71.63	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	226.87	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl^- B, Argentometric Method	63.04	mg/l	250	1000
10.	#Cyanide as CN	IS:3025 (P-27)	*BDL (**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	8.82	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	586.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA , 4500 E, Turbidimetric Method	43.08	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F^- D, SPADNS Method	0.62	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	7.93	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	1.0@	No relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.5	2.4@
19.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	No Relaxation

KANCHAN SHARMA (Tested By) Jr. Lab Analyst

ARJUN RAWAT (Checked By)

VARDAN ENVIROLAB * Authorised Signatory * Dr. Shiv Bhushan Singh (Approved By)

VEL/E/N/TR/PN4932

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 No.: VEL/HPCL/W/06					Report No.: VEL/W/2110/04/006	
					Limits of IS:10500 -2012	
S. No.	Parameter	Test-Method	Result	Unit	Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.0004 mg/l)	mg/l	0.001	0.002
21.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05mg/l)	mg/l	0.5	No Relaxation
22.	#Anionic Detergents as MBAS	Annex K, IS 13428/IS 3025 (P-68)	*BDL(**DL 0.05 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	0.43	mg/l	5	15
24.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation@
30.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	901	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	24.1	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	5.7	mg/l	--	--
35.	Total Coliform	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100 ml sample	

Note: - This Report Complies as per IS 10500:2012 (RA: 2018)

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

@Amendment No.1 in June 2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept. 2018(Limit of Boron & IS method of Total Coliform & E.Coli)

RAVI KUMAR
Analyst
(Tested By)

Mohammad Shaffi
Technical Manager
(Checked By)

Mr. ROHIT TRIPATHI
Deputy Technical Manager
(Approved By)

VEL/E/N/TR/PN4933

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/07	**Report No.:**	VEL/W/2110/04/007
Name & Address of Party:	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:**	08/10/2021
Longitude:	75° 4' 8.62" E	**Period of Analysis:**	04/10/2021 – 08/10/2021
Sample Description:	Ground Water Sample	**Receipt Date:**	04/10/2021
Sample Location:	Baghi Bandar	**Sampling Date:**	30/09/2021
Sample Collected by:	Vardan Enviro Lab Representative	**Sampling Quantity:**	2.0 Ltr + 200 ml
Parameter Required	As per Client Requirement	**Sampling Type:**	Garb
Sampling & Analysis Protocol:	IS-3025, APHA	**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	7.37	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**DL 1.0 Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephlelometric Method	*BDL (**DL 1.0 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	314.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	99.86	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	326.51	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl^- B, Argentometric Method	86.08	mg/l	250	1000
10.	#Cyanide as CN	IS:3025 (P-27)	*BDL (**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	15.76	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	734.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA , 4500 E, Turbidimetric Method	61.27	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F^- D, SPADNS Method	0.78	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	8.63	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	1.0@	No relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.5	2.4@
19.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	No Relaxation

(Tested By) KANCHAN SHARMA
Jr. Lab Analyst

(Checked By) ARJUN RAWAT

VARDAN ENVIROLAB * Authorised Signatory
(Approved By) Dr. Shiv Prakash Singh

VEL/E/N/TR/PN4934

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 No.: VEL/HPCL/W/07				Report No.: VEL/W/2110/04/007		
					Limits of IS:10500 -2012	
S. No.	Parameter	Test-Method	Result	Unit	Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.0004 mg/l)	mg/l	0.001	0.002
21.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05mg/l)	mg/l	0.5	No Relaxation
22.	#Anionic Detergents as MBAS	Annex K, IS 13428/IS 3025 (P-68)	*BDL(**DL 0.05 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	0.51	mg/l	5	15
24.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation@
30.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1129	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	29.3	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	8.2	mg/l	--	--
35.	Total Coliform	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100 ml sample	

Note: - This Report Complies as per IS 10500:2012 (RA: 2018)

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

@Amendment No.1 in June 2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept. 2018(Limit of Boron & IS method of Total Coliform & E.Coli)

RAVI KUMAR
Analyst
(Tested By)

Mohammad Shaffi
Technical Manager
(Checked By)

Mr. ROHIT TRIPATHI
Deputy Technical Manager
(Approved By)

VEL/E/N/TR/PN4935

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/08	**Report No.:**	VEL/W/2110/04/008
Name & Address of Party:	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:**	08/10/2021
Longitude:	75° 4' 54.51" E	**Period of Analysis:**	04/10/2021 – 08/10/2021
Sample Description:	Surface Water Sample	**Receipt Date:**	04/10/2021
Sample Location:	Kot Fatta	**Sampling Date:**	30/09/2021
Sample Collected by:	Vardan Enviro Lab Representative	**Sampling Quantity:**	2.0 Ltr + 200 ml
Parameter Required	As per Client Requirement	**Sampling Type:**	Garb
Sampling & Analysis Protocol:	IS 3025, APHA	**Preservation:**	Refrigerated

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 ^{0}C)	APHA ,4500-H^+ B Electrometric Method	7.53	--
2.	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**DL 1.0Hazen)	Hazen
3.	Turbidity	APHA, 2130 B, Nephlelometric Method	23	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	62.15	mg/l
7.	Conductivity	APHA, 2510 B, Conductivity Meter Method	634	µS/cm
8.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	11.51	mg/l
9.	Iron as Fe	APHA , 3500-Fe B 1,10 Phenanthroline Method	0.19	mg/l
10.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	412.00	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	0.13	mg/l
13.	Sulphate as SO^4	APHA , 4500 E, Turbidimetric Method	12.54	mg/l
14.	Fluoride as F	APHA , 4500-F^- D, SPADNS Method	0.49	mg/l
15.	BOD (3 Days at 27^{0}C)	APHA, 5210 C / IS 3025,P-44	5.60	mg/l
16.	COD	APHA, 5220 B, Open Reflux Method	23.00	mg/l
17.	Free Ammonia as NH_3	IS 3025 (P-34) , Titrimetric Method	9.86	mg/l
18.	Total Coliform	IS 1622	23	MPN/100ml
19.	Arsenic as As	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l

KANCHAN SHARMA (Tested By)
Jr. Lab Analyst

ARJUN RAWAT (Checked By)

VARDAN ENVIROLAB Dr. Shiv Singh (Approved By) Authorised Signatory

VEL/E/N/TR/PN4936

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 No.: VEL/HPCL/W/08			Report No.: VEL/W/2110/04/008	
S. No.	**Parameter**	**Test-Method**	**Result**	**Unit**
20.	Total Hardness as $CaCO_3$	APHA , 2340 C, EDTA Titrimetric Method	154.00	mg/l
21.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	53.88	mg/l
22.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	168.19	mg/l
23.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	4.75	mg/l
24.	Copper as Cu	APHA , 3111 B, Direct Air, Acetylene Flame Method	2.5	mg/l
25.	Sodium	APHA. 3500 Na B Flame Photometric Method	69.07	mg/l
26.	Potassium	APHA, 3500 Na B Flame Photometric Method	25.44	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.

KANCHAN SHARMA
Jr. Analyst
(Tested By)

ARJUN RAWAT
(Checked By)

VARDAN ENVIROLAB
Dr. Shiv Prakash Singh
(Approved By)
Authorised Signatory

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/09	**Report No.:**	VEL/W/2110/04/009
Name & Address of Party:	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:**	08/10/2021
Longitude:	75° 4' 6.08" E	**Period of Analysis:**	04/10/2021 – 08/10/2021
Sample Description:	Surface Water Sample	**Receipt Date:**	04/10/2021
Sample Location:	Chathewala	**Sampling Date:**	30/09/2021
Sample Collected by:	Vardan Enviro Lab Representative	**Sampling Quantity:**	2.0 Ltr + 200 ml
Parameter Required	As per Client Requirement	**Sampling Type:**	Garb
Sampling & Analysis Protocol:	IS 3025, APHA	**Preservation:**	Refrigerated

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 ^{0}C)	APHA ,4500-H^+ B Electrometric Method	7.75	--
2.	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**DL 1.0Hazen)	Hazen
3.	Turbidity	APHA, 2130 B, Nephlelometric Method	18	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	52.31	mg/l
7.	Conductivity	APHA, 2510 B, Conductivity Meter Method	784	µS/cm
8.	Nitrate as NO_3	IS 3025 (P-34) ,Chromotropic Method	6.86	mg/l
9.	Iron as Fe	APHA , 3500-Fe B 1,10 Phenanthroline Method	0.23	mg/l
10.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	510.00	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	0.11	mg/l
13.	Sulphate as SO^{-4}	APHA , 4500 E, Turbidimetric Method	21.08	mg/l
14.	Fluoride as F	APHA , 4500-F^- D, SPADNS Method	0.39	mg/l
15.	BOD (3 Days at 27^{0}C)	APHA, 5210 C / IS 3025.P-44	5.40	mg/l
16.	COD	APHA, 5220 B, Open Reflux Method	26.00	mg/l
17.	Free Ammonia as NH_3	IS 3025 (P-34) , Titrimetric Method	8.58	mg/l
18.	Total Coliform	IS 1622	23	MPN/100ml
19.	Arsenic as As	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l

KANCHAN SHARMA
Jr. Analyst
(Tested By)

ARJUN RAWAT
(Checked By)

VARDAN ENVIROLAB
Dr. Shiv Singh
(Approved By)
Authorised Signatory

VEL/E/N/TR/PN4938

Test Report

Sample No.: VEL/HPCL/W/09			Report No.: VEL/W/2110/04/009	
S. No.	Parameter	Test-Method	Result	Unit
20.	Total Hardness as $CaCO_3$	APHA , 2340 C, EDTA Titrimetric Method	161.00	mg/l
21.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	52.36	mg/l
22.	Alkalinity as $CaCO_3$	APHA , 2320 B, Titrimetric Method	186.05	mg/l
23.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	7.38	mg/l
24.	Copper as Cu	APHA , 3111 B, Direct Air, Acetylene Flame Method	2.96	mg/l
25.	Sodium	APHA, 3500 Na B Flame Photometric Method	74.62	mg/l
26.	Potassium	APHA, 3500 Na B Flame Photometric Method	21.09	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.

KANCHAN SHARMA
(Tested By)
Jr. Lab Analyst

ARJUN RAWAT
(Checked By)

VARDAN ENVIROLAB
Dr. Shiv Singh
(Approved By)
Authorised Signatory

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/S/01	**Report No.:**	VEL/S/2110/04/001
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:	08/10/2021
Latitude:	30° 3' 13.34"N	**Period of Analysis :**	04/10/2021 - 08/10/2021
Longitude:	75° 0' 41.57"E	**Receipt Date:**	04/10/2021
Sample Description:	Soil Sample	**Sampling Date:**	29/09/2021
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 & SOP	**Packing Status:**	Temp Sealed

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	0.315	mS/cm
3	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
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	31.54	%
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	50.64	mg/100g
8	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	37.63	mg/100g
9	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	39.87	mg/kg
10	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	128.64	kg/hec
11	Iron as Fe	USEPA 3050B	2.89	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	17.16	mg/100g
14	Available Nitrogen as N	IS:14684 Distillation Method	198.34	kg./hec
15	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	16.51	kg./hec
16	Zinc (as Zn)	SOP , SP-86,Issue No.-01	9.86	mg/kg
17	Organic Carbon	USEPA 3050B	0.51	%
18	Lead (as Pb)	USEPA 3050B	0.78	mg/kg
19	Cadmium (as Cd)	USEPA 3050B	0.69	mg/kg
20	Chromium (as Cr)	USEPA 3050B	0.80	mg/kg
21	Copper (as Cu)	USEPA 3050B	6.12	mg/kg
22	Molybdenum as MO	USEPA 3050B	0.34	mg/100g
23	Nickel	USEPA 3050B	*BDL	mg/100g
24	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	14.2	%

Note: SOP-Standard Operating Procedure

KANCHAN SHARMA
(Tested By)
Jr. Lab Analyst

ARJUN RAWAT
(Checked By)

VARDAN ENVIROLAB
Dr. Shiv Prakash Singh
(Approved By)
Authorised Signatory

VEL/E/N/TR/PN4940

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/S/02	**Report No.:**	VEL/S/2110/04/002
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
		Reporting Date:	08/10/2021
Latitude:	30° 3' 37.63"N	**Period of Analysis :**	04/10/2021 - 08/10/2021
Longitude:	75° 2' 75.30"E	**Receipt Date:**	04/10/2021
Sample Description:	Soil Sample	**Sampling Date:**	29/09/2021
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 & SOP	**Depth of Sampling:**	Temp Sealed
Packing Status:	Temp Sealed		

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	0.319	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No -01& Issue Date-14/02/2013	Silty	--
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	31.95	%
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	45.97	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No -01& Issue Date-14/02/2013	37.05	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No -01& Issue Date-14/02/2013	49.03	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No -01& Issue Date-14/02/2013	144.12	kg/hec
11.	Iron as Fe	USEPA 3050B	2.43	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	24.13	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	224.00	kg /hec
15.	Available Phosphorus	SOP , SP-86,Issue No -01& Issue Date-14/02/2013	17.06	kg /hec
16.	Zinc (as Zn)	SOP , SP-86,Issue No -01	10.09	mg/kg
17.	Organic Carbon	USEPA 3050B	0.53	%
18.	Lead (as Pb)	USEPA 3050B	0.71	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.76	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.41	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.62	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	11.6	%

Note: SOP-Standard Operating Procedure

KANC [illegible] SHARMA
(Tested By)
Jr. Lab Analyst

ARJUN RAWAT
(Checked By)

VARDAN ENVIROLAB
Dr. Shiv Prakash Singh
(Approved By)
Authorised Signatory

VEL/E/N/TR/PN4941

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/S/03	**Report No.:**	VEL/S/2110/04/003
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
		Reporting Date:	08/10/2021
Latitude:	30° 2' 33.23"N	**Period of Analysis :**	04/10/2021 - 08/10/2021
Longitude:	75° 58' 6.88"E	**Receipt Date:**	04/10/2021
Sample Description:	Soil Sample	**Sampling Date:**	29/09/2021
Sampling Location:	Maanwala	**Type of Sampling:**	Composite
Sample Collected by:	Vardan Enviro Lab Team	**Sampling Quantity:**	2.0 Kg
Sampling & Analysis Protocol:	IS 2720 , USEPA & SOP	**Depth of Sampling:**	Temp Sealed
Packing Status:	Temp Sealed		

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.76	--
2.	Conductivity	IS:14767 by Conductivity meter	0.322	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
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	31.88	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.36	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	43.81	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	64.19	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	56.17	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	140.15	kg/hec
11.	Iron as Fe	USEPA 3050B	2.34	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	22.37	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	222.05	kg /hec
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	26.18	kg /hec
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	12.69	mg/kg
17.	Organic Carbon	USEPA 3050B	0.39	%
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	1.48	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.11	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	16.4	%

Note: SOP-Standard Operating Procedure

KANCHAN SHARMA
(Tested By)
Jr. Lab Analyst

ARJUN RAWAT
(Checked By)

VARDAN ENVIROLAB
Dr. Shiv Prakash Singh
(Approved By)
Authorised Signatory

VEL/E/N/TR/PN4942

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/S/04	**Report No.:**	VEL/S/2110/04/004
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
		Reporting Date:	08/10/2021
Latitude:	30° 1' 13.05"N	**Period of Analysis :**	04/10/2021 - 08/10/2021
Longitude:	75° 1' 3.89"E	**Receipt Date:**	04/10/2021
Sample Description:	Soil Sample	**Sampling Date:**	29/09/2021
Sampling Location:	Mahi Nangal	**Type of Sampling:**	Composite
Sample Collected by:	Vardan Enviro Lab Team	**Sampling Quantity:**	2.0 Kg
Sampling & Analysis Protocol:	IS 2720 , USEPA & SOP	**Depth of Sampling:**	Temp Sealed
Packing Status:	Temp Sealed		VEL/S/2107/02/001

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	0.348	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
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	33.05	%
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	53.04	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	43.67	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	63.18	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	141.75	kg/hec.
11.	Iron as Fe	USEPA 3050B	2.89	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	32.05	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	216.00	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	21.75	kg./hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	7.39	mg/kg
17.	Organic Carbon	USEPA 3050B	0.45	%
18.	Lead (as Pb)	USEPA 3050B	0.67	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.73	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.47	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.53	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	18.3	%

Note: SOP-Standard Operating Procedure

KANCHAN SHARMA
(Tested By)
Jr. Lab Analyst

ARJUN RAWAT
(Checked By)

VARDAN ENVIROLAB
Dr. Shiv Prakash Singh
(Approved By)
Authorised Signatory

VEL/E/N/TR/PN4943

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/S/05	**Report No.:**	VEL/S/2110/04/005
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:	08/10/2021
Latitude:	29° 59' 40.64"N	**Period of Analysis :**	04/10/2021 - 08/10/2021
Longitude:	75° 1' 17.61"E	**Receipt Date:**	04/10/2021
Sample Description:	Soil Sample	**Sampling Date:**	29/09/2021
Sampling Location:	Leleana	**Type of Sampling:**	Composite
Sample Collected by:	Vardan Enviro Lab Team	**Sampling Quantity:**	2.0 Kg
Sampling & Analysis Protocol:	IS 2720 , USEPA & SOP	**Depth of Sampling:**	Temp Sealed
Packing Status:	Temp Sealed		VEL/S/2107/02/001

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.75	--
2.	Conductivity	IS:14767 by Conductivity meter	0.350	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
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	29.34	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.25	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	66.08	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	48.17	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	53.96	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	159.57	kg/hec.
11.	Iron as Fe	USEPA 3050B	2.72	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	29.55	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	248.00	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	27.96	kg./hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	8.68	mg/kg
17.	Organic Carbon	USEPA 3050B	0.49	%
18.	Lead (as Pb)	USEPA 3050B	0.92	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.84	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.79	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.21	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.46	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.

ANCHAL SHARMA
(Tested By)
Jr. Lab Analyst

ARJUN RAWAT
(Checked By)

VARDAN ENVIROLAB * Authorised Signatory
Dr. Shiv Prakash Singh
(Approved By)

VEL/E/N/TR/PN4944

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/S/06	**Report No.:**	VEL/S/2110/04/006
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:	08/10/2021
Latitude:	30° 1' 27.46"N	**Period of Analysis :**	04/10/2021 - 08/10/2021
Longitude:	75° 4' 8.62"E	**Receipt Date:**	04/10/2021
Sample Description:	Soil Sample	**Sampling Date:**	29/09/2021
Sampling Location:	Baghi Bandar	**Type of Sampling:**	Composite
Sample Collected by:	Vardan Enviro Lab Team	**Sampling Quantity:**	2.0 Kg
Sampling & Analysis Protocol:	IS 2720 , USEPA & SOP	**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	7.68	--
2	Conductivity	IS:14767 by Conductivity meter	0.319	mS/cm
3	Soil Texture	SOP , SP-87,Issue No -01& Issue Date-14/02/2013	Silty	--
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	42.96	%
6	Bulk density	SOP , SP-80,Issue No -01& Issue Date-14/02/2013	1.27	gm/cc
7	Chloride as Cl	SOP , SP-85,Issue No -01& Issue Date-14/02/2013	53.05	mg/100g
8	Calcium as Ca	SOP , SP-82,Issue No -01& Issue Date-14/02/2013	44.87	mg/100g
9	Sodium as Na	SOP , SP-84,Issue No -01& Issue Date-14/02/2013	51.75	mg/kg
10	Potassium as K	SOP , SP-84,Issue No -01& Issue Date-14/02/2013	161.27	kg/hec.
11	Iron as Fe	USEPA 3050B	2.23	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	35.08	mg/100g
14	Available Nitrogen as N	IS:14684 Distillation Method	238.00	kg /hec.
15	Available Phosphorus	SOP , SP-86,Issue No -01& Issue Date-14/02/2013	21.34	kg /hec.
16	Zinc (as Zn)	SOP . SP-86,Issue No -01	9.46	mg/kg
17	Organic Carbon	USEPA 3050B	0.45	%
18	Lead (as Pb)	USEPA 3050B	0.68	mg/kg
19	Cadmium (as Cd)	USEPA 3050B	0.76	mg/kg
20	Chromium (as Cr)	USEPA 3050B	0.45	mg/kg
21	Copper (as Cu)	USEPA 3050B	2.30	mg/kg
22	Molybdenum as MO	USEPA 3050B	0.34	mg/100g
23	Nickel	USEPA 3050B	*BDL	mg/100g
24	Moisture Content	SOP , SP-79,Issue No -01& Issue Date-14/02/2013	17.3	%

Note: SOP-Standard Operating Procedure.

RANJEET SHARMA (Tested By)
Jr. Lab Analyst

ARJUN RAWAT (Checked By)

VARDAN ENVIROLAB * Authorised Signatory * Dr. Shiv Prakash Singh (Approved By)

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/S/07	**Report No.:**	VEL/S/2110/04/007
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
		Reporting Date:	08/10/2021
Latitude:	30° 4' 34.79"N	**Period of Analysis :**	04/10/2021 - 08/10/2021
Longitude:	74° 59' 57.45"E	**Receipt Date:**	04/10/2021
Sample Description:	Soil Sample	**Sampling Date:**	29/09/2021
Sampling Location:	Nasibpura	**Type of Sampling:**	Composite
Sample Collected by:	Vardan Enviro Lab Team	**Sampling Quantity:**	2.0 Kg
Sampling & Analysis Protocol:	IS 2720 , USEPA & SOP	**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	7.62	--
2.	Conductivity	IS:14767 by Conductivity meter	0.338	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	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	47.15	%
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	45.67	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	68.51	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	53.26	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	121.18	kg/hec.
11.	Iron as Fe	USEPA 3050B	3.61	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.84	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	24.57	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	247.00	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	28.56	kg./hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	16.81	mg/kg
17.	Organic Carbon	USEPA 3050B	0.49	%
18.	Lead (as Pb)	USEPA 3050B	0.57	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.71	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.68	mg/kg
21.	Copper (as Cu)	USEPA 3050B	1.92	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	17.5	%

Note: SOP-Standard Operating Procedure.

KANCHAN SHARMA (Tested By) Jr. Lab Analyst

ARJUN RAWAT (Checked By)

VARDAN ENVIROLAB * Authorised Signatory (Approved By) Dr. Shiv Prakash Singh

VEL/E/N/TR/PN4946

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/IOCL/S/08	**Report No.:**	VEL/S/2110/04/008
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:	08/10/2021
Latitude:	30° 5' 40.22"N	**Period of Analysis :**	04/10/2021 - 08/10/2021
Longitude:	75° 4' 5.30"E	**Receipt Date:**	04/10/2021
Sample Description:	Soil Sample	**Sampling Date:**	29/09/2021
Sampling Location:	Kotbhara	**Type of Sampling:**	Composite
Sample Collected by:	Vardan Enviro Lab Team	**Sampling Quantity:**	2.0 Kg
Sampling & Analysis Protocol:	IS 2720 , USEPA & SOP	**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	7.76	--
2.	Conductivity	IS:14767 by Conductivity meter	0.352	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
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	35.47	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.45	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	39.31	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	46.12	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	54.18	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	137.05	kg/hec.
11.	Iron as Fe	USEPA 3050B	1.91	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.59	%
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	208.64	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	16.43	kg./hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	8.38	mg/kg
17.	Organic Carbon	USEPA 3050B	0.37	%
18.	Lead (as Pb)	USEPA 3050B	0.51	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.66	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.42	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.26	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.81	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	14.6	%

Note: SOP-Standard Operating Procedure

KANCHAN SHARMA
(Tested By)
Jr. Lab Analyst

ARJUN RAWAT
(Checked By)

VARDAN ENVIROLAB
Dr. Shiv Prakash Singh
(Approved By)
Authorised Signatory

VEL/E/N/TR/PN4947

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/S/09	**Report No.:**	VEL/S/2110/04/009
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
		Reporting Date:	08/10/2021
Latitude:	30° 6' 34.53"N	**Period of Analysis :**	04/10/2021 - 08/10/2021
Longitude:	75° 0' 23.67"E	**Receipt Date:**	04/10/2021
Sample Description:	Soil Sample	**Sampling Date:**	29/09/2021
Sampling Location:	Kot Kashmir	**Type of Sampling:**	Composite
Sample Collected by:	Vardan Enviro Lab Team	**Sampling Quantity:**	2.0 Kg
Sampling & Analysis Protocol:	IS 2720 , USEPA & SOP	**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	7.67	--
2.	Conductivity	IS:14767 by Conductivity meter	0.362	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
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	27.31	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.65	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	54.16	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	37.26	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	42.91	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	142.51	kg/hec.
11.	Iron as Fe	USEPA 3050B	2.42	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.45	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	21.80	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	210.35	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	23.19	kg./hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	8.42	mg/kg
17.	Organic Carbon	USEPA 3050B	0.31	%
18.	Lead (as Pb)	USEPA 3050B	0.85	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.74	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.83	mg/kg
21.	Copper (as Cu)	USEPA 3050B	6.71	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	15.7	%

Note: SOP-Standard Operating Procedure.

KANCHAN SHARMA
(Tested By)
Jr. Lab Analyst

ARJUN RAWAT
(Checked By)

VARDAN ENVIROLAB
Dr. Shiv Prakash Singh
(Approved By)
Authorised Signatory

VEL/E/N/TR/PN4948

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/S/10	**Report No.:**	VEL/S/2110/04/010
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
		Reporting Date:	08/10/2021
Latitude:	30° 6' 44.02"N	**Period of Analysis :**	04/10/2021 - 08/10/2021
Longitude:	74° 57' 21.06"E	**Receipt Date:**	04/10/2021
Sample Description:	Soil Sample	**Sampling Date:**	29/09/2021
Sampling Location:	Gehri Boghi	**Type of Sampling:**	Composite
Sample Collected by:	Vardan Enviro Lab Team	**Sampling Quantity:**	2.0 Kg
Sampling & Analysis Protocol:	IS 2720 , USEPA & SOP	**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	7.65	--
2	Conductivity	IS:14767 by Conductivity meter	0.312	mS/cm
3	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	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	33.06	%
6	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.84	gm/cc
7	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	48.23	mg/100g
8	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	39.54	mg/100g
9	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	47.26	mg/kg
10	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	140.84	kg/hec.
11	Iron as Fe	USEPA 3050B	2.22	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	26.49	mg/100g
14	Available Nitrogen as N	IS:14684 Distillation Method	243.06	kg /hec.
15	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	25.18	kg /hec.
16	Zinc (as Zn)	SOP , SP-86,Issue No.-01	11.54	mg/kg
17	Organic Carbon	USEPA 3050B	0.48	%
18	Lead (as Pb)	USEPA 3050B	0.67	mg/kg
19	Cadmium (as Cd)	USEPA 3050B	0.72	mg/kg
20	Chromium (as Cr)	USEPA 3050B	0.51	mg/kg
21	Copper (as Cu)	USEPA 3050B	2.16	mg/kg
22	Molybdenum as MO	USEPA 3050B	0.23	mg/100g
23	Nickel	USEPA 3050B	*BDL	mg/100g
24	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	13.7	%

Note: SOP-Standard Operating Procedure

KANCHAN SHARMA
(Tested By)
Jr. Lab Analyst

ARJUN RAWAT
(Checked By)

VARDAN ENVIROLAB * Authorised Signatory *
Dr. Shiv Prakash Singh
(Approved By)

VEL/E/N/TR/PN4949

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/S/11	**Report No.:**	VEL/S/2110/04/011
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:	08/10/2021
Latitude:	30° 3' 45.41"N	**Period of Analysis :**	04/10/2021 - 08/10/2021
Longitude:	75° 4' 6.08"E	**Receipt Date:**	04/10/2021
Sample Description:	Soil Sample	**Sampling Date:**	29/09/2021
Sampling Location:	Chathewala	**Type of Sampling:**	Composite
Sample Collected by:	Vardan Enviro Lab Team	**Sampling Quantity:**	2.0 Kg
Sampling & Analysis Protocol:	IS 2720 , USEPA & SOP	**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	7.82	--
2.	Conductivity	IS:14767 by Conductivity meter	0.298	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	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	24.12	%
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	62.34	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	44.61	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	47.66	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	110.78	kg/hec
11.	Iron as Fe	USEPA 3050B	2.94	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	17.49	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	188.15	kg /hec
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	26.37	kg /hec
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	9.77	mg/kg
17.	Organic Carbon	USEPA 3050B	0.39	%
18.	Lead (as Pb)	USEPA 3050B	0.94	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.73	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.79	mg/kg
21.	Copper (as Cu)	USEPA 3050B	6.11	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.37	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	12.8	%

Note: SOP-Standard Operating Procedure

(Tested By)
KANCHAN SHARMA
Jr. Lab Analyst

(Checked By)
ARJUN RAWAT

(Approved By)
Dr. Shiv Prakash Singh
VARDAN ENVIROLAB Authorised Signatory

VEL/E/N/TR/PN4950

Vardan EnviroLab

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

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Test Report

Sample Number:	VEL/HPCL/S/12	**Report No.:**	VEL/S/2110/04/012
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:	08/10/2021
Latitude:	30° 6' 48.99"N	**Period of Analysis :**	04/10/2021 - 08/10/2021
Longitude:	75° 4' 54.51"E	**Receipt Date:**	04/10/2021
Sample Description:	Soil Sample	**Sampling Date:**	29/09/2021
Sampling Location:	Kot Fatta	**Type of Sampling:**	Composite
Sample Collected by:	Vardan Enviro Lab Team	**Sampling Quantity:**	2.0 Kg
Sampling & Analysis Protocol:	IS 2720 , USEPA & SOP	**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	7.66	--
2.	Conductivity	IS:14767 by Conductivity meter	0.325	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
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	31.68	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.22	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	48.37	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	61.05	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	50.34	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	102.61	kg/hec.
11.	Iron as Fe	USEPA 3050B	3.18	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.71	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	19.35	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	191.63	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	14.18	kg./hec.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	10.27	mg/kg
17.	Organic Carbon	USEPA 3050B	0.41	%
18.	Lead (as Pb)	USEPA 3050B	0.52	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.69	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.63	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.14	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	14.2	%

Note: SOP-Standard Operating Procedure.

KANCHAN SHARMA (Tested By) Jr. Lab Analyst

ARJUN RAWAT (Checked By)

VARDAN ENVIROLAB Dr. Shiv Prakash Singh (Approved By) Authorised Signatory

VEL/E/N/TR/PN4951