

O/C



Mangalore SEZ Limited

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Website: www.mangaloresez.com

CIN: U45209KA2006PLC038590

28/12/2018

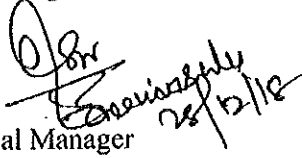
To,
Environmental Officer
KSPCB Mangalore,
Baikampady Industrial area
Mangalore-575011

Dear Sir,

Sub: Submission of Six monthly Compliance Report

With reference to above subject, we hereby submit the six monthly Compliance reports of Mangalore SEZ & OMPL for the months up to April 2018.

Thanks & Regards

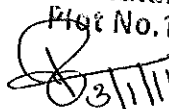

Sr. General Manager

Civil & Environment

MSEZL

Encl : Compliance Report

Copy to: MoEF Director, Bangalore

REGIONAL OFFICE
Karnataka State Pollution Control Board
Plot No.10-B, Baikampady Industrial Area
MANGALORE-575011




o/c

Mangalore SEZ Limited3rd Floor, MUDA Building, Ashok nagar,

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28 Dec, 2018

MSEZL/MNG/EN/2018-19

To,

The Director,
Southern Region, Regional Office,
Ministry of Environment and Forests,
Kendriya Sadan, 4th Floor, E&F Wings,
17th Main Road, 1st Block, Koramangala,
Bangalore - 560 034

Sir,

Sub: Six monthly Compliance Report.

Ref:

1. Environmental Clearance No: 21-383/2007-IA-III, dated 3rd April 2008.
2. Amendment to Environmental Clearance for setting up of Phase-I of Special Economic Zone at Mangalore by M/s Mangalore SEZ Ltd -- regarding No: 21-383/2007-IA-III dated 13th July, 2012.
3. Amendment to Environmental Clearance for setting up of Phase-I of Special Economic Zone at Mangalore by M/s Mangalore SEZ Ltd date 27 Aug 2014.
4. Amendment to Environmental Clearance for development of Multi Product Units as Mangalore SEZ dated 18 June 2015.

With reference to above, we would like to submit the compliance report as on date.

S. No.	A. SPECIFIC CONDITIONS	COMPLIANCE
(i)	No Objection Certificate from the Karnataka State Pollution Control Board shall be obtained before initiating the project.	Consent For Establishment from KSPCB obtained on 30 April 2008 and Extension of validity of Consent For Establishment obtained on 27 May 2013 and the copy was submitted to MoEF.
(ii)	The MSEZ project shall be restricted to the Phase-I of the project, proposed over 1,800 acres. The phase II of the project shall be considered by Ministry of Environment and Forests only after receipt of all requisite documents/information as laid down in the Environmental Impact Assessment Notification, 2006 and Coastal Regulation Zone Notification, 1991 as applicable.	Will be complied. MSEZL will approach MoEF with requisite documents as per EIA Notification, 2006 for Phase-2 expansions if taken in future.
(iii)	All development in the Coastal Regulation Zone area shall be in accordance with the Coastal Regulation Zone Notification, 1991. No destruction of mangroves shall be	Complied.



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S. No.	A. SPECIFIC CONDITIONS	COMPLIANCE
	undertaken except while undertaking the permissible activities in the Coastal Regulation Zone-I areas.	
(iv)	The project proponent shall not take up any activity in 875 acres of Coastal Regulation Zone land, other than those permissible under the Coastal Regulation Zone Notification 1991 such as pipeline corridors, pipelines roads on stilts.	Complied.
(v)	With regard to the containing the suspected contamination of the groundwater near Athurkodi area of Kuthethoor village, MRPL have given an undertaking vide their letter dated 19.3.2008 which is as follows:- - Implementation of recommendation of NGPRI will be started by MRPL immediately after submission of their report. - Depending upon the nature of their recommendations, we will make efforts to complete necessary actions within 6 months from the date of receipt of their report. - In addition to above, a daily vigil is already in place to take samples from different places and to monitor any suspected oil leakage. This will continue till the problem is resolved. - We are also in continuous contact with the residents in the surround areas with regard to any contamination. KSPCB and MRPL shall ensure that (a) to (d) above is implemented in a time bound manner and a monthly report on the progress of the activities provided to the Regional Office of this Ministry at Bangalore. For this purpose a separate budget would be allocated by MRPL.	This condition pertains to MRPL phase III expansion project. MRPL phase III expansion has been detached from MSEZ phase I project vide EC amendment dated 13th July 2012. MRPL shall be complying conditions relevant to them as part of their existing clearance.
(vi)	The project proponent shall obtain a report from the Wildlife Department with regard to existence of wildlife in the proposed site as claimed by the public before implementing the project.	Report from the Forest Department is obtained and submitted to the MoEF dated June 5, 2008.
(vii)	The R&R package shall be strictly in accordance with the laid down norms of the State Government.	The R&R Package is being implemented strictly as per approved policy by State Government. In 1 st PDF 1235 families out of 1253, In 2 nd PDF 214 families out of 214, In 3 rd PDF 141 families out of 147 families & 14 shops has been compensated with R&R Packages. Totally 1604 families have vacated their houses and are rehabilitated.



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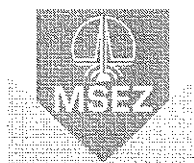
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S. No.	A. SPECIFIC CONDITIONS	COMPLIANCE
(xii)	The industrial units in the SEZ and the associated facilities shall be strictly in accordance with the norms laid down by the Karnataka State Government and CPCB.	Noted and will be adhered.
(xiii)	The project proponent shall ensure that the greenery of the area is maintained. Further, 33% of the project area shall be dedicated for green belt development of which at least 5% shall be for mangrove afforestation. The local Forest Department shall be associated for this purpose and requisite budget earmarked.	Presently MSEZL has completed Green Belt development in 237 acres out of 272 acres by planting 106650 saplings and remaining green belt development will be completed in the year 2018-19. Green Belt operation & maintenance is for 2-3 years & plants are maintained as per the good practises to ensure 100% survival. Slope stabilisation in about 18 acres with vetiver grass has been completed.
(xiv)	The project proponent shall ensure that the water requirement of the Mangalore city does not get affected due to the SEZ operation. Adequate provision shall be made in the reservoirs to provide for the water requirement of the cities.	Noted.
(xv)	The project proponent shall ensure that during construction and operation of the project the traffic in the city is not affected.	Complied.
(xvi)	All precautions of the highest standards shall be incorporated in the design of the project to ensure that there is no chance of emission/leakage of hazardous chemicals including Benzene. Detailed monitoring programme shall be designed and the information provided to the public through display and dedicated website by means of online monitoring.	Noted and will be complied.
(xvii)	Low Sulphur internal fuel oil and fuel gas shall be fired in process heaters and boilers.	Noted and will be complied.
(xviii)	Quarterly monitoring of fugitive emissions shall be carried out by Fugitive Emission Detectors (GMI Leak Surveyor). Guidelines of CPCB will be followed for monitoring fugitive emissions. For control of fugitive emissions, all unsaturated hydrocarbons shall be routed to the flare system. The flare system shall be designed for smokeless burning. Flare Gas Recovery System shall be installed for reduction of Hydrocarbon loss and emission of VOCs, NO _x , N ₂ O, SO _x & CO ₂ to the environment.	Noted and will be complied.
(xix)	Regular Ambient Air Quality Monitoring shall be carried out. The location and results of existing monitoring stations shall be reviewed in consultation with the concerned State Pollution Control Board based on the	Ambient Air Quality Monitoring is being carried out regularly in two locations and the locations of monitoring are selected in consultation with KSPCB. The reports of



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S. No.	A. SPECIFIC CONDITIONS	COMPLIANCE
(viii)	A marine Environment Impact Assessment and Risk Assessment along with the Disaster Management Plan shall be prepared for the outfall facilities proposed in the Coastal Regulation Zone and the marine areas.	NIO has carried out EIA, Risk Assessment, DMP and Bathymetry survey along with Marine Outfall pipeline alignment. The detailed design report of the Marine Outfall facility is prepared by Master planning consultants of MSEZ under the guidance of Department of Oceanography, IIT Chennai. The design report was also vetted by NIO, Goa. The detailed project report of the facility is submitted to MoEF during November 2009. MSEZ has taken up the implementation of the above facility and completed the work by July 2014. MSEZ obtained consent for operation of treated waste water discharge line from KSPCB vide dated 9 Sep 2014, 8 Oct 2015 & 27 Aug 2016.
(ix)	Project proponent shall put up a dedicated website and a display panel to inform the public regarding the Ambient Air Quality along with SO ₂ NO _x and other parameters as prescribed as Central Pollution Control Board (CPCB).	MSEZL has dedicated website 'www.msezl.com', wherein Environment Monitoring Parameters are periodically uploaded and made available to the public. Installation and commissioning of Continuous Ambient Air Quality Monitoring station (CAAQMS) has been completed during the month July 2017 and presently data is being transferred to CPCB server continuously. The location of monitoring station is finalized in consultation with KSPCB.
(x)	The gaseous emissions (SO ₂ , NO _x , HC, VOC and Benzene) from various process units shall conform to the standards prescribed by the concerned State Pollution Control Board. All the measures detailed in the EMP and response to the Public Hearing shall be taken to control the point/stack and fugitive gaseous emissions from the proposed facilities, processes and storage units etc., for ensuring that the ambient air quality around the Refinery due to the expansion is maintained at the predicted 24 hourly average maximum concentration.	Noted. The existing units in MSEZ are complying the conditions and submitting reports to KSPCB directly. MRPL phase III expansion has been detached from MSEZ phase I project vide EC amendment dated 13 th July 2012. MRPL shall be complying conditions relevant to them as part of their existing clearance.
(xi)	The emission levels of the other pollutants shall also remain within the permissible levels	Noted.



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S. No.	A. SPECIFIC CONDITIONS	COMPLIANCE
	occurrence of maximum ground level concentration and downwind direction of wind. Additional Stations shall be set up, if required. It shall be ensured that at least one monitoring station is set up in up-wind & in down-wind direction along with those in other directions.	monitored data attached as Annexure-I .
(xx)	On-line data for air emissions shall be transferred to the CPCB and SPCB regularly. The instruments used for ambient air quality monitoring shall be calibrated regularly. The monitoring protocol shall ensure continuous monitoring of all the parameters.	Installation and commissioning of Continuous Ambient Air Quality Monitoring station (CAAQMS) has been completed during the month July 2017 and presently data is being transferred to CPCB server continuously. The location of monitoring station is finalized in consultation with KSPCB.
(xxi)	The practice of acoustic plant design shall be adopted to limit noise exposure for personnel to an 8 hr time weighted average of 90 dB (A).	Noted and will be complied.
(xxii)	All the pumps and other equipment's, where there is a likelihood of HC leakages, shall be provided with appropriate indicators and detectors. Provision for immediate isolation of such equipment, in case of a leakage shall also be made. The company shall adopt Leak Detection And Repair (LDAR) programme for quantification and control of fugitive emissions.	Noted and will be complied.
(xxiii)	The product loading gantry shall be connected to the product sphere in closed circuit through the vapour arm connected to the tanker. Data on fugitive emissions shall be regularly monitored and records shall be maintained	Noted and will be complied.
(xxiv)	The company shall ensure that no halogenated organic is sent to the flares. If any of the halogenated organic are present, then the respective streams may be incinerated, if there are no technically feasible or economically viable reduction/recovery options. Any stream containing organic carbon, other than halogenated shall be connected to proper flaring system, if not to a recovery device or an incinerator.	Noted and will be complied.
(xxv)	The new standards/norms that are being proposed by the CPCB for Petrochemical Plants and Refineries shall be applicable for the proposed expansion unit. The company shall conform to the process vent standards for organic chemicals including non-VOCs and all possible VOCs i.e., TOCs standards and process vent standards for top priority chemicals. Regular monitoring will be carried out for VOC and HC and On-line monitors for VOC measurements may be installed.	Noted and will be complied.



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S. No.	A. SPECIFIC CONDITIONS	COMPLIANCE
(xxvi)	Regular monitoring of relevant parameters for the underground water in the surrounding areas shall be undertaken and the results shall be submitted to the relevant States Pollution Control Board.	Regular monitoring of ground water is being carried in 10 locations & the reports are attached as Annexure-I . The locations are finalized in consultation with KSPCB.
(xxvii)	Solid waste generated as Pretreater and Reformer Catalysts, Sulphur guard absorbent and Alumina Balls shall be disposed off as per the authorization from the State Pollution Control Board.	Noted and will be complied. During operation stage MSEZL will dispose the solid waste as per the directions of State Pollution Control Board.
(xxviii)	Oily sludge shall be sent to melting pit treatment for recovery of oil. The recovered oil shall be recycled into the refinery system. The residual sludge will be stored in HDPE lined pit for disposal after treatment. The sludge shall be incinerated in the premises only.	Noted and will be complied.
(xxix)	The company shall strictly follow all the recommendations mentioned in the Charter on Corporate Responsibility for Environmental Protection (CREP).	Noted and will be complied.
(xxx)	The Company shall harvest surface as well as rainwater from the rooftops of the buildings proposed in the expansion project and storm water drains to recharge the ground water and use the same water for the various activities of the project to conserve fresh water.	Noted and will be complied.
(xxxi)	Occupational Health Surveillance of the workers should be done on a regular basis and records maintained as per the Factories Act.	Complied and copy of the same is attached as Annexure-II .
(xxxii)	The Company shall implement all the recommendations made in the Environmental Impact Assessment /EMP report and risk assessment report.	MSEZL has implemented most of the recommendations of EIA/EMP report and still some of the projects of MSEZL as per EIA/EMP recommendations are under way.
(xxxiii)	The company will undertake all relevant measures, as indicated during the Public Hearing for improving the Socio-economic conditions of the surrounding area.	MSEZL is undertaking all relevant measures for improving the Socio-economic condition of the surrounding area as indicated during the Public Hearing.
(xxxiv)	With regard to R&R colony the project proponent shall obtain all requisite clearances as prescribed by the concerned agencies.	The R&R Colonies are developed after obtaining the requisite clearances from the concerned Departments like MoEF, KSPCB, Mangalore Urban Development Authority etc.



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S. No	B. GENERAL CONDITIONS	Compliance
(i)	The project authorities shall strictly adhere to the stipulations made by the concerned State Pollution Control Board (SPCB) and the State Government.	Noted and will be complied.
(ii)	No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment and Forests.	MSEZ obtained amendment to EC 1. Dated 13 July 2012 2. 27 Aug 2014, this involves widening of existing public road towards river side adjacent to MSEZ proposed pipeline cum road Corridor in Reach-II area. 3. 18 th June 2015 for development of Multi Product Units as Mangalore SEZ. Copy of amendments is submitted.
(iii)	At no time, the emissions shall be allowed to go beyond the prescribed standards. In the event of failure of any pollution control system adopted by the units, the respective unit should be immediately put out of operation and should not be restarted until the desired efficiency has been achieved.	Noted and will be complied.
(iv)	Adequate number of influent and effluent quality monitoring stations shall be set up in consultation with the SPCB. Regular monitoring shall be carried out for relevant parameters for both surface and ground water.	The treated effluent parameters are measured through online measuring instruments installed at outlet line of Marine outfall pump house for the parameters like pH, DO, COD, TSS, and Conductivity. Further Ground water and surface water monitoring is carried out in the surrounding areas regularly & the reports are attached as Annexure-I . The locations are finalized in consultation with KSPCB.
(v)	Industrial wastewater shall be properly collected and treated so as to conform to the standards prescribed under GSR 422 (E) dated 19 th May 1993 and 31 st December, 1993 or as amended from time to time. The treated wastewater shall be utilized for plantation purpose.	Noted and will be complied.
(vi)	The overall noise levels in and around the plant area shall be limited within the prescribed standards (85dBA) by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels should conform to the standards prescribed under EPA Rules, 1989 viz.	Noted and will be complied.



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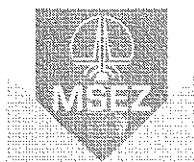
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S. No	B. GENERAL CONDITIONS	Compliance
	75dBA (day time) and 70dBA (night time).	
(vii)	The project authorities shall strictly comply with the provisions made in Manufacture, Storage and Import of Hazardous Chemicals Rules 1989 as amended in 2000 for handling of hazardous chemicals etc. Necessary approvals from Chief Controller of Explosives must be obtained before commission of the expansion project. Requisite On-site and Off-site Disaster Management Plans will be prepared and implemented.	Noted and will be complied. MRPL phase III expansion has been detached From MSEZ phase I project vide EC amendment dated 13 th July 2012. MRPL shall be complying conditions relevant to them as part of their existing clearance.
(viii)	Authorization from the State Pollution Control Board must be obtained for collections/treatment/storage/disposal of hazardous wastes.	Noted and will be complied.
(ix)	The project authorities shall provide adequate funds both recurring and non-recurring to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so provided shall not be diverted for any other purposes.	Noted and will be complied.
(x)	The stipulated conditions shall be monitored by the concerned Regional Office of this Ministry/Central Pollution Control Board/State Pollution Control Board. A six monthly compliance report and the monitored data shall be submitted to them regularly. It shall also be displayed on the Website of the Company.	Compliance report is being submitted to MoEF/KSPCB on regular basis for every six months along with Ambient Air Quality monitoring report, Noise monitoring report & Ground water monitoring report. Compliance report is also displayed in the Company website.
(xi)	The Project Proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the State Pollution Control Board/ Committee and may also be seen at Website of the Ministry of Environment and Forests at http://www.envfor.nic.in . This should 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 should be forwarded to the concerned Regional office of this Ministry.	The information regarding the EC has been published in the news papers and same was submitted to Ministry and KSPCB.
(xii)	The date of Financial Closure and final approval of the project by the concerned authorities and the date of commencing the land development work as well as the commissioning of the project shall be informed to the	MSEZL has taken up the land development & infrastructure works from April 2011. MSEZL Board has approved the Business Plan for Infrastructure



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S. No	B. GENERAL CONDITIONS	Compliance
	Ministry and its Regional Office.	Development during Aug. 2012.
(xiii)	Proper Housekeeping and adequate occupational health programmes shall be taken up. Regular Occupational Health Surveillance Programme for the relevant diseases shall be carried out and the records shall be maintained properly for at least 30-40 years. Sufficient preventive measures shall be adopted to avoid direct exposure to emission and other Hydrocarbons etc.	Noted and will be complied.
(xiv)	A separate environment management cell with full fledged laboratory facilities to carry out various management and monitoring functions shall be set up under the control of a Senior Executive.	Sr. General Manager (Environment & Civil) & Sr. Environmental Engineer are in place to take care of Environmental issues. Horticulture Sr. Manager is appointed for development and maintenance of Green belt. The set up of laboratory facilities is under progress.

S. No	EC Amendment conditions dtd. 13 th July 2012	Compliance
(i)	Only the sector Specific shall be permitted in the SEZ & those units shall obtain separate Environmental Clearance as applicable.	MSEZL obtained amendment to EC for development of Multi Product units as Mangalore SEZ dated 18 th June 2015.
(ii)	Proponent shall enhance the allocation for the CSR activities from 2.5 to 5 % of the total cost & item-wise details along with time bound action plan shall be prepared & submitted to the Ministry's Regional office at Bangalore. Implementation of such program shall be ensured accordingly in a time bound manner.	MSEZL has already taken up CSR activities and details of CSR activity is attached as Annexure- III .
(iii)	The green belt shall be 33% all along the periphery & width of the green belt shall be minimum 50 mts.	Noted and will be complied.



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S. No	EC Amendment conditions dtd. 27 th Sep 2014	Compliance
(i)	The project proponent while carrying out the road widening works towards river side should not cause any impact to the river water flow and should be clear of river water way.	Complied.
(ii)	The project proponent to take up the bank protection works like stone pitching etc to avoid soil erosion of the banks.	River bank protection works as directed by WRDO are carried out.
(iii)	The project proponent to take up all adequate measures to mitigate the dust pollution during the road widening works.	Complied.
(iv)	The proponent shall not dump any construction wastes etc in the river portion.	Complied.

With Regards

Eta Sreenivasulu

Sr. General Manager

Mangalore SEZ Ltd.

Encl.:

1. Monitoring reports for Air, Water & Noise Environment.
2. Environmental compliance report & Environmental Monitoring Reports from OMPL.

Copy to: Environmental Officer, Karnataka State Pollution Control Board, Mangalore.

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28, Dec 2018

MSEZL/MNG/EN/2018-19

To,

The Director,
Southern Region, Regional Office,
Ministry of Environment and Forests,
Kendriya Sadan, 4th Floor, E&F Wings,
17th Main Road, 1st Block, Koramangala,
Bangalore - 560 034

Sir,

Sub: Development of Residential Colony for Rehabilitation and Resettlement for SEZ Complex at Kulai & Thokur village, Mangalore Taluk & District by M/s Mangalore SEZ Limited, Mangalore.

Ref: 1) Environmental Clearance No: SEIAA: 140: CON: 2008, dated 25th June 2008.

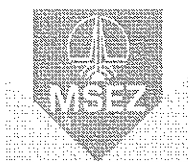
With reference to above, we would like to submit the compliance report as on date

A. SPECIFIC CONDITIONS		
I. CONSTRUCTION PHASE		
(i)	Setup an Environment Management cell and ensure that the cell manages/maintains all the environmental aspects such as sewage treatment, solid waste disposal, maintenance of green belt areas etc, and in case the commercial space is sold/leased, then enter into agreement as per the draft agreement copy submitted, with the prospective buyers to ensure that they maintain the cell and take care of all environment concerns during the operation phase of the project. In addition sufficient fees should be levied so as to raise a corpus fund to maintain the Environment Cell.	MSEZL Environment Management cell is established to look after the environmental aspects like sewage treatment, Solid waste disposal & Development and maintenance of Green belt etc. The conditions specified regarding selling or leasing of Commercial space will be complied.
(ii)	Appoint an Environment and Safety Engineer during the construction phase to take care of environment and safety aspects as committed.	Yes. Sr. Environmental Engineer and Sr. General Manager (Environment & Civil) are in place to take care of Environmental issues and Safety aspects. Horticulture Sr. Manager has appointed for development and maintenance of Green belt.

REGIONAL OFFICE

Karnataka State Pollution Control Board
Plot No.10-8, Baikampady Industrial Area
MANGALORE-575006

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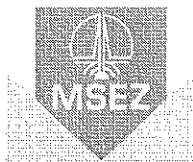
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(iii)	All required sanitary and hygienic measures should be in place before starting construction activities and to be maintained throughout the construction phase. Sufficient number of toilets/bathrooms should be provided with required septic tanks and soak pits for construction work force.	Complied.
(iv)	A First Aid Room should be provided in the project both during construction and operation of the project.	A Doctor, clinic and Medical shop is established at 48 acres R&R colony to look after the Project Rehabilitated People. MSEZL has taken up with GoK for setting up Primary Health centre and agreed to provide land for the setting up the same.
(v)	Adequate drinking water and sanitary facilities should be provided for construction workers at the site. The safe disposal of waste water and solid wastes generated during the construction phase should be ensured.	Works are completed.
(vi)	Provision should be made for the supply of fuel (kerosene or cooking gas) utensils such as pressure cookers etc, to the labourers during the construction phase.	Works are completed.
(vii)	All the labourers to be engaged for construction should be screened for health and adequately treated before engaging them to work at the site and detailed report submitted to SEIAA. Safety standards as per National Building Code (NBC) should be ensured.	Works are completed.
(viii)	For disinfection of waste water meant for uses other than toilet flushing, use ultra violet radiation and not chlorination. For recirculation of treated waste water for toilet flushing, use chlorination.	Works are completed.
(ix)	All the top soil excavated during construction activities should be stored for use in horticulture/Landscape development within the Project site.	Works are completed.
(x)	Disposal of construction waste during construction phase should not create any adverse effect on the neighbouring communities and be disposed taking the necessary precautions for general safety and health aspects of people, only in approved sites with the approval of competent authority.	Works are completed.
(xi)	Soil and ground water samples should be tested at the project site during the construction phase to ascertain that there is no threat to ground water quality by leaching of heavy metals and or other toxic contaminants and report submitted to SEIAA.	The project is for development of R&R Colony and the scope of works is to develop the graded sites to Project displaced families with water and sanitation facilities. There are no chances of heavy metals or toxic



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		contaminants produced from the activity. However MSEZL has carried out the portability test for water & report has been forwarded.
(xii)	Construction spoils, including bituminous material and other hazardous materials, must not be allowed to contaminate water courses and the dumpsites for such material must be secured, so that they should not leach into the ground water.	Noted. The project is development of R&R Colony and the scope of works is to develop the graded sites to Project displaced families with water and sanitation facilities. There are no chances of construction spoils or Hazardous materials produced from the activity.
(xiii)	The diesel generator sets to be used during construction phase should be of low sulphur diesel type and should conform to Environment (Protection) Rules prescribed for air and noise emission standards.	Noted. No Diesel generators were used during the construction works.
(xiv)	Vehicles hired for bringing construction material to the site should be in good condition and should conform to applicable air and noise emission standards and should be operated only during non-peak hours.	Works are completed.
(xv)	Ambient noise levels should conform to residential standards both during day and night. Incremental pollution loads on the ambient air and noise quality should be closely monitored during construction phase. Adequate measures to reduce air and noise pollution during construction keeping in mind CPCB norms on noise limits.	Works are completed.
(xvi)	Fly ash should be used as building material in the construction as per the provisions of Fly Ash Notification of September 1999 and amended as on August 2003	The Project is for development of R&R Colonies with Infrastructure like roads, water & Drainage facilities. There is no requirement of building construction and hence usage of Fly ash does not arise. However in future if MSEZL takes up any building the same will be complied.
(xvii)	Ready mixed concrete must be used in building construction.	The Project is for development of R&R Colonies with Infrastructure like roads, water & Drainage facilities. There is no requirement of building construction and hence usage of Ready mixed concrete does not arise. However in future if MSEZL takes up any building the same will be complied.
(xviii)	Storm water control and its re-use as per CGWB and BIS standards for various applications.	Complied by developing efficient drainage facilities.



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(xix)	Water demand during construction should be reduced by use of pre-mixed concrete, curing agents and other best practices.	Complied.
(xx)	The Project Authorities shall not undertake either draws of Ground water or drilling of bore wells.	Complied.
(xxi)	Separation of grey and black water should be done by the use of dual plumbing line for separation of grey and black water.	Project is development of R&R colonies and there is no scope for MSEZ in plumbing work.
(xxii)	Treatment of 100% grey water by decentralized treatment should be done.	100 cum/day Skid mounted STP is erected already in 48 Acres & 35 Acres colony to treat the grey water.
(xxiii)	Fixtures for showers, toilet flushing and drinking should be of low flow either by use of aerators or pressure reducing devices or sensor based control.	The Project is for development of R&R Colonies with Infrastructure like roads, water & Drainage facilities. There is no requirement for usage of Showers, toilet flushing etc and the condition is not relevant to project implementation.
(xxiv)	Use of glass may be reduced by up to 40% of exposed area to reduce the electricity consumption and load on air conditioning. If necessary, use high quality double glass with special reflective coating in windows.	The Project is for development of R&R Colonies with Infrastructure like roads, water & Drainage facilities. There is no requirement for usage of glass etc and the condition is not relevant to project implementation.
(xxv)	Roof should meet prescriptive requirement as per Energy Conservation Building Code by using appropriate thermal insulation material.	The Project is for development of R&R Colonies with Infrastructure like roads, water & Drainage facilities. There is no requirement for construction of Building roof etc and the condition is not relevant to project implementation.
(xxvi)	Opaque wall should meet prescriptive requirement as per Energy Conservation Building Code which is proposed to be mandatory for all air conditioned spaces while it is optional for non-air conditioned spaces by use of appropriate thermal insulation material to fulfil the requirement.	The Project is for development of R&R Colonies with Infrastructure like roads, water & Drainage facilities. There is no requirement for construction of Building wall or air conditioned spaces etc and the condition is not relevant to project implementation.

II. OPERATION PHASE

(i)	The installation of the Sewage Treatment Plant (STP) of	It was informed to the Assessment Authority
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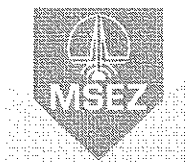
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	16.5 MLD capacity should be carried out before the construction of the second floor of the main structures is commenced and the plant shall be got certified by an independent expert and a report in this regard should be submitted to the SEIAA immediately. Discharge of treated sewage shall conform to the norms & standards of the Karnataka State Pollution Control Board. Treated sewage should be used for flushing, gardening, etc. as proposed.	by vide our letter dated 22 nd July 2008, that MSEZL has not proposed installation of 16.5 MLD STP, but however the sewage generated in the proposed Colonies will be taken to the proposed 16.5 MLD STP by Mangalore City Corporation.
(ii)	Rainwater harvesting for roof run-off with sufficient capacity artificial pond at ground level for rainwater collection and also surface run-off harvesting should be implemented. Before recharging the surface runoff, pre-treatment must be done to remove suspended matter, oil and grease. Detailed rainwater harvesting plan should be submitted immediately.	The project is development of R&R colonies. The scope of MSEZL is development of plots and hand over to PDF's. The building construction is in the scope of PDF's.
(iii)	Ensure that the excess runoff rainwater from the green belt area, which is irrigated by treated water, does not get into infiltration pits and contaminate the ground water. Such excess flow should be safely let in to the storm water drains.	Complied.
(iv)	The solid waste generated should be properly collected and segregated before disposal to the City Municipality Facility.	Noted. Being complied.
(v)	Any hazardous waste including biomedical waste should be disposed of as per applicable Rules and norms with necessary approvals of the Karnataka State Pollution Control Board.	Noted and will be complied.
(vi)	As agreed to by the project proponent, develop minimum 13% of the project area i.e., minimum 50 acres area for green belt and plant with tree species at an espacement of 3mts x 3mts i.e. 1,111 plants/hectare. The balance 20% shall be made up by taking up tree planting on the road sides in the project and if required outside the project so as to ensure that 33% of the project area covered under green belt. The green belt design along the Periphery of the plot shall achieve attenuation factor conforming to the day and night noise standards prescribed for residential land use. The open spaces inside the plot should be suitably landscaped and covered with vegetation of indigenous variety.	The green belt development is already taken up in Phase I (48 Acres) colony. Around 3000 trees are planted in an extent of 6.6 acres and 600 trees are planted in Bajpe R&R Colony and 8500 tree samplings are planted in other R&R colonies. The balance tree plantation in 22.5 Acres land will be taken in the year of 2018-19. Slope stabilization by vetiver grass taken up in 3 Acre area to check soil erosion.
(vii)	Incremental pollution loads on the ambient air quality;	Noted.



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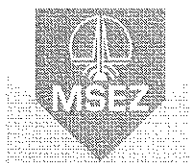
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	noise and water quality should be periodically monitored after commissioning of the project.	
(viii)	Application of Solar energy should be incorporated for illumination of common areas, lighting for gardens and street lighting in addition to provision for solar water heating. A hybrid system or fully solar system for the complex should be provided. Details in this regard should be submitted to the SEIAA.	The Project is for development of R&R Colonies with Infrastructure like roads, water & Drainage facilities. There is no requirement for solar water heating or lighting for gardens and the condition is not relevant to project implementation. The colony will be handed over to Mangalore City Corporation after development & O&M tenure issued. Hence the street lighting with MESCOM connections are provided.
(ix)	Traffic congestion near the entry and exit points from the roads adjoining the proposed project site must be avoided. Parking must be fully internalized and no public space should be utilized.	Complied.
(x)	A Report on the energy conservation measures confirming to energy conservation norms finalized by Bureau of Energy Efficiency should be prepared incorporating details about building materials & technology, R&U Factors etc and submit to the SEIAA in three months time.	The Project is for development of R&R Colonies with Infrastructure like roads, water & Drainage facilities. There is no requirement for energy consumption equipments or Building appliances and the condition is not relevant to project implementation.
B. GENERAL CONDITIONS		
(i)	The Environmental safeguards contained in the EIA Report should be implemented in letter and spirit.	Complied.
(ii)	All commitments made by the proponents in their application, and subsequent letters addressed to the SEAC/SEIAA should be accomplished before the construction work of the project is completed.	Complied.
(iii)	Six monthly monitoring reports should be submitted to the SEIAA and the Regional Office, MoEF, Bangalore, failing which action may be taken to cancel the Environmental Clearance certificate issued.	Noted. Being complied.
(iv)	Officials from the Department of Ecology and Environment, Bangalore/Regional Office of MoEF, Bangalore/Regional Director (Environment) Dept. of Ecology and Environment, Mangalore/ Regional Officer, KSPCB Mangalore and KSPCB Bangalore who would be monitoring the implementation of Environmental safe guards should be given full	The complete sets of documents submitted to MoEF/SEIAA were forwarded as directed in the Conditions. MSEZL will comply in providing the full cooperation to the Monitoring officers.



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	cooperation, facilities and documents/data by the project proponents during their inspection. A complete set of all the documents submitted to MoEF/SEIAA should be forwarded to the CCF, Regional Office of MoEF, Bangalore/Department of Ecology and Environment, Bangalore /Regional Director, (Environment) Department of Ecology and Environment, Mangalore/Regional Officer, KSPCB Mangalore and KSPCB Bangalore.	
(v)	In the case of any change(s) in the scope of project, the project would require a fresh appraisal by this Authority.	Noted.
(vi)	The Authority reserves the right to add additional safeguard measures subsequently, if found necessary, and to take action including revoking of the environment clearance under the provisions of the Environment (Protection) Act, 1986, to ensure effective implementation of the suggested safeguard measures in a time bound and satisfactory manner.	Noted.
(vii)	All other statutory clearances such as the approvals for storage of diesel from Chief Controller of Explosives, Fire Department, Civil Aviation Department, Forest Conservation Act 1980 and Wildlife (Protection) Act, 1972 etc shall be obtained, as applicable by project proponents from the competent authorities.	Noted.
(viii)	The project proponent should advertise in at least two local Newspapers widely circulated in the region, one of which shall be in vernacular language informing that the project has been accorded environmental clearance and copies of clearance letters are available with the Karnataka State pollution Control board and may also be seen on the website of the Ecology and Environment Department at http://seiaa.kar.nic.in . The advertisement should be made within 7 days from the day of issue of the clearance letter and a copy of the same should be forwarded to the Regional Office of MoEF at Bangalore/Department of Environment and Ecology, Bangalore.	Noted. The advertisement was made in three local News papers and the copy of the same was forwarded to all concerned as directed.
(ix)	These stipulations would be enforced among others under the provisions of water (Prevention and Control of Pollution) Act, 1974, The Air (Prevention and Control of Pollution) act 1981, the Environment (Protection) Act, 1986, the Public Liability (Insurance) Act, 1991 and EIA Notification,2006.	Noted.



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(x)	Under the provisions of Environment (Protection) Act, 1986, legal action shall be initiated against the project proponent if it was found that construction of the project has been started without obtaining environmental clearance.	Noted.
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The R&R Package is being implemented strictly as per Approved policy by State Government. In 1st PDF 1235 families out of 1253, In 2nd PDF 214 families out of 214, In 3rd PDF 141 families out of 147 families & 14 shops has been compensated with R&R Packages. Totally 1604 families have vacated their houses and the process is in progress for the balance.

10 nos. R&R colonies developed - 1403 sites allotted to eligible Project Displaced Families so far and balance 30 is in the process. 359 nominees of the displaced people given training at Karnataka Polytechnic (KPT) for diploma equivalent programs in Chemical, Mechanical & Electrical disciplines and 341 nominees have already been employed. 1628 nominees would have been eligible for employment out of which 872 nominees have opted for "one time" compensation in lieu of job and balance 756 nominees opted for the jobs. 594 nos. PDF nominees have already got employment out of 756 nos. empanelled.

With Regards,

Sr. General Manager

Civil & Environment

Mangalore SEZ Ltd.

Copy to: 1) Environmental Officer, Karnataka State Pollution Control Board, Mangalore.

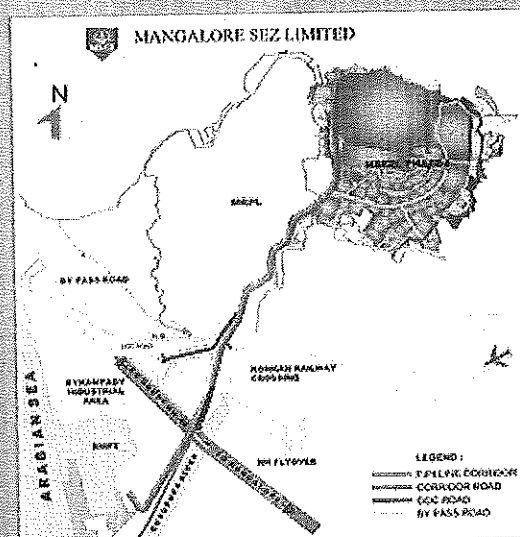


Mangalore SEZ Limited

ENVIRONMENTAL MONITORING REPORT

AMBIENT AIR QUALITY
REPORT FOR THE MONTH OF MAY 2018

Submitted to



Submitted By



M/s Hubert Enviro Care Systems Private Limited
(NABL Accredited & MOEF Recognized Laboratory)

7/C-45, Baikampady Industrial Estate, Mangaluru, Karnataka - 575011

Email: krom@hecs.in; kro@hecs.in

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AMBIENT AIR, WATER QUALITY AND NOISE MONITORING REPORT - MAY 2018

1. INTRODUCTION

Mangalore Special Economic Zone, known as MSEZ is spread across 1638 acres, located 15 km from Mangalore city, off Cochin-Mumbai NH 66, 5 km from Mangalore International Airport and 8 km from all-weather deep draft sea port, New Mangalore Port in Mangalore, Karnataka, India. MSEZ limited is jointly promoted by Oil and Natural Gas Corporation (ONGC), a fortune 500 company and infrastructure leasing & finance services, one of India's leading infrastructure development and finance companies, Karnataka Industrial Area Development Board (KIADB) and Kanara Chamber of Commerce and Industry (KCCI). A unique combination of Government entities, a large financial institution and an apex chamber brings in the expertise to develop MSEZL with world-class industrial infrastructure.

2. ENVIRONMENT MONITORING

Environmental monitoring is being carried out at Mangalore SEZ, following guidelines and regulations of MoEF/CPCB and KSPCB statutory norms. In this regard, MSEZL has awarded the work to M/s Hubert EnviroCare Systems Pvt Ltd. and to monitor air quality, water quality & noise level for the three years. As per work order, during MAY 2018, we have conducted ambient air quality, ground water quality and noise level monitoring at 2, 9 and 2 locations respectively.

3. SCOPE AND METHODOLOGY

The scope of work carried out and methodology adopted for the survey are described below:

3.1. Ambient Air Quality

Ambient air quality monitoring was carried out at each location on 24 hour basis on two consecutive days per month. The identified monitoring stations are: A₁-CETP & A₂-WTP Area. To assess the ambient air quality status, monitoring stations are identified on the basis of meteorology in the upwind and downwind direction as well as to represent the cross sectional scenario of the MSEZ. Based on the activities the parameters chosen for assessment of air quality are PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂-Nitrogen-dioxide; CO-Carbon Mono Oxide (DL 0.1 mg/m³); O₃-Ozone (DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni- (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(α)P- Benzo-α-pyrene (DL 0.1 ng/m³) as per CPCB stipulation.

3.1.1. Sampling and analysis of PM_{2.5} and PM₁₀ in ambient air (Gravimetric Method)

- i. Condition a filter paper in oven (i.e. 10 or 2.5 μm diameter)
- ii. Prepare a sampling assembly by uncorking screws of the bracket
- iii. Take a tare (initial) weight of the filter paper (w_i , mg)
- iv. Place the filter in the sampling system securely and tighten the screws of the bracket
- v. Set the timer for the period of sampling
- vi. Start the sampler and adjust flow rate to about 2L/ min for 24 hrs sampling
- vii. Note the flow rate at the end of the desired sampling period and stop the sampler
- viii. Transit the sampling train to environmental laboratory carefully with scientific precautions
- ix. Condition the filter paper again for the same period as was done prior to sampling.

Laboratory analysis:**Weighing of exposed samples:**

- i. Take final weight of the exposed filter with a standard balance (w_f , mg)

Calculations:

- i. Average flow rate (initial and final flow rates) in L/ min
$$= (\text{Initial flow rate} + \text{final flow rate}) / 2$$
- ii. Total vol. of air sampled (TVA) in m^3
$$= \text{Avg. flow rate (L/min)} * 10^{-3} (\text{m}^3/\text{L}) * \text{sampling time (hr)} * 60 (\text{min/hr})$$
- iii. Concentration of SPM in $\mu\text{g}/\text{m}^3$
$$= (w_f - w_i) (\text{mg}) / \text{TVA} (\text{m}^3) * 10^6 \mu\text{g}/\text{m}^3$$

3.1.2. Sampling and analysis of Sulphur dioxide

- i. Prepare absorbing reagent (sodium tetra-chloromercurate) by dissolving 27.2 g mercuric chloride and 11.7 g sodium chloride in 1 lit of water
- ii. Prepare a sampling train of at least 2 gas bubblers (for average reading) properly washed with distilled water and air dried.
- iii. Place bubblers in the sampling system securely connecting to the manifold. Check the connections of bubblers with the manifold and the inlet and outlet
- iv. Fill the bubblers with an absorbing reagent with an amount sufficient to last for 24 hours (approximately 15 ml for 8 hours sampling to 50 ml for 24 hours sampling)
- v. To eliminate interference of traces metals, if any, 1 drop of 0.01% EDTA solution may be added to the reagent prior to sampling ;similarly, effect of oxide of nitrogen may also be eliminated by adding 1 ml of 0.06% sulphamic acid to the reagent at site
- vi. Start the sampler and adjust flow rate to 2 lit/ min.
- vii. Note the flow rate at the end of desired sampling period and stop the sampler
- viii. Transit the sampling train to environmental laboratory carefully with scientific precautions and preserve the sample tubes in a controlled environmental conditions

Laboratory analysis:**Calibration curve:**

- i. Prepare a standard solution of SO₂ concentrations ranging from 0 to 25 µg SO₂ by taking definite amount of std. sulphur dioxide solution in a 25 ml volumetric flasks
- ii. Add 14 ml of absorbing reagent and 1 ml of pararosaniline hydrochloride to each of the flasks making a total volume of 20 ml.
- iii. Measure absorbance for each flasks by spectrophotometer at 540 nm wavelength
- iv. Plot graph of absorbance v/s concentration

Absorbance in samples:

- i. Transfer samples to a 25 ml flask and develop colour as done in calibration curve
- ii. Measure absorbance at 540 nm
- iii. Find out the concentration (µgSO₂) corresponding to the measured absorbance from the calibration curve

Calculations:

- i. Average flow rate (if there is a significant difference in initial and final flow rates)
- ii. Total volume of air sampled (TVA) in m³
= Avg. flow rate (lit) * 10⁻³ (m³/lit) * sampling time (hr) * 60 (min/hr)
- iii. µgSO₂/TVA

3.1.3. Sampling and analysis of Nitrogen-di-oxide

- i. Prepare absorbing reagent (a solution of sodium hydroxide and arsenite) by dissolving 4 g sodium hydroxide and 1 g of sodium arsenite in 1 lit of distilled water
- ii. Prepare a sampling train of at least 2 gas bubblers (for average reading) properly washed with distilled water and air dried .
- iii. Place bubblers in the sampling system securely connecting to the manifold. Check the connections of bubblers with the manifold and the inlet and outlet
- iv. Fill the bubblers with an absorbing reagent with an amount sufficient to last for 24 hours (approximately 15 ml for 8 hours sampling to 50 ml for hours sampling)
- v. To eliminate interference of sulphur dioxide , drop of hydrogen peroxide may be added to the reagents to convert sulphur dioxide into sulphate during analysis
- vi. Start the sampler and adjust flow rate to about 0.2 lit/ min for 24 hours sampling
- vii. Note the flow rate at the end of desired sampling period and stop the sampler
- viii. Transit the sampling train to environmental laboratory carefully with scientific precautions and preserve the sample tubes in a controlled environmental conditions

Laboratory analysis:**Calibration curve:**

- i. Prepare a standard solution of NO_x concentrations ranging from 0 to 25 $\mu\text{g SO}_2$ by taking definite amount of std. sulphur dioxide solution in a 25 ml volumetric flasks
- ii. Add 14 ml of absorbing reagent and 1 ml of pararosaniline hydrochloride to each of the flasks making a total volume of 20 ml.
- iii. Measure absorbance for each flasks by spectrophotometer at 540 nm wavelength
- iv. Plot graph of absorbance v/s concentration

Absorbance in samples:

- i. Transfer samples to a 25 ml flask and develop colour as done in calibration curve
- ii. Measure absorbance at 540 nm
- iii. Find out the concentration ($\mu\text{g NO}_x$) corresponding to the measured absorbance from the calibration curve

Calculations:

- i. Average flow rate (if there is a significant difference in initial and final flow rates)
- ii. Total volume of air sampled (TVA) in m^3
$$= \text{Avg. flow rate (lit)} * 10^{-3} (\text{m}^3/\text{lit}) * \text{sampling time (hr)} * 60 (\text{min/hr})$$
$$\mu\text{gNO}_x/\text{TVA}$$

3.1.4. Sampling and analysis of Carbon Mono Oxide**Preparation of sample train:**

- i. Sampling begins with conditioning a sampling train and then gas analyzer
- ii. Pressure system is preferred to condition the sampling train by installing pump before the analyzer. Reducing valve needs to be fitted between the analyser and pump to eliminate the pulsing effect of pump on the analyzer
- iii. Flow meter is to be installed just before the analyzer
- iv. A fibre filter is used to capture the particulate matter prior to the optical cell to prevent its interference. As it often accumulates on the optical cell reducing the efficiency
- v. To eliminate the interference of water vapour, refrigeration or desiccant with magnesium perchlorate may be used

Mode of operation:

- i. Continuous analysis is carried out at the flow rate of about 100 ml/min to 1000 ml/min (depending upon the level of pollution near the location) for the desired sampling period
- ii. Discrete sampling may also be possible with infra red analyzer. It however requires proper cleaning of the sampling train.

Steps:

- i. Calibration of analyzer can be carried out if required using standard gases
- ii. Sampler is allowed to warm up for some time before actual readings are taken till the sampler gives steady response and temperature stability

3.1.5. Sampling and analysis of Ozone**Dynamic calibration:**

- i. Dynamic calibration may be performed by preparing a large mixture of ozone in air
- ii. The output of an ozonizer is fed into the intake of a small blower delivering air. The mixture of gas however emerges through a short length of pipe
- iii. One portion of this mixture is analyzed in the recorder.
- iv. Another portion is analyzed through a faintly blue iodine solution containing starch and potassium iodide.
- v. Titrated this solution with sodium thiosulphate(0.1N)
- vi. The end point established by comparison with the blue starch- iodine solution
- vii. Mixture of ozone and air in polyester film bag may be prepared and admitted to the analyzer.
- viii. The mixture is analyzed at the time it is used since the ozone decomposes gradually
- ix. Analysis is then performed by passing a measured volume through an impinge containing buffered KI solution and determined the released iodine by spectrometer method
- x. Make the second mixture about midscale concentration and adjust sample or reagent flow rates until the recorder reading agrees with the absorbance scale according to the analytically determined concentration of ozone
- xi. Check several other points on the curve if desired and liner or logarithmic chart may be prepared followed by a calibration curve to read in ppm

Laboratory analysis:**Calibration curve:**

- i. Plot graph of absorbance v/s concentration

Procedure:

- i. Place a fresh absorbent solution in the storage bottle and operate the solution pump until the liquid are full
- ii. After the flow has stabilized itself, zero the recorder and start the air pump
- iii. Set the flow at convenient rates such as 4 ml/ min of solution and 4 l/min of air
- iv. Check and adjust the flow rates daily.
- v. Adjust the pH of the solution once or twice a week ,at time the solution shall be brought up to volume by addition of distilled water
- vi. Change the carbon filter about once a month. Also change the absorbing solution at the same time

3.1.6. Sampling and analysis of Ammonia:

Ammonia is collected in dilute Sulphuric acid solution in midjet impingers to form Ammonium Sulphate. The solution is treated with Nessler's reagent to produce a yellow brown complex. The Ammonia concentration is determined by reading the absorption of the complex at 440 nm and comparing with a standard curve.

3.1.7. Sampling and analysis of Lead, Nickel, Arsenic:

1. Sampling procedure:

Tilt back the inlet and secure it according to manufacturer's instructions. Loosen the face-plate wing-nuts and remove the face plate. Remove the filter from its jacket and centre it on the support screen with the rough side of the filter facing upwards. Replace the face-plate and tighten the wing-nuts to secure the rubber gasket against the filter edge. Gently lower the inlet. For automatically flow-controlled units, record the designated flow rate on the data sheet. Record the reading of the elapsed time meter. The specified length of sampling is commonly 8 hours or 24 hours. During this period, several reading (hourly) of flow rate should be taken. After the required time of sampling, record the flow meter reading and take out the filter media from the sampler and put in a container or envelope

2. Analysis:

i. Hot plate procedure:

Cut a 1" x 8" strip or half the filter from the 8" x 10" filter using a stainless steel pizza cutter. Place the filter in a beaker using vinyl gloves or plastic forceps. Cover the filter with the extraction solution (3% HNO_3 & 8% HCl). Place beaker on the hotplate, contained in a fume hood, and reflux gently while covered with a watch glass for 30 min. Do not allow sample to dry. Remove the beakers from the hot-plate and allow to cool. Rinse the beaker walls and wash with distilled water. Add approximately 10 mL reagent water to the remaining filter material in the beaker and allow to stand for at least 30 min. Transfer the extraction fluid in the beaker to a 100 mL volumetric flask or other graduated vessel. Rinse the beaker and any remaining solid material with distilled water and add the rinses to the flask. Dilute to the mark with distilled water (Type I) water and shake. The final extraction solution concentration is 3 % HNO_3 /8% HCl . The filtered sample is now ready for analysis

2.1. Analysis of samples:

i. Instrument / Equipment:

A light beam containing the corresponding wavelength of the energy required to raise the atoms of the analyte from the ground state to the excited state is directed through the flame or furnace. This wavelength is observed by a monochromator and a detector that measure the amount of light absorbed by the element, hence the number of atoms in the ground state in the flame or furnace. A hollow cathode lamp for the element being determined provides a source of that metal's particular absorption wavelength. The method describes both flame atomic absorption (FAA) spectroscopy and graphite furnace atomic absorption (GFAA) spectroscopy. Atomic Absorption Spectrophotometer - analyze the metals by Flame, if results are below detection limit then go for GTA. Arsenic is analyzed by Flame – VGA.

ii. Flame Procedure:

Set the atomic absorption spectrophotometer for the standard condition as follows: choose the correct hollow cathode lamp, align the instrument, position the monochromator at the value recommended by the manufacturer, select the proper monochromator slit width, set the light source current, ignite the flame, regulate the flow of fuel and oxidant, adjust the burner for maximum absorption and stability and balance the meter. Run a series of standards of the metal of interest and construct a calibration curve. Aspirate the blanks and samples. Dilute samples that exceed the calibration range. For Lead (Pb) and Nickel (Ni), the wavelength required for analysis is 217nm and 232nm respectively. Where as in case of Arsenic (As), the VGA should attach with Flame and the wavelength required for analysis is 193.7nm.

3. Calibration:

Prepare standard solutions from the stock solutions. Select at least three standards to cover linear range as recommended by method. Aspirate the standards into the flame or inject the standards into the furnace and record the absorbance. Prepare the calibration graph by plotting absorbance and concentration in $\mu\text{g/ml}$.

i. Preparation of Standards:

For each metal that is to be determined, standards of known concentration must be acquired commercially certified standards.

ii. Standard Curve:

Standard curve is prepared by using standard solutions of known concentration.

4. Calculations:**i. Sample Air Volume:**

Sample air volume can be calculated by using the following equation:

$$V = (Q) (t)$$

Where,

V = volume of air, m^3

Q = average sampling rate, m^3/min .

t = time in minutes.

ii. Metal Concentration:

$$C = (M_s - M_b) \times V_s \times F_a / V \times F_t$$

Where,

C = concentration, $\mu\text{g metal}/\text{m}^3$

M_s = metal concentration $\mu\text{g}/\text{mL}$

M_b = blank concentration $\mu\text{g}/\text{mL}$

V_s = total volume of extraction in mL

F_a = total area of exposed filter in cm^2

V = Volume of air sampled in m^3

F_t = Area of filter taken for digestion in cm^2

3.1.8. Sampling and analysis of Benzo- α -pyrene:

Benzo (a) Pyrene (BaP) is one of the most important constituent of PAH compounds and also one of the most potent carcinogens. This can be measured in both particulate phase and vapour phase. In the vapour phase the concentration of B(a)P is significantly less than the particulate phase. Therefore, more care to be taken for the measurement of Benzo (a) Pyrene in the particulate phase. The molecular formula of B(a)P is $C_{20}H_{12}$ having molecular weight 252.

It is based on BIS method IS 5182 (Part 12):2004 and USEPA method (TO-13). This method is designed to collect particulate phase PAHs in ambient air and fugitive emissions and to determine individual PAH compounds using capillary gas chromatograph equipped with flame ionization detector. It is a high volume (1.2m³/min) sampling method capable of detecting sub.ng/m³ concentration of PAH in 24 hours sample (i.e. collected in 3 shifts of 8 hour each with 480 m³ sampling volume of air).

i. Sampling:

i. Instrument/Filter Selection:

24 hr. sampling using PM₁₀ high volume sampler with 8 hourly samples using EPM-2000 glass fibre or equivalent filter

ii. Sample Processing

a. Extraction:

Filter papers (half of all the filters papers collected in a day) are cut into strips using scissors and transfer to 250 ml beaker. Add ~50 ml. of Toluene (GC/HPLC grade). These samples are extracted with toluene using ultra sonic sample can be extracted using soxhlet bath for about 30 minutes. Repeat the procedure twice (50ml x 2 times) for complete extraction. Alternatively, extraction apparatus for about 8 hr. with Toluene and repeat it twice.

b. Filtration:

Filter the extracted samples with Whatman filter paper No. 41 containing 2 gm of Anhydrous Sodium Sulphate (to remove moisture).

c. Concentration:

After filtration, the filtrate is concentrated using Rotary vacuum evaporator to 2ml final volume.

d. Clean-up with silica Gel:

To clean up the impurities, pass 2 ml of concentrated sample through silica gel column (pre conditioned, 60-80 mesh, and 200-250mm×10 mm with Teflon stopcock). After cleaning add 5ml cyclohexane and collect the elute in 25 ml beaker. Repeat the process for at least 3 times and collect it in the same beaker. Alternatively Solid Phase Extraction (SPE) may be used for clean up the impurities of sample.

e. Re-concentration with rotary vacuum evaporator:

The Cleaned up extract/filtrate (approximately 17 ml) is further concentrated using rotary evaporator and it is evaporated to nearly dryness with Nitrogen.

f. Final Sample volume:

The dried sample is re-dissolved in 1ml of toluene and transfer into 4 or 5 ml amber vials final analysis.

ii. Calculations:

Calculate the concentration in ng/ μ l of each identified analyte or B(a)P in the sample extract (Cs) as follows:

Calculate the air volume from the periodic flow reading taken during sampling using the following equation:

$$V = Q \times T$$

Where,

Q = Average flow rate of sampling m³/min

T = sampling time, in min.

V = total sample volume at ambient conditions in m³

Concentration of analyte i.e B(a)P:

The concentration of PAH compound or Benzo(a)pyrene in ng /m³ in the air sampled is given by:

$$C \text{ (ng /m}^3\text{)} = C_s \times V_e / V_i \times V_s$$

Where,

C_s : Concentration of Benzo (a) pyrene in ng / μl in the sample extract recorded by GC.

V_e : Final volume of extract in μl (i.e 1000)

V_i : Injection Volume (i.e 1μl)

V_s : Volume of air sample in m³

4.0 Results

4.1 Ambient Air Quality

TEST REPORT: AMBIENT AIR MONITORING (AAQ)

Name of the Industry	M/s. Mangalore SEZ Limited
Address of the Industry	3 rd Floor, MUDA Building, Ashok Nagar, Urwa Stores, Mangalore- 575006
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	CETP
Sampling Date	16.05.2018
Report Date	04.06.2018
Report No	HECS/AA/001/040618

CONSOLIDATED TEST RESULTS: MAY 2018

Parameter Monitored	NAAQ Standard, 2009	Results
PM _{2.5} (µg/m ³)	60 [*]	17
PM ₁₀ (µg/m ³)	100 [*]	58
SO ₂ (µg/m ³)	80 [*]	05
NO ₂ (µg/m ³)	80 [*]	10
CO (mg/m ³)	2 ^{**}	BDL
O ₃ (µg/m ³)	100 ^{**}	BDL
NH ₃ (µg/m ³)	400 [*]	BDL
Pb (µg/m ³)	1 [*]	BDL
As (ng/m ³)	6 ^{***}	BDL
Ni (ng/m ³)	20 ^{***}	BDL
Benzene (µg/m ³)	5 ^{***}	BDL
B(α)P (ng/m ³)	1 ^{***}	BDL

Note: * : 24 hours average; ** : 8 hours average; *** : Annual average *

Note: BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m³); O₃-Ozone(DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(α)P- Benzo -α-pyrene (DL 0.1 ng/m³); ng/m³: nanogram per cubic meter; µg/m³ - microgram per cubic meter

CONCLUSION: All the parameters meet the NAAQ Standards, 2009

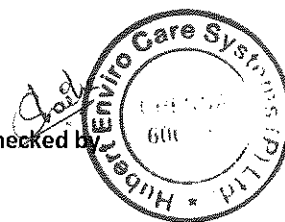
*****End of Report *****

Sampled by

Prepared by

Checked by

Authorized Signatory



TEST REPORT: AMBIENT AIR MONITORING (AAQ): MAY 2018

Name of the Industry	M/s. Mangalore SEZ Limited
Address of the Industry	3 rd Floor, MUDA Building, Ashok Nagar, Urwa Stores, Mangalore- 575006
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	WTP
Sampling Date	18.05.2018
Report Date	04.06.2018
Report No	HECS/AA/002/040618

Parameter Monitored	NAAQ Standard, 2009	Results
PM _{2.5} (µg/m ³)	60 [*]	16
PM ₁₀ (µg/m ³)	100 [*]	52
SO ₂ (µg/m ³)	80 [*]	08
NO ₂ (µg/m ³)	80 [*]	11
CO (mg/m ³)	2 ^{**}	BDL
O ₃ (µg/m ³)	100 ^{**}	BDL
NH ₃ (µg/m ³)	400 [*]	BDL
Pb (µg/m ³)	1 [*]	BDL
As (ng/m ³)	6 ^{***}	BDL
Ni (ng/m ³)	20 ^{***}	BDL
Benzene (µg/m ³)	5 ^{***}	BDL
B(α)P (ng/m ³)	1 ^{***}	BDL

Note: * : 24 hours average; ** : 8 hours average; *** : Annual average

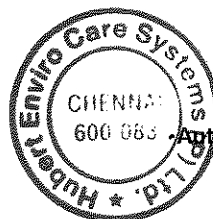
Note: BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m³); O₃-Ozone(DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(α)P- Benzo - α-pyrene (DL 0.1 ng/m³); ng/m³: nanogram per cubic meter; µg/m³ - microgram per cubic meter

CONCLUSION: All the parameters meet the NAAQ Standards, 2009

*****End of Report *****

Prepared by

Checked by



Authorized Signatory

5. MONITORING SCHEDULE OF MANGALORE SEZ LIMITED

ENVIRONMENTAL MONITORING

Sl.No	Environmental Attributes monitored	Parameters analyzed and presented in analysis Report	Monitoring requirement
1	Ambient Air Quality	PM _{2.5} , PM ₁₀ , SO ₂ , NO ₂ , CO, O ₃ , NH ₃ , Pb, As, Ni, Benzene, B(α)P	Two Locations/Month, 24 hrs/day
2	Surface/ Ground Water Quality	Colour, pH (at 25 °C), Odour, Taste, Turbidity, Total Dissolved Solids, Alkalinity as CaCO ₃ , Total Hardness, Calcium as Ca, Magnesium as Mg, Iron as Fe, Sulphate as SO ₄ , Chloride as Cl, Boron as B, Residual free chlorine, Fluoride, Phenolic Compounds, Carbon monoxide, Manganese as Mn, Zinc as Zn, Arsenic as As, Cyanide as CN, Cadmium as Cd, Chromium as Cr, Aluminium as Al, Selenium as Se, Lead as Pb, Mercury as Hg, Nitrate Nitrogen NO ₃ , <i>E.Coli</i>	Ten Locations, Seasons (Summer, Winter, Post monsoon), By using Grab Sampling technique
3	Ambient Noise Level	Noise Level (db) in Day and Night	Two Locations, Seasons (Summer, Winter, Post monsoon), Fortnightly interval

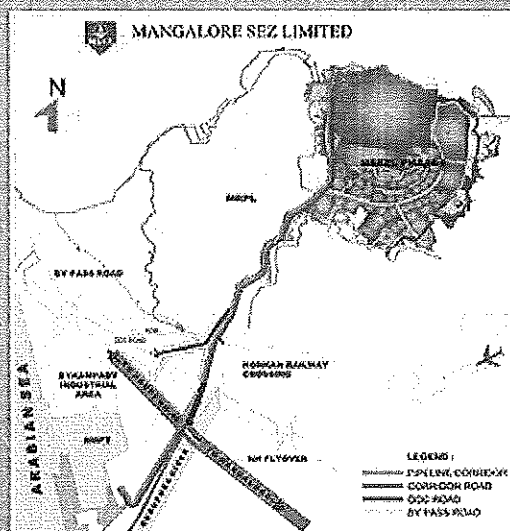


Mangalore SEZ Limited

ENVIRONMENTAL MONITORING REPORT

AMBIENT AIR QUALITY
REPORT FOR THE MONTH OF JUNE 2018

Submitted to



Submitted By



M/s Hubert Enviro Care Systems Private Limited

(NABL Accredited & MOEF Recognized Laboratory)

7/C-45, Baikampady Industrial Estate, Mangaluru, Karnataka - 575011

Email: krom@hecs.in; kro@hecs.in

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AMBIENT AIR, WATER QUALITY AND NOISE MONITORING REPORT - JUNE 2018

1. INTRODUCTION

Mangalore Special Economic Zone, known as MSEZ is spread across 1638 acres, located 15 km from Mangalore city, off Cochin-Mumbai NH 66, 5 km from Mangalore International Airport and 8 km from all-weather deep draft sea port, New Mangalore Port in Mangalore, Karnataka, India. MSEZ limited is jointly promoted by Oil and Natural Gas Corporation (ONGC), a fortune 500 company & infrastructure leasing & finance services, one of India's leading infrastructure development and finance companies, Karnataka Industrial Area Development Board (KIADB) and Kanara Chamber of Commerce and Industry (KCCI). A unique combination of Government entities, a large financial institution and an apex chamber brings in the expertise to develop MSEZL with world-class industrial infrastructure.

2. ENVIRONMENT MONITORING

Environmental monitoring is being carried out at Mangalore SEZ, following guidelines and regulations of MoEF/CPCB and KSPCB statutory norms. In this regard, MSEZL has awarded the work to M/s Hubert EnviroCare Systems Pvt Ltd. and to monitor air quality, water quality & noise level for the three years. As per work order, during JUNE 2018, we have conducted ambient air quality, ground water quality and noise level monitoring at 2, 9 and 2 locations respectively.

3. SCOPE AND METHODOLOGY

The scope of work carried out and methodology adopted for the survey are described below:

3.1. Ambient Air Quality

Ambient air quality monitoring was carried out at each location on 24 hour basis on two consecutive days per month. The identified monitoring stations are: A₁-CETP & A₂-WTP Area. To assess the ambient air quality status, monitoring stations are identified on the basis of meteorology in the upwind and downwind direction as well as to represent the cross sectional scenario of the MSEZ. Based on the activities the parameters chosen for assessment of air quality are PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂-Nitrogen-di-oxide; CO-Carbon Mono Oxide (DL 0.1 mg/m³); O₃-Ozone (DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni- (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(α)P- Benzo-α-pyrene (DL 0.1 ng/m³) as per CPCB stipulation.

3.1.1. Sampling and analysis of PM_{2.5} and PM₁₀ in ambient air (Gravimetric Method)

- i. Condition a filter paper in oven (i.e. 10 or 2.5 μm diameter)
- ii. Prepare a sampling assembly by uncorking screws of the bracket
- iii. Take a tare (initial) weight of the filter paper (w_i , mg)
- iv. Place the filter in the sampling system securely and tighten the screws of the bracket
- v. Set the timer for the period of sampling
- vi. Start the sampler and adjust flow rate to about 2L/ min for 24 hrs sampling
- vii. Note the flow rate at the end of the desired sampling period and stop the sampler
- viii. Transit the sampling train to environmental laboratory carefully with scientific precautions
- ix. Condition the filter paper again for the same period as was done prior to sampling.

Laboratory analysis:**Weighing of exposed samples:**

- i. Take final weight of the exposed filter with a standard balance (w_f , mg)

Calculations:

- i. Average flow rate (initial and final flow rates) in L/ min
$$= (\text{Initial flow rate} + \text{final flow rate}) / 2$$
- ii. Total vol. of air sampled (TVA) in m^3
$$= \text{Avg. flow rate (L/min)} * 10^{-3} (\text{m}^3/\text{L}) * \text{sampling time (hr)} * 60 (\text{min/hr})$$
- iii. Concentration of SPM in $\mu\text{g}/\text{m}^3$
$$= (w_f - w_i) (\text{mg}) / \text{TVA (m}^3) * 10^6 \mu\text{g}/\text{m}^3$$

3.1.2. Sampling and analysis of Sulphur dioxide

- i. Prepare absorbing reagent (sodium tetra-chloromercurate) by dissolving 27.2 g mercuric chloride and 11.7 g sodium chloride in 1 lit of water
- ii. Prepare a sampling train of at least 2 gas bubblers (for average reading) properly washed with distilled water and air dried.
- iii. Place bubblers in the sampling system securely connecting to the manifold. Check the connections of bubblers with the manifold and the inlet and outlet
- iv. Fill the bubblers with an absorbing reagent with an amount sufficient to last for 24 hours (approximately 15 ml for 8 hours sampling to 50 ml for 24 hours sampling)
- v. To eliminate interference of traces metals, if any, 1 drop of 0.01% EDTA solution JUNE be added to the reagent prior to sampling ;similarly, effect of oxide of nitrogen JUNE also be eliminated by adding 1 ml of 0.06% sulphamic acid to the reagent at site
- vi. Start the sampler and adjust flow rate to 2 lit/ min.
- vii. Note the flow rate at the end of desired sampling period and stop the sampler
- viii. Transit the sampling train to environmental laboratory carefully with scientific precautions and preserve the sample tubes in a controlled environmental conditions

Laboratory analysis:**Calibration curve:**

- i. Prepare a standard solution of SO₂ concentrations ranging from 0 to 25 µg SO₂ by taking definite amount of std. sulphur dioxide solution in a 25 ml volumetric flasks
- ii. Add 14 ml of absorbing reagent and 1 ml of pararosaniline hydrochloride to each of the flasks making a total volume of 20 ml.
- iii. Measure absorbance for each flasks by spectrophotometer at 540 nm wavelength
- iv. Plot graph of absorbance v/s concentration

Absorbance in samples:

- i. Transfer samples to a 25 ml flask and develop colour as done in calibration curve
- ii. Measure absorbance at 540 nm
- iii. Find out the concentration (µgSO₂) corresponding to the measured absorbance from the calibration curve

Calculations:

- i. Average flow rate (if there is a significant difference in initial and final flow rates)
- ii. Total volume of air sampled (TVA) in m³
= Avg. flow rate (lit) * 10⁻³ (m³/lit) * sampling time (hr) * 60 (min/hr)
- iii. µgSO₂/TVA

3.1.3. Sampling and analysis of Nitrogen-di-oxide

- i. Prepare absorbing reagent (a solution of sodium hydroxide and arsenite) by dissolving 4 g sodium hydroxide and 1 g of sodium arsenite in 1 lit of distilled water
- ii. Prepare a sampling train of at least 2 gas bubblers (for average reading) properly washed with distilled water and air dried .
- iii. Place bubblers in the sampling system securely connecting to the manifold. Check the connections of bubblers with the manifold and the inlet and outlet
- iv. Fill the bubblers with an absorbing reagent with an amount sufficient to last for 24 hours (approximately 15 ml for 8 hours sampling to 50 ml for hours sampling)
- v. To eliminate interference of sulphur dioxide , drop of hydrogen peroxide JUNE be added to the reagents to convert sulphur dioxide into sulphate during analysis
- vi. Start the sampler and adjust flow rate to about 0.2 lit/ min for 24 hours sampling
- vii. Note the flow rate at the end of desired sampling period and stop the sampler
- viii. Transit the sampling train to environmental laboratory carefully with scientific precautions and preserve the sample tubes in a controlled environmental conditions

Laboratory analysis:**Calibration curve:**

- i. Prepare a standard solution of NO_x concentrations ranging from 0 to 25 $\mu\text{g SO}_2$ by taking definite amount of std. sulphur dioxide solution in a 25 ml volumetric flasks
- ii. Add 14 ml of absorbing reagent and 1 ml of pararosaniline hydrochloride to each of the flasks making a total volume of 20 ml.
- iii. Measure absorbance for each flasks by spectrophotometer at 540 nm wavelength
- iv. Plot graph of absorbance v/s concentration

Absorbance in samples:

- i. Transfer samples to a 25 ml flask and develop colour as done in calibration curve
- ii. Measure absorbance at 540 nm
- iii. Find out the concentration ($\mu\text{g NO}_x$) corresponding to the measured absorbance from the calibration curve

Calculations:

- i. Average flow rate (if there is a significant difference in initial and final flow rates)
- ii. Total volume of air sampled (TVA) in m^3
$$= \text{Avg. flow rate (lit)} * 10^{-3} (\text{m}^3/\text{lit}) * \text{sampling time (hr)} * 60 (\text{min/hr})$$
$$\mu\text{gNO}_x/\text{TVA}$$

3.1.4. Sampling and analysis of Carbon Mono Oxide**Preparation of sample train:**

- i. Sampling begins with conditioning a sampling train and then gas analyzer
- ii. Pressure system is preferred to condition the sampling train by installing pump before the analyzer. Reducing valve needs to be fitted between the analyser and pump to eliminate the pulsing effect of pump on the analyzer
- iii. Flow meter is to be installed just before the analyzer
- iv. A fibre filter is used to capture the particulate matter prior to the optical cell to prevent its interference. As it often accumulates on the optical cell reducing the efficiency
- v. To eliminate the interference of water vapour, refrigeration or desiccant with magnesium perchlorate JUNE be used

Mode of operation:

- i. Continuous analysis is carried out at the flow rate of about 100 ml/min to 1000 ml/min (depending upon the level of pollution near the location) for the desired sampling period
- ii. Discrete sampling JUNE also be possible with infra red analyzer. It however requires proper cleaning of the sampling train.

Steps:

- i. Calibration of analyzer can be carried out if required using standard gases
- ii. Sampler is allowed to warm up for some time before actual readings are taken till the sampler gives steady response and temperature stability

3.1.5. Sampling and analysis of Ozone**Dynamic calibration:**

- i. Dynamic calibration JUNE be performed by preparing a large mixture of ozone in air
- ii. The output of an ozonizer is fed into the intake of a small blower delivering air. The mixture of gas however emerges through a short length of pipe
- iii. One portion of this mixture is analyzed in the recorder.
- iv. Another portion is analyzed through a faintly blue iodine solution containing starch and potassium iodide.
- v. Titrated this solution with sodium thiosulphate(0.1N)
- vi. The end point established by comparison with the blue starch- iodine solution
- vii. Mixture of ozone and air in polyester film bag JUNE be prepared and admitted to the analyzer.
- viii. The mixture is analyzed at the time it is used since the ozone decomposes gradually
- ix. Analysis is then performed by passing a measured volume through an impinge containing buffered KI solution and determined the released iodine by spectrometer method
- x. Make the second mixture about midscale concentration and adjust sample or reagent flow rates until the recorder reading agrees with the absorbance scale according to the analytically determined concentration of ozone
- xi. Check several other points on the curve if desired and liner or logarithmic chart JUNE be prepared followed by a calibration curve to read in ppm

Laboratory analysis:**Calibration curve:**

- i. Plot graph of absorbance v/s concentration

Procedure:

- i. Place a fresh absorbent solution in the storage bottle and operate the solution pump until the liquid are full
- ii. After the flow has stabilized itself, zero the recorder and start the air pump
- iii. Set the flow at convenient rates such as 4 ml/ min of solution and 4 l/min of air
- iv. Check and adjust the flow rates daily.
- v. Adjust the pH of the solution once or twice a week ,at time the solution shall be brought up to volume by addition of distilled water
- vi. Change the carbon filter about once a month. Also change the absorbing solution at the same time

3.1.6. Sampling and analysis of Ammonia:

Ammonia is collected in dilute Sulphuric acid solution in midjet impingers to form Ammonium Sulphate. The solution is treated with Nessler's reagent to produce a yellow brown complex. The Ammonia concentration is determined by reading the absorption of the complex at 440 nm and comparing with a standard curve.

3.1.7. Sampling and analysis of Lead, Nickel, Arsenic:

1. Sampling procedure:

Tilt back the inlet and secure it according to manufacturer's instructions. Loosen the face-plate wing-nuts and remove the face plate. Remove the filter from its jacket and centre it on the support screen with the rough side of the filter facing upwards. Replace the face-plate and tighten the wing-nuts to secure the rubber gasket against the filter edge. Gently lower the inlet. For automatically flow-controlled units, record the designated flow rate on the data sheet. Record the reading of the elapsed time meter. The specified length of sampling is commonly 8 hours or 24 hours. During this period, several reading (hourly) of flow rate should be taken. After the required time of sampling, record the flow meter reading and take out the filter media from the sampler and put in a container or envelope

2. Analysis:

i. Hot plate procedure:

Cut a 1" x 8" strip or half the filter from the 8" x 10" filter using a stainless steel pizza cutter. Place the filter in a beaker using vinyl gloves or plastic forceps. Cover the filter with the extraction solution (3% HNO_3 & 8% HCl). Place beaker on the hotplate, contained in a fume hood, and reflux gently while covered with a watch glass for 30 min. Do not allow sample to dry. Remove the beakers from the hot-plate and allow to cool. Rinse the beaker walls and wash with distilled water. Add approximately 10 mL reagent water to the remaining filter material in the beaker and allow to stand for at least 30 min. Transfer the extraction fluid in the beaker to a 100 mL volumetric flask or other graduated vessel. Rinse the beaker and any remaining solid material with distilled water and add the rinses to the flask. Dilute to the mark with distilled water (Type I) water and shake. The final extraction solution concentration is 3 % HNO_3 /8% HCl . The filtered sample is now ready for analysis

2.1. Analysis of samples:

i. Instrument / Equipment:

A light beam containing the corresponding wavelength of the energy required to raise the atoms of the analyte from the ground state to the excited state is directed through the flame or furnace. This wavelength is observed by a monochromator and a detector that measure the amount of light absorbed by the element, hence the number of atoms in the ground state in the flame or furnace. A hollow cathode lamp for the element being determined provides a source of that metal's particular absorption wavelength. The method describes both flame atomic absorption (FAA) spectroscopy and graphite furnace atomic absorption (GFAA) spectroscopy. Atomic Absorption Spectrophotometer - analyze the metals by Flame, if results are below detection limit then go for GTA. Arsenic is analyzed by Flame – VGA.

ii. Flame Procedure:

Set the atomic absorption spectrophotometer for the standard condition as follows: choose the correct hollow cathode lamp, align the instrument, position the monochromator at the value recommended by the manufacturer, select the proper monochromator slit width, set the light source current, ignite the flame, regulate the flow of fuel and oxidant, adjust the burner for maximum absorption and stability and balance the meter. Run a series of standards of the metal of interest and construct a calibration curve. Aspirate the blanks and samples. Dilute samples that exceed the calibration range. For Lead (Pb) and Nickel (Ni), the wavelength required for analysis is 217nm and 232nm respectively. Where as in case of Arsenic (As), the VGA should attach with Flame and the wavelength required for analysis is 193.7nm.

3. Calibration:

Prepare standard solutions from the stock solutions. Select at least three standards to cover linear range as recommended by method. Aspirate the standards into the flame or inject the standards into the furnace and record the absorbance. Prepare the calibration graph by plotting absorbance and concentration in µg/ml.

i. Preparation of Standards:

For each metal that is to be determined, standards of known concentration must be acquired commercially certified standards.

ii. Standard Curve:

Standard curve is prepared by using standard solutions of known concentration.

4. Calculations:**i. Sample Air Volume:**

Sample air volume can be calculated by using the following equation:

$$V = (Q) (t)$$

Where,

V = volume of air, m³

Q = average sampling rate, m³/min.

t = time in minutes.

ii. Metal Concentration:

$$C = (M_s - M_b) \times V_s \times F_a / V \times F_t$$

Where,

C = concentration, µg metal/m³

M_s = metal concentration µg/mL

M_b = blank concentration µg/mL

V_s = total volume of extraction in mL

F_a = total area of exposed filter in cm²

V = Volume of air sampled in m³

F_t = Area of filter taken for digestion in cm²

3.1.8. Sampling and analysis of Benzo- α -pyrene:

Benzo (a) Pyrene (BaP) is one of the most important constituent of PAH compounds and also one of the most potent carcinogens. This can be measured in both particulate phase and vapour phase. In the vapour phase the concentration of B(a)P is significantly less than the particulate phase. Therefore, more care to be taken for the measurement of Benzo (a) Pyrene in the particulate phase. The molecular formula of B(a)P is $C_{20}H_{12}$ having molecular weight 252.

It is based on BIS method IS 5182 (Part 12):2004 and USEPA method (TO-13). This method is designed to collect particulate phase PAHs in ambient air and fugitive emissions and to determine individual PAH compounds using capillary gas chromatograph equipped with flame ionization detector. It is a high volume (1.2m³/min) sampling method capable of detecting sub.ng/m³ concentration of PAH in 24 hours sample (i.e. collected in 3 shifts of 8 hour each with 480 m³ sampling volume of air).

i. Sampling:

i. Instrument/Filter Selection:

24 hr. sampling using PM₁₀ high volume sampler with 8 hourly samples using EPM-2000 glass fibre or equivalent filter

ii. Sample Processing

a. Extraction:

Filter papers (half of all the filters papers collected in a day) are cut into strips using scissors and transfer to 250 ml beaker. Add ~50 ml. of Toluene (GC/HPLC grade). These samples are extracted with toluene using ultra sonic sample can be extracted using soxhlet bath for about 30 minutes. Repeat the procedure twice (50ml x 2 times) for complete extraction. Alternatively, extraction apparatus for about 8 hr. with Toluene and repeat it twice.

b. Filtration:

Filter the extracted samples with Whatman filter paper No. 41 containing 2 gm of Anhydrous Sodium Sulphate (to remove moisture).

c. Concentration:

After filtration, the filtrate is concentrated using Rotary vacuum evaporator to 2ml final volume.

d. Clean-up with silica Gel:

To clean up the impurities, pass 2 ml of concentrated sample through silica gel column (pre conditioned, 60-80 mesh, and 200-250mm×10 mm with Teflon stopcock). After cleaning add 5ml cyclohexane and collect the elute in 25 ml beaker. Repeat the process for at least 3 times and collect it in the same beaker. Alternatively Solid Phase Extraction (SPE) JUNE be used for clean up the impurities of sample.

e. Re-concentration with rotary vacuum evaporator:

The Cleaned up extract/filtrate (approximately 17 ml) is further concentrated using rotary evaporator and it is evaporated to nearly dryness with Nitrogen.

f. Final Sample volume:

The dried sample is re-dissolved in 1ml of toluene and transfer into 4 or 5 ml amber vials final analysis.

ii. Calculations:

Calculate the concentration in ng/ μ l of each identified analyte or B(a)P in the sample extract (Cs) as follows:

Calculate the air volume from the periodic flow reading taken during sampling using the following equation:

$$V = Q \times T$$

Where,

Q = Average flow rate of sampling m³/min

T = sampling time, in min.

V = total sample volume at ambient conditions in m³

Concentration of analyte i.e B(a)P:

The concentration of PAH compound or Benzo(a)pyrene in ng /m³ in the air sampled is given by:

$$C \text{ (ng /m}^3\text{)} = C_s \times V_e / V_i \times V_s$$

Where,

C_s : Concentration of Benzo (a) pyrene in ng / μl in the sample extract recorded by GC.

V_e : Final volume of extract in μl (i.e 1000)

V_i : Injection Volume (i.e 1μl)

V_s : Volume of air sample in m³

4.0 Results

4.1 Ambient Air Quality

TEST REPORT: AMBIENT AIR MONITORING (AAQ)

Name of the Industry	M/s. Mangalore SEZ Limited
Address of the Industry	3 rd Floor, MUDA Building, Ashok Nagar, Urwa Stores, Mangalore- 575006
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	CETP
Sampling Date	29.06.2018
Report Date	03.07.2018
Report No	HECS/AA/001/030718

CONSOLIDATED TEST RESULTS: JUNE 2018

Parameter Monitored	NAAQ Standard, 2009	Results
PM _{2.5} (µg/m ³)	60 [*]	14
PM ₁₀ (µg/m ³)	100 [*]	49
SO ₂ (µg/m ³)	80 [*]	04
NO ₂ (µg/m ³)	80 [*]	8
CO (mg/m ³)	2 ^{**}	BDL
O ₃ (µg/m ³)	100 ^{**}	BDL
NH ₃ (µg/m ³)	400 [*]	BDL
Pb (µg/m ³)	1 [*]	BDL
As (ng/m ³)	6 ^{***}	BDL
Ni (ng/m ³)	20 ^{***}	BDL
Benzene (µg/m ³)	5 ^{***}	BDL
B(α)P (ng/m ³)	1 ^{***}	BDL

Note: * : 24 hours average; ** : 8 hours average; *** : Annual average

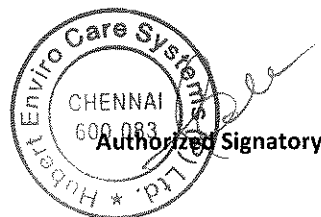
Note: BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide (DL 0.1 mg/m³); O₃-Ozone (DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(α)P- Benzo-α-pyrene (DL 0.1 ng/m³); ng/m³: nanogram per cubic meter; µg/m³ - microgram per cubic meter

CONCLUSION: All the parameters meet the NAAQ Standards, 2009

*****End of Report *****

[Signature]
Prepared by

[Signature]
Checked by



TEST REPORT: AMBIENT AIR MONITORING (AAQ): JUNE 2018

Name of the Industry	M/s. Mangalore SEZ Limited
Address of the Industry	3 rd Floor, MUDA Building, Ashok Nagar, Urwa Stores, Mangalore- 575006
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	WTP
Sampling Date	29.06.2018
Report Date	03.07.2018
Report No	HECS/AA/002/030718

Parameter Monitored	NAAQ Standard, 2009	Results
PM _{2.5} (µg/m ³)	60 [*]	13
PM ₁₀ (µg/m ³)	100 [*]	43
SO ₂ (µg/m ³)	80 [*]	06
NO ₂ (µg/m ³)	80 [*]	09
CO (mg/m ³)	2 ^{**}	BDL
O ₃ (µg/m ³)	100 ^{**}	BDL
NH ₃ (µg/m ³)	400 [*]	BDL
Pb (µg/m ³)	1 [*]	BDL
As (ng/m ³)	6 ^{***}	BDL
Ni (ng/m ³)	20 ^{***}	BDL
Benzene (µg/m ³)	5 ^{***}	BDL
B(α)P (ng/m ³)	1 ^{***}	BDL

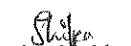
Note: ^{*}: 24 hours average; ^{**}: 8 hours average; ^{***}: Annual average

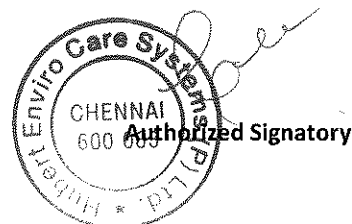
Note: BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m³);O₃-Ozone(DL 10 µg/m³);NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³);As-Arsenic (DL 0.1 ng/m³);Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(α)P- Benzo - α-pyrene (DL0.1 ng/m³); ng/m³: nanogram per cubic meter; µg/m³ - microgram per cubic meter

CONCLUSION: All the parameters meet the NAAQ Standards, 2009

*****End of Report *****


Prepared by


Checked by



5. MONITORING SCHEDULE OF MANGALORE SEZ LIMITED **ENVIRONMENTAL MONITORING**

Sl.No	Environmental Attributes monitored	Parameters analyzed and presented in analysis Report	Monitoring requirement
1	Ambient Air Quality	PM _{2.5} , PM ₁₀ , SO ₂ , NO ₂ , CO, O ₃ , NH ₃ , Pb, As, Ni, Benzene, B(α)P	Two Locations/Month, 24 hrs/day
2	Surface/ Ground Water Quality	Colour, pH (at 25 °C), Odour, Taste, Turbidity, Total Dissolved Solids, Alkalinity as CaCO ₃ , Total Hardness, Calcium as Ca, Magnesium as Mg, Iron as Fe, Sulphate as SO ₄ , Chloride as Cl, Boron as B, Residual free chlorine, Fluoride, Phenolic Compounds, Carbon monoxide, Manganese as Mn, Zinc as Zn, Arsenic as As, Cyanide as CN, Cadmium as Cd, Chromium as Cr, Aluminium as Al, Selenium as Se, Lead as Pb, Mercury as Hg, Nitrate Nitrogen NO ₃ , <i>E.Coli</i>	Ten Locations, Seasons (Summer, Winter, Post monsoon), By using Grab Sampling technique
3	Ambient Noise Level	Noise Level (db) in Day and Night	Two Locations, Seasons (Summer, Winter, Post monsoon), Fortnightly interval

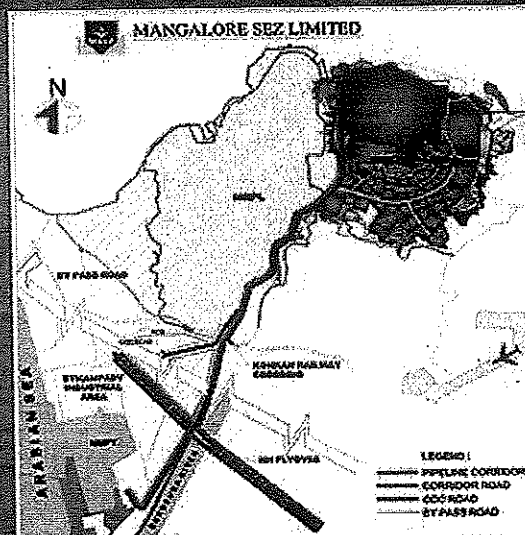


Mangalore SEZ Limited

ENVIRONMENTAL MONITORING REPORT

**AMBIENT AIR QUALITY
REPORT FOR THE MONTH OF JULY 2018**

Submitted to



Submitted By



M/s Hubert Enviro Care Systems Private Limited

(NABL Accredited & MOEF Recognized Laboratory)

7/C-45, Baikampady Industrial Estate, Mangaluru, Karnataka - 575011

Email: krom@hecs.in; kro@hecs.in

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AMBIENT AIR, WATER QUALITY AND NOISE MONITORING REPORT - JULY 2018

1. INTRODUCTION

Mangalore Special Economic Zone, known as MSEZ is spread across 1638 acres, located 15 km from Mangalore city, off Cochin-Mumbai NH 66, 5 km from Mangalore International Airport and 8 km from all-weather deep draft sea port, New Mangalore Port in Mangalore, Karnataka, India. MSEZ limited is jointly promoted by Oil and Natural Gas Corporation (ONGC), a fortune 500 company & infrastructure leasing & finance services, one of India's leading infrastructure development and finance companies, Karnataka Industrial Area Development Board (KIADB) and Kanara Chamber of Commerce and Industry (KCCI). A unique combination of Government entities, a large financial institution and an apex chamber brings in the expertise to develop MSEZL with world-class industrial infrastructure.

2. ENVIRONMENT MONITORING

Environmental monitoring is being carried out at Mangalore SEZ, following guidelines and regulations of MoEF/CPCB and KSPCB statutory norms. In this regard, MSEZL has awarded the work to M/s Hubert EnviroCare Systems Pvt Ltd. and to monitor air quality, water quality & noise level for the three years. As per work order, during JULY 2018, we have conducted ambient air quality, ground water quality and noise level monitoring at 2, 9 and 2 locations respectively.

3. SCOPE AND METHODOLOGY

The scope of work carried out and methodology adopted for the survey are described below:

3.1. Ambient Air Quality

Ambient air quality monitoring was carried out at each location on 24 hour basis on two consecutive days per month. The identified monitoring stations are: A₁-CETP & A₂-WTP Area. To assess the ambient air quality status, monitoring stations are identified on the basis of meteorology in the upwind and downwind direction as well as to represent the cross sectional scenario of the MSEZ. Based on the activities the parameters chosen for assessment of air quality are PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂-Nitrogen-dioxide; CO-Carbon Mono Oxide (DL 0.1 mg/m³); O₃-Ozone (DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni- (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(α)P- Benzo-α-pyrene (DL 0.1 ng/m³) as per CPCB stipulation.

3.1.1. Sampling and analysis of PM_{2.5} and PM₁₀ in ambient air (Gravimetric Method)

- i. Condition a filter paper in oven (i.e. 10 or 2.5 μm diameter)
- ii. Prepare a sampling assembly by uncorking screws of the bracket
- iii. Take a tare (initial) weight of the filter paper (w_i , mg)
- iv. Place the filter in the sampling system securely and tighten the screws of the bracket
- v. Set the timer for the period of sampling
- vi. Start the sampler and adjust flow rate to about 2L/ min for 24 hrs sampling
- vii. Note the flow rate at the end of the desired sampling period and stop the sampler
- viii. Transit the sampling train to environmental laboratory carefully with scientific precautions
- ix. Condition the filter paper again for the same period as was done prior to sampling.

Laboratory analysis:

Weighing of exposed samples:

- i. Take final weight of the exposed filter with a standard balance (w_f , mg)

Calculations:

- i. Average flow rate (initial and final flow rates) in L/ min

$$= (\text{Initial flow rate} + \text{final flow rate}) / 2$$
- ii. Total vol. of air sampled (TVA) in m^3

$$= \text{Avg. flow rate (L/min)} * 10^{-3} (\text{m}^3/\text{L}) * \text{sampling time (hr)} * 60 (\text{min/hr})$$
- iii. Concentration of SPM in $\mu\text{g}/\text{m}^3$

$$= (w_f - w_i) (\text{mg}) / \text{TVA} (\text{m}^3) * 10^6 \mu\text{g}/\text{m}^3$$

3.1.2. Sampling and analysis of Sulphur dioxide

- i. Prepare absorbing reagent (sodium tetra-chloromercurate) by dissolving 27.2 g mercuric chloride and 11.7 g sodium chloride in 1 lit of water
- ii. Prepare a sampling train of at least 2 gas bubblers (for average reading) properly washed with distilled water and air dried.
- iii. Place bubblers in the sampling system securely connecting to the manifold. Check the connections of bubblers with the manifold and the inlet and outlet
- iv. Fill the bubblers with an absorbing reagent with an amount sufficient to last for 24 hours (approximately 15 ml for 8 hours sampling to 50 ml for 24 hours sampling)
- v. To eliminate interference of traces metals, if any, 1 drop of 0.01% EDTA solution JULY be added to the reagent prior to sampling ;similarly, effect of oxide of nitrogen JULY also be eliminated by adding 1 ml of 0.06% sulphamic acid to the reagent at site
- vi. Start the sampler and adjust flow rate to 2 lit/ min.
- vii. Note the flow rate at the end of desired sampling period and stop the sampler
- viii. Transit the sampling train to environmental laboratory carefully with scientific precautions and preserve the sample tubes in a controlled environmental conditions

Laboratory analysis:**Calibration curve:**

- i. Prepare a standard solution of SO₂ concentrations ranging from 0 to 25 µg SO₂ by taking definite amount of std. sulphur dioxide solution in a 25 ml volumetric flasks
- ii. Add 14 ml of absorbing reagent and 1 ml of pararosaniline hydrochloride to each of the flasks making a total volume of 20 ml.
- iii. Measure absorbance for each flasks by spectrophotometer at 540 nm wavelength
- iv. Plot graph of absorbance v/s concentration

Absorbance in samples:

- i. Transfer samples to a 25 ml flask and develop colour as done in calibration curve
- ii. Measure absorbance at 540 nm
- iii. Find out the concentration (µgSO₂) corresponding to the measured absorbance from the calibration curve

Calculations:

- i. Average flow rate (if there is a significant difference in initial and final flow rates)
- ii. Total volume of air sampled (TVA) in m³
$$= \text{Avg. flow rate (lit)} * 10^{-3} (\text{m}^3/\text{lit}) * \text{sampling time (hr)} * 60 (\text{min/hr})$$
- iii. $\mu\text{gSO}_2/\text{TVA}$

3.1.3. Sampling and analysis of Nitrogen-di-oxide

- i. Prepare absorbing reagent (a solution of sodium hydroxide and arsenite) by dissolving 4 g sodium hydroxide and 1 g of sodium arsenite in 1 lit of distilled water
- ii. Prepare a sampling train of at least 2 gas bubblers (for average reading) properly washed with distilled water and air dried .
- iii. Place bubblers in the sampling system securely connecting to the manifold. Check the connections of bubblers with the manifold and the inlet and outlet
- iv. Fill the bubblers with an absorbing reagent with an amount sufficient to last for 24 hours (approximately 15 ml for 8 hours sampling to 50 ml for hours sampling)
- v. To eliminate interference of sulphur dioxide , drop of hydrogen peroxide JULY be added to the reagents to convert sulphur dioxide into sulphate during analysis
- vi. Start the sampler and adjust flow rate to about 0.2 lit/ min for 24 hours sampling
- vii. Note the flow rate at the end of desired sampling period and stop the sampler
- viii. Transit the sampling train to environmental laboratory carefully with scientific precautions and preserve the sample tubes in a controlled environmental conditions

Laboratory analysis:**Calibration curve:**

- i. Prepare a standard solution of NO_x concentrations ranging from 0 to 25 $\mu\text{g SO}_2$ by taking definite amount of std. sulphur dioxide solution in a 25 ml volumetric flasks
- ii. Add 14 ml of absorbing reagent and 1 ml of pararosaniline hydrochloride to each of the flasks making a total volume of 20 ml.
- iii. Measure absorbance for each flasks by spectrophotometer at 540 nm wavelength
- iv. Plot graph of absorbance v/s concentration

Absorbance in samples:

- i. Transfer samples to a 25 ml flask and develop colour as done in calibration curve
- ii. Measure absorbance at 540 nm
- iii. Find out the concentration ($\mu\text{g NO}_x$) corresponding to the measured absorbance from the calibration curve

Calculations:

- i. Average flow rate (if there is a significant difference in initial and final flow rates)
- ii. Total volume of air sampled (TVA) in m^3

$$= \text{Avg. flow rate (lit)} * 10^{-3} (\text{m}^3/\text{lit}) * \text{sampling time (hr)} * 60 (\text{min/hr})$$

$$\mu\text{gNO}_x / \text{TVA}$$

3.1.4. Sampling and analysis of Carbon Mono Oxide**Preparation of sample train:**

- i. Sampling begins with conditioning a sampling train and then gas analyzer
- ii. Pressure system is preferred to condition the sampling train by installing pump before the analyzer. Reducing valve needs to be fitted between the analyser and pump to eliminate the pulsing effect of pump on the analyzer
- iii. Flow meter is to be installed just before the analyzer
- iv. A fibre filter is used to capture the particulate matter prior to the optical cell to prevent its interference. As it often accumulates on the optical cell reducing the efficiency
- v. To eliminate the interference of water vapour, refrigeration or desiccant with magnesium perchlorate JULY be used

Mode of operation:

- i. Continuous analysis is carried out at the flow rate of about 100 ml/min to 1000 ml/min (depending upon the level of pollution near the location) for the desired sampling period
- ii. Discrete sampling JULY also be possible with infra red analyzer. It however requires proper cleaning of the sampling train.

Steps:

- i. Calibration of analyzer can be carried out if required using standard gases
- ii. Sampler is allowed to warm up for some time before actual readings are taken till the sampler gives steady response and temperature stability

3.1.5. Sampling and analysis of Ozone**Dynamic calibration:**

- i. Dynamic calibration JULY be performed by preparing a large mixture of ozone in air
- ii. The output of an ozonizer is fed into the intake of a small blower delivering air. The mixture of gas however emerges through a short length of pipe
- iii. One portion of this mixture is analyzed in the recorder.
- iv. Another portion is analyzed through a faintly blue iodine solution containing starch and potassium iodide.
- v. Titrated this solution with sodium thiosulphate(0.1N)
- vi. The end point established by comparison with the blue starch- iodine solution
- vii. Mixture of ozone and air in polyester film bag JULY be prepared and admitted to the analyzer.
- viii. The mixture is analyzed at the time it is used since the ozone decomposes gradually
- ix. Analysis is then performed by passing a measured volume through an impinge containing buffered KI solution and determined the released iodine by spectrometer method
- x. Make the second mixture about midscale concentration and adjust sample or reagent flow rates until the recorder reading agrees with the absorbance scale according to the analytically determined concentration of ozone
- xi. Check several other points on the curve if desired and liner or logarithmic chart JULY be prepared followed by a calibration curve to read in ppm

Laboratory analysis:**Calibration curve:**

- i. Plot graph of absorbance v/s concentration

Procedure:

- i. Place a fresh absorbent solution in the storage bottle and operate the solution pump until the liquid are full
- ii. After the flow has stabilized itself, zero the recorder and start the air pump
- iii. Set the flow at convenient rates such as 4 ml/ min of solution and 4 l/min of air
- iv. Check and adjust the flow rates daily.
- v. Adjust the pH of the solution once or twice a week ,at time the solution shall be brought up to volume by addition of distilled water
- vi. Change the carbon filter about once a month. Also change the absorbing solution at the same time

3.1.6. Sampling and analysis of Ammonia:

Ammonia is collected in dilute Sulphuric acid solution in midjet impingers to form Ammonium Sulphate. The solution is treated with Nessler's reagent to produce a yellow brown complex. The Ammonia concentration is determined by reading the absorption of the complex at 440 nm and comparing with a standard curve.

3.1.7. Sampling and analysis of Lead, Nickel, Arsenic:

1. Sampling procedure:

Tilt back the inlet and secure it according to manufacturer's instructions. Loosen the face-plate wing-nuts and remove the face plate. Remove the filter from its jacket and centre it on the support screen with the rough side of the filter facing upwards. Replace the face-plate and tighten the wing-nuts to secure the rubber gasket against the filter edge. Gently lower the inlet. For automatically flow-controlled units, record the designated flow rate on the data sheet. Record the reading of the elapsed time meter. The specified length of sampling is commonly 8 hours or 24 hours. During this period, several reading (hourly) of flow rate should be taken. After the required time of sampling, record the flow meter reading and take out the filter media from the sampler and put in a container or envelope

2. Analysis:

i. Hot plate procedure:

Cut a 1" x 8" strip or half the filter from the 8" x 10" filter using a stainless steel pizza cutter. Place the filter in a beaker using vinyl gloves or plastic forceps. Cover the filter with the extraction solution (3% HNO_3 & 8% HCl). Place beaker on the hotplate, contained in a fume hood, and reflux gently while covered with a watch glass for 30 min. Do not allow sample to dry. Remove the beakers from the hot-plate and allow to cool. Rinse the beaker walls and wash with distilled water. Add approximately 10 mL reagent water to the remaining filter material in the beaker and allow to stand for at least 30 min. Transfer the extraction fluid in the beaker to a 100 mL volumetric flask or other graduated vessel. Rinse the beaker and any remaining solid material with distilled water and add the rinses to the flask. Dilute to the mark with distilled water (Type I) water and shake. The final extraction solution concentration is 3 % HNO_3 /8% HCl . The filtered sample is now ready for analysis

2.1. Analysis of samples:

i. Instrument / Equipment:

A light beam containing the corresponding wavelength of the energy required to raise the atoms of the analyte from the ground state to the excited state is directed through the flame or furnace. This wavelength is observed by a monochromator and a detector that measure the amount of light absorbed by the element, hence the number of atoms in the ground state in the flame or furnace. A hollow cathode lamp for the element being determined provides a source of that metal's particular absorption wavelength. The method describes both flame atomic absorption (FAA) spectroscopy and graphite furnace atomic absorption (GFAA) spectroscopy. Atomic Absorption Spectrophotometer - analyze the metals by Flame, if results are below detection limit then go for GTA. Arsenic is analyzed by Flame – VGA.

ii. Flame Procedure:

Set the atomic absorption spectrophotometer for the standard condition as follows: choose the correct hollow cathode lamp, align the instrument, position the monochromator at the value recommended by the manufacturer, select the proper monochromator slit width, set the light source current, ignite the flame, regulate the flow of fuel and oxidant, adjust the burner for maximum absorption and stability and balance the meter. Run a series of standards of the metal of interest and construct a calibration curve. Aspirate the blanks and samples. Dilute samples that exceed the calibration range. For Lead (Pb) and Nickel (Ni), the wavelength required for analysis is 217nm and 232nm respectively. Where as in case of Arsenic (As), the VGA should attach with Flame and the wavelength required for analysis is 193.7nm.

3. Calibration:

Prepare standard solutions from the stock solutions. Select at least three standards to cover linear range as recommended by method. Aspirate the standards into the flame or inject the standards into the furnace and record the absorbance. Prepare the calibration graph by plotting absorbance and concentration in $\mu\text{g/ml}$.

i. Preparation of Standards:

For each metal that is to be determined, standards of known concentration must be acquired commercially certified standards.

ii. Standard Curve:

Standard curve is prepared by using standard solutions of known concentration.

4. Calculations:

i. Sample Air Volume:

Sample air volume can be calculated by using the following equation:

$$V = (Q) (t)$$

Where,

V = volume of air, m^3

Q = average sampling rate, m^3/min .

t = time in minutes.

ii. Metal Concentration:

$$C = (M_s - M_b) \times V_s \times F_a / V \times F_t$$

Where,

C = concentration, $\mu\text{g metal}/\text{m}^3$

M_s = metal concentration $\mu\text{g/mL}$

M_b = blank concentration $\mu\text{g/mL}$

V_s = total volume of extraction in mL

F_a = total area of exposed filter in cm^2

V = Volume of air sampled in m^3

F_t = Area of filter taken for digestion in cm^2

3.1.8. Sampling and analysis of Benzo- α -pyrene:

Benzo (a) Pyrene (BaP) is one of the most important constituent of PAH compounds and also one of the most potent carcinogens. This can be measured in both particulate phase and vapour phase. In the vapour phase the concentration of B(a)P is significantly less than the particulate phase. Therefore, more care to be taken for the measurement of Benzo (a) Pyrene in the particulate phase. The molecular formula of B(a)P is $C_{20}H_{12}$ having molecular weight 252.

It is based on BIS method IS 5182 (Part 12):2004 and USEPA method (TO-13). This method is designed to collect particulate phase PAHs in ambient air and fugitive emissions and to determine individual PAH compounds using capillary gas chromatograph equipped with flame ionization detector. It is a high volume (1.2m³/min) sampling method capable of detecting sub.ng/m³ concentration of PAH in 24 hours sample (i.e. collected in 3 shifts of 8 hour each with 480 m³ sampling volume of air).

i. Sampling:

i. Instrument/Filter Selection:

24 hr. sampling using PM₁₀ high volume sampler with 8 hourly samples using EPM-2000 glass fibre or equivalent filter

ii. Sample Processing

a. Extraction:

Filter papers (half of all the filters papers collected in a day) are cut into strips using scissors and transfer to 250 ml beaker. Add ~50 ml. of Toluene (GC/HPLC grade). These samples are extracted with toluene using ultra sonic sample can be extracted using soxhlet bath for about 30 minutes. Repeat the procedure twice (50ml x 2 times) for complete extraction. Alternatively, extraction apparatus for about 8 hr. with Toluene and repeat it twice.

b. Filtration:

Filter the extracted samples with Whatman filter paper No. 41 containing 2 gm of Anhydrous Sodium Sulphate (to remove moisture).

c. Concentration:

After filtration, the filtrate is concentrated using Rotary vacuum evaporator to 2ml final volume.

d. Clean-up with silica Gel:

To clean up the impurities, pass 2 ml of concentrated sample through silica gel column (pre conditioned, 60-80 mesh, and 200-250mm×10 mm with Teflon stopcock). After cleaning add 5ml cyclohexane and collect the elute in 25 ml beaker. Repeat the process for at least 3 times and collect it in the same beaker. Alternatively Solid Phase Extraction (SPE) JULY be used for clean up the impurities of sample.

e. Re-concentration with rotary vacuum evaporator:

The Cleaned up extract/filtrate (approximately 17 ml) is further concentrated using rotary evaporator and it is evaporated to nearly dryness with Nitrogen.

f. Final Sample volume:

The dried sample is re-dissolved in 1ml of toluene and transfer into 4 or 5 ml amber vials final analysis.

ii. Calculations:

Calculate the concentration in ng/ μ l of each identified analyte or B(a)P in the sample extract (Cs) as follows:

Calculate the air volume from the periodic flow reading taken during sampling using the following equation:

$$V = Q \times T$$

Where,

Q = Average flow rate of sampling m³/min

T = sampling time, in min.

V = total sample volume at ambient conditions in m³

Concentration of analyte i.e B(a)P:

The concentration of PAH compound or Benzo(a)pyrene in ng /m³ in the air sampled is given by:

$$C \text{ (ng /m}^3\text{)} = C_s \times V_e / V_i \times V_s$$

Where,

C_s : Concentration of Benzo (a) pyrene in ng / μl in the sample extract recorded by GC.

V_e : Final volume of extract in μl (i.e 1000)

V_i : Injection Volume (i.e 1μl)

V_s : Volume of air sample in m³

4.0 Results

4.1 Ambient Air Quality

TEST REPORT: AMBIENT AIR MONITORING (AAQ)

Name of the Industry	M/s. Mangalore SEZ Limited
Address of the Industry	3 rd Floor, MUDA Building, Ashok Nagar, Urwa Stores, Mangalore- 575006
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	CETP
Sampling Date	12.07.2018
Report Date	17.08.2018
Report No	HECS/AA/001/170818

CONSOLIDATED TEST RESULTS: JULY 2018

Parameter Monitored	NAAQ Standard, 2009	Results
PM _{2.5} (µg/m ³)	60*	13
PM ₁₀ (µg/m ³)	100*	48
SO ₂ (µg/m ³)	80*	03
NO ₂ (µg/m ³)	80*	7
CO (mg/m ³)	2**	BDL
O ₃ (µg/m ³)	100**	BDL
NH ₃ (µg/m ³)	400*	BDL
Pb (µg/m ³)	1*	BDL
As (ng/m ³)	6***	BDL
Ni (ng/m ³)	20***	BDL
Benzene (µg/m ³)	5***	BDL
B(α)P (ng/m ³)	1***	BDL

Note: * : 24 hours average; ** : 8 hours average; *** : Annual average

Note: BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5.Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m³); O₃-Ozone(DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(α)P- Benzo-α-pyrene (DL 0.1 ng/m³); ng/m³: nanogram per cubic meter; µg/m³ - microgram per cubic meter

CONCLUSION: All the parameters meet the NAAQ Standards, 2009

*****End of Report *****

Prepared by

Checked by



Authorized Signatory

TEST REPORT: AMBIENT AIR MONITORING (AAQ): JULY 2018

Name of the Industry	M/s. Mangalore SEZ Limited
Address of the Industry	3 rd Floor, MUDA Building, Ashok Nagar, Urwa Stores, Mangalore- 575006
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	WTP
Sampling Date	11.07.2018
Report Date	17.08.2018
Report No	HECS/AA/002/170818

Parameter Monitored	NAAQ Standard, 2009	Results
PM _{2.5} (µg/m ³)	60*	11
PM ₁₀ (µg/m ³)	100*	42
SO ₂ (µg/m ³)	80*	05
NO ₂ (µg/m ³)	80*	07
CO (mg/m ³)	2**	BDL
O ₃ (µg/m ³)	100**	BDL
NH ₃ (µg/m ³)	400*	BDL
Pb (µg/m ³)	1*	BDL
As (ng/m ³)	6***	BDL
Ni (ng/m ³)	20***	BDL
Benzene (µg/m ³)	5***	BDL
B(α)P (ng/m ³)	1***	BDL

Note: * : 24 hours average; ** : 8 hours average; *** : Annual average

Note: BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m³); O₃-Ozone(DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(α)P- Benzo - α-pyrene (DL 0.1 ng/m³); ng/m³: nanogram per cubic meter; µg/m³ - microgram per cubic meter

CONCLUSION: All the parameters meet the NAAQ Standards, 2009

*****End of Report *****

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AMBIENT AIR, WATER QUALITY AND NOISE MONITORING REPORT - AUGUST 2018

1. INTRODUCTION

Mangalore Special Economic Zone, known as MSEZ is spread across 1638 acres, located 15 km from Mangalore city, off Cochin-Mumbai NH 66, 5 km from Mangalore International Airport and 8 km from all-weather deep draft sea port, New Mangalore Port in Mangalore, Karnataka, India. MSEZ limited is jointly promoted by Oil and Natural Gas Corporation (ONGC), a fortune 500 company & infrastructure leasing & finance services, one of India's leading infrastructure development and finance companies, Karnataka Industrial Area Development Board (KIADB) and Kanara Chamber of Commerce and Industry (KCCI). A unique combination of Government entities, a large financial institution and an apex chamber brings in the expertise to develop MSEZL with world-class industrial infrastructure.

2. ENVIRONMENT MONITORING

Environmental monitoring is being carried out at Mangalore SEZ, following guidelines and regulations of MoEF/CPCB and KSPCB statutory norms. In this regard, MSEZL has awarded the work to M/s Hubert EnviroCare Systems Pvt Ltd. and to monitor air quality, water quality & noise level for the three years. As per work order, during August 2018, we have conducted ambient air quality, ground water quality and noise level monitoring at 2, 10 and 2 locations respectively.

3. SCOPE AND METHODOLOGY

The scope of work carried out and methodology adopted for the survey are described below:

3.1. Ambient Air Quality

Ambient air quality monitoring was carried out at each location on 24 hour basis on two consecutive days per month. The identified monitoring stations are: A₁-CETP & A₂-WTP Area. To assess the ambient air quality status, monitoring stations are identified on the basis of meteorology in the upwind and downwind direction as well as to represent the cross sectional scenario of the MSEZ. Based on the activities the parameters chosen for assessment of air quality are PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂-Nitrogen-di-oxide; CO-Carbon Mono Oxide (DL 0.1 mg/m³); O₃-Ozone (DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni- (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(α)P- Benzo-α-pyrene (DL 0.1 ng/m³) as per CPCB stipulation.

3.1.1. Sampling and analysis of PM_{2.5} and PM₁₀ in ambient air (Gravimetric Method)

- i. Condition a filter paper in oven (i.e. 10 or 2.5 μm diameter)
- ii. Prepare a sampling assembly by uncorking screws of the bracket
- iii. Take a tare (initial) weight of the filter paper (w_i , mg)
- iv. Place the filter in the sampling system securely and tighten the screws of the bracket
- v. Set the timer for the period of sampling
- vi. Start the sampler and adjust flow rate to about 2L/ min for 24 hrs sampling
- vii. Note the flow rate at the end of the desired sampling period and stop the sampler
- viii. Transit the sampling train to environmental laboratory carefully with scientific precautions
- ix. Condition the filter paper again for the same period as was done prior to sampling.

Laboratory analysis:

Weighing of exposed samples:

- i. Take final weight of the exposed filter with a standard balance (w_f , mg)

Calculations:

- i. Average flow rate (initial and final flow rates) in L/ min

$$= (\text{Initial flow rate} + \text{final flow rate}) / 2$$
- ii. Total vol. of air sampled (TVA) in m^3

$$= \text{Avg. flow rate (L/min)} * 10^{-3} (\text{m}^3/\text{L}) * \text{sampling time (hr)} * 60 (\text{min/hr})$$
- iii. Concentration of SPM in $\mu\text{g}/\text{m}^3$

$$= (w_f - w_i) (\text{mg}) / \text{TVA} (\text{m}^3) * 10^6 \mu\text{g}/\text{m}^3$$

3.1.2. Sampling and analysis of Sulphur dioxide

- i. Prepare absorbing reagent (sodium tetra-chloromercurate) by dissolving 27.2 g mercuric chloride and 11.7 g sodium chloride in 1 lit of water
- ii. Prepare a sampling train of at least 2 gas bubblers (for average reading) properly washed with distilled water and air dried.
- iii. Place bubblers in the sampling system securely connecting to the manifold. Check the connections of bubblers with the manifold and the inlet and outlet
- iv. Fill the bubblers with an absorbing reagent with an amount sufficient to last for 24 hours (approximately 15 ml for 8 hours sampling to 50 ml for 24 hours sampling)
- v. To eliminate interference of traces metals, if any, 1 drop of 0.01% EDTA solution could be added to the reagent prior to sampling; similarly, effect of oxide of nitrogen could also be eliminated by adding 1 ml of 0.06% sulphamic acid to the reagent at site
- vi. Start the sampler and adjust flow rate to 2 lit/ min.
- vii. Note the flow rate at the end of desired sampling period and stop the sampler
- viii. Transit the sampling train to environmental laboratory carefully with scientific precautions and preserve the sample tubes in a controlled environmental conditions

Laboratory analysis:**Calibration curve:**

- i. Prepare a standard solution of SO₂ concentrations ranging from 0 to 25 µg SO₂ by taking definite amount of std. sulphur dioxide solution in a 25 ml volumetric flasks
- ii. Add 14 ml of absorbing reagent and 1 ml of pararosaniline hydrochloride to each of the flasks making a total volume of 20 ml.
- iii. Measure absorbance for each flasks by spectrophotometer at 540 nm wavelength
- iv. Plot graph of absorbance v/s concentration

Absorbance in samples:

- i. Transfer samples to a 25 ml flask and develop colour as done in calibration curve
- ii. Measure absorbance at 540 nm
- iii. Find out the concentration (µgSO₂) corresponding to the measured absorbance from the calibration curve

Calculations:

- i. Average flow rate (if there is a significant difference in initial and final flow rates)
- ii. Total volume of air sampled (TVA) in m³
= Avg. flow rate (lit) * 10⁻³ (m³/lit) * sampling time (hr) * 60 (min/hr)
- iii. µgSO₂/TVA

3.1.3. Sampling and analysis of Nitrogen-di-oxide

- i. Prepare absorbing reagent (a solution of sodium hydroxide and arsenite) by dissolving 4 g sodium hydroxide and 1 g of sodium arsenite in 1 lit of distilled water
- ii. Prepare a sampling train of at least 2 gas bubblers (for average reading) properly washed with distilled water and air dried.
- iii. Place bubblers in the sampling system securely connecting to the manifold. Check the connections of bubblers with the manifold and the inlet and outlet
- iv. Fill the bubblers with an absorbing reagent with an amount sufficient to last for 24 hours (approximately 15 ml for 8 hours sampling to 50 ml for hours sampling)
- v. To eliminate interference of sulphur dioxide , drop of hydrogen peroxide to be added to the reagents to convert sulphur dioxide into sulphate during analysis
- vi. Start the sampler and adjust flow rate to about 0.2 lit/ min for 24 hours sampling
- vii. Note the flow rate at the end of desired sampling period and stop the sampler
- viii. Transit the sampling train to environmental laboratory carefully with scientific precautions and preserve the sample tubes in a controlled environmental conditions

Laboratory analysis:**Calibration curve:**

- i. Prepare a standard solution of NO_x concentrations ranging from 0 to 25 $\mu\text{g SO}_2$ by taking definite amount of std. sulphur dioxide solution in a 25 ml volumetric flasks
- ii. Add 14 ml of absorbing reagent and 1 ml of pararosaniline hydrochloride to each of the flasks making a total volume of 20 ml.
- iii. Measure absorbance for each flasks by spectrophotometer at 540 nm wavelength
- iv. Plot graph of absorbance v/s concentration

Absorbance in samples:

- i. Transfer samples to a 25 ml flask and develop colour as done in calibration curve
- ii. Measure absorbance at 540 nm
- iii. Find out the concentration ($\mu\text{g NO}_x$) corresponding to the measured absorbance from the calibration curve

Calculations:

- i. Average flow rate (if there is a significant difference in initial and final flow rates)
- ii. Total volume of air sampled (TVA) in m^3
$$= \text{Avg. flow rate (lit)} * 10^{-3} (\text{m}^3/\text{lit}) * \text{sampling time (hr)} * 60 (\text{min/hr})$$
$$\mu\text{gNO}_x/\text{TVA}$$

3.1.4. Sampling and analysis of Carbon Mono Oxide**Preparation of sample train:**

- i. Sampling begins with conditioning a sampling train and then gas analyzer
- ii. Pressure system is preferred to condition the sampling train by installing pump before the analyzer. Reducing valve needs to be fitted between the analyser and pump to eliminate the pulsing effect of pump on the analyzer
- iii. Flow meter is to be installed just before the analyzer
- iv. A fibre filter is used to capture the particulate matter prior to the optical cell to prevent its interference. As it often accumulates on the optical cell reducing the efficiency
- v. To eliminate the interference of water vapour ,refrigeration or desiccant with magnesium perchlorate AUGUST be used

Mode of operation:

- i. Continuous analysis is carried out at the flow rate of about 100 ml/min to 1000 ml/min (depending upon the level of pollution near the location) for the desired sampling period
- ii. Discrete sampling AUGUST also be possible with infra red analyzer. It however requires proper cleaning of the sampling train.

Steps:

- i. Calibration of analyzer can be carried out if required using standard gases
- ii. Sampler is allowed to warm up for some time before actual readings are taken till the sampler gives steady response and temperature stability

3.1.5. Sampling and analysis of Ozone**Dynamic calibration:**

- i. Dynamic calibration be performed by preparing a large mixture of ozone in air
- ii. The output of an ozonizer is fed into the intake of a small blower delivering air. The mixture of gas however emerges through a short length of pipe
- iii. One portion of this mixture is analyzed in the recorder.
- iv. Another portion is analyzed through a faintly blue iodine solution containing starch and potassium iodide.
- v. Titrated this solution with sodium thiosulphate(0.1N)
- vi. The end point established by comparison with the blue starch- iodine solution
- vii. Mixture of ozone and air in polyester film bag to be prepared and admitted to the analyzer.
- viii. The mixture is analyzed at the time it is used since the ozone decomposes gradually
- ix. Analysis is then performed by passing a measured volume through an impinge containing buffered KI solution and determined the released iodine by spectrometer method
- x. Make the second mixture about midscale concentration and adjust sample or reagent flow rates until the recorder reading agrees with the absorbance scale according to the analytically determined concentration of ozone
- xi. Check several other points on the curve if desired and liner or logarithmic chart to be prepared followed by a calibration curve to read in ppm

Laboratory analysis:**Calibration curve:**

- i. Plot graph of absorbance v/s concentration

Procedure:

- i. Place a fresh absorbent solution in the storage bottle and operate the solution pump until the liquid are full
- ii. After the flow has stabilized itself, zero the recorder and start the air pump
- iii. Set the flow at convenient rates such as 4 ml/ min of solution and 4 l/min of air
- iv. Check and adjust the flow rates daily.
- v. Adjust the pH of the solution once or twice a week ,at time the solution shall be brought up to volume by addition of distilled water
- vi. Change the carbon filter about once a month. Also change the absorbing solution at the same time

3.1.6. Sampling and analysis of Ammonia:

Ammonia is collected in dilute Sulphuric acid solution in midget impingers to form Ammonium Sulphate. The solution is treated with Nessler's reagent to produce a yellow brown complex. The Ammonia concentration is determined by reading the absorption of the complex at 440 nm and comparing with a standard curve.

3.1.7. Sampling and analysis of Lead, Nickel, Arsenic:

1. Sampling procedure:

Tilt back the inlet and secure it according to manufacturer's instructions. Loosen the face-plate wing-nuts and remove the face plate. Remove the filter from its jacket and centre it on the support screen with the rough side of the filter facing upwards. Replace the face-plate and tighten the wing-nuts to secure the rubber gasket against the filter edge. Gently lower the inlet. For automatically flow-controlled units, record the designated flow rate on the data sheet. Record the reading of the elapsed time meter. The specified length of sampling is commonly 8 hours or 24 hours. During this period, several reading (hourly) of flow rate should be taken. After the required time of sampling, record the flow meter reading and take out the filter media from the sampler and put in a container or envelope

2. Analysis:

i. Hot plate procedure:

Cut a 1" x 8" strip or half the filter from the 8" x 10" filter using a stainless steel pizza cutter. Place the filter in a beaker using vinyl gloves or plastic forceps. Cover the filter with the extraction solution (3% HNO_3 & 8% HCl). Place beaker on the hotplate, contained in a fume hood, and reflux gently while covered with a watch glass for 30 min. Do not allow sample to dry. Remove the beakers from the hot-plate and allow to cool. Rinse the beaker walls and wash with distilled water. Add approximately 10 mL reagent water to the remaining filter material in the beaker and allow to stand for at least 30 min. Transfer the extraction fluid in the beaker to a 100 mL volumetric flask or other graduated vessel. Rinse the beaker and any remaining solid material with distilled water and add the rinses to the flask. Dilute to the mark with distilled water (Type I) water and shake. The final extraction solution concentration is 3 % HNO_3 /8% HCl . The filtered sample is now ready for analysis

2.1. Analysis of samples:

i. Instrument / Equipment:

A light beam containing the corresponding wavelength of the energy required to raise the atoms of the analyte from the ground state to the excited state is directed through the flame or furnace. This wavelength is observed by a monochromator and a detector that measure the amount of light absorbed by the element, hence the number of atoms in the ground state in the flame or furnace. A hollow cathode lamp for the element being determined provides a source of that metal's particular absorption wavelength. The method describes both flame atomic absorption (FAA) spectroscopy and graphite furnace atomic absorption (GFAA) spectroscopy. Atomic Absorption Spectrophotometer - analyze the metals by Flame; if results are below detection limit then go for GTA. Arsenic is analyzed by Flame – VGA.

ii. Flame Procedure:

Set the atomic absorption spectrophotometer for the standard condition as follows: choose the correct hollow cathode lamp, align the instrument, position the monochromator at the value recommended by the manufacturer, select the proper monochromator slit width, set the light source current, ignite the flame, regulate the flow of fuel and oxidant, adjust the burner for maximum absorption and stability and balance the meter. Run a series of standards of the metal of interest and construct a calibration curve. Aspirate the blanks and samples. Dilute samples that exceed the calibration range. For Lead (Pb) and Nickel (Ni), the wavelength required for analysis is 217nm and 232nm respectively. Where as in case of Arsenic (As), the VGA should attach with Flame and the wavelength required for analysis is 193.7nm.

3. Calibration:

Prepare standard solutions from the stock solutions. Select at least three standards to cover linear range as recommended by method. Aspirate the standards into the flame or inject the standards into the furnace and record the absorbance. Prepare the calibration graph by plotting absorbance and concentration in µg/ml.

i. Preparation of Standards:

For each metal that is to be determined, standards of known concentration must be acquired commercially certified standards.

ii. Standard Curve:

Standard curve is prepared by using standard solutions of known concentration.

4. Calculations:**i. Sample Air Volume:**

Sample air volume can be calculated by using the following equation:

$$V = (Q) (t)$$

Where,

V = volume of air, m³

Q = average sampling rate, m³/min.

t = time in minutes.

ii. Metal Concentration:

$$C = (M_s - M_b) \times V_s \times F_a / V \times F_t$$

Where,

C = concentration, µg metal/m³

M_s = metal concentration µg/mL

M_b = blank concentration µg/mL

V_s = total volume of extraction in mL

F_a = total area of exposed filter in cm²

V = Volume of air sampled in m³

F_t = Area of filter taken for digestion in cm²

3.1.8. Sampling and analysis of Benzo- α -pyrene:

Benzo (a) Pyrene (BaP) is one of the most important constituent of PAH compounds and also one of the most potent carcinogens. This can be measured in both particulate phase and vapour phase. In the vapour phase the concentration of B(a)P is significantly less than the particulate phase. Therefore, more care to be taken for the measurement of Benzo (a) Pyrene in the particulate phase. The molecular formula of B(a)P is $C_{20}H_{12}$ having molecular weight 252.

It is based on BIS method IS 5182 (Part 12):2004 and USEPA method (TO-13). This method is designed to collect particulate phase PAHs in ambient air and fugitive emissions and to determine individual PAH compounds using capillary gas chromatograph equipped with flame ionization detector. It is a high volume (1.2m³/min) sampling method capable of detecting sub.ng/m³ concentration of PAH in 24 hours sample (i.e. collected in 3 shifts of 8 hour each with 480 m³ sampling volume of air).

i. Sampling:

i. Instrument/Filter Selection:

24 hr. sampling using PM₁₀ high volume sampler with 8 hourly samples using EPM-2000 glass fibre or equivalent filter

ii. Sample Processing

a. Extraction:

Filter papers (half of all the filters papers collected in a day) are cut into strips using scissors and transfer to 250 ml beaker. Add ~50 ml. of Toluene (GC/HPLC grade). These samples are extracted with toluene using ultra sonic sample can be extracted using Soxhlet bath for about 30 minutes. Repeat the procedure twice (50ml x 2 times) for complete extraction. Alternatively, extraction apparatus for about 8 hr. with Toluene and repeat it twice.

b. Filtration:

Filter the extracted samples with Whatman filter paper No. 41 containing 2 gm of Anhydrous Sodium Sulphate (to remove moisture).

c. Concentration:

After filtration, the filtrate is concentrated using Rotary vacuum evaporator to 2ml final volume.

d. Clean-up with silica Gel:

To clean up the impurities, pass 2 ml of concentrated sample through silica gel column (pre conditioned, 60-80 mesh, and 200-250mm×10 mm with Teflon stopcock). After cleaning add 5ml cyclohexane and collect the elute in 25 ml beaker. Repeat the process for at least 3 times and collect it in the same beaker. Alternatively Solid Phase Extraction (SPE) could be used for clean up the impurities of sample.

e. Re-concentration with rotary vacuum evaporator:

The Cleaned up extract/filtrate (approximately 17 ml) is further concentrated using rotary evaporator and it is evaporated to nearly dryness with Nitrogen.

f. Final Sample volume:

The dried sample is re-dissolved in 1ml of toluene and transfer into 4 or 5 ml amber vials final analysis.

ii. Calculations:

Calculate the concentration in ng/ μ L of each identified analyte or B(a)P in the sample extract (Cs) as follows:

Calculate the air volume from the periodic flow reading taken during sampling using the following equation:

$$V = Q \times T$$

Where,

Q = Average flow rate of sampling m³/min

T = sampling time, in min.

V = total sample volume at ambient conditions in m³

Concentration of analyte i.e B(a)P:

The concentration of PAH compound or Benzo(a)pyrene in ng /m³ in the air sampled is given by:

$$C \text{ (ng /m}^3\text{)} = C_s \times V_e / V_i \times V_s$$

Where,

C_s : Concentration of Benzo (a) pyrene in ng / μl in the sample extract recorded by GC.

V_e : Final volume of extract in μl (i.e 1000)

V_i : Injection Volume (i.e 1μl)

V_s : Volume of air sample in m³

3.2 Noise Levels

In general, noise is sound which is composed of many frequency components of various loudness distributed over the audible frequency range. Various noise scales have been introduced to describe, in a single number, the response of an average human to a complex sound made up of various frequencies at different loudness levels. The most common and universally accepted scale is the A weighted scale which is measured as decibel (dB). This is more suitable for audible range of 20 to 20000 HZ and has been designed to weigh various components of noise according to the response of human ear.

The impact of noise can be undertaken by taking in to consideration various factors like potential damage to hearing. Physiological responses, annoyance and general community responses, which have several effects, like Noise Induced Hearing Loss (NIHL). Noise generating sources are identified based on the activities like vehicle movement & associated construction activities. Accordingly, about 2 locations were identified to assess the noise levels The identified locations are:

N₁-CETP and N₂-WTP

Noise measurements were carried out using Lutron SL 4001 model. The sound level meter used was in accordance with IS: 9779 and IEC 651 standards for noise survey. Instrument calibration was done in NABL accredited.

Noise measurements were undertaken at all locations, with duration of 10 minutes per hour (as per Order one minute per hour) continuously for 24 hours in a day for two days in a week for four weeks in the month. The day noise levels were monitored during 6 am to 10 pm and night levels during 10 pm to 6 am at all locations.

For noise levels measured over a given period of time interval, it is possible to describe important features of noise using statistical quantities. This is calculated using the percent of the time certain noise levels are exceeded during the time interval. The notation for the statistical quantities of noise levels are:

L10 is the noise level exceeded 10 percent of the time,

L50 is the noise level exceeded 50 percent of the time and

L90 is the noise level exceeded 90 percent of the time.

Leq is the Equivalent sound pressure level, which is equivalent to the same sound energy as the actual fluctuating sound.

This is necessary because sound from noise source often fluctuates widely during a given period of time. Leq is calculated from the following equation:

$$\text{Leq (hrly)} = L50 + [(L10-L90)^2/60]$$

The noise rating developed for community noise from all sources is the Day-Night sound Level (Ldn). It is similar to a 24 hrs, equivalent sound level except that during night time period a 10 dB(A) weighting penalty is added to the instantaneous sound level before computing the 24 hourly average. This nighttime penalty is added to account for the fact that noise during night when people usually sleep is judged as more annoying than the same noise during the daytime.

The Ldn for a given location in a community is calculated from the hourly Leq values by the following equation: $Ldn = 10 \log (1/24 (16[10^{Ld/10}] + [10^{Ln-10/10}]))$

Where Ld is the equivalent sound level during the day time (6 am to 10 pm) and Ln is the equivalent Sound level during the night time (10 pm to 6 am).

Ambient Noise standards have been notified by the Ministry of environment and Forests vide Gazette notification dated 18th April, 2009 based on the 'A' weighted equivalent noise level (Leq). The standards are given in the Annexure.

Noise measurements were made at 1.5 m above the ground level and a suitable distance from the corridor. The basic Unit of measurements was taken in the fast mode and was sampled to yield statistical information's such as Leq (equivalent noise level), L 10 and L9, those exceeded for 10 and 90 percent of the time respectively. The noise level L10 can be considered as long term noise L90 can be considered as the background noise.

Calibration: The monitoring and analytical instruments are being calibrated by ETDC periodically. The correction factors, if any, are being used in computation of the data.

3.3 Water Quality

Any adverse impact or pollution water will have serious effect on the environment. Hence, it becomes important to monitor the water quality periodically in the port project area. The samples were analysed as per IS: 3025 and compared to the specifications of IS: 10500 norms. The locations identified for collection of samples were

- W₁-Oddidakal (GW)
- W₂-Shantigudde (GW)
- W₃-Chandrasahas Nagar (GW)
- W₄- Permude (GW)
- W₅- CETP (GW)
- W₆- Non Processing Area (GW)
- W₇- Permude Bajpe Village Bandary (GW)
- W₈- Kalavar (GW)
- W₉- 10mL water Reservoir (GW)
- W₁₀- Permude Surface Water

4.0 Results

4.1 Ambient Air Quality

TEST REPORT: AMBIENT AIR MONITORING (AAQ)

Name of the Industry	M/s. Mangalore SEZ Limited
Address of the Industry	3 rd Floor, MUDA Building, Ashok Nagar, Urwa Stores, Mangalore- 575006
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	CETP
Sampling Date	21.08.2018
Report Date	17.09.2018
Report No	HECS/AA/001/170918

CONSOLIDATED TEST RESULTS: AUGUST 2018

Parameter Monitored	NAAQ Standard, 2009	Results
PM _{2.5} (µg/m ³)	60 [*]	11
PM ₁₀ (µg/m ³)	100 [*]	47
SO ₂ (µg/m ³)	80 [*]	02
NO ₂ (µg/m ³)	80 [*]	5
CO (mg/m ³)	2 ^{**}	BDL
O ₃ (µg/m ³)	100 ^{**}	BDL
NH ₃ (µg/m ³)	400 [*]	BDL
Pb (µg/m ³)	1 [*]	BDL
As (ng/m ³)	6 ^{***}	BDL
Ni (ng/m ³)	20 ^{***}	BDL
Benzene (µg/m ³)	5 ^{***}	BDL
B(α)P (ng/m ³)	1 ^{***}	BDL

Note: * : 24 hours average; ** : 8 hours average; *** : Annual average

Note: BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide (DL 0.1 mg/m³); O₃-Ozone (DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(α)P- Benzo-α-pyrene (DL 0.1 ng/m³); ng/m³: nanogram per cubic meter; µg/m³ - microgram per cubic meter

CONCLUSION: All the parameters meet the NAAQ Standards, 2009

*****End of Report *****



Authorized Signatory

TEST REPORT: AMBIENT AIR MONITORING (AAQ): AUGUST 2018

Name of the Industry	M/s. Mangalore SEZ Limited
Address of the Industry	3 rd Floor, MUDA Building, Ashok Nagar, Urwa Stores, Mangalore- 575006
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	WTP
Sampling Date	22.08.2018
Report Date	17.09.2018
Report No	HECS/AA/002/170918

Parameter Monitored	NAAQ Standard, 2009	Results
PM _{2.5} (µg/m ³)	60 [*]	10
PM ₁₀ (µg/m ³)	100 [*]	40
SO ₂ (µg/m ³)	80 [*]	03
NO ₂ (µg/m ³)	80 [*]	06
CO (mg/m ³)	2 ^{**}	BDL
O ₃ (µg/m ³)	100 ^{**}	BDL
NH ₃ (µg/m ³)	400 [*]	BDL
Pb (µg/m ³)	1 [*]	BDL
As (ng/m ³)	6 ^{***}	BDL
Ni (ng/m ³)	20 ^{***}	BDL
Benzene (µg/m ³)	5 ^{***}	BDL
B(α)P (ng/m ³)	1 ^{***}	BDL

Note: * : 24 hours average; ** : 8 hours average; *** : Annual average

Note: BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m³); O₃-Ozone(DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(α)P- Benzo - α-pyrene (DL 0.1 ng/m³); ng/m³: nanogram per cubic meter; µg/m³ - microgram per cubic meter

CONCLUSION: All the parameters meet the NAAQ Standards, 2009

*****End of Report *****



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4.2 Noise level:

TEST REPORT: NOISE MONITORING: AUGUST 2018

Name of the Industry	M/s. Mangalore SEZ Limited
Address of the Industry	3 rd Floor, MUDA Building, Ashok Nagar, Urwa Stores, Mangalore- 575006
Sample Description	Noise Monitoring
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	CETP & WTP areas
Sampling Date	08-09.08.2018 & 10-11.08.2018
Report Date	17.09.2018
Report No.	HECS/N/001-004/170918

Time (Hrs)	CETP AREA (08-09.08.2018)	WTP AREA (10-11.08.2018)
06.00	49.4	51.5
07.00	48.8	52.7
08.00	49.2	53.1
09.00	50.2	54.6
10.00	52.3	55.9
11.00	53.5	56.2
12.00	54.1	58.8
13.00	55.6	59.7
14.00	55.9	59.2
15.00	57.1	59.4
16.00	58.7	58.1
17.00	57.5	58.8
18.00	56.6	58.6
19.00	55.4	59.1
20.00	55.1	59.4
21.00	54.6	58.7
22.00	54.3	58.2
23.00	53.9	57.6
00.00	53.8	56.2
01.00	52.9	55.4
02.00	50.2	54.3
03.00	48.5	53.9
04.00	43.6	46.9
05.00	42.4	49.2
MIN	42.40	46.90
MAX	58.70	59.70
Day dB(A)	54.02	57.18
Night dB(A)	49.33	53.36

Limits: Industrial Area: Day Time-75 dB (A), Night Time-70 dB (A). Commercial Area: Day Time-65 dB (A), Night Time-55 dB (A). Residential Area: Day Time-55 dB (A), Night Time-45 dB (A). Silence Zone: Day Time-50 dB (A), Night Time-40 dB (A).

Note: Monitoring Date represents 24 hours from 6:00 am to 6:00am next day. Legend: Leq- Equivalent Noise Level (hourly); Ld-Day Time Equivalent Noise Level (06:00-22:00 hrs); Ln-Night Time Equivalent Noise Level (22:00-06:00 hrs); and Ldn-24 hourly Equivalent Noise Level. Reference: The Noise Pollution (Regulation and Control) Rules, 2000, CPCB, New Delhi

CONCLUSION: All the parameters meet MoEF Standards



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TEST REPORT: NOISE MONITORING: AUGUST 2018

Name of the Industry	M/s. Mangalore SEZ Limited
Address of the Industry	3 rd Floor, MUDA Building, Ashok Nagar, Urwa Stores, Mangalore- 575006
Sample Description	Noise Monitoring
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	CETP & WTP areas
Sampling Date	24-25.08.2018 & 27-28.08.2018
Report Date	17.09.2018
Report No.	HECS/N/001-002/170918

Time (Hrs)	CETP AREA (24-25.08.2018)	WTP AREA (27-28.08.2018)
06.00	49.8	52.4
07.00	48.6	51.2
08.00	49	52.5
09.00	49.8	53.1
10.00	51.5	54.5
11.00	52.7	56.4
12.00	53.5	56.2
13.00	54.6	57.7
14.00	54.7	58.3
15.00	55.2	58.9
16.00	56.1	58.1
17.00	57	59.2
18.00	57.3	58.8
19.00	56.7	57.4
20.00	55.4	57.2
21.00	56.2	58.1
22.00	53.6	58.2
23.00	53.4	56.7
00.00	53.6	55.3
01.00	52.9	55.5
02.00	51.7	53.1
03.00	50.4	53.4
04.00	49.5	50.9
05.00	48.5	52.6
MIN	48.50	50.90
MAX	57.30	59.20
Day dB(A)	53.63	56.36
Night dB(A)	51.43	53.93

Limits: Industrial Area: Day Time-75 dB (A), Night Time-70 dB (A). Commercial Area: Day Time-65 dB (A), Night Time-55 dB (A). Residential Area: Day Time-55 dB (A), Night Time-45 dB (A). Silence Zone: Day Time-50 dB (A), Night Time-40 dB (A).

Note: Monitoring Date represents 24 hours from 6:00 am to 6:00am next day. Legend: Leq- Equivalent Noise Level (hourly); Ld-Day Time Equivalent Noise Level (06:00-22:00 hrs); Ln-Night Time Equivalent Noise Level (22:00-06:00 hrs); and Ldn-24 hourly Equivalent Noise Level. Reference: The Noise Pollution (Regulation and Control) Rules, 2000, CPCB, New Delhi

CONCLUSION: All the parameters meet MoEF Standards



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4.3 Water Analysis Results

TEST REPORT

Name of the Industry	M/s. Mangalore SEZ Limited				
Address of the Industry	3 rd Floor, MUDA Building, Ashok Nagar, Urwa Stores, Mangalore- 575006				
Sample Description	Oddidakal (GW)				
Date of Sampling	22.08.2018				
Sample Collected by	Hubert Enviro Care Systems (P) Ltd				
Report Date	17.09.2018				
Report No	HECS/W/001/170918				
Sl.No.	Parameters monitored	Units	Results	As per IS 10500:2012 standard limit	
				Acceptable (max)	Permissible (max)
1.	Colour	Hazen	Colourless	5	15
2.	pH (at 25 °C)	-	7.13	6.5-8.5	No Relaxation
3.	Electrical Conductivity	µS/cm	260	Nil	Nil
4.	Odour	-	Unobjectionable	Agreeable	
5.	Taste	-	Agreeable	Agreeable	
6.	Turbidity	NTU	BDL (DL 0.1)	1	5
7.	Total Dissolved Solids	mg/L	230.0	500	2000
8.	Alkalinity as CaCO ₃	mg/L	49.5	200	600
9.	Total Hardness	mg/L	166.6	200	600
10.	Calcium as Ca	mg/L	47.13	75	200
11.	Magnesium as Mg	mg/L	11.91	30	100
12.	Iron as Fe	mg/L	0.28	0.3	No Relaxation
13.	Sulphate as SO ₄	mg/L	4.8	200	400
14.	Chloride as Cl	mg/L	7.28	250	1000
15.	Boron as B	mg/L	BDL(DL 0.1)	0.5	1.0
16.	Residual free chlorine	mg/L	BDL (DL 0.1)	0.2	1
17.	Fluoride	mg/L	0.16	1.0	1.5
18.	Phenolic Compounds	mg/L	BDL(DL 0.001)	0.001	0.002
19.	Manganese as Mn	mg/L	BDL(DL 0.01)	0.1	0.3
20.	Zinc as Zn	mg/L	BDL(DL 0.01)	5	15
21.	Arsenic as As	mg/L	BDL(DL 0.005)	0.01	0.05
22.	Cyanide as CN	mg/L	BDL (DL 0.01)	0.05	No Relaxation
23.	Cadmium as Cd	mg/L	BDL(DL 0.01)	0.003	No Relaxation
24.	Chromium as Cr	mg/L	BDL(DL 0.01)	0.05	No Relaxation
25.	Aluminium	mg/L	BDL(DL 0.02)	0.03	0.2
26.	Selenium as Se	mg/L	BDL(DL 0.005)	0.01	No Relaxation
27.	Lead as Pb	mg/L	BDL(DL 0.01)	0.01	No Relaxation
28.	Mercury as Hg	mg/L	BDL(DL 0.001)	0.001	No Relaxation
29.	Nitrate Nitrogen NO ₃	mg/L	0.4	45	No Relaxation
30.	E.Coli	MPN/100mL	Nil	Shall not be detectable in any 100 mL sample	

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter; MPN- Most Probable Number; mL-Milliliter

CONCLUSION: GROUND WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report



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TEST REPORT

Name of the Industry		M/s. Mangalore SEZ Limited			
Address of the Industry		3 rd Floor, MUDA Building, Ashok Nagar, Urwa Stores, Mangalore- 575006			
Sample Description		Shantigudde (GW)			
Date of Sampling		22.08.2018			
Sample Collected by		Hubert Enviro Care Systems (P) Ltd			
Report Date		17.09.2018			
Report No		HECS/W/002/170918			
Sl.No.	Parameters monitored	Units	Results	As per IS 10500:2012 standard limit	
				Acceptable (max)	Permissible (max)
1.	Colour	Hazen	Colourless	5	15
2.	pH (at 25 °C)	-	6.58	6.5-8.5	No Relaxation
3.	Electrical Conductivity	µS/cm	220	Nil	Nil
4.	Odour	-	Unobjectionable	Agreeable	
5.	Taste	-	Agreeable	Agreeable	
6.	Turbidity	NTU	BDL (DL 0.1)	1	5
7.	Total Dissolved Solids	mg/L	190	500	2000
8.	Alkalinity as CaCO ₃	mg/L	3.96	200	600
9.	Total Hardness	mg/L	58.8	200	600
10.	Calcium as Ca	mg/L	15.71	75	200
11.	Magnesium as Mg	mg/L	4.76	30	100
12.	Iron as Fe	mg/L	0.31	0.3	No Relaxation
13.	Sulphate as SO ₄	mg/L	2.12	200	400
14.	Chloride as Cl	mg/L	27.19	250	1000
15.	Boron as B	mg/L	BDL(DL 0.1)	0.5	1.0
16.	Residual free chlorine	mg/L	BDL (DL 0.1)	0.2	1
17.	Fluoride	mg/L	0.21	1.0	1.5
18.	Phenolic Compounds	mg/L	BDL(DL 0.001)	0.001	0.002
19.	Manganese as Mn	mg/L	BDL(DL 0.01)	0.1	0.3
20.	Zinc as Zn	mg/L	BDL(DL 0.01)	5	15
21.	Arsenic as As	mg/L	BDL(DL 0.005)	0.01	0.05
22.	Cyanide as CN	mg/L	BDL (DL 0.01)	0.05	No Relaxation
23.	Cadmium as Cd	mg/L	BDL(DL 0.01)	0.003	No Relaxation
24.	Chromium as Cr	mg/L	BDL(DL 0.01)	0.05	No Relaxation
25.	Aluminium	mg/L	BDL(DL 0.02)	0.03	0.2
26.	Selenium as Se	mg/L	BDL(DL 0.005)	0.01	No Relaxation
27.	Lead as Pb	mg/L	BDL(DL 0.01)	0.01	No Relaxation
28.	Mercury as Hg	mg/L	BDL(DL 0.001)	0.001	No Relaxation
29.	Nitrate Nitrogen NO ₃	mg/L	1.3	45	No Relaxation
30.	E.Coli	MPN/100mL	Nil	Shall not be detectable in any 100 mL sample	

Note:- BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter; MPN- Most Probable Number; mL-Milliliter

CONCLUSION: GROUND WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report



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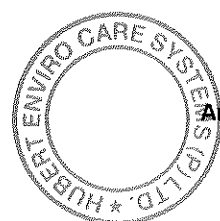
TEST REPORT

Name of the Industry		M/s. Mangalore SEZ Limited			
Address of the Industry		3 rd Floor, MUDA Building, Ashok Nagar, Urwa Stores, Mangalore- 575006			
Sample Description		Chandrasahas Nagar (GW)			
Date of Sampling		22.08.2018			
Sample Collected by		Hubert Enviro Care Systems (P) Ltd			
Report Date		17.09.2018			
Report No		HECS/W/003/170918			
Sl.No.	Parameters monitored	Units	Results	As per IS 10500:2012 standard limit	
				Acceptable (max)	Permissible (max)
1.	Colour	Hazen	Colourless	5	15
2.	pH (at 25 °C)	-	7.72	6.5-8.5	No Relaxation
3.	Electrical Conductivity	µS/cm	123	Nil	Nil
4.	Odour	-	NA	Agreeable	
5.	Taste	-	Agreeable	Agreeable	
6.	Turbidity	NTU	BDL (DL 0.1)	1	5
7.	Total Dissolved Solids	mg/L	109.0	500	2000
8.	Alkalinity as CaCO ₃	mg/L	27.72	200	600
9.	Total Hardness	mg/L	67.32	200	600
10.	Calcium as Ca	mg/L	23.81	75	200
11.	Magnesium as Mg	mg/L	1.92	30	100
12.	Iron as Fe	mg/L	0.11	0.3	No Relaxation
13.	Sulphate as SO ₄	mg/L	15.4	200	400
14.	Chloride as Cl	mg/L	0.97	250	1000
15.	Boron as B	mg/L	BDL(DL 0.1)	0.5	1.0
16.	Residual free chlorine	mg/L	BDL (DL 0.1)	0.2	1
17.	Fluoride	mg/L	0.18	1.0	1.5
18.	Phenolic Compounds	mg/L	BDL(DL 0.001)	0.001	0.002
19.	Manganese as Mn	mg/L	BDL(DL 0.01)	0.1	0.3
20.	Zinc as Zn	mg/L	BDL(DL 0.01)	5	15
21.	Arsenic as As	mg/L	BDL(DL 0.005)	0.01	0.05
22.	Cyanide as CN	mg/L	BDL (DL 0.01)	0.05	No Relaxation
23.	Cadmium as Cd	mg/L	BDL(DL 0.01)	0.003	No Relaxation
24.	Chromium as Cr	mg/L	BDL(DL 0.01)	0.05	No Relaxation
25.	Aluminium	mg/L	BDL(DL 0.02)	0.03	0.2
26.	Selenium as Se	mg/L	BDL(DL 0.005)	0.01	No Relaxation
27.	Lead as Pb	mg/L	BDL(DL 0.01)	0.01	No Relaxation
28.	Mercury as Hg	mg/L	BDL(DL 0.001)	0.001	No Relaxation
29.	Nitrate Nitrogen NO ₃	mg/L	1.0	45	No Relaxation
30.	E.Coli	MPN/100mL	Nil	Shall not be detectable in any 100 mL sample	

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter; MPN- Most Probable Number; mL-Milliliter

CONCLUSION: GROUND WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report



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TEST REPORT

Name of the Industry	M/s. Mangalore SEZ Limited				
Address of the Industry	3 rd Floor, MUDA Building, Ashok Nagar, Urwa Stores, Mangalore- 575006				
Sample Description	Permude (GW)				
Date of Sampling	22.08.2018				
Sample Collected by	Hubert Enviro Care Systems (P) Ltd				
Report Date	17.09.2018				
Report No	HECS/W/004/170918				
Sl.No.	Parameters monitored	Units	Results	As per IS 10500:2012 standard limit	
				Acceptable (max)	Permissible (max)
1.	Colour	Hazen	Colourless	5	15
2.	pH (at 25 °C)	-	6.64	6.5-8.5	No Relaxation
3.	Electrical Conductivity	µS/cm	172	Nil	Nil
4.	Odour	-	NA	Agreeable	
5.	Taste	-	Agreeable	Agreeable	
6.	Turbidity	NTU	BDL (DL 0.1)	1	5
7.	Total Dissolved Solids	mg/L	148	500	2000
8.	Alkalinity as CaCO ₃	mg/L	9.9	200	600
9.	Total Hardness	mg/L	67.32	200	600
10.	Calcium as Ca	mg/L	19.04	75	200
11.	Magnesium as Mg	mg/L	4.81	30	100
12.	Iron as Fe	mg/L	0.112	0.3	No Relaxation
13.	Sulphate as SO ₄	mg/L	87.50	200	400
14.	Chloride as Cl	mg/L	14.6	250	1000
15.	Boron as B	mg/L	BDL(DL 0.1)	0.5	1.0
16.	Residual free chlorine	mg/L	BDL (DL 0.1)	0.2	1
17.	Fluoride	mg/L	0.14	1.0	1.5
18.	Phenolic Compounds	mg/L	BDL(DL 0.001)	0.001	0.002
19.	Manganese as Mn	mg/L	BDL(DL 0.01)	0.1	0.3
20.	Zinc as Zn	mg/L	BDL(DL 0.01)	5	15
21.	Arsenic as As	mg/L	BDL(DL 0.005)	0.01	0.05
22.	Cyanide as CN	mg/L	BDL (DL 0.01)	0.05	No Relaxation
23.	Cadmium as Cd	mg/L	BDL(DL 0.01)	0.003	No Relaxation
24.	Chromium as Cr	mg/L	BDL(DL 0.01)	0.05	No Relaxation
25.	Aluminium	mg/L	BDL(DL 0.02)	0.03	0.2
26.	Selenium as Se	mg/L	BDL(DL 0.005)	0.01	No Relaxation
27.	Lead as Pb	mg/L	BDL(DL 0.01)	0.01	No Relaxation
28.	Mercury as Hg	mg/L	BDL(DL 0.001)	0.001	No Relaxation
29.	Nitrate Nitrogen NO ₃	mg/L	0.91	45	No Relaxation
30.	E.Coli	MPN/100mL	Nil	Shall not be detectable in any 100 mL sample	

Note:- BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter; MPN- Most Probable Number; mL-Milliliter

CONCLUSION: GROUND WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report



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TEST REPORT

Name of the Industry		M/s. Mangalore SEZ Limited			
Address of the Industry		3 rd Floor, MUDA Building, Ashok Nagar, Urwa Stores, Mangalore- 575006			
Sample Description		CETP (GW)			
Date of Sampling		22.08.2018			
Sample Collected by		Hubert Enviro Care Systems (P) Ltd			
Report Date		17.09.2018			
Report No		HECS/W/005/170918			
Sl.No.	Parameters monitored	Units	Results	As per IS 10500:2012 standard limit	
				Acceptable (max)	Permissible (max)
1.	Colour	Hazen	Colourless	5	15
2.	pH (at 25 °C)	-	7.30	6.5-8.5	No Relaxation
3.	Electrical Conductivity	µS/cm	183	Nil	Nil
4.	Odour	-	Unobjectionable	Agreeable	
5.	Taste	-	Agreeable	Agreeable	
6.	Turbidity	NTU	BDL (DL 0.1)	1	5
7.	Total Dissolved Solids	mg/L	158.0	500	2000
8.	Alkalinity as CaCO ₃	mg/L	37.62	200	600
9.	Total Hardness	mg/L	98.0	200	600
10.	Calcium as Ca	mg/L	25.14	75	200
11.	Magnesium as Mg	mg/L	8.57	30	100
12.	Iron as Fe	mg/L	0.087	0.3	No Relaxation
13.	Sulphate as SO ₄	mg/L	4.6	200	400
14.	Chloride as Cl	mg/L	5.83	250	1000
15.	Boron as B	mg/L	BDL(DL 0.1)	0.5	1.0
16.	Residual free chlorine	mg/L	BDL (DL 0.1)	0.2	1
17.	Fluoride	mg/L	0.13	1.0	1.5
18.	Phenolic Compounds	mg/L	BDL(DL 0.001)	0.001	0.002
19.	Manganese as Mn	mg/L	BDL(DL 0.01)	0.1	0.3
20.	Zinc as Zn	mg/L	BDL(DL 0.01)	5	15
21.	Arsenic as As	mg/L	BDL(DL 0.005)	0.01	0.05
22.	Cyanide as CN	mg/L	BDL (DL 0.01)	0.05	No Relaxation
23.	Cadmium as Cd	mg/L	BDL(DL 0.01)	0.003	No Relaxation
24.	Chromium as Cr	mg/L	BDL(DL 0.01)	0.05	No Relaxation
25.	Aluminium	mg/L	BDL(DL 0.02)	0.03	0.2
26.	Selenium as Se	mg/L	BDL(DL 0.005)	0.01	No Relaxation
27.	Lead as Pb	mg/L	BDL(DL 0.01)	0.01	No Relaxation
28.	Mercury as Hg	mg/L	BDL(DL 0.001)	0.001	No Relaxation
29.	Nitrate Nitrogen NO ₃	mg/L	BDL (0.1)	45	No Relaxation
30.	E.Coli	MPN/100mL	Nil	Shall not be detectable in any 100 mL sample	

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter; MPN- Most Probable Number; mL-Milliliter

CONCLUSION: GROUND WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report



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TEST REPORT

Name of the Industry		M/s. Mangalore SEZ Limited			
Address of the Industry		3 rd Floor, MUDA Building, Ashok Nagar, Urwa Stores, Mangalore- 575006			
Sample Description		Non Processing Area(GW)			
Date of Sampling		23.08.2018			
Sample Collected by		Hubert Enviro Care Systems (P) Ltd			
Report Date		17.09.2018			
Report No		HECS/W/006/170918			
Sl.No.	Parameters monitored	Units	Results	As per IS 10500:2012 standard limit	
				Acceptable (max)	Permissible (max)
1.	Colour	Hazen	Colourless	5	15
2.	pH (at 25 °C)	-	7.30	6.5-8.5	No Relaxation
3.	Electrical Conductivity	µS/cm	79	Nil	Nil
4.	Odour	-	Unobjectionable	Agreeable	
5.	Taste	-	Agreeable	Agreeable	
6.	Turbidity	NTU	BDL (DL 0.1)	1	5
7.	Total Dissolved Solids	mg/L	700	500	2000
8.	Alkalinity as CaCO ₃	mg/L	5.94	200	600
9.	Total Hardness	mg/L	35.28	200	600
10.	Calcium as Ca	mg/L	9.42	75	200
11.	Magnesium as Mg	mg/L	2.85	30	100
12.	Iron as Fe	mg/L	0.114	0.3	No Relaxation
13.	Sulphate as SO ₄	mg/L	2.32	200	400
14.	Chloride as Cl	mg/L	7.7	250	1000
15.	Boron as B	mg/L	BDL(DL 0.1)	0.5	1.0
16.	Residual free chlorine	mg/L	BDL (DL 0.1)	0.2	1
17.	Fluoride	mg/L	0.17	1.0	1.5
18.	Phenolic Compounds	mg/L	BDL(DL 0.001)	0.001	0.002
19.	Manganese as Mn	mg/L	BDL(DL 0.01)	0.1	0.3
20.	Zinc as Zn	mg/L	BDL(DL 0.01)	5	15
21.	Arsenic as As	mg/L	BDL(DL 0.005)	0.01	0.05
22.	Cyanide as CN	mg/L	BDL (DL 0.01)	0.05	No Relaxation
23.	Cadmium as Cd	mg/L	BDL(DL 0.01)	0.003	No Relaxation
24.	Chromium as Cr	mg/L	BDL(DL 0.01)	0.05	No Relaxation
25.	Aluminium	mg/L	BDL(DL 0.02)	0.03	0.2
26.	Selenium as Se	mg/L	BDL(DL 0.005)	0.01	No Relaxation
27.	Lead as Pb	mg/L	BDL(DL 0.01)	0.01	No Relaxation
28.	Mercury as Hg	mg/L	BDL(DL 0.001)	0.001	No Relaxation
29.	Nitrate Nitrogen NO ₃	mg/L	0.15	45	No Relaxation
30.	E.Coli	MPN/100mL	Nil	Shall not be detectable in any 100 mL sample	

Note:- BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter; MPN- Most Probable Number; mL-Milliliter

CONCLUSION: GROUND WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report


Authorized Signatory



TEST REPORT

Name of the Industry	M/s. Mangalore SEZ Limited				
Address of the Industry	3 rd Floor, MUDA Building, Ashok Nagar, Urwa Stores, Mangalore- 575006				
Sample Description	Permude Baipe Village Boundary (GW)				
Date of Sampling	23.08.2018				
Sample Collected by	Hubert Enviro Care Systems (P) Ltd				
Report Date	17.09.2018				
Report No	HECS/W/007/170918				
Sl.No.	Parameters monitored	Units	Results	As per IS 10500:2012 standard limit	
				Acceptable (max)	Permissible (max)
1.	Colour	Hazen	Colourless	5	15
2.	pH (at 25 °C)	-	5.53	6.5-8.5	No Relaxation
3.	Electrical Conductivity	µS/cm	94	Nil	Nil
4.	Odour	-	NA	Agreeable	
5.	Taste	-	Agreeable	Agreeable	
6.	Turbidity	NTU	BDL (DL 0.1)	1	5
7.	Total Dissolved Solids	mg/L	81	500	2000
8.	Alkalinity as CaCO ₃	mg/L	1.98	200	600
9.	Total Hardness	mg/L	43.56	200	600
10.	Calcium as Ca	mg/L	9.52	75	200
11.	Magnesium as Mg	mg/L	4.811	30	100
12.	Iron as Fe	mg/L	0.1128	0.3	No Relaxation
13.	Sulphate as SO ₄	mg/L	150.60	200	400
14.	Chloride as Cl	mg/L	2.91	250	1000
15.	Boron as B	mg/L	BDL(DL 0.1)	0.5	1.0
16.	Residual free chlorine	mg/L	BDL (DL 0.1)	0.2	1
17.	Fluoride	mg/L	0.17	1.0	1.5
18.	Phenolic Compounds	mg/L	BDL(DL 0.001)	0.001	0.002
19.	Manganese as Mn	mg/L	BDL(DL 0.01)	0.1	0.3
20.	Zinc as Zn	mg/L	BDL(DL 0.01)	5	15
21.	Arsenic as As	mg/L	BDL(DL 0.005)	0.01	0.05
22.	Cyanide as CN	mg/L	BDL (DL 0.01)	0.05	No Relaxation
23.	Cadmium as Cd	mg/L	BDL(DL 0.01)	0.003	No Relaxation
24.	Chromium as Cr	mg/L	BDL(DL 0.01)	0.05	No Relaxation
25.	Aluminium	mg/L	BDL(DL 0.02)	0.03	0.2
26.	Selenium as Se	mg/L	BDL(DL 0.005)	0.01	No Relaxation
27.	Lead as Pb	mg/L	BDL(DL 0.01)	0.01	No Relaxation
28.	Mercury as Hg	mg/L	BDL(DL 0.001)	0.001	No Relaxation
29.	Nitrate Nitrogen NO ₃	mg/L	0.25	45	No Relaxation
30.	E.Coli	MPN/100mL	Nil	Shall not be detectable in any 100 mL sample	

Note:- BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter; MPN- Most Probable Number; mL-Milliliter

CONCLUSION: GROUND WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report



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TEST REPORT

Name of the Industry	M/s. Mangalore SEZ Limited				
Address of the Industry	3 rd Floor, MUDA Building, Ashok Nagar, Urwa Stores, Mangalore- 575006				
Sample Description	Kalavar (GW)				
Date of Sampling	23.08.2018				
Sample Collected by	Hubert Enviro Care Systems (P) Ltd				
Report Date	17.09.2018				
Report No	HECS/W/008/170918				
Sl.No.	Parameters monitored	Units	Results	As per IS 10500:2012 standard limit	
				Acceptable (max)	Permissible (max)
1.	Colour	Hazen	Colourless	5	15
2.	pH (at 25 °C)	-	6.63	6.5-8.5	No Relaxation
3.	Electrical Conductivity	µS/cm	157	Nil	Nil
4.	Odour	-	NA	Agreeable	
5.	Taste	-	Agreeable	Agreeable	
6.	Turbidity	NTU	BDL (DL 0.1)	1	5
7.	Total Dissolved Solids	mg/L	135	500	2000
8.	Alkalinity as CaCO ₃	mg/L	33.66	200	600
9.	Total Hardness	mg/L	71.28	200	600
10.	Calcium as Ca	mg/L	23.80	75	200
11.	Magnesium as Mg	mg/L	2.88	30	100
12.	Iron as Fe	mg/L	0.1037	0.3	No Relaxation
13.	Sulphate as SO ₄	mg/L	26.61	200	400
14.	Chloride as Cl	mg/L	7.77	250	1000
15.	Boron as B	mg/L	BDL(DL 0.1)	0.5	1.0
16.	Residual free chlorine	mg/L	BDL (DL 0.1)	0.2	1
17.	Fluoride	mg/L	0.18	1.0	1.5
18.	Phenolic Compounds	mg/L	BDL(DL 0.001)	0.001	0.002
19.	Manganese as Mn	mg/L	BDL(DL 0.01)	0.1	0.3
20.	Zinc as Zn	mg/L	BDL(DL 0.01)	5	15
21.	Arsenic as As	mg/L	BDL(DL 0.005)	0.01	0.05
22.	Cyanide as CN	mg/L	BDL (DL 0.01)	0.05	No Relaxation
23.	Cadmium as Cd	mg/L	BDL(DL 0.01)	0.003	No Relaxation
24.	Chromium as Cr	mg/L	BDL(DL 0.01)	0.05	No Relaxation
25.	Aluminium	mg/L	BDL(DL 0.02)	0.03	0.2
26.	Selenium as Se	mg/L	BDL(DL 0.005)	0.01	No Relaxation
27.	Lead as Pb	mg/L	BDL(DL 0.01)	0.01	No Relaxation
28.	Mercury as Hg	mg/L	BDL(DL 0.001)	0.001	No Relaxation
29.	Nitrate Nitrogen NO ₃	mg/L	0.03	45	No Relaxation
30.	E.Coli	MPN/100mL	Nil	Shall not be detectable in any 100 mL sample	

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: GROUND WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report



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TEST REPORT

Name of the Industry	M/s. Mangalore SEZ Limited				
Address of the Industry	3 rd Floor, MUDA Building, Ashok Nagar, Urwa Stores, Mangalore- 575006				
Sample Description	10 ml water Reservoir (GW)				
Date of Sampling	23.08.2018				
Sample Collected by	Hubert Enviro Care Systems (P) Ltd				
Report Date	17.09.2018				
Report No	HECS/W/009/170918				
Sl.No.	Parameters monitored	Units	Results	As per IS 10500:2012 standard limit	
				Acceptable (max)	Permissible (max)
1.	Colour	Hazen	Colourless	5	15
2.	pH (at 25 °C)	-	7.95	6.5-8.5	No Relaxation
3.	Electrical Conductivity	µS/cm	350	Nil	Nil
4.	Odour	-	Unobjectionable	Agreeable	
5.	Taste	-	Agreeable	Agreeable	
6.	Turbidity	NTU	BDL(DL 0.1)	1	5
7.	Total Dissolved Solids	mg/L	310	500	2000
8.	Alkalinity as CaCO ₃	mg/L	59.4	200	600
9.	Total Hardness	mg/L	264.6	200	600
10.	Calcium as Ca	mg/L	94.27	75	200
11.	Magnesium as Mg	mg/L	7.14	30	100
12.	Iron as Fe	mg/L	0.17	0.3	No Relaxation
13.	Sulphate as SO ₄	mg/L	19.35	200	400
14.	Chloride as Cl	mg/L	2.43	250	1000
15.	Boron as B	mg/L	BDL(DL 0.1)	0.5	1.0
16.	Residual free chlorine	mg/L	BDL (DL 0.1)	0.2	1
17.	Fluoride	mg/L	0.13	1.0	1.5
18.	Phenolic Compounds	mg/L	BDL(DL 0.001)	0.001	0.002
19.	Manganese as Mn	mg/L	BDL(DL 0.01)	0.1	0.3
20.	Zinc as Zn	mg/L	BDL(DL 0.01)	5	15
21.	Arsenic as As	mg/L	BDL(DL 0.005)	0.01	0.05
22.	Cyanide as CN	mg/L	BDL (DL 0.01)	0.05	No Relaxation
23.	Cadmium as Cd	mg/L	BDL(DL 0.01)	0.003	No Relaxation
24.	Chromium as Cr	mg/L	BDL(DL 0.01)	0.05	No Relaxation
25.	Aluminium	mg/L	BDL(DL 0.02)	0.03	0.2
26.	Selenium as Se	mg/L	BDL(DL 0.005)	0.01	No Relaxation
27.	Lead as Pb	mg/L	BDL(DL 0.01)	0.01	No Relaxation
28.	Mercury as Hg	mg/L	BDL(DL 0.001)	0.001	No Relaxation
29.	Nitrate Nitrogen NO ₃	mg/L	0.03	45	No Relaxation
30.	E.Coli	MPN/100mL	Nil	Shall not be detectable in any 100 mL sample	

Note:- BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter; MPN- Most Probable Number; mL-Milliliter

CONCLUSION: GROUND WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report



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TEST REPORT

Name of the Industry	M/s. Mangalore SEZ Limited				
Address of the Industry	3 rd Floor, MUDA Building, Ashok Nagar, Urwa Stores, Mangalore- 575006				
Sample Description	Permude Surface Water				
Date of Sampling	23.08.2018				
Sample Collected by	Hubert Enviro Care Systems (P) Ltd				
Report Date	17.09.2018				
Report No	HECS/W/010/310818				
Sl.No.	Parameters monitored	Units	Results	As per IS 10500:2012 standard limit	
				Acceptable (max)	Permissible (max)
1.	Colour	Hazen	Colourless	5	15
2.	pH (at 25 °C)	-	7.35	6.5-8.5	No Relaxation
3.	Electrical Conductivity	µS/cm	84	Nil	Nil
4.	Odour	-	NA	Agreeable	
5.	Taste	-	Agreeable	Agreeable	
6.	Turbidity	NTU	BDL(DL 0.1)	1	5
7.	Total Dissolved Solids	mg/L	72	500	2000
8.	Alkalinity as CaCO ₃	mg/L	5.94	200	600
9.	Total Hardness	mg/L	35.64	200	600
10.	Calcium as Ca	mg/L	9.52	75	200
11.	Magnesium as Mg	mg/L	2.88	30	100
12.	Iron as Fe	mg/L	0.12	0.3	No Relaxation
13.	Sulphate as SO ₄	mg/L	17.44	200	400
14.	Chloride as Cl	mg/L	0.971	250	1000
15.	Boron as B	mg/L	BDL(DL 0.1)	0.5	1.0
16.	Residual free chlorine	mg/L	BDL (DL 0.1)	0.2	1
17.	Fluoride	mg/L	0.16	1.0	1.5
18.	Phenolic Compounds	mg/L	BDL(DL 0.001)	0.001	0.002
19.	Manganese as Mn	mg/L	BDL(DL 0.01)	0.1	0.3
20.	Zinc as Zn	mg/L	BDL(DL 0.01)	5	15
21.	Arsenic as As	mg/L	BDL(DL 0.005)	0.01	0.05
22.	Cyanide as CN	mg/L	BDL (DL 0.01)	0.05	No Relaxation
23.	Cadmium as Cd	mg/L	BDL(DL 0.01)	0.003	No Relaxation
24.	Chromium as Cr	mg/L	BDL(DL 0.01)	0.05	No Relaxation
25.	Aluminium	mg/L	BDL(DL 0.02)	0.03	0.2
26.	Selenium as Se	mg/L	BDL(DL 0.005)	0.01	No Relaxation
27.	Lead as Pb	mg/L	BDL(DL 0.01)	0.01	No Relaxation
28.	Mercury as Hg	mg/L	BDL(DL 0.001)	0.001	No Relaxation
29.	Nitrate Nitrogen NO ₃	mg/L	0.04	45	No Relaxation
30.	E.Coli	MPN/100mL	Nil	Shall not be detectable in any 100 mL sample	

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: GROUND WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report



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5. MONITORING SCHEDULE OF MANGALORE SEZ LIMITED **ENVIRONMENTAL MONITORING**

Sl.No	Environmental Attributes monitored	Parameters analyzed and presented in analysis Report	Monitoring requirement
1	Ambient Air Quality	PM _{2.5} , PM ₁₀ , SO ₂ , NO ₂ , CO, O ₃ , NH ₃ , Pb, As, Ni, Benzene, B(α)P	Two Locations/Month, 24 hrs/day
2	Surface/ Ground Water Quality	Colour, pH (at 25 °C), Odour, Taste, Turbidity, Total Dissolved Solids, Alkalinity as CaCO ₃ , Total Hardness, Calcium as Ca, Magnesium as Mg, Iron as Fe, Sulphate as SO ₄ , Chloride as Cl, Boron as B, Residual free chlorine, Fluoride, Phenolic Compounds, Carbon monoxide, Manganese as Mn, Zinc as Zn, Arsenic as As, Cyanide as CN, Cadmium as Cd, Chromium as Cr, Aluminium as Al, Selenium as Se, Lead as Pb, Mercury as Hg, Nitrate Nitrogen NO ₃ , <i>E.Coli</i>	Ten Locations, Seasons (Summer, Winter, Post monsoon), By using Grab Sampling technique
3	Ambient Noise Level	Noise Level (db) in Day and Night	Two Locations, Seasons (Summer, Winter, Post monsoon), Fortnightly interval

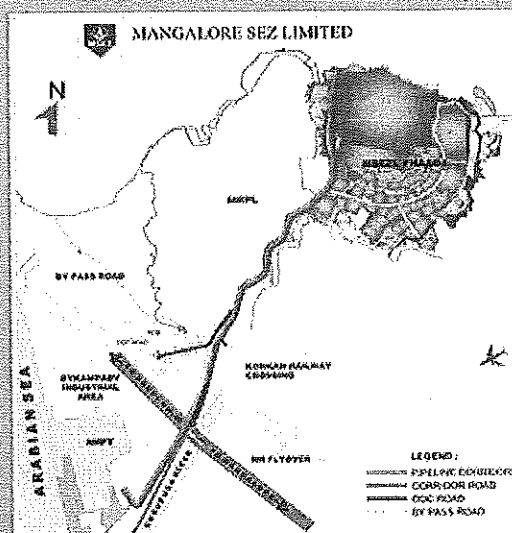


Mangalore SEZ Limited

ENVIRONMENTAL MONITORING REPORT

**AMBIENT AIR QUALITY
REPORT FOR THE MONTH OF SEPTEMBER 2018**

Submitted to



Submitted By



M/s Hubert Enviro Care Systems Private Limited
(NABL Accredited & MOEF Recognized Laboratory)

7/C-45, Baikampady Industrial Estate, Mangaluru, Karnataka - 575011

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AMBIENT AIR QUALITY MONITORING REPORT - SEPTEMBER 2018

1. INTRODUCTION

Mangalore Special Economic Zone, known as MSEZ is spread across 1638 acres, located 15 km from Mangalore city, off Cochin-Mumbai NH 66, 5 km from Mangalore International Airport and 8 km from all-weather deep draft sea port, New Mangalore Port in Mangalore, Karnataka, India. MSEZ limited is jointly promoted by Oil and Natural Gas Corporation (ONGC), a fortune 500 company & infrastructure leasing & finance services, one of India's leading infrastructure development and finance companies, Karnataka Industrial Area Development Board (KIADB) and Kanara Chamber of Commerce and Industry (KCCI). A unique combination of Government entities, a large financial institution and an apex chamber brings in the expertise to develop MSEZL with world-class industrial infrastructure.

2. ENVIRONMENTAL MONITORING

Environmental monitoring is being carried out at Mangalore SEZ, following guidelines and regulations of MoEF/CPCB and KSPCB statutory norms. In this regard, MSEZL has awarded the work to M/s Hubert EnviroCare Systems Pvt Ltd. and to monitor air quality, water quality & noise level for the three years. As per work order, during September 2018, we have conducted ambient air quality, ground water quality and noise level monitoring at 2, 9 and 2 locations respectively.

3. SCOPE AND METHODOLOGY

The scope of work carried out and methodology adopted for the survey are described below:

3.1. Ambient Air Quality

Ambient air quality monitoring was carried out at each location on 24 hour basis on two consecutive days per month. The identified monitoring stations are: A₁-CETP & A₂-WTP Area. To assess the ambient air quality status, monitoring stations are identified on the basis of meteorology in the upwind and downwind direction as well as to represent the cross sectional scenario of the MSEZ. Based on the activities the parameters chosen for assessment of air quality are PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂-Nitrogen-di-oxide; CO-Carbon Mono Oxide (DL 0.1 mg/m³); O₃-Ozone (DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni- (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(α)P- Benzo-α-pyrene (DL 0.1 ng/m³) as per CPCB stipulation.

3.1.1. Sampling and analysis of PM_{2.5} and PM₁₀ in ambient air (Gravimetric Method)

- i. Condition a filter paper in oven (i.e. 10 or 2.5 µm diameter)
- ii. Prepare a sampling assembly by uncorking screws of the bracket
- iii. Take a tare (initial) weight of the filter paper (w_i , mg)
- iv. Place the filter in the sampling system securely and tighten the screws of the bracket
- v. Set the timer for the period of sampling
- vi. Start the sampler and adjust flow rate to about 2L/ min for 24 hrs sampling
- vii. Note the flow rate at the end of the desired sampling period and stop the sampler
- viii. Transit the sampling train to environmental laboratory carefully with scientific precautions
- ix. Condition the filter paper again for the same period as was done prior to sampling.

Laboratory analysis:

Weighing of exposed samples:

- i. Take final weight of the exposed filter with a standard balance (w_f , mg)

Calculations:

- i. Average flow rate (initial and final flow rates) in L/ min

$$= (\text{Initial flow rate} + \text{final flow rate}) / 2$$
- ii. Total vol. of air sampled (TVA) in m^3

$$= \text{Avg. flow rate (L/min)} * 10^{-3} (m^3/L) * \text{sampling time (hr)} * 60 (min/hr)$$
- iii. Concentration of SPM in $\mu g/m^3$

$$= (w_f - w_i) (mg) / TVA (m^3) * 10^6 \mu g/m^3$$

3.1.2. Sampling and analysis of Sulphur dioxide

- i. Prepare absorbing reagent (sodium tetra-chloromercurate) by dissolving 27.2 g mercuric chloride and 11.7 g sodium chloride in 1 lit of water
- ii. Prepare a sampling train of at least 2 gas bubblers (for average reading) properly washed with distilled water and air dried.
- iii. Place bubblers in the sampling system securely connecting to the manifold. Check the connections of bubblers with the manifold and the inlet and outlet
- iv. Fill the bubblers with an absorbing reagent with an amount sufficient to last for 24 hours (approximately 15 ml for 8 hours sampling to 50 ml for 24 hours sampling)
- v. To eliminate interference of traces metals, if any, 1 drop of 0.01% EDTA solution SEPTEMBER be added to the reagent prior to sampling ;similarly, effect of oxide of nitrogen SEPTEMBER also be eliminated by adding 1 ml of 0.06% sulphamic acid to the reagent at site
- vi. Start the sampler and adjust flow rate to 2 lit/ min.
- vii. Note the flow rate at the end of desired sampling period and stop the sampler
- viii. Transit the sampling train to environmental laboratory carefully with scientific precautions and preserve the sample tubes in a controlled environmental conditions

Laboratory analysis:**Calibration curve:**

- i. Prepare a standard solution of SO₂ concentrations ranging from 0 to 25 µg SO₂ by taking definite amount of std. sulphur dioxide solution in a 25 ml volumetric flasks
- ii. Add 14 ml of absorbing reagent and 1 ml of pararosaniline hydrochloride to each of the flasks making a total volume of 20 ml.
- iii. Measure absorbance for each flasks by spectrophotometer at 540 nm wavelength
- iv. Plot graph of absorbance v/s concentration

Absorbance in samples:

- i. Transfer samples to a 25 ml flask and develop colour as done in calibration curve
- ii. Measure absorbance at 540 nm
- iii. Find out the concentration (µgSO₂) corresponding to the measured absorbance from the calibration curve

Calculations:

- i. Average flow rate (if there is a significant difference in initial and final flow rates)
- ii. Total volume of air sampled (TVA) in m³
= Avg. flow rate (lit) * 10⁻³ (m³/lit) * sampling time (hr) * 60 (min/hr)
- iii. µgSO₂/TVA

3.1.3. Sampling and analysis of Nitrogen-di-oxide

- i. Prepare absorbing reagent (a solution of sodium hydroxide and arsenite) by dissolving 4 g sodium hydroxide and 1 g of sodium arsenite in 1 lit of distilled water
- ii. Prepare a sampling train of at least 2 gas bubblers (for average reading) properly washed with distilled water and air dried .
- iii. Place bubblers in the sampling system securely connecting to the manifold. Check the connections of bubblers with the manifold and the inlet and outlet
- iv. Fill the bubblers with an absorbing reagent with an amount sufficient to last for 24 hours (approximately 15 ml for 8 hours sampling to 50 ml for hours sampling)
- v. To eliminate interference of sulphur dioxide , drop of hydrogen peroxide SEPTEMBER be added to the reagents to convert sulphur dioxide into sulphate during analysis
- vi. Start the sampler and adjust flow rate to about 0.2 lit/ min for 24 hours sampling
- vii. Note the flow rate at the end of desired sampling period and stop the sampler
- viii. Transit the sampling train to environmental laboratory carefully with scientific precautions and preserve the sample tubes in a controlled environmental conditions

Laboratory analysis:

Calibration curve:

- i. Prepare a standard solution of NO_x concentrations ranging from 0 to 25 $\mu\text{g SO}_2$ by taking definite amount of std. sulphur dioxide solution in a 25 ml volumetric flasks
- ii. Add 14 ml of absorbing reagent and 1 ml of pararosaniline hydrochloride to each of the flasks making a total volume of 20 ml.
- iii. Measure absorbance for each flasks by spectrophotometer at 540 nm wavelength
- iv. Plot graph of absorbance v/s concentration

Absorbance in samples:

- i. Transfer samples to a 25 ml flask and develop colour as done in calibration curve
- ii. Measure absorbance at 540 nm
- iii. Find out the concentration ($\mu\text{g NO}_x$) corresponding to the measured absorbance from the calibration curve

Calculations:

- i. Average flow rate (if there is a significant difference in initial and final flow rates)
- ii. Total volume of air sampled (TVA) in m^3

$$= \text{Avg. flow rate (lit)} * 10^{-3} (\text{m}^3/\text{lit}) * \text{sampling time (hr)} * 60 (\text{min/hr})$$

$$\mu\text{gNO}_x/\text{TVA}$$

3.1.4. Sampling and analysis of Carbon Mono Oxide

Preparation of sample train:

- i. Sampling begins with conditioning a sampling train and then gas analyzer
- ii. Pressure system is preferred to condition the sampling train by installing pump before the analyzer. Reducing valve needs to be fitted between the analyser and pump to eliminate the pulsing effect of pump on the analyzer
- iii. Flow meter is to be installed just before the analyzer
- iv. A fibre filter is used to capture the particulate matter prior to the optical cell to prevent its interference. As it often accumulates on the optical cell reducing the efficiency
- v. To eliminate the interference of water vapour ,refrigeration or desiccant with magnesium perchlorate SEPTEMBER be used

Mode of operation:

- i. Continuous analysis is carried out at the flow rate of about 100 ml/min to 1000 ml/min (depending upon the level of pollution near the location) for the desired sampling period
- ii. Discrete sampling SEPTEMBER also be possible with infra red analyzer. It however requires proper cleaning of the sampling train.

Steps:

- i. Calibration of analyzer can be carried out if required using standard gases
- ii. Sampler is allowed to warm up for some time before actual readings are taken till the sampler gives steady response and temperature stability

3.1.5. Sampling and analysis of Ozone**Dynamic calibration:**

- i. Dynamic calibration SEPTEMBER be performed by preparing a large mixture of ozone in air
- ii. The output of an ozonizer is fed into the intake of a small blower delivering air. The mixture of gas however emerges through a short length of pipe
- iii. One portion of this mixture is analyzed in the recorder.
- iv. Another portion is analyzed through a faintly blue iodine solution containing starch and potassium iodide.
- v. Titrated this solution with sodium thiosulphate(0.1N)
- vi. The end point established by comparison with the blue starch- iodine solution
- vii. Mixture of ozone and air in polyester film bag SEPTEMBER be prepared and admitted to the analyzer.
- viii. The mixture is analyzed at the time it is used since the ozone decomposes gradually
- ix. Analysis is then performed by passing a measured volume through an impinge containing buffered KI solution and determined the released iodine by spectrometer method
- x. Make the second mixture about midscale concentration and adjust sample or reagent flow rates until the recorder reading agrees with the absorbance scale according to the analytically determined concentration of ozone
- xi. Check several other points on the curve if desired and liner or logarithmic chart SEPTEMBER be prepared followed by a calibration curve to read in ppm

Laboratory analysis:**Calibration curve:**

- i. Plot graph of absorbance v/s concentration

Procedure:

- i. Place a fresh absorbent solution in the storage bottle and operate the solution pump until the liquid are full
- ii. After the flow has stabilized itself, zero the recorder and start the air pump
- iii. Set the flow at convenient rates such as 4 ml/ min of solution and 4 l/min of air
- iv. Check and adjust the flow rates daily.
- v. Adjust the pH of the solution once or twice a week ,at time the solution shall be brought up to volume by addition of distilled water
- vi. Change the carbon filter about once a month. Also change the absorbing solution at the same time

3.1.6. Sampling and analysis of Ammonia:

Ammonia is collected in dilute Sulphuric acid solution in midjet impingers to form Ammonium Sulphate. The solution is treated with Nessler's reagent to produce a yellow brown complex. The Ammonia concentration is determined by reading the absorption of the complex at 440 nm and comparing with a standard curve.

3.1.7. Sampling and analysis of Lead, Nickel, Arsenic:

1. Sampling procedure:

Tilt back the inlet and secure it according to manufacturer's instructions. Loosen the face-plate wing-nuts and remove the face plate. Remove the filter from its jacket and centre it on the support screen with the rough side of the filter facing upwards. Replace the face-plate and tighten the wing-nuts to secure the rubber gasket against the filter edge. Gently lower the inlet. For automatically flow-controlled units, record the designated flow rate on the data sheet. Record the reading of the elapsed time meter. The specified length of sampling is commonly 8 hours or 24 hours. During this period, several reading (hourly) of flow rate should be taken. After the required time of sampling, record the flow meter reading and take out the filter media from the sampler and put in a container or envelope

2. Analysis:

i. Hot plate procedure:

Cut a 1" x 8" strip or half the filter from the 8" x 10" filter using a stainless steel pizza cutter. Place the filter in a beaker using vinyl gloves or plastic forceps. Cover the filter with the extraction solution (3% HNO₃ & 8% HCl). Place beaker on the hotplate, contained in a fume hood, and reflux gently while covered with a watch glass for 30 min. Do not allow sample to dry. Remove the beakers from the hot-plate and allow to cool. Rinse the beaker walls and wash with distilled water. Add approximately 10 mL reagent water to the remaining filter material in the beaker and allow to stand for at least 30 min. Transfer the extraction fluid in the beaker to a 100 mL volumetric flask or other graduated vessel. Rinse the beaker and any remaining solid material with distilled water and add the rinses to the flask. Dilute to the mark with distilled water (Type I) water and shake. The final extraction solution concentration is 3 % HNO₃/8% HCl. The filtered sample is now ready for analysis

2.1. Analysis of samples:

i. Instrument / Equipment:

A light beam containing the corresponding wavelength of the energy required to raise the atoms of the analyte from the ground state to the excited state is directed through the flame or furnace. This wavelength is observed by a monochromator and a detector that measure the amount of light absorbed by the element, hence the number of atoms in the ground state in the flame or furnace. A hollow cathode lamp for the element being determined provides a source of that metal's particular absorption wavelength. The method describes both flame atomic absorption (FAA) spectroscopy and graphite furnace atomic absorption (GFAA) spectroscopy. Atomic Absorption Spectrophotometer - analyze the metals by Flame, if results are below detection limit then go for GTA. Arsenic is analyzed by Flame – VGA.

ii. Flame Procedure:

Set the atomic absorption spectrophotometer for the standard condition as follows: choose the correct hollow cathode lamp, align the instrument, position the monochromator at the value recommended by the manufacturer, select the proper monochromator slit width, set the light source current, ignite the flame, regulate the flow of fuel and oxidant, adjust the burner for maximum absorption and stability and balance the meter. Run a series of standards of the metal of interest and construct a calibration curve. Aspirate the blanks and samples. Dilute samples that exceed the calibration range. For Lead (Pb) and Nickel (Ni), the wavelength required for analysis is 217nm and 232nm respectively. Where as in case of Arsenic (As), the VGA should attach with Flame and the wavelength required for analysis is 193.7nm.

3. Calibration:

Prepare standard solutions from the stock solutions. Select at least three standards to cover linear range as recommended by method. Aspirate the standards into the flame or inject the standards into the furnace and record the absorbance. Prepare the calibration graph by plotting absorbance and concentration in µg/ml.

i. Preparation of Standards:

For each metal that is to be determined, standards of known concentration must be acquired commercially certified standards.

ii. Standard Curve:

Standard curve is prepared by using standard solutions of known concentration.

4. Calculations:**i. Sample Air Volume:**

Sample air volume can be calculated by using the following equation:

$$V = (Q) (t)$$

Where,

V = volume of air, m³

Q = average sampling rate, m³/min.

t = time in minutes.

ii. Metal Concentration:

$$C = (M_s - M_b) \times V_s \times F_a / V \times F_t$$

Where,

C = concentration, µg metal/m³

M_s = metal concentration µg/mL

M_b = blank concentration µg/mL

V_s = total volume of extraction in mL

F_a = total area of exposed filter in cm²

V = Volume of air sampled in m³

F_t = Area of filter taken for digestion in cm²

3.1.8. Sampling and analysis of Benzo- α -pyrene:

Benzo (a) Pyrene (BaP) is one of the most important constituent of PAH compounds and also one of the most potent carcinogens. This can be measured in both particulate phase and vapour phase. In the vapour phase the concentration of B(a)P is significantly less than the particulate phase. Therefore, more care to be taken for the measurement of Benzo (a) Pyrene in the particulate phase. The molecular formula of B(a)P is $C_{20}H_{12}$ having molecular weight 252.

It is based on BIS method IS 5182 (Part 12):2004 and USEPA method (TO-13). This method is designed to collect particulate phase PAHs in ambient air and fugitive emissions and to determine individual PAH compounds using capillary gas chromatograph equipped with flame ionization detector. It is a high volume (1.2m³/min) sampling method capable of detecting sub.ng/m³ concentration of PAH in 24 hours sample (i.e. collected in 3 shifts of 8 hour each with 480 m³ sampling volume of air).

i. Sampling:

i. Instrument/Filter Selection:

24 hr. sampling using PM₁₀ high volume sampler with 8 hourly samples using EPM-2000 glass fibre or equivalent filter

ii. Sample Processing

a. Extraction:

Filter papers (half of all the filters papers collected in a day) are cut into strips using scissors and transfer to 250 ml beaker. Add ~50 ml. of Toluene (GC/HPLC grade). These samples are extracted with toluene using ultra sonic sample can be extracted using soxhlet bath for about 30 minutes. Repeat the procedure twice (50ml x 2 times) for complete extraction. Alternatively, extraction apparatus for about 8 hr. with Toluene and repeat it twice.

b. Filtration:

Filter the extracted samples with Whatman filter paper No. 41 containing 2 gm of Anhydrous Sodium Sulphate (to remove moisture).

c. Concentration:

After filtration, the filtrate is concentrated using Rotary vacuum evaporator to 2ml final volume.

d. Clean-up with silica Gel:

To clean up the impurities, pass 2 ml of concentrated sample through silica gel column (pre conditioned, 60-80 mesh, and 200-250mm×10 mm with Teflon stopcock). After cleaning add 5ml cyclohexane and collect the elute in 25 ml beaker. Repeat the process for at least 3 times and collect it in the same beaker. Alternatively Solid Phase Extraction (SPE) SEPTEMBER be used for clean up the impurities of sample.

e. Re-concentration with rotary vacuum evaporator:

The Cleaned up extract/filtrate (approximately 17 ml) is further concentrated using rotary evaporator and it is evaporated to nearly dryness with Nitrogen.

f. Final Sample volume:

The dried sample is re-dissolved in 1ml of toluene and transfer into 4 or 5 ml amber vials final analysis.

ii. Calculations:

Calculate the concentration in ng/ μ l of each identified analyte or B(a)P in the sample extract (Cs) as follows:

Calculate the air volume from the periodic flow reading taken during sampling using the following equation:

$$V = Q \times T$$

Where,

Q = Average flow rate of sampling m³/min

T = sampling time, in min.

V = total sample volume at ambient conditions in m³

Concentration of analyte i.e B(a)P:

The concentration of PAH compound or Benzo(a)pyrene in ng /m³ in the air sampled is given by:

$$C \text{ (ng /m}^3\text{)} = C_s \times V_e / V_i \times V_s$$

Where,

C_s : Concentration of Benzo (a) pyrene in ng / μl in the sample extract recorded by GC.

V_e : Final volume of extract in μl (i.e 1000)

V_i : Injection Volume (i.e 1μl)

V_s : Volume of air sample in m³

4.0 Results

4.1 Ambient Air Quality

AMBIENT AIR QUALITY (AAQ) MONITORING TEST REPORT: SEPTEMBER 2018

Name of the Industry	M/s. Mangalore SEZ Limited
Address of the Industry	3 rd Floor, MUDA Building, Ashok Nagar, Urwa Stores, Mangalore- 575006
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	CETP
Sampling Date	12.09.2018
Report Date	10.10.2018
Report No	HECS/AA/001/101018

CONSOLIDATED TEST RESULTS: SEPTEMBER 2018

Parameter Monitored	NAAQ Standard, 2009	Results
PM _{2.5} (µg/m ³)	60 [*]	14
PM ₁₀ (µg/m ³)	100 [*]	49
SO ₂ (µg/m ³)	80 [*]	04
NO ₂ (µg/m ³)	80 [*]	08
CO (mg/m ³)	2 ^{**}	BDL
O ₃ (µg/m ³)	100 ^{**}	BDL
NH ₃ (µg/m ³)	400 [*]	BDL
Pb (µg/m ³)	1 [*]	BDL
As (ng/m ³)	6 ^{***}	BDL
Ni (ng/m ³)	20 ^{***}	BDL
Benzene (µg/m ³)	5 ^{***}	BDL
B(α)P (ng/m ³)	1 ^{***}	BDL

Note: * : 24 hours average; ** : 8 hours average; *** : Annual average

Test Methods Followed:

PM₁₀ : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)
 PM_{2.5} : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
 SO₂ : IS 5182 (Pt 2): 2001 (RA 2017) (Improved wet and Geake method)
 NO₂ : IS 5182 (Pt 6): 2006 (RA 2017) (Jacob and Hochheiser modified method)
 O₃ : HECS/AIR/SOP/005 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
 NH₃ : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)
 CO : IS 5182 (Pt 10): 1999 (RA 2013)
 Pb, As, Ni: In-house method based on CPCB guidelines vol. I (2011)
 C₆H₆ : GC FID/ GC MS based on IS: 5182 (Pt 11) based on CPCB guidelines vol. I (2011)
 B(α)P : In-house validated method based on CPCB guidelines vol. I (2011)

BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m³); O₃-Ozone(DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(α)P- Benzo - α-pyrene (DL 0.1 ng/m³); ng/m³: nanogram per cubic meter; µg/m³ - microgram per cubic meter.



(Dr K GANESAN)
Authorized Signatory

AMBIENT AIR QUALITY (AAQ) MONITORING TEST REPORT: SEPTEMBER 2018

Name of the Industry	M/s. Mangalore SEZ Limited
Address of the Industry	3 rd Floor, MUDA Building, Ashok Nagar, Urwa Stores, Mangalore- 575006
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	WTP
Sampling Date	11.09.2018
Report Date	10.10.2018
Report No	HECS/AA/002/101018

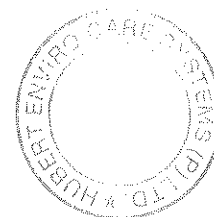
Parameter Monitored	NAAQ Standard, 2009	Results
PM _{2.5} (µg/m ³)	60 [*]	12
PM ₁₀ (µg/m ³)	100 [*]	43
SO ₂ (µg/m ³)	80 [*]	06
NO ₂ (µg/m ³)	80 [*]	09
CO (mg/m ³)	2 ^{**}	BDL
O ₃ (µg/m ³)	100 ^{**}	BDL
NH ₃ (µg/m ³)	400 [*]	BDL
Pb (µg/m ³)	1 [*]	BDL
As (ng/m ³)	6 ^{***}	BDL
Ni (ng/m ³)	20 ^{***}	BDL
Benzene (µg/m ³)	5 ^{***}	BDL
B(α)P (ng/m ³)	1 ^{***}	BDL

Note: * : 24 hours average; ** : 8 hours average; *** : Annual average

Test Methods Followed:

PM₁₀ : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)
 PM_{2.5} : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
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 NO₂ : IS 5182 (Pt 6): 2006 (RA 2017) (Jacob and Hochheiser modified method)
 O₃ : HECS/AIR/SOP/005 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
 NH₃ : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)
 CO : IS 5182 (Pt 10): 1999 (RA 2013)
 Pb, As, Ni: In-house method based on CPCB guidelines vol. I (2011)
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BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m³); O₃-Ozone(DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(α)P- Benzo - α-pyrene (DL 0.1 ng/m³); ng/m³: nanogram per cubic meter; µg/m³ - microgram per cubic meter.



(Signature)

(Dr K GANESAN)
Authorized Signatory

5. MONITORING SCHEDULE OF MANGALORE SEZ LIMITED

ENVIRONMENTAL MONITORING

Sl.No	Environmental Attributes monitored	Parameters analyzed and presented in analysis Report	Monitoring requirement
1	Ambient Air Quality	PM _{2.5} , PM ₁₀ , SO ₂ , NO ₂ , CO, O ₃ , NH ₃ , Pb, As, Ni, Benzene, B(α)P	Two Locations/Month, 24 hrs/day
2	Surface/ Ground Water Quality	Colour, pH (at 25 °C), Odour, Taste, Turbidity, Total Dissolved Solids, Alkalinity as CaCO ₃ , Total Hardness, Calcium as Ca, Magnesium as Mg, Iron as Fe, Sulphate as SO ₄ , Chloride as Cl, Boron as B, Residual free chlorine, Fluoride, Phenolic Compounds, Carbon monoxide, Manganese as Mn, Zinc as Zn, Arsenic as As, Cyanide as CN, Cadmium as Cd, Chromium as Cr, Aluminium as Al, Selenium as Se, Lead as Pb, Mercury as Hg, Nitrate Nitrogen NO ₃ , <i>E.Coli</i>	Ten Locations, Seasons (Summer, Winter, Post monsoon), By using Grab Sampling technique
3	Ambient Noise Level	Noise Level (db) in Day and Night	Two Locations, Seasons (Summer, Winter, Post monsoon), Fortnightly interval

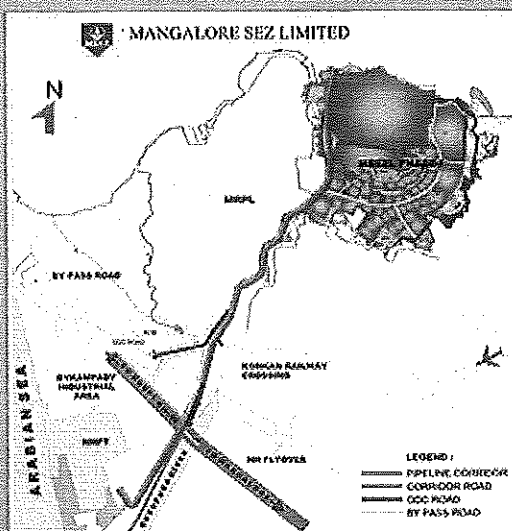


Mangalore SEZ Limited

ENVIRONMENTAL MONITORING REPORT

**AMBIENT AIR QUALITY
REPORT FOR THE MONTH OF OCTOBER 2018**

Submitted to



Submitted By



M/s Hubert Enviro Care Systems Private Limited
(NABL Accredited & MOEF Recognized Laboratory)

7/C-45, Baikampady Industrial Estate, Mangaluru, Karnataka - 575011

Email: krom@hecs.in; kro@hecs.in

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AMBIENT AIR QUALITY MONITORING REPORT - OCTOBER 2018

1. INTRODUCTION

Mangalore Special Economic Zone, known as MSEZ is spread across 1638 acres, located 15 km from Mangalore city, off Cochin-Mumbai NH 66, 5 km from Mangalore International Airport and 8 km from all-weather deep draft sea port, New Mangalore Port in Mangalore, Karnataka, India. MSEZ limited is jointly promoted by Oil and Natural Gas Corporation (ONGC), a fortune 500 company & infrastructure leasing & finance services, one of India's leading infrastructure development and finance companies, Karnataka Industrial Area Development Board (KIADB) and Kanara Chamber of Commerce and Industry (KCCI). A unique combination of Government entities, a large financial institution and an apex chamber brings in the expertise to develop MSEZL with world-class industrial infrastructure.

2. ENVIRONMENTAL MONITORING

Environmental monitoring is being carried out at Mangalore SEZ, following guidelines and regulations of MoEF/CPCB and KSPCB statutory norms. In this regard, MSEZL has awarded the work to M/s Hubert EnviroCare Systems Pvt Ltd. and to monitor air quality, water quality & noise level for the three years. As per work order, during OCTOBER 2018, we have conducted ambient air quality, ground water quality and noise level monitoring at 2, 9 and 2 locations respectively.

3. SCOPE AND METHODOLOGY

The scope of work carried out and methodology adopted for the survey are described below:

3.1. Ambient Air Quality

Ambient air quality monitoring was carried out at each location on 24 hour basis on two consecutive days per month. The identified monitoring stations are: A₁-CETP & A₂-WTP Area. To assess the ambient air quality status, monitoring stations are identified on the basis of meteorology in the upwind and downwind direction as well as to represent the cross sectional scenario of the MSEZ. Based on the activities the parameters chosen for assessment of air quality are PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂-Nitrogen-dioxide; CO-Carbon Mono Oxide (DL 0.1 mg/m³); O₃-Ozone (DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni- (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(α)P- Benzo-α-pyrene (DL 0.1 ng/m³) as per CPCB stipulation.

3.1.1. Sampling and analysis of PM_{2.5} and PM₁₀ in ambient air (Gravimetric Method)

- i. Condition a filter paper in oven (i.e. 10 or 2.5 μm diameter)
- ii. Prepare a sampling assembly by uncorking screws of the bracket
- iii. Take a tare (initial) weight of the filter paper (w_i , mg)
- iv. Place the filter in the sampling system securely and tighten the screws of the bracket
- v. Set the timer for the period of sampling
- vi. Start the sampler and adjust flow rate to about 2L/ min for 24 hrs sampling
- vii. Note the flow rate at the end of the desired sampling period and stop the sampler
- viii. Transit the sampling train to environmental laboratory carefully with scientific precautions
- ix. Condition the filter paper again for the same period as was done prior to sampling.

Laboratory analysis:

Weighing of exposed samples:

- i. Take final weight of the exposed filter with a standard balance (w_f , mg)

Calculations:

- i. Average flow rate (initial and final flow rates) in L/ min

$$= (\text{Initial flow rate} + \text{final flow rate}) / 2$$
- ii. Total vol. of air sampled (TVA) in m^3

$$= \text{Avg. flow rate (L/min)} * 10^{-3} (\text{m}^3/\text{L}) * \text{sampling time (hr)} * 60 (\text{min/hr})$$
- iii. Concentration of SPM in $\mu\text{g}/\text{m}^3$

$$= (w_f - w_i) (\text{mg}) / \text{TVA} (\text{m}^3) * 10^6 \mu\text{g}/\text{m}^3$$

3.1.2. Sampling and analysis of Sulphur dioxide

- i. Prepare absorbing reagent (sodium tetra-chloromercurate) by dissolving 27.2 g mercuric chloride and 11.7 g sodium chloride in 1 lit of water
- ii. Prepare a sampling train of at least 2 gas bubblers (for average reading) properly washed with distilled water and air dried.
- iii. Place bubblers in the sampling system securely connecting to the manifold. Check the connections of bubblers with the manifold and the inlet and outlet
- iv. Fill the bubblers with an absorbing reagent with an amount sufficient to last for 24 hours (approximately 15 ml for 8 hours sampling to 50 ml for 24 hours sampling)
- v. To eliminate interference of traces metals, if any, 1 drop of 0.01% EDTA solution to be added to the reagent prior to sampling; similarly, effect of oxide of nitrogen also be eliminated by adding 1 ml of 0.06% sulphamic acid to the reagent at site
- vi. Start the sampler and adjust flow rate to 2 lit/ min.
- vii. Note the flow rate at the end of desired sampling period and stop the sampler
- viii. Transit the sampling train to environmental laboratory carefully with scientific precautions and preserve the sample tubes in a controlled environmental conditions

Laboratory analysis:**Calibration curve:**

- i. Prepare a standard solution of SO₂ concentrations ranging from 0 to 25 µg SO₂ by taking definite amount of std. sulphur dioxide solution in a 25 ml volumetric flasks
- ii. Add 14 ml of absorbing reagent and 1 ml of pararosaniline hydrochloride to each of the flasks making a total volume of 20 ml.
- iii. Measure absorbance for each flasks by spectrophotometer at 540 nm wavelength
- iv. Plot graph of absorbance v/s concentration

Absorbance in samples:

- i. Transfer samples to a 25 ml flask and develop colour as done in calibration curve
- ii. Measure absorbance at 540 nm
- iii. Find out the concentration (µgSO₂) corresponding to the measured absorbance from the calibration curve

Calculations:

- i. Average flow rate (if there is a significant difference in initial and final flow rates)
- ii. Total volume of air sampled (TVA) in m³
= Avg. flow rate (lit) * 10⁻³ (m³/lit) * sampling time (hr) * 60 (min/hr)
- iii. µgSO₂/TVA

3.1.3. Sampling and analysis of Nitrogen-di-oxide

- i. Prepare absorbing reagent (a solution of sodium hydroxide and arsenite) by dissolving 4 g sodium hydroxide and 1 g of sodium arsenite in 1 lit of distilled water
- ii. Prepare a sampling train of at least 2 gas bubblers (for average reading) properly washed with distilled water and air dried .
- iii. Place bubblers in the sampling system securely connecting to the manifold. Check the connections of bubblers with the manifold and the inlet and outlet
- iv. Fill the bubblers with an absorbing reagent with an amount sufficient to last for 24 hours (approximately 15 ml for 8 hours sampling to 50 ml for hours sampling)
- v. To eliminate interference of sulphur dioxide , drop of hydrogen peroxide OCTOBER be added to the reagents to convert sulphur dioxide into sulphate during analysis
- vi. Start the sampler and adjust flow rate to about 0.2 lit/ min for 24 hours sampling
- vii. Note the flow rate at the end of desired sampling period and stop the sampler
- viii. Transit the sampling train to environmental laboratory carefully with scientific precautions and preserve the sample tubes in a controlled environmental conditions

Laboratory analysis:**Calibration curve:**

- i. Prepare a standard solution of NO_x concentrations ranging from 0 to 25 $\mu\text{g SO}_2$ by taking definite amount of std. sulphur dioxide solution in a 25 ml volumetric flasks
- ii. Add 14 ml of absorbing reagent and 1 ml of pararosaniline hydrochloride to each of the flasks making a total volume of 20 ml.
- iii. Measure absorbance for each flasks by spectrophotometer at 540 nm wavelength
- iv. Plot graph of absorbance v/s concentration

Absorbance in samples:

- i. Transfer samples to a 25 ml flask and develop colour as done in calibration curve
- ii. Measure absorbance at 540 nm
- iii. Find out the concentration ($\mu\text{g NO}_x$) corresponding to the measured absorbance from the calibration curve

Calculations:

- i. Average flow rate (if there is a significant difference in initial and final flow rates)
- ii. Total volume of air sampled (TVA) in m^3
$$= \text{Avg. flow rate (lit)} * 10^{-3} (\text{m}^3/\text{lit}) * \text{sampling time (hr)} * 60 (\text{min/hr})$$
$$\mu\text{gNO}_x/\text{TVA}$$

3.1.4. Sampling and analysis of Carbon Mono Oxide**Preparation of sample train:**

- i. Sampling begins with conditioning a sampling train and then gas analyzer
- ii. Pressure system is preferred to condition the sampling train by installing pump before the analyzer. Reducing valve needs to be fitted between the analyser and pump to eliminate the pulsing effect of pump on the analyzer
- iii. Flow meter is to be installed just before the analyzer
- iv. A fibre filter is used to capture the particulate matter prior to the optical cell to prevent its interference. As it often accumulates on the optical cell reducing the efficiency
- v. To eliminate the interference of water vapour, refrigeration or desiccant with magnesium perchlorate OCTOBER be used

Mode of operation:

- i. Continuous analysis is carried out at the flow rate of about 100 ml/min to 1000 ml/min (depending upon the level of pollution near the location) for the desired sampling period
- ii. Discrete sampling is also possible with infra red analyzer. It however requires proper cleaning of the sampling train.

Steps:

- i. Calibration of analyzer can be carried out if required using standard gases
- ii. Sampler is allowed to warm up for some time before actual readings are taken till the sampler gives steady response and temperature stability

3.1.5. Sampling and analysis of Ozone**Dynamic calibration:**

- i. Dynamic calibration OCTOBER be performed by preparing a large mixture of ozone in air
- ii. The output of an ozonizer is fed into the intake of a small blower delivering air. The mixture of gas however emerges through a short length of pipe
- iii. One portion of this mixture is analyzed in the recorder.
- iv. Another portion is analyzed through a faintly blue iodine solution containing starch and potassium iodide.
- v. Titrated this solution with sodium thiosulphate(0.1N)
- vi. The end point established by comparison with the blue starch- iodine solution
- vii. Mixture of ozone and air in polyester film bag OCTOBER be prepared and admitted to the analyzer.
- viii. The mixture is analyzed at the time it is used since the ozone decomposes gradually
- ix. Analysis is then performed by passing a measured volume through an impinge containing buffered KI solution and determined the released iodine by spectrometer method
- x. Make the second mixture about midscale concentration and adjust sample or reagent flow rates until the recorder reading agrees with the absorbance scale according to the analytically determined concentration of ozone
- xi. Check several other points on the curve if desired and liner or logarithmic chart to be prepared followed by a calibration curve to read in ppm

Laboratory analysis:**Calibration curve:**

- i. Plot graph of absorbance v/s concentration

Procedure:

- i. Place a fresh absorbent solution in the storage bottle and operate the solution pump until the liquid are full
- ii. After the flow has stabilized itself, zero the recorder and start the air pump
- iii. Set the flow at convenient rates such as 4 ml/ min of solution and 4 l/min of air
- iv. Check and adjust the flow rates daily.
- v. Adjust the pH of the solution once or twice a week ,at time the solution shall be brought up to volume by addition of distilled water
- vi. Change the carbon filter about once a month. Also change the absorbing solution at the same time

3.1.6. Sampling and analysis of Ammonia:

Ammonia is collected in dilute Sulphuric acid solution in midget impingers to form Ammonium Sulphate. The solution is treated with Nessler's reagent to produce a yellow brown complex. The Ammonia concentration is determined by reading the absorption of the complex at 440 nm and comparing with a standard curve.

3.1.7. Sampling and analysis of Lead, Nickel, Arsenic:

1. Sampling procedure:

Tilt back the inlet and secure it according to manufacturer's instructions. Loosen the face-plate wing-nuts and remove the face plate. Remove the filter from its jacket and centre it on the support screen with the rough side of the filter facing upwards. Replace the face-plate and tighten the wing-nuts to secure the rubber gasket against the filter edge. Gently lower the inlet. For automatically flow-controlled units, record the designated flow rate on the data sheet. Record the reading of the elapsed time meter. The specified length of sampling is commonly 8 hours or 24 hours. During this period, several reading (hourly) of flow rate should be taken. After the required time of sampling, record the flow meter reading and take out the filter media from the sampler and put in a container or envelope

2. Analysis:

i. Hot plate procedure:

Cut a 1" x 8" strip or half the filter from the 8" x 10" filter using a stainless steel pizza cutter. Place the filter in a beaker using vinyl gloves or plastic forceps. Cover the filter with the extraction solution (3% HNO_3 & 8% HCl). Place beaker on the hotplate, contained in a fume hood, and reflux gently while covered with a watch glass for 30 min. Do not allow sample to dry. Remove the beakers from the hot-plate and allow to cool. Rinse the beaker walls and wash with distilled water. Add approximately 10 mL reagent water to the remaining filter material in the beaker and allow to stand for at least 30 min. Transfer the extraction fluid in the beaker to a 100 mL volumetric flask or other graduated vessel. Rinse the beaker and any remaining solid material with distilled water and add the rinses to the flask. Dilute to the mark with distilled water (Type I) water and shake. The final extraction solution concentration is 3 % HNO_3 /8% HCl . The filtered sample is now ready for analysis

2.1. Analysis of samples:

i. Instrument / Equipment:

A light beam containing the corresponding wavelength of the energy required to raise the atoms of the analyte from the ground state to the excited state is directed through the flame or furnace. This wavelength is observed by a monochromator and a detector that measure the amount of light absorbed by the element, hence the number of atoms in the ground state in the flame or furnace. A hollow cathode lamp for the element being determined provides a source of that metal's particular absorption wavelength. The method describes both flame atomic absorption (FAA) spectroscopy and graphite furnace atomic absorption (GFAA) spectroscopy. Atomic Absorption Spectrophotometer - analyze the metals by Flame, if results are below detection limit then go for GTA. Arsenic is analyzed by Flame – VGA.

ii. Flame Procedure:

Set the atomic absorption spectrophotometer for the standard condition as follows: choose the correct hollow cathode lamp, align the instrument, position the monochromator at the value recommended by the manufacturer, select the proper monochromator slit width, set the light source current, ignite the flame, regulate the flow of fuel and oxidant, adjust the burner for maximum absorption and stability and balance the meter. Run a series of standards of the metal of interest and construct a calibration curve. Aspirate the blanks and samples. Dilute samples that exceed the calibration range. For Lead (Pb) and Nickel (Ni), the wavelength required for analysis is 217nm and 232nm respectively. Where as in case of Arsenic (As), the VGA should attach with Flame and the wavelength required for analysis is 193.7nm.

3. Calibration:

Prepare standard solutions from the stock solutions. Select at least three standards to cover linear range as recommended by method. Aspirate the standards into the flame or inject the standards into the furnace and record the absorbance. Prepare the calibration graph by plotting absorbance and concentration in µg/ml.

i. Preparation of Standards:

For each metal that is to be determined, standards of known concentration must be acquired commercially certified standards.

ii. Standard Curve:

Standard curve is prepared by using standard solutions of known concentration.

4. Calculations:**i. Sample Air Volume:**

Sample air volume can be calculated by using the following equation:

$$V = (Q) (t)$$

Where,

V = volume of air, m³

Q = average sampling rate, m³/min.

t = time in minutes.

ii. Metal Concentration:

$$C = (M_s - M_b) \times V_s \times F_a / V \times F_t$$

Where,

C = concentration, µg metal/m³

M_s = metal concentration µg/mL

M_b = blank concentration µg/mL

V_s = total volume of extraction in mL

F_a = total area of exposed filter in cm²

V = Volume of air sampled in m³

F_t = Area of filter taken for digestion in cm²

3.1.8. Sampling and analysis of Benzo- α -pyrene:

Benzo (a) Pyrene (BaP) is one of the most important constituent of PAH compounds and also one of the most potent carcinogens. This can be measured in both particulate phase and vapour phase. In the vapour phase the concentration of B(a)P is significantly less than the particulate phase. Therefore, more care to be taken for the measurement of Benzo (a) Pyrene in the particulate phase. The molecular formula of B(a)P is $C_{20}H_{12}$ having molecular weight 252.

It is based on BIS method IS 5182 (Part 12):2004 and USEPA method (TO-13). This method is designed to collect particulate phase PAHs in ambient air and fugitive emissions and to determine individual PAH compounds using capillary gas chromatograph equipped with flame ionization detector. It is a high volume (1.2m³/min) sampling method capable of detecting sub.ng/m³ concentration of PAH in 24 hours sample (i.e. collected in 3 shifts of 8 hour each with 480 m³ sampling volume of air).

i. Sampling:

i. Instrument/Filter Selection:

24 hr. sampling using PM₁₀ high volume sampler with 8 hourly samples using EPM-2000 glass fibre or equivalent filter

ii. Sample Processing

a. Extraction:

Filter papers (half of all the filters papers collected in a day) are cut into strips using scissors and transfer to 250 ml beaker. Add ~50 ml. of Toluene (GC/HPLC grade). These samples are extracted with toluene using ultra sonic sample can be extracted using soxhlet bath for about 30 minutes. Repeat the procedure twice (50ml x 2 times) for complete extraction. Alternatively, extraction apparatus for about 8 hr. with Toluene and repeat it twice.

b. Filtration:

Filter the extracted samples with Whatman filter paper No. 41 containing 2 gm of Anhydrous Sodium Sulphate (to remove moisture).

c. Concentration:

After filtration, the filtrate is concentrated using Rotary vacuum evaporator to 2ml final volume.

d. Clean-up with silica Gel:

To clean up the impurities, pass 2 ml of concentrated sample through silica gel column (pre conditioned, 60-80 mesh, and 200-250mm×10 mm with Teflon stopcock). After cleaning add 5ml cyclohexane and collect the elute in 25 ml beaker. Repeat the process for at least 3 times and collect it in the same beaker. Alternatively Solid Phase Extraction (SPE) OCTOBER be used for clean up the impurities of sample.

e. Re-concentration with rotary vacuum evaporator:

The Cleaned up extract/filtrate (approximately 17 ml) is further concentrated using rotary evaporator and it is evaporated to nearly dryness with Nitrogen.

f. Final Sample volume:

The dried sample is re-dissolved in 1ml of toluene and transfer into 4 or 5 ml amber vials final analysis.

ii. Calculations:

Calculate the concentration in ng/ μ l of each identified analyte or B(a)P in the sample extract (Cs) as follows:

Calculate the air volume from the periodic flow reading taken during sampling using the following equation:

$$V = Q \times T$$

Where,

Q = Average flow rate of sampling m³/min

T = sampling time, in min.

V = total sample volume at ambient conditions in m³

Concentration of analyte i.e B(a)P:

The concentration of PAH compound or Benzo(a)pyrene in ng /m³ in the air sampled is given by:

$$C \text{ (ng /m}^3\text{)} = C_s \times V_e / V_i \times V_s$$

Where,

C_s : Concentration of Benzo (a) pyrene in ng / μl in the sample extract recorded by GC.

V_e : Final volume of extract in μl (i.e 1000)

V_i : Injection Volume (i.e 1μl)

V_s : Volume of air sample in m³

4.0 Results

4.1 Ambient Air Quality

AMBIENT AIR QUALITY (AAQ) MONITORING TEST REPORT: OCTOBER 2018

Name of the Industry	M/s. Mangalore SEZ Limited
Address of the Industry	3 rd Floor, MUDA Building, Ashok Nagar, Urwa Stores, Mangalore- 575006
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	CETP
Sampling Date	12.10.2018
Report Date	15.11.2018
Report No	HECS/AA/001/151118

CONSOLIDATED TEST RESULTS: OCTOBER 2018

Parameter Monitored	NAAQ Standard, 2009	Results
PM _{2.5} (µg/m ³)	60 [*]	21
PM ₁₀ (µg/m ³)	100 [*]	52
SO ₂ (µg/m ³)	80 [*]	11
NO ₂ (µg/m ³)	80 [*]	14
CO (mg/m ³)	2 ^{**}	BDL
O ₃ (µg/m ³)	100 ^{**}	BDL
NH ₃ (µg/m ³)	400 [*]	BDL
Pb (µg/m ³)	1 [*]	BDL
As (ng/m ³)	6 ^{***}	BDL
Ni (ng/m ³)	20 ^{***}	BDL
Benzene (µg/m ³)	5 ^{***}	BDL
B(α)P (ng/m ³)	1 ^{***}	BDL

Note: * : 24 hours average; ** : 8 hours average; *** : Annual average

Test Methods Followed:

PM₁₀ : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)
 PM_{2.5} : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
 SO₂ : IS 5182 (Pt 2): 2001 (RA 2017) (Improved wet and Geake method)
 NO₂ : IS 5182 (Pt 6): 2006 (RA 2017) (Jacob and Hochheiser modified method)
 O₃ : HECS/AIR/SOP/005 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
 NH₃ : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)
 CO : IS 5182 (Pt 10): 1999 (RA 2013)
 Pb, As, Ni: In-house method based on CPCB guidelines vol. I (2011)
 C₆H₆ : GC FID/ GC MS based on IS: 5182 (Pt 11) based on CPCB guidelines vol. I (2011)
 B(α)P : In-house validated method based on CPCB guidelines vol. I (2011)

BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m³); O₃-Ozone(DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(α)P- Benzo - α-pyrene (DL 0.1 ng/m³); ng/m³: nanogram per cubic meter; µg/m³ - microgram per cubic meter.



(Dr K GANESAN)
Authorized Signatory

AMBIENT AIR QUALITY (AAQ) MONITORING TEST REPORT: OCTOBER 2018

Name of the Industry	M/s. Mangalore SEZ Limited
Address of the Industry	3 rd Floor, MUDA Building, Ashok Nagar, Urwa Stores, Mangalore- 575006
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	WTP
Sampling Date	12.10.2018
Report Date	15.11.2018
Report No	HECS/AA/002/151118

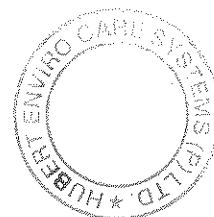
Parameter Monitored	NAAQ Standard, 2009	Results
PM _{2.5} (µg/m ³)	60 [*]	19
PM ₁₀ (µg/m ³)	100 [*]	51
SO ₂ (µg/m ³)	80 [*]	11
NO ₂ (µg/m ³)	80 [*]	16
CO (mg/m ³)	2 ^{**}	BDL
O ₃ (µg/m ³)	100 ^{**}	BDL
NH ₃ (µg/m ³)	400 [*]	BDL
Pb (µg/m ³)	1 [*]	BDL
As (ng/m ³)	6 ^{***}	BDL
Ni (ng/m ³)	20 ^{***}	BDL
Benzene (µg/m ³)	5 ^{***}	BDL
B(α)P (ng/m ³)	1 ^{***}	BDL

Note: * : 24 hours average; ** : 8 hours average; *** : Annual average

Test Methods Followed:

PM₁₀ : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)
 PM_{2.5} : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
 SO₂ : IS 5182 (Pt 2): 2001 (RA 2017) (Improved wet and Geake method)
 NO₂ : IS 5182 (Pt 6): 2006 (RA 2017) (Jacob and Hochheiser modified method)
 O₃ : HECS/AIR/SOP/005 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
 NH₃ : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)
 CO : IS 5182 (Pt 10): 1999 (RA 2013)
 Pb, As, Ni: In-house method based on CPCB guidelines vol. I (2011)
 C₆H₆ : GC FID/ GC MS based on IS: 5182 (Pt 11) based on CPCB guidelines vol. I (2011)
 B(α)P : In-house validated method based on CPCB guidelines vol. I (2011)

BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m³); O₃-Ozone(DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(α)P- Benzo - α-pyrene (DL 0.1 ng/m³); ng/m³: nanogram per cubic meter; µg/m³ - microgram per cubic meter.



(Dr K GANESAN)
Authorized Signatory

5. MONITORING SCHEDULE OF MANGALORE SEZ LIMITED

ENVIRONMENTAL MONITORING

Sl.No	Environmental Attributes monitored	Parameters analyzed and presented in analysis Report	Monitoring requirement
1	Ambient Air Quality	PM _{2.5} , PM ₁₀ , SO ₂ , NO ₂ , CO, O ₃ , NH ₃ , Pb, As, Ni, Benzene, B(α)P	Two Locations/Month, 24 hrs/day
2	Surface/ Ground Water Quality	Colour, pH (at 25 °C), Odour, Taste, Turbidity, Total Dissolved Solids, Alkalinity as CaCO ₃ , Total Hardness, Calcium as Ca, Magnesium as Mg, Iron as Fe, Sulphate as SO ₄ , Chloride as Cl, Boron as B, Residual free chlorine, Fluoride, Phenolic Compounds, Carbon monoxide, Manganese as Mn, Zinc as Zn, Arsenic as As, Cyanide as CN, Cadmium as Cd, Chromium as Cr, Aluminium as Al, Selenium as Se, Lead as Pb, Mercury as Hg, Nitrate Nitrogen NO ₃ , <i>E.Coli</i>	Ten Locations, Seasons (Summer, Winter, Post monsoon), By using Grab Sampling technique
3	Ambient Noise Level	Noise Level (db) in Day and Night	Two Locations, Seasons (Summer, Winter, Post monsoon), Fortnightly interval

owards this
of MSEZL

KMC Hospital
LIFE'S ON

Dy Mgr (HK)
For info p/b
14/9/18

Ref: KMCHAC/CB/ 1291 /2018-19

07TH SEP 2018

The Manager
Mangalore SEZ Limited
3rd Floor | Mangalore Urban Development Authority Building
Urwa Stores | Ashok Nagar | Mangalore - 575 006
Ph.No.0824-2452760 |



Dear Sir/ Madam,

Please find enclosed herewith the Statement of OP credit bills AUGUST, 2018 your clients who undergone medicals at our centre.

Kindly arrange to send the payment of Rs.1,15,500/- in favour of MANIPAL HEALTH ENTERPRISES PVT. LTD. MANGALORE , at the earliest.

Any query in this regard please feel free to contact under signed on 2444590

Thanking you,

Yours truly,

SR. OFFICER - CREDIT BILLING

Note: Kindly issue the TDS Certificate in the name of
MANIPAL HEALTH ENTERPRISES P.

PAN No.AAGCM5933R

KMC Hospital

DrB R Ambedkar Circle, Mangalore 575 001P +91 824 2444 590 www.manipalhospitals.com

Registered Office

Manipal Health Enterprises Pvt Ltd

The Annexe, #98/2, Rustom Bagh Road, Off HAL Airport Road, Bangalore 560 017 P+91 804936

0300 www.manipalhospitals.com

CIN: U85110KA2010PTC052540



2444590



(of Manipal Health Enterprises P Ltd)
B.R.Ambedkar Circle, Mangaluru, - 575 001
Ph: 0824-444590, www.kmchospitalsmangalore.com
KA-DKD/20/776 and KA-DKD/21/776
GSTIN: 29AAGCM5933R2ZK
CIN: U85110KA2010PTC052540

BILL OF SUPPLY

Bill No : OCR116196/18-19
Bill Date : 24-08-2018

Payer Name : MANGALORE SEZ LIMITED
Address : 3rd Floor, MUDA Building,
Urwa Stores Ashok nagar,
Mangalore 575006

GSTIN : 29AAECM8545K2ZU

S.No.	Service Description	Units	Price	HSN No.	Amount (In INR)
1	MANGALORE SEZ	42	2,750.00	99931	1,15,500.00
				TOTAL	1,15,500.00

Amount In Words: Rupees One Lakh Fifteen Thousand Five Hundred only

Payment Terms:

NEFT/Cheques/ Drafts to be drawn in favour of M/S Manipal Health Enterprises Pvt. Ltd


Signature

Note: Unless otherwise stated, tax on this invoice is not payable under reverse charge

KMC HOSPITAL
AMBEDKAR CIRCLE
MANGALURU - 575 001

ALORE SEZ LIMITED OP CREDIT BILLS STATEMENT FOR THE MONTH OF AUGUST 2018

NO	DATE	BILL NO	NAME	AMOUNT
1	06-08-2018 09:18	OCR100763/18-19	Mr. NARENDRA K	2750
2	06-08-2018 09:22	OCR100772/18-19	Mr. SUDHIR H SHETTY	2750
3	06-08-2018 09:50	OCR100820/18-19	Mr. VINAYA KUMAR	2750
4	06-08-2018 09:53	OCR100828/18-19	Mr. GANESHA B	2750
5	07-08-2018 08:15	OCR101830/18-19	Mr. SUBHAS PAI	2750
6	07-08-2018 08:18	OCR101834/18-19	Mr. JUNUS MONTEIRO	2750
7	07-08-2018 08:35	OCR101857/18-19	Mr. KISHORE KUMAR	2750
8	07-08-2018 08:49	OCR101874/18-19	Mr. DURGAPRASAD SANIL	2750
9	07-08-2018 08:54	OCR101881/18-19	Mrs KAVYA AKSHAY	2750
10	07-08-2018 09:13	OCR101902/18-19	Mrs ASHWINI HEGDE	2750
11	08-08-2018 08:34	OCR102762/18-19	Mr. RATHISHA	2750
12	08-08-2018 08:35	OCR102764/18-19	Mr. SUKUMARA M	2750
13	08-08-2018 08:37	OCR102766/18-19	Mr. NARENDRA CHANDRASHEKA	2750
14	08-08-2018 08:38	OCR102768/18-19	Mr. PADMANABHA RAO	2750
15	08-08-2018 08:43	OCR102771/18-19	Mr. GURUPRASAD K	2750
16	08-08-2018 08:46	OCR102773/18-19	Mr. HARISHA B	2750
17	09-08-2018 08:41	OCR103849/18-19	Mr. URWA HARISH	2750
18	09-08-2018 09:11	OCR103885/18-19	Mr. JAYAPRAKASH	2750
19	10-08-2018 08:26	OCR104772/18-19	Mr. KEERTHAN PS	2750
20	10-08-2018 08:27	OCR104775/18-19	Mr. MAHAMMED HANIEF K	2750
21	10-08-2018 08:29	OCR104777/18-19	Mr. ALWYN WILSON LOBO	2750
22	10-08-2018 08:30	OCR104779/18-19	Mr. VADIRAJA A	2750
23	10-08-2018 08:34	OCR104784/18-19	Mr. SANDEEP P SHIBAROOR	2750
24	10-08-2018 08:55	OCR104813/18-19	Mr. PRABHAT RAJ BEJA	2750
25	10-08-2018 09:18	OCR104853/18-19	Mr. PRAKASH BHAT H	2750
26	13-08-2018 08:30	OCR106939/18-19	Mr. RANJITH KUMAR J	2750
27	13-08-2018 08:40	OCR106949/18-19	Mr. RAMANUJAM KS	2750
28	13-08-2018 08:42	OCR106953/18-19	Mr. SUPREETH BK	2750
29	14-08-2018 08:52	OCR107925/18-19	Mrs SARITHA	2750
30	14-08-2018 08:55	OCR107928/18-19	Mr. PUNDALIKA SHENOY	2750
31	14-08-2018 09:09	OCR107945/18-19	Mrs DIVYA T	2750
32	17-08-2018 08:19	OCR110228/18-19	Mr. JAYAPRASAD	2750
33	17-08-2018 08:22	OCR110232/18-19	Mr. YOGESHA K	2750
34	17-08-2018 09:09	OCR110270/18-19	Mr. GOURANGA CH SWAIN	2750
35	20-08-2018 08:45	OCR112184/18-19	Mr. RAMACHANDRA BHNADARKA	2750
36	20-08-2018 08:56	OCR112198/18-19	Mr. NISHANTH BS	2750
37	20-08-2018 09:03	OCR112207/18-19	Ms. HARSHITHA KUMARI B	2750
38	20-08-2018 09:04	OCR112212/18-19	Mrs SARITHA K	2750
39	20-08-2018 09:19	OCR112233/18-19	Mrs VIDYA R SHETTY	2750
40	22-08-2018 08:36	OCR114257/18-19	Dr. RAGHAVENDRA HOLLA N	2750
41	22-08-2018 08:47	OCR114267/18-19	Mr. PRAJWAL K SALIAN	2750
42	24-08-2018 08:59	OCR116196/18-19	Mr. SUDARSHAN NAYAK	2750
			TOTAL	115500

43 V Suryanarayana

1. BM Pathare

44 Eta Enamiasathu

2. Chandrachudkar KM

45 Suresh B

46 Vijesh Shetty

47 Harsha Mahesh

48 Phanihasthara

Item wise Details of CSR Activities and Proposed time bound Action Plan

5% of Approved MSEZL Phase I project Cost (Rs 1527.5 Crores)- Rs 76.375 Crores														
S. No.	Description	Proposed CSR Expenses	Amount Ind. In Project-Cost	Expenses till Oct-2012	Expenses from Oct-2012-Feb-2014	Expenses from Feb-2014-March-2015	Expenses from March 2015-April-2016	Expenses from April-2016-March 2017	Total expense till Date	Balance	2017-18	2019-20	2020-21	2021-2022
1	Water Supply facilities													
a	RCC Over Head water tanks including main supply pipeline in Perumde, Bajpe & Kulai Villages & 48 Acres Drain work b/w HPL colony & ODC road	2.00	1.00	0.85	0.99	0.145	0.110	0.220	2.32	0.000	-	-	-	-
b	Drinking Water facilities for neighboring Villages 6 acres & 5.8 Acres R&R Colony	1.50	2.20	1.20	0.26	0.04	0.00	0.370	1.87	-0.37	-	-	-	-
c	Provision of Bore wells in Perumde & Bajpe Villages	0.70		0.17	0.00	0.530	0.000		0.70	0.00	-	-	-	-
2	Sanitation facilities								0.00					
a	Development of Under Ground Drainage	4.09	4.09	2.60	1.08	0.00	0.13	0.25	4.05	0.03	0.21	0.060	0.010	-
b	Skid mounted STPs for Kulai & Bajpe Villages	0.60	0.60	0.17	0.00	0.235	0.077		0.48	0.12	0.07	0.05	-	-
3	Community facilities								0.00					
a	Creation of self employment facilities by provision of suitable shops in Kulai & Perumde villages	0.11	0.11	0.11	0.00	0.00	0.00		0.11	0.00	-	-	-	-
b	Sponsoring of Community facilities including Primary Health Centre, Play ground, Primary School, Post Office, gravity yard, compound wall, temple, Drain work near Bajjema mandir, Jokatta, road repair near swarnalingeshwara temple bajpe etc etc	4.00	4.00	0.00	3.85	0.150	0.000		4.00	0.00	-	-	-	-
c	Any Miscellaneous Development works to local communities	0.50	0.50	0.00	0.00	0.500	0.000		0.50	0.00	-	-	-	-
4	Educational Sponsorship								0.00					
a	Up gradation of Skills & Technical training facilities for local youth.	5.00	6.00	5.53	0.00	0.260	0.002	0.030	5.82	0.18	0.10	0.11	-	-
b	Bypass Road for connectivity between Suradai to Bajpe for Public use.	35.98	36.98	17.84	7.26	0.00	0.00		0.00	11.88	4.00	4.00	3.89	-
5	Events Sponsorship								0.00					
a	Improvement of facilities for various Religious places for local communities and sponsoring traditional ceremonies of local communities.	2.00	1.37	1.37	0.00	0.530	0.000		1.90	0.10	0.05	-	-	-
b	Sponsoring of various local events in the major Educational Institutions, Cultural functions, Traditional events, Medical camps, Distribution of Medications etc in nearby schools & Villages in and around Mangalore.	2.00	0.95	0.95	0.00	0.903	0.129	0.055	2.05	-0.05	0.00	0.02	-	-
6	Sponsoring education and cultural activities to local fishermen Community	2.97	2.93	1.27	1.36	0.40	0.21		0.00	-0.27	0.00	0.00		
7	Development roads in surrounding villages & Panchayat roads in Kattel, Perumde & Kuduthoor Villages and Villages enroute River water Pipeline	12.95	2.79	2.79	9.54	0.402	0.085		12.82	0.11	-	-	-	-
8	Total	76.38	63.52	34.85	24.34	4.10	0.745	0.935	64.96	11.73	4.54	4.29	3.89	0.00

ANNEXURE

Speed Post

No Q 15018/42/2014-CPW
Government of India
Ministry of Environment, Forest & Climate Change
CP Division

Indira Paryavaran Bhawan,
Prithvi, 2nd Floor,
Jorbagh Road, Aligarh,
New Delhi-110 003.
Dated: 18th August 2016

To,

M/s Hubert Enviro Care Systems Pvt. Ltd.
No. C-45, Industrial Estate, Baikampady,
Mangalore- 575011,
Karnataka.

Subject: Recognition of M/s Hubert Enviro Care Systems Pvt. Ltd. No. C-45, Industrial Estate, Baikampady, Mangalore- 575011, Karnataka as Environmental Laboratory under the Environment (Protection) Act, 1986 - reg.

Sir,

Kindly refer to your letter no. nll Dated 17.12.2014 approval for recognition of laboratory under Environment (Protection) Act, 1986 Based on the recommendation of the 44th meeting of Expert Committee for recognition of environmental laboratories held on 09.10.2015 & 14.10.2015 and your acceptance of the terms & conditions at Annexure -III, IV&V of guidelines for recognition of environmental laboratories under the Environment (Protection) Act 1986 this Ministry approves the recognition of your laboratory for five years as shall be notified in the Gazette of India.

2. The laboratory shall compulsorily participate in the Analytical Quality Control (AQC) exercise conducted by the Central Pollution Control Board, at least once a year to ascertain the capability of the laboratory and analysis from time to time and to provide quarterly progress reports of your laboratory to the MoEF&CC.

3. Periodic surveillance of recognized Environmental Laboratory under Environment (Protection) Act, 1986 will be undertaken by MoEF&CC/Central Pollution Control Board (CPCB) to assess its proper functioning, systematic operation and reliability of data generated at the laboratory.

4. It is also mandatory for the laboratory to renew NABL, ISO 9001:2008, ISO 14001:2004 and OHSAS from time to time.

Yours faithfully,


(Dr. (Ms.) Rubab Jaffer)
Deputy Director



**National Accreditation Board for
Testing and Calibration Laboratories**

(A Constituent Board of Quality Council of India)



CERTIFICATE OF ACCREDITATION

**HUBERT ENVIRO CARE SYSTEMS
PRIVATE LIMITED**

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2005

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

7/C-45, Baikampady Industrial Estate, Mangaluru, Karnataka

in the field of

TESTING

Certificate Number TC-7920 (in lieu of T-3180)

Issue Date 31/10/2018

Valid Until 30/10/2020

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.

(To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

Signed for and on behalf of NABL



89076970100030002021

Anil Relia
Chief Executive Officer



**National Accreditation Board for
Testing and Calibration Laboratories**

(A Constituent Board of Quality Council of India)



CERTIFICATE OF ACCREDITATION

HUBERT ENVIRO CARE SYSTEMS (P) LTD.

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2005

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

No. 18, 92nd Street, Ashok Nagar, Chennai, Tamil Nadu

in the field of

TESTING

Certificate Number TC-5786 (in lieu of T-0985 & T-2528)

Issue Date 30/04/2017

Valid Until 29/04/2019

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.

(To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

Signed for and on behalf of NABL

N. Venkateswaran
Program Director



89076970100930000043

Anil Relia
Chief Executive Officer



BSCIC

CERTIFICATE OF REGISTRATION

OCCUPATIONAL HEALTH & SAFETY
MANAGEMENT SYSTEM

This is to certify that:

HUBERT ENVIRO CARE SYSTEMS (P) LTD.

LOCATION-I: # 18, 92ND STREET, ASHOK NAGAR
CHENNAI - 600 083, TAMIL NADU, INDIA

LOCATION-II: # C-45 INDUSTRIAL ESTATE, BAIKAMPADI
MANGALORE - 575 011, KARNATAKA, INDIA

Hereby granted the certificate number : **BN7480/6888:0713**

Subsequent to the Re-Assessment conducted on 06-Jul-2016 and the organization has been found to be operating a Occupational Health & Safety Management System which complies with the requirements of

OHSAS 18001:2007

For the following scope:

Provision of Environmental Management Consultancy, Turnkey Environmental Management Projects, Operation and Maintenance of ETP/STP/WTP and Other Environmental Installations, Laboratory Testing Covering Chemical/ Microbiological/ Environmental Fields and Allied Activities

Originally Registered: 13-Jul-2013 Latest issue: 13-Jul-2016 Expiry Date: 12-Jul-2019

For BSCIC CERTIFICATIONS PVT.LTD.

Page 1 of 1

Sanjay Seth
Managing Director



Validity of this Certificate is subject to Annual Surveillance Audits to be done Successfully on or before 06-Jul-2017 and 06-Jul-2018 resp.

(In case if Surveillance Audit is not allowed to be conducted; this Certificate shall be Suspended/Withdrawn).

Please re-validate this certificate's status at <http://bscic.com/ocoinformation/certificatestatus.php> or www.bscic.co.in at REGISTRATION STATUS.
This Certificate of Registration is granted subject to relevant provisions of the BSCIC Certifications PVT. LTD. Contract Terms & Scheme for Registration form B-018 (latest version). Please see B-018 at our website www.bscic.co.in.
The certificate of Registration remains the property of BSCIC Certifications PVT. LTD. and shall be returned immediately upon request.
BSCIC Headquarters: 11th Floor, SCO 150, Sector - 21 C, Faridabad 121001 Haryana, India.



BSCIC

CERTIFICATE OF REGISTRATION

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MANAGEMENT SYSTEM

This is to certify that:

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[Signature]
Sanjay Seth
Managing Director



Validity of this Certificate is subject to Annual Surveillance Audits to be done Successfully on or before 06-Jul-2017 and 06-Jul-2018 resp.

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This Certificate of Registration is granted subject to relevant provisions of the BSCIC Certifications Pvt. Ltd. Contract Terms & Scheme for Registration Form 2.018 (latest version). Please see 2.018 at our website www.bsc-icc.com. The certificate of registration remains the property of BSCIC Certifications Pvt. Ltd. and shall be returned immediately upon request.
BSCIC headquarters: 11th Floor, SCO 150, Sector - 21 C, Faridabad 121001 Haryana, India.



ओ एन जी सी मंगलूर पेट्रोकेमिकल्स लिमिटेड

(मंगलूर रिफाइनरी एण्ड पेट्रोकेमिकल्स लिमिटेड की सहायक कंपनी)

ONGC Mangalore Petrochemicals Ltd.

(A Subsidiary of Mangalore Refinery and Petrochemicals Ltd.)

एमएसईजेड, पेमुदे, मंगलूरू - ५७४ ५०९ MSEZ, Permude, Mangaluru - 574 509.

CIN : U40107KA2006GOI041258

दूरभाषा Direct Line :- 0824-2872000, फैक्स Fax:- 0824-2872005, Website: www.ompl.co.in

REF: OMPL/PCB/SP/2018-19/

Date: 11/06/2018

To:

The Environmental Officer

Regional Office

KSPCB

Baikampady, Mangalore-11

Dear Sir,

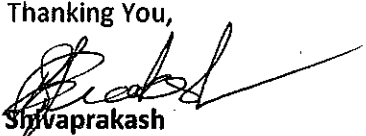
Sub: Submission of Environmental Monitoring Report for the Month of May 2018 and Production Report for May 2018

Ref: KSPCB Combined Consent Order No. AW-301949 dated 27th January, 2017

With respect to the above subject; we are herewith submitting the following Environmental Monitoring Reports and Production Reports for the Month of May 2018 respectively, enclosed herewith.

1. Ambient Air Quality Monitoring at 5 different locations in and around OMPL, enclosed as Annexure- A
2. Water Analysis Reports at 9 different locations in and around OMPL, as Annexure-B
3. Noise Level Monitoring Report at OMPL, as Annexure-C
4. Treated Effluent Analysis Report, Annexure-D
5. Stack Monitoring Analysis Report, Annexure-E
6. Returns Regarding Water Consumed, for the Month of May 2018, as Annexure-F
7. Production Report as Annexure-G

Thanking You,


Shivaprakash
Manager (Env)

CC: Member Secretary, KSPCB, Bangalore

CC: Head (Technical), MSEZ

CC: CEO, OMPL for info

CC: COO, OMPL for info

Hubert Enviro Care Systems (P) Ltd.C-45, Industrial Estate, Baikampady, Mangalore, Karnataka - 575011.
Ph: 0824 - 2408111, Email: kro@hecs.in, Website: www.hecs.inH.O.: # 18, 92nd Street, Ashok Nagar, Chennai - 600 083.
Ph: 42985555 Fax : 42985500 E-mail : labsales@hecs.in**Laboratory Services Division**Accredited by NABL in the fields of Chemical
ISO 9001, 14001 & OHSAS 18001 Certified.

Certificate No. TC-5786

TEST REPORT OF AMBIENT AIR QUALITY MONITORING (MAY 2018)

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	OMPL - East Side
Report Date	02.06.2018
Report No	HECS/AA/001/020618

CONSOLIDATED TEST RESULTS

APRIL '18 - Week		15-Week		16-Week		17-Week		18-Week		19-Week	Average Value
Parameters	NAAQ	02.05.18	04.05.18	08.05.18	11.05.18	15.05.18	18.05.18	22.05.18	25.05.18	29.05.18	
PM _{2.5} (µg/m ³)	60	18.2	18.3	18.1	19.1	18.5	19.2	17.5	19.1	19.1	18.26
PM ₁₀ (µg/m ³)	100	48.0	48.7	49.0	48.7	47.8	49.2	48.9	49.1	47.7	48.23
SO ₂ (µg/m ³)	80	3.4	3.5	3.8	3.9	3.5	3.6	3.5	3.9	3.8	3.32
NO ₂ (µg/m ³)	80	3.3	3.4	3.4	3.6	3.6	3.4	3.7	3.6	3.7	3.20
CO (mg/m ³)	2.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
O ₃ (µg/m ³)	100	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NH ₃ (µg/m ³)	400	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb (µg/m ³)	1.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
As (ng/m ³)	6.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni (ng/m ³)	20	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene (µg/m ³)	05	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
B(α)P (ng/m ³)	01	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note: BDL = Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide (DL 0.1 mg/m³); O₃-Ozone (DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(α)P- Benzo -α-pyrene (DL 0.1 ng/m³); ng/m³: nanogram per cubic meter; µg/m³ - microgram per cubic meter

CONCLUSION: All the parameters meet the NAAQ Standards

*****End of Report *****

Shaila
Prepared by

[Signature]
Checked by



[Signature]
Authorized Signatory

Hubert Enviro Care Systems (P) Ltd.

C-45, Industrial Estate, Balkampady, Mangalore, Karnataka - 575011.
Ph: 0824 - 2408111, Email: kro@hecs.in, Website: www.hecs.in

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**Laboratory Services Division**

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Certificate No. TC-5786

TEST REPORT OF AMBIENT AIR QUALITY MONITORING (MAY. 2018)

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	Shantigudda
Report Date	02.06.2018
Report No	HECS/AA/002/020618

CONSOLIDATED TEST RESULTS

APRIL '18 - Week		15-Week		16-Week		17-Week		18-Week		19-Week	Average Value
Parameters	NAAQ	02.05.18	04.05.18	08.05.18	11.05.18	15.05.18	18.05.18	22.05.18	25.05.18	29.05.18	
PM _{2.5} (µg/m ³)	60	19.2	18.2	19.1	18.5	17.9	18.5	18.4	19.2	19.5	18.41
PM ₁₀ (µg/m ³)	100	49.7	48.6	49.6	48.8	48.7	49.0	48.6	48.9	48.4	48.57
SO ₂ (µg/m ³)	80	3.9	3.7	3.9	3.9	3.6	3.8	3.7	3.8	4.2	3.52
NO ₂ (µg/m ³)	80	3.5	3.6	3.7	3.5	3.3	3.7	3.5	3.7	3.9	3.27
CO (mg/m ³)	2.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
O ₃ (µg/m ³)	100	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NH ₃ (µg/m ³)	400	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb (µg/m ³)	1.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
As (ng/m ³)	6.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni (ng/m ³)	20	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene (µg/m ³)	05	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
B(α)P (ng/m ³)	01	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note: BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide (DL 0.1 mg/m³); O₃-Ozone (DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(α)P- Benzo-α-pyrene (DL 0.1 ng/m³); ng/m³: nanogram per cubic meter; µg/m³ - microgram per cubic meter

CONCLUSION: All the parameters meet the NAAQ Standards

*****End of Report *****

Prepared by

Checked by



Authorized Signatory

1. The report in full or part shall not be used for any promotional or publicity purpose without written consent by HECS organization. 2. Samples are not drawn by HECS unless or otherwise mentioned. 3. Unless specifically requested by customer the test items will not be retained more than 15 days from the date of issue of test report. 4. Under no circumstances lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issue of test report. 5. The test results relate only to the test items. 6. # not under scope of accreditation.

Hubert Enviro Care Systems (P) Ltd.

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Ph: 0824 - 2408111, Email: kro@hecs.in, Website: www.hecs.in

H.O.: # 18, 92nd Street, Ashok Nagar, Chennai - 600 083.
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**Laboratory Services Division**

Accredited by NABL in the fields of Chemical
ISO 9001, 14001 & OHSAS 18001 Certified.

Certificate No. TC-5786

TEST REPORT OF AMBIENT AIR QUALITY MONITORING (MAY, 2018)

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	Tenka Ekkar
Report Date	02.06.2018
Report No	HECS/AA/003/020618

CONSOLIDATED TEST RESULTS

APRIL '18 - Week		15-Week		16-Week		17-Week		18-Week		19-Week	Average Value
Parameters	NAAQ	02.05.18	04.05.18	08.05.18	11.05.18	15.05.18	18.05.18	22.05.18	25.05.18	29.05.18	
PM _{2.5} (µg/m ³)	60	18.5	16.4	18.3	17.6	17.3	17.6	17.1	17.2	17.0	17.11
PM ₁₀ (µg/m ³)	100	51.7	50.0	49.9	50.0	49.4	51.7	49.7	50.3	51.5	50.11
SO ₂ (µg/m ³)	80	3.6	3.5	3.4	3.4	3.5	3.6	3.2	3.4	3.6	3.13
NO ₂ (µg/m ³)	80	3.5	3.4	3.7	3.5	3.6	3.4	3.5	3.5	3.4	3.16
CO (mg/m ³)	2.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
O ₃ (µg/m ³)	100	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NH ₃ (µg/m ³)	400	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb (µg/m ³)	1.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
As (ng/m ³)	6.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni (ng/m ³)	20	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene (µg/m ³)	05	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
B(α)P (ng/m ³)	01	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note: BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m³); O₃-Ozone(DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(α)P- Benzo -α-pyrene (DL 0.1 ng/m³); ng/m³: nanogram per cubic meter; µg/m³ - microgram per cubic meter

CONCLUSION: All the parameters meet the NAAQ Standards

*****End of Report *****

Prepared by

Checked by



Authorized Signatory

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Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	Permude Village
Report Date	02.06.2018
Report No	HECS/AA/004/020618

CONSOLIDATED TEST RESULTS

APRIL '18 - Week		15-Week		16-Week		17-Week		18-Week		19-Week	Average Value
Parameters	NAAQS	02.05.18	04.05.18	08.05.18	11.05.18	15.05.18	18.05.18	22.05.18	25.05.18	29.05.18	
PM _{2.5} (µg/m ³)	60	17.4	17.2	17.5	16.4	17.7	17.2	17.0	17.4	17.6	16.94
PM ₁₀ (µg/m ³)	100	49.6	48.5	49.4	48.5	49.5	49.5	48.8	49.0	48.7	48.70
SO ₂ (µg/m ³)	80	3.8	3.4	3.5	3.4	3.7	3.4	3.7	3.9	3.5	3.27
NO ₂ (µg/m ³)	80	3.5	3.7	3.4	3.8	3.8	3.5	3.8	3.5	3.8	3.32
CO (mg/m ³)	2.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
O ₃ (µg/m ³)	100	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NH ₃ (µg/m ³)	400	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb (µg/m ³)	1.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
As (ng/m ³)	6.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni (ng/m ³)	20	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene (µg/m ³)	05	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
B(a)P (ng/m ³)	01	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note: BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m³); O₃-Ozone(DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(a)P- Benzo -α-pyrene (DL 0.1 ng/m³); ng/m³: nanogram per cubic meter; µg/m³ - microgram per cubic meter

CONCLUSION: All the parameters meet the NAAQ Standards

*****End of Report *****

Prepared by

Checked by



Authorized Signatory

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Certificate No. TC-5786

TEST REPORT OF AMBIENT AIR QUALITY MONITORING (MAY. 2018)

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	OMPL - West Side
Report Date	02.06.2018
Report No	HECS/AA/005/020618

CONSOLIDATED TEST RESULTS

APRIL '18 - Week		15-Week		16-Week		17-Week		18-Week		19-Week	Average Value
Parameters	NAAQ	02.05.18	04.05.18	08.05.18	11.05.18	15.05.18	18.05.18	22.05.18	25.05.18	29.05.18	
PM _{2.5} (µg/m ³)	60	18.5	17.4	18.4	18.6	18.0	18.2	17.0	18.7	17.9	17.72
PM ₁₀ (µg/m ³)	100	47.4	46.5	46.6	47.5	46.8	47.4	46.8	47.6	47.5	46.79
SO ₂ (µg/m ³)	80	3.7	3.4	3.8	3.9	3.5	3.7	3.6	3.9	3.2	3.32
NO ₂ (µg/m ³)	80	3.6	3.5	3.4	3.7	3.4	3.5	3.5	3.8	3.4	3.20
CO (mg/m ³)	2.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
O ₃ (µg/m ³)	100	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NH ₃ (µg/m ³)	400	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb (µg/m ³)	1.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
As (ng/m ³)	6.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni (ng/m ³)	20	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene (µg/m ³)	05	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
B(a)P (ng/m ³)	01	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note: BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide (DL 0.1 mg/m³); O₃-Ozone (DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(a)P- Benzo -α-pyrene (DL 0.1 ng/m³); ng/m³: nanogram per cubic meter; µg/m³ - microgram per cubic meter

CONCLUSION: All the parameters meet the NAAQ Standards

*****End of Report *****

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1. The report in full or part shall not be used for any promotional or publicity purpose without written consent by HECS organization. 2. Samples are not drawn by HECS unless or otherwise mentioned. 3. Unless specifically requested by customer the test items will not be retained more than 15 days from the date of issue of test report. 4. Under no circumstances lab accepts any liability or loss / damage caused by use or misuse of test report after invoicing or issue of test report. 5. The test results relate only to the test items. 6. # not under scope of accreditation.

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TEST REPORT OF GROUND WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	GW1 - Ground Water collected from Narayana Guru Community Hall, Permude
Date of Sampling	10.05.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	02.06.2018
Report No	HECS/W/001/020618

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	IS10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.76	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	1.1	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	36.5	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	8.5	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	88.7	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	9.4	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	5.7	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	136.0	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	11.4	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	0.35	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	7.9	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

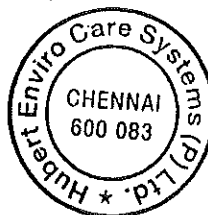
Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: GROUND WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

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TEST REPORT OF GROUND WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	GW2 - Ground Water collected from Gagtel Labor Colony
Date of Sampling	10.05.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	02.06.2018
Report No	HECS/W/002/020618

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	6.85	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	1.26	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	42.3	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	8.5	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	33.4	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	14.6	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	5.9	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	85.2	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	6.8	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	1.34	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: GROUND WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report

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TEST REPORT OF GROUND WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	GW3- Ground Water collected from L&T New Labor Colony
Date of Sampling	10.05.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	02.06.2018
Report No	HECS/W/003/020618

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.95	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	1.25	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	6.8	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	14.3	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	62.7	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	16.5	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	7.8	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	142.0	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	8.8	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	1.27	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: GROUND WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report

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TEST REPORT OF GROUND WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	GW4-Ground Water collected Near OMPL - ETP
Date of Sampling	10.05.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	02.06.2018
Report No	HECS/W/004/020618

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.77	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	BDL (DL 0.1)	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	58.4	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	15.3	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	45.6	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	19.8	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	5.4	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	154.0	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	7.96	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	2.46	45 max
15.	Iron as Fe	IS 3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS 3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS 1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS 1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: GROUND WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report

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TEST REPORT OF OPEN WELL WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	OW1- Open Water collected from Tenka Ekkar
Date of Sampling	10.05.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	02.06.2018
Report No	HECS/W/005/020618

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.65	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	2.67	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	53.6	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	9.4	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	43.7	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	9.8	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	4.9	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	76.5	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	6.09	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	2.06	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter**CONCLUSION: OPENWELL WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012**

End of Report

Prepared by
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TEST REPORT OF OPEN WELL WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	OW2 - Open Water collected from Shantigudda Village
Date of Sampling	10.05.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	02.06.2018
Report No	HECS/W/006/020618

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.63	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	2.85	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	BDL (DL 0.1)	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	43.6	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	8.68	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	62.6	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	15.4	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	4.9	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	78.4	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	6.6	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	2.19	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

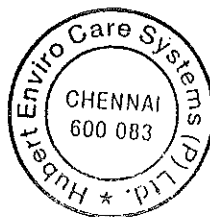
Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: OPENWELL WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

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TEST REPORT OF OPEN WELL WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	OW3 - Open Water collected from Permude Village
Date of Sampling	10.05.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	02.06.2018
Report No	HECS/W/007/020618

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.33	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	2.76	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	45.6	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	7.6	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	25.2	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	14.1	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	4.5	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	48.9	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	4.6	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	4.5	45 max
15.	Iron as Fe	IS 3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS 3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS 1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS 1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: OPENWELL WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

Prepared by
[Signature]

End of Report
Checked by
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TEST REPORT OF SURFACE WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	SW1 - Surface Water collected Near OMPL - Flare Area
Date of Sampling	10.05.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	02.06.2018
Report No	HECS/W/008/020618

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.64	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	2.12	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	151.0	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	54.1	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	98.6	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	16.2	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	9.8	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	415	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	67.2	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	0.38	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	2.47	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	0.28	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per liter; NA-Not Available

CONCLUSION: SURFACE WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report

Prepared by
Checked by
Authorized Signatory

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TEST REPORT OF SURFACE WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	SW2 - Surface Water collected Near OMPL - Near Central Warehouse
Date of Sampling	10.05.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	02.06.2018
Report No	HECS/W/009/020618

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.35	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	4.7	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	84	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	14.6	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	36	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	72	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	8.5	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	160.2	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	56	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	4.20	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	0.25	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per liter

CONCLUSION: SURFACE WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report

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TEST REPORT OF NOISE MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Noise Monitoring
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	OMPL - North, South, East and West sides
Sampling Date	10.05.2018
Report Date	01.06.2018
Report No.	HECS/N/001/010618

NOISE MONITORING: APRIL 2018

S.No.	Sampling Location	MoEF requirements in dB		Avg. Noise level observed in dB	
		Day	Night	Day	Night
1.	OMPL-North	75	70	68.5	65.5
2.	OMPL-South			66.8	63.7
3.	OMPL-East			68.9	66.1
4.	OMPL-West			66.6	65.0

Note: dB: Decibel

CONCLUSION: All the parameters meet MoEF Standards

*****End of Report *****

Prepared by

Checked by



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TEST REPORT OF ETP EFFLUENT MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Guard Pond Pump Discharge (ETP Effluent)
Date of Sampling	07.05.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	02.06.2018
Report No	HECS/W/011/020618

RESULTS

No.	Parameters monitored	Test method followed	Units	Results	Permissible Limit
1.	Color	IS:3025:(Pt 4):1983 (Reaff 2006)	Hazen Units	3.2	All efforts should be made to remove colour and unpleasant odour as far as practicable
2.	Odour	IS 3025 (Part5)-1983, Reaff 2006	-	Agreeable	
3.	Total suspended Solids	2540D APHA 22nd Edn.. 2012	mg/L	9.7	100
4.	pH	IS:3025:(Pt 11):1983 (Reaff 2006)	-	6.95	6.0-8.5
5.	Temperature	IS 3025 (Pt 9):1983 (Reaff:2006)	°C	29.0	Shall not exceed 5 degree Centigrade above the receiving water temperature
6.	Oil & Grease	IS 3025,4(Pt 39):2000 (Reaff 2009)	mg/L	BDL(DL 1)	5
7.	Total Residual Chlorine as Cl ₂	IS:3025 (Pt26)1986 (Reaff 2009)	mg/L	BDL (DL 0.1)	1
8.	Ammonical Nitrogen as N	IS 3025 Part (34)1988	mg/L	9.2	50
9.	Total Kjeldhal Nitrogen as N	IS 3025 Part (34)1988	mg/L	34.3	100
10.	Free Ammonia as NH ₃	IS:3025 (Part34)1998 Reaff. 2003	mg/L	BDL(DL 0.02)	5
11.	BOD, 3 days @ 27°C as O ₂	IS:3025 (Pt 44)1993 (Reaff 2009)	mg/L	9.8	30
12.	COD as O ₂	IS 3025 Part (58)2006	mg/L	60.7	125
13.	Lead as Pb	IS:3025 (Pt 47)1994 (Reaff 2009)	mg/L	BDL(DL 0.1)	0.1
14.	Chromium (Hexavalent) as Cr ⁶⁺	IS 3025 Part (52):2003	mg/L	BDL(DL 0.01)	0.1
15.	Total Chromium as Cr	IS 3025(Pt52):2003 (Reaff 2009)	mg/L	BDL(DL 0.01)	2.0
16.	Copper as Cu	IS:3025:5,(Pt 42)1992 (Reaff 2009)	mg/L	BDL(DL 0.05)	1.0
17.	Zinc as Zn	IS:3025 (Part49)1994 (Reaff 2009)	mg/L	BDL(DL 0.1)	5.0

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TEST REPORT OF ETP EFFULENT MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	07.05.2018
Date of Sampling	07.04.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	02.06.2018
Report No	HECS/W/011/020618

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	Permissible Limit
18.	Nickel as Ni	IS:3025 (Part54)2003 (Reaff 2009)	mg/L	BDL(DL 0.05)	1.0
19.	Fluoride as F-	IS 3025 part (60):2008	mg/L	BDL(DL 0.2)	1.0
20.	Sulphide as S ²⁻	IS:3025 (Pt 29)1986 (Reaff 2009)	mg/L	BDL(DL 0.04)	2.0
21.	Particle Size of Suspended solids	APHA 22nd Edition	-	Passed through 850 micron	850 micron
22.	Arsenic as As	IS:3025 (Part37)1988(Reaff 2009)	mg/L	BDL(DL 0.005)	0.2
23.	Mercury as Hg	IS:3025 (Part48)1994 RA 1999	mg/L	BDL(DL 0.001)	0.01
24.	Cadmium as Cd	IS:3025 (Part41)1991	mg/L	BDL(DL 0.01)	0.1
25.	Selenium as Se	IS:3025 (Part56)2003	mg/L	BDL(DL 0.005)	0.05
26.	Cyanide as CN	IS:3025 (Part27)1986 Reaff. 2009	mg/L	BDL(DL 0.01)	0.2
27.	Phenols as C ₆ H ₅ OH	IS 3025 Part (43)1992,RA 2009	mg/L	BDL(DL 0.001)	0.35
28.	Total Iron as Fe	IS 3025(Pt 53):2003(Reaff 2009)	mg/L	0.35	3
29.	Manganese	IS:3025:(Pt-59):2006	mg/L	BDL(DL 0.01)	2
30.	Total Phosphorous as P	IS 3025(Pt 31):1988(Reaff 2009)	mg/L	BDL(DL 0.01)	3
31.	Nitrate	IS 3025 (Pt 34):1988 (Reaff 2009)	mg/L	BDL(DL 1)	20
32.	Vanadium as V	IS:3025 (Part56)2003	mg/L	BDL(DL 0.01)	0.1
33.	Benzo(a)pyrene	USEPA 8270C	mg/L	BDL(DL 0.0001)	0.2
34.	Benzene	USEPA 8270C	mg/L	BDL(DL 0.0001)	0.1
35.	Bioassay Test	IS 6582(Part 2):2001	Tf	9:1	90% survival of fish after 96 hrs in 100% effluent

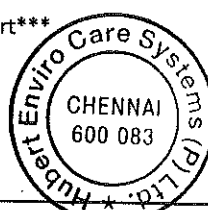
Note:-BDL - Below Detection Limit; D.L- Detection Limit; mg/L - Milligrams per liter

CONCLUSION: ETP OUTLET EFFULENT WATER AS ABOVE PARAMETERS ARE WITHIN STANDARDS

End of Report

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TEST REPORT OF ETP EFFLUENT MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore – 574509
Sample Description	Guard Pond Pump Discharge (ETP Effluent)
Date of Sampling	17.05.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	02.06.2018
Report No	HECS/AW/015/020618

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	Permissible Limit
1.	Color	IS:3025:(Pt 4)1983 (Reaff 2006)	Hazen Units	3.1	All efforts should be made to remove colour and unpleasant odour as far as practicable
2.	Odour	IS 3025 (Part5)-1983, Reaff 2006	-	Agreeable	
3.	Total suspended Solids	2540D APHA 22nd Edn.. 2012	mg/L	9.5	100
4.	pH	IS:3025:(Pt 11):1983 (Reaff 2006)	-	7.5	6.0-8.5
5.	Temperature	IS 3025 (Pt 9):1983 (Reaff:2006)	°C	28.0	Shall not exceed 5 degree Centigrade above the receiving water temperature
6.	Oil & Grease	IS 3025,4(Pt 39):2000 (Reaff 2009)	mg/L	BDL(DL 1)	5
7.	Total Residual Chlorine as Cl ₂	IS:3025 (Pt26)1986 (Reaff 2009)	mg/L	BDL (DL 0.1)	1
8.	Ammonical Nitrogen as N	IS 3025 Part (34)1988	mg/L	9.4	50
9.	Total Kjeldhal Nitrogen as N	IS 3025 Part (34)1988	mg/L	17.0	100
10.	Free Ammonia as NH ₃	IS:3025 (Part34)1998 Reaff. 2003	mg/L	BDL(DL 0.02)	5
11.	BOD, 3 days @ 27°C as O ₂	IS:3025 (Pt 44)1993 (Reaff 2009)	mg/L	9.5	30
12.	COD as O ₂	IS 3025 Part (58)2006	mg/L	54.0	125
13.	Lead as Pb	IS:3025 (Pt 47)1994 (Reaff 2009)	mg/L	BDL(DL 0.1)	0.1
14.	Chromium (Hexavalent) as Cr ⁶⁺	IS 3025 Part (52):2003	mg/L	BDL(DL 0.01)	0.1
15.	Total Chromium as Cr	IS 3025(Pt52):2003 (Reaff 2009)	mg/L	BDL(DL 0.01)	2.0
16.	Copper as Cu	IS:3025:5,(Pt 42)1992 (Reaff 2009)	mg/L	BDL(DL 0.05)	1.0
17.	Zinc as Zn	IS:3025 (Part49)1994 (Reaff 2009)	mg/L	BDL(DL 0.1)	5.0

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TEST REPORT OF ETP EFFLUENT MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Guard Pond Pump Discharge (ETP Effluent)
Date of Sampling	17.05.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	02.06.2018
Report No	HECS/W/015/020618

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	Permissible Limit
18.	Nickel as Ni	IS:3025 (Part54)2003 (Reaff 2009)	mg/L	BDL(DL 0.05)	1.0
19.	Fluoride as F-	IS 3025 part (60):2008	mg/L	BDL(DL 0.2)	1.0
20.	Sulphide as S ²⁻	IS:3025 (Pt 29)1986 (Reaff 2009)	mg/L	BDL(DL 0.04)	2.0
21.	Particle Size of Suspended solids	APHA 22nd Edition	-	Passed through 850 micron	850 micron
22.	Arsenic as As	IS:3025 (Part37)1988(Reaff 2009)	mg/L	BDL(DL 0.005)	0.2
23.	Mercury as Hg	IS:3025 (Part48)1994 RA 1999	mg/L	BDL(DL 0.001)	0.01
24.	Cadmium as Cd	IS:3025 (Part41)1991	mg/L	BDL(DL 0.01)	0.1
25.	Selenium as Se	IS:3025 (Part56)2003	mg/L	BDL(DL 0.005)	0.05
26.	Cyanide as CN	IS:3025 (Part27)1986 Reaff. 2009	mg/L	BDL(DL 0.01)	0.2
27.	Phenolic Compounds as C ₆ H ₅ OH	IS 3025 Part (43)1992,RA 2009	mg/L	BDL(DL 0.001)	0.35
28.	Total Iron as Fe	IS 3025(Pt 53):2003(Reaff 2009)	mg/L	0.48	3
29.	Manganese	IS:3025:(Pt-59):2006	mg/L	BDL(DL 0.01)	2
30.	Total Phosphorous as P	IS 3025(Pt 31):1988(Reaff 2009)	mg/L	BDL(DL 0.01)	3
31.	Nitrate	IS 3025 (Pt 34):1988 (Reaff 2009)	mg/L	BDL(DL 1)	20
32.	Vanadium as V	IS:3025 (Part56)2003	mg/L	BDL(DL 0.01)	0.1
33.	Benzo(a)pyrene	USEPA 8270C	mg/L	BDL(DL 0.0001)	0.2
34.	Benzene	USEPA 8270C	mg/L	BDL(DL 0.0001)	0.1
35.	Bioassay Test	IS 6582(Part 2):2001	Tf	9:1	90% survival of fish after 96 hrs in 100% effluent

Note:-BDL - Below Detection Limit; D.L- Detection Limit; mg/L - Milligrams per liter

CONCLUSION: ETP OUTLET EFFLUENT WATER AS ABOVE PARAMETERS ARE WITHIN STANDARDS

End of Report

Prepared by

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TEST REPORT OF EMISSION AIR FROM STACK/ CHIMNEY MONITORING (MAY - 2018)

Page No. 1 of 9

Name of the Industry	M/s ONGC Mangalore Petrochemicals Limited
Address of the Industry	Mangalore SEZ, Permude Village, Mangalore-574509, Karnataka, India.
Stack ID	NHT Charge heater
Sample Description	Manual Stack Emission Monitoring
Sampling Date	02.05.2018
Sample Receipt	03.05.2018
Equipment Used	Vayubodhan VSS1
Method of Sampling & Analysis	IS 11255:1995 Methods for Measurement of Emission from Stationary Sources
Sample Drawn by	Hubert Enviro Care Systems (P) Ltd
Report Date	02.06.2018
Report No	HECS-OMPL/SEM/001/020618

General Details	
Ambient Temperature (°C)	36
Stack Diameter (m)	1.94
Stack Height (m)	65
Stack Temperature (°C)	256
Flue Gas Velocity (m/s)	9.7
Flue gas flow rate (Nm ³ /hr)	56584.5

Parameter monitored	Protocol	Results(mg/Nm ³)	Standard Norms(mg/Nm ³)
SPM	IS 11255(Part 1)-1985	4.8	5
Sulphur Dioxide (SO ₂)	IS 11255(Part 3)-1985	48	50
Oxides of Nitrogen(NO _x)	IS 11255(Part 7)-2005	88	250
Carbon monoxide (CO)	IS 5182(Part 10)-1999	BDL	100

Note: mg/Nm³: milligram per normal cubic meter; SPM: Suspended Particulate Matter;
m/s - Meter per second; Nm³/hr - Normal cubic meter per hour

Inference: - STACK EMISSIONS AS ABOVE PARAMETERS ARE WITHIN STANDARDS

Prepared by

Verified by



Authorized Signatory

Hubert Enviro Care Systems (P) Ltd.

C-45, Industrial Estate, Balkampady, Mangalore, Karnataka - 575011.
Ph: 0824 - 2408111, Email: kro@hecs.in, Website: www.hecs.in

H.O.: # 18, 92nd Street, Ashok Nagar, Chennai - 600 083.
Ph: 42985555 Fax : 42985500 E-mail : labsales@hecs.in

**Laboratory Services Division**

Accredited by NABL in the fields of Chemical
ISO 9001, 14001 & OHSAS 18001 Certified.

Certificate No. TC-5786

TEST REPORT OF EMISSION AIR FROM STACK/ CHIMNEY MONITORING (MAY – 2018)

Page No. 2 of 9

Name of the Industry	M/s ONGC Mangalore Petrochemicals Limited
Address of the Industry	Mangalore SEZ, Permude Village, Mangalore-574509, Karnataka, India.
Stack ID	Isomer Charge Heater
Sample Description	Manual Stack Emission Monitoring
Sampling Date	05.05.2018
Sample Receipt	07.05.2018
Equipment Used	Vayubodhan VSS1
Method of Sampling & Analysis	IS 11255:1995 Methods for Measurement of Emission from Stationary Sources
Sample Drawn by	Hubert Enviro Care Systems (P) Ltd
Report Date	02.06.2018
Report No	HECS-OMPL/SEM/002/020618

General Details	
Ambient Temperature (°C)	36
Stack Diameter (m)	2.3
Stack Height (m)	65
Stack Temperature (°C)	183
Flue Gas Velocity (m/s)	4.3
Flue gas flow rate (Nm ³ /hr)	41425.6

Parameter monitored	Protocol	Results(mg/Nm ³)	Standard Norms(mg/Nm ³)
SPM	IS 11255(Part 1)-1985	4.3	5
Sulphur Dioxide(SO ₂)	IS 11255(Part 3)-1985	23	50
Oxides of Nitrogen(NO _x)	IS 11255(Part 7)-2005	66	250
Carbon monoxide (CO)	IS 5182(Part 10)-1999	BDL	100

Note: mg/Nm³: milligram per normal cubic meter; SPM: Suspended Particulate Matter;
m/s – Meter per second; Nm³/hr – Normal cubic meter per hour

Inference: - STACK EMISSIONS AS ABOVE PARAMETERS ARE WITHIN STANDARDS

Prepared by

Verified by



Authorized Signatory

**TEST REPORT OF EMISSION AIR FROM STACK/ CHIMNEY MONITORING (MAY – 2018)**

Page No. 3 of 9

Name of the Industry	M/s ONGC Mangalore Petrochemicals Limited
Address of the Industry	Mangalore SEZ, Permude Village, Mangalore-574509, Karnataka, India.
Stack ID	CPP (GTG-HRSG) – 1
Sample Description	Manual Stack Emission Monitoring
Sampling Date	04.05.2018
Sample Receipt	05.05.2018
Equipment Used	Vayubodhan VSS1
Method of Sampling & Analysis	IS 11255:1995 Methods for Measurement of Emission from Stationary Sources
Sample Drawn by	Hubert Enviro Care Systems (P) Ltd
Report Date	02.06.2018
Report No	HECS-OMPL/SEM/003/020618

General Details	
Ambient Temperature (°C)	36
Stack Diameter (m)	2.8
Stack Height (m)	70
Stack Temperature (°C)	116
Flue Gas Velocity (m/s)	12.6
Flue gas flow rate (Nm ³ /hr)	19456.9

Parameter monitored	Protocol	Results(mg/Nm ³)	Standard Norms(mg/Nm ³)
SPM	IS 11255(Part 1)-1985	39	50
Sulphur Dioxide(SO ₂)	IS 11255(Part 3)-1985	160	850
Oxides of Nitrogen(NO _x)	IS 11255(Part 7)-2005	225	350
Carbon monoxide (CO)	IS 5182(Part 10)-1999	BDL	150

Note: mg/Nm³: milligram per normal cubic meter; SPM: Suspended Particulate Matter;
m/s – Meter per second; Nm³/hr – Normal cubic meter per hour

Inference: - STACK EMISSIONS AS ABOVE PARAMETERS ARE WITHIN STANDARDS

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Verified by



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Certificate No. TC-5786

TEST REPORT OF EMISSION AIR FROM STACK/ CHIMNEY MONITORING (MAY - 2018)

Page No. 4 of 9

Name of the Industry	M/s ONGC Mangalore Petrochemicals Limited
Address of the Industry	Mangalore SEZ, Permude Village, Mangalore-574509, Karnataka, India.
Stack ID	Plat former Unit Charge Heater
Sample Description	Manual Stack Emission Monitoring
Sampling Date	02.05.2018
Sample Receipt	03.05.2018
Equipment Used	Vayubodhan VSS1
Method of Sampling & Analysis	IS 11255:1995 Methods for Measurement of Emission from Stationary Sources
Sample Drawn by	Hubert Enviro Care Systems (P) Ltd
Report Date	02.06.2018
Report No	HECS-OMPL/SEM/004/020618

General Details	
Ambient Temperature (°C)	36
Stack Diameter (m)	4.1
Stack Height (m)	94
Stack Temperature (°C)	179
Flue Gas Velocity (m/s)	5.2
Flue gas flow rate (Nm ³ /hr)	183675.3

Parameter monitored	Protocol	Results(mg/Nm ³)	Standard Norms(mg/Nm ³)
SPM	IS 11255(Part 1)-1985	3.8	5
Sulphur Dioxide (SO ₂)	IS 11255(Part 3)-1985	47	50
Oxides of Nitrogen(NO _x)	IS 11255(Part 7)-2005	133	250
Carbon monoxide (CO)	IS 5182(Part 10)-1999	BDL	100

Note: mg/Nm³ : milligram per normal cubic meter; SPM: Suspended Particulate Matter;
m/s – Meter per second; Nm³/hr – Normal cubic meter per hour

Inference: - STACK EMSSIONS AS ABOVE PARAMETERS ARE WITHIN STANDARDS,

Prepared by

Verified by



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TEST REPORT OF EMISSION AIR FROM STACK/ CHIMNEY MONITORING (MAY – 2018)

Page No. 5 of 9

Name of the Industry	M/s ONGC Mangalore Petrochemicals Limited
Address of the Industry	Mangalore SEZ, Permude Village, Mangalore-574509, Karnataka, India.
Stack ID	CPP Utility Boiler
Sample Description	Manual Stack Emission Monitoring
Sampling Date	04.05.2018
Sample Receipt	05.05.2018
Equipment Used	Vayubodhan VSS1
Method of Sampling & Analysis	IS 11255:1995 Methods for Measurement of Emission from Stationary Sources
Sample Drawn by	Hubert Enviro Care Systems (P) Ltd
Report Date	02.06.2018
Report No	HECS-OMPL/SEM/005/020618

General Details	
Ambient Temperature (°C)	36
Stack Diameter (m)	2.74
Stack Height (m)	70
Stack Temperature (°C)	179
Flue Gas Velocity (m/s)	14.9
Flue gas flow rate (Nm ³ /hr)	204586.3

Parameter monitored	Protocol	Results(mg/Nm ³)	Standard Norms(mg/Nm ³)
SPM	IS 11255(Part 1)-1985	24.6	50
Sulphur Dioxide(SO ₂)	IS 11255(Part 3)-1985	80	850
Oxides of Nitrogen(NO _x)	IS 11255(Part 7)-2005	162	350
Carbon monoxide (CO)	IS 5182(Part 10)-1999	BDL	150

Note: mg/Nm³: milligram per normal cubic meter; SPM: Suspended Particulate Matter;
m/s – Meter per second; Nm³/hr – Normal cubic meter per hour

Inference: - STACK EMISSIONS AS ABOVE PARAMETERS ARE WITHIN STANDARDS

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TEST REPORT OF EMISSION AIR FROM STACK/ CHIMNEY MONITORING (MAY – 2018)

Page No. 6 of 9

Name of the Industry	M/s ONGC Mangalore Petrochemicals Limited
Address of the Industry	Mangalore SEZ, Permude Village, Mangalore-574509, Karnataka, India.
Stack ID	Tatory Charge Heater
Sample Description	Manual Stack Emission Monitoring
Sampling Date	05.05.2018
Sample Receipt	07.05.2018
Equipment Used	Vayubodhan VSS1
Method of Sampling & Analysis	IS 11255:1995 Methods for Measurement of Emission from Stationary Sources
Sample Drawn by	Hubert Enviro Care Systems (P) Ltd
Report Date	02.06.2018
Report No	HECS-OMPL/SEM/006/020618

General Details	
Ambient Temperature (°C)	36
Stack Diameter (m)	1.75
Stack Height (m)	65
Stack Temperature (°C)	186
Flue Gas Velocity (m/s)	5.2
Flue gas flow rate (Nm ³ /hr)	32564.4

Parameter monitored	Protocol	Results(mg/Nm ³)	Standard Norms(mg/Nm ³)
SPM	IS 11255(Part 1)-1985	3.9	5
Sulphur Dioxide(SO ₂)	IS 11255(Part 3)-1985	23	50
Oxides of Nitrogen(NO _x)	IS 11255(Part 7)-2005	205	250
Carbon monoxide (CO)	IS 5182(Part 10)-1999	BDL	100

Note: mg/Nm³: milligram per normal cubic meter; SPM: Suspended Particulate Matter;
m/s – Meter per second; Nm³/hr – Normal cubic meter per hour

INFERENCE: - STACK EMISSIONS AS ABOVE PARAMETERS ARE WITHIN STANDARDS

Prepared by

Verified by



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TEST REPORT OF EMISSION AIR FROM STACK/ CHIMNEY MONITORING (MAY – 2018)

Page No. 7 of 9

Name of the Industry	M/s ONGC Mangalore Petrochemicals Limited
Address of the Industry	Mangalore SEZ, Permude Village, Mangalore-574509, Karnataka, India.
Stack ID	Xylene Column Reboiler Heater(Part A)
Sample Description	Manual Stack Emission Monitoring
Sampling Date	03.05.2018
Sample Receipt	04.05.2018
Equipment Used	Vayubodhan VSS1
Method of Sampling & Analysis	IS 11255:1995 Methods for Measurement of Emission from Stationary Sources
Sample Drawn by	Hubert Enviro Care Systems (P) Ltd
Report Date	02.06.2018
Report No	HECS-OMPL/SEM/007/020618

General Details	
Ambient Temperature (°C)	36
Stack Diameter (m)	3.69
Stack Height (m)	98
Stack Temperature (°C)	208
Flue Gas Velocity (m/s)	5.6
Flue gas flow rate (Nm ³ /hr)	158653.8

Parameter monitored	Protocol	Results(mg/Nm ³)	Standard Norms(mg/Nm ³)
SPM	IS 11255(Part 1)-1985	9	50
Sulphur Dioxide(SO ₂)	IS 11255(Part 3)-1985	17	850
Oxides of Nitrogen(NO _x)	IS 11255(Part 7)-2005	64	350
Carbon monoxide (CO)	IS 5182(Part 10)-1999	BDL	150

Note: mg/Nm³: milligram per normal cubic meter; SPM: Suspended Particulate Matter;
m/s – Meter per second; Nm³/hr – Normal cubic meter per hour

Inference: - STACK EMISSIONS AS ABOVE PARAMETERS ARE WITHIN STANDARDS

Prepared by

Verified by



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TEST REPORT OF EMISSION AIR FROM STACK/ CHIMNEY MONITORING (MAY - 2018)

Page No. 8 of 9

Name of the Industry	M/s ONGC Mangalore Petrochemicals Limited
Address of the Industry	Mangalore SEZ, Permude Village, Mangalore-574509, Karnataka, India.
Stack ID	Xylene Column Reboiler Heater(Part B)
Sample Description	Manual Stack Emission Monitoring
Sampling Date	03.05.2018
Sample Receipt	04.05.2018
Equipment Used	Vayubodhan VSS1
Method of Sampling & Analysis	IS 11255:1995 Methods for Measurement of Emission from Stationary Sources
Sample Drawn by	Hubert Enviro Care Systems (P) Ltd
Report Date	02.06.2018
Report No	HECS-OMPL/SEM/008/020618

General Details	
Ambient Temperature (°C)	36
Stack Diameter (m)	3.69
Stack Height (m)	98
Stack Temperature (°C)	201
Flue Gas Velocity (m/s)	5.6
Flue gas flow rate (Nm ³ /hr)	155324

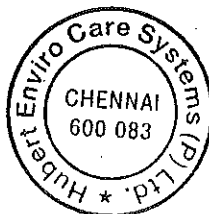
Parameter monitored	Protocol	Results(mg/Nm ³)	Standard Norms(mg/Nm ³)
SPM	IS 11255(Part 1)-1985	10	50
Sulphur Dioxide(SO ₂)	IS 11255(Part 3)-1985	17	850
Oxides of Nitrogen(NO _x)	IS 11255(Part 7)-2005	74	350
Carbon monoxide (CO)	IS 5182(Part 10)-1999	BDL	150

Note: mg/Nm³ : milligram per normal cubic meter; SPM: Suspended Particulate Matter;
m/s – Meter per second; Nm³/hr – Normal cubic meter per hour

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Prepared by

Verified by



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TEST REPORT OF EMISSION AIR FROM STACK/ CHIMNEY MONITORING (MAY – 2018)

Page No. 9 of 9

Name of the Industry	M/s ONGC Mangalore Petrochemicals Limited
Address of the Industry	Mangalore SEZ, Permude Village, Mangalore-574509, Karnataka, India.
Stack ID	BTF (Toluene Column Reboiler Heater)
Sample Description	Manual Stack Emission Monitoring
Sampling Date	03.05.2018
Sample Receipt	04.05.2018
Equipment Used	Vayubodhan VSS1
Method of Sampling & Analysis	IS 11255:1995 Methods for Measurement of Emission from Stationary Sources
Sample Drawn by	Hubert Enviro Care Systems (P) Ltd
Report Date	02.06.2018
Report No	HECS-OMPL/SEM/009/020618

General Details	
Ambient Temperature (°C)	36
Stack Diameter (m)	3.29
Stack Height (m)	80
Stack Temperature (°C)	178
Flue Gas Velocity (m/s)	5.4
Flue gas flow rate (Nm ³ /hr)	92356.7

Parameter monitored	Protocol	Results (mg/Nm ³)	Standard Norms (mg/Nm ³)
SPM	IS 11255(Part 1)-1985	9	50
Sulphur Dioxide(SO ₂)	IS 11255(Part 3)-1985	14	850
Oxides of Nitrogen(NO _x)	IS 11255(Part 7)-2005	49	350
Carbon monoxide (CO)	IS 5182(Part 10)-1999	BDL	150

Note: mg/Nm³: milligram per normal cubic meter; SPM: Suspended Particulate Matter;
m/s – Meter per second; Nm³/hr – Normal cubic meter per hour

Inference: - STACK EMSSIONS AS ABOVE PARAMETERS ARE WITHIN STANDARDS

Prepared by

Verified by



Authorized Signatory

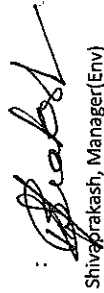
Form-1 (Rule 4)
Returns Regarding Water Consumed during the Month of May, 2018

Name and address of the Consumer	Purpose for which water consumed	Reading at the beginning of the first day of the calendar month under report	Reading at the end of the last day of the calendar month under report	Quantity of Water Consumed in Kilo Liters	If the meter was out of order, the monthly average consumption of water for the previous 3 months of the working period	Quantity of water qualifying for rebate according to the assessee	Remarks
M/s ONGC Mangalore Petrochemicals Limited, Mangalore Special Economic Zone, Permude, Mangalore -574 509	Industrial cooling, spraying in mine pits or boiler feed						
	Cooling Water	0	95653	95653			
	Boiler Feed Water	0	62901	62901			
	Fire Water	0	25550	25550			
	Domestic purpose						
	Drinking Water & Sanitation	0	5548	5548			
	Processing whereby water gets polluted and the pollutants are easily bio-degradable						
	Service Water		14534	14534			Subtracting total flow from BFW, CT & Drinking water consumption
	Total Consumption			204186			

Signature of the Consumer

Name

Address


Shivaprakash, Manager(Env)

M/s ONGC Mangalore Petrochemicals Limited, Mangalore Special Economic Zone, Permude, Mangalore -574 509

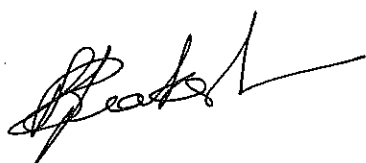
ANNEXURE - G.

ONGC Mangalore Petrochemicals Limited

Production Details for May, 2018

Net Naptha Processed -1,26,057.71 MT

Sl. No.	Name of the Product	Quantity, MT
1	Paraxylene (Product)	60,606
2	Benzene (Co product)	19,112





ओ एन जी सी मंगलूर पेट्रोकेमिकल्स लिमिटेड

(मंगलूर रिफाइनरी एण्ड पेट्रोकेमिकल्स लिमिटेड की सहायक कंपनी)

ONGC Mangalore Petrochemicals Ltd.

(A Subsidiary of Mangalore Refinery and Petrochemicals Ltd.)

एमएसईजेड, पेमुदे, मंगलूर - ५७४ ५०९ MSEZ, Permude, Mangaluru - 574 509.

CIN : U40107KA2006GOI041258, दूरभाष Direct Line :- 0824-2872000, फैक्स Fax:- 0824-2872005, Website: www.ompl.co.in

Ref.: OMPL/MoEF/SP/2018-19/

Date: 28.05.2018

To:

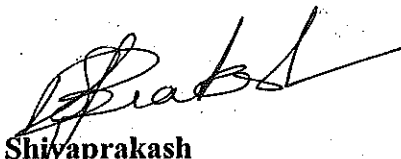
The Head- Technical
MSEZL, Mangalore

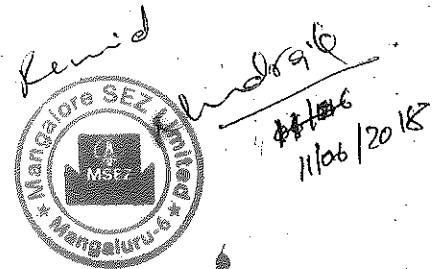
Dear Sir,

Sub: Submission of Half Yearly Compliance Reports of OMPL under Environmental Clearance for Phase-I, MSEZ project, (Including Aromatic Complex) for the period from October, 2017 to March, 2018

With reference to the above, please find enclosed herewith, Half Yearly Compliance Reports of OMPL, for compilation at your end and submission to the concerned Authority under intimation to our office.

Thanking You,


Shivaprakash
Manager (Env)



Cc:- 1. CEO, OMPL for info.
2. COO, OMPL for info.



ओ एन जी सी मंगलूर पेट्रोकेमिकल्स लिमिटेड

(मंगलूर रिफाइनरी एण्ड पेट्रोकेमिकल्स लिमिटेड की सहायक कंपनी)

ONGC Mangalore Petrochemicals Ltd.

(A Subsidiary of Mangalore Refinery and Petrochemicals Ltd.)

एमएसईजेड, पेमुदे, मंगलूर - ५७४ ५०९ MSEZ, Permude, Mangaluru - 574 509.

CIN: U40107KA2006GOI041258

दूरभाषा Direct Line :- 0824-2872000, फैक्स Fax:- 0824-2872005, Website: www.ompl.co.in

REF: OMPL/PCB/SP/2018-19/

Date: 16/07/2018

To:

The Environmental Officer

Regional Office

KSPCB

Baikampady, Mangalore-11



Dear Sir,

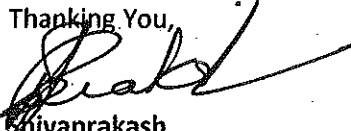
Sub: Submission of Environmental Monitoring Report for the Month of June 2018 and Production Report for June 2018

Ref: KSPCB Combined Consent Order No. AW-301949 dated 27th January, 2017

With respect to the above subject; we are herewith submitting the following Environmental Monitoring Reports and Production Reports for the Month of June 2018 respectively, enclosed herewith.

1. Ambient Air Quality Monitoring at 5 different locations in and around OMPL, enclosed as Annexure- A
2. Water Analysis Reports at 9 different locations in and around OMPL, as Annexure-B
3. Noise Level Monitoring Report at OMPL, as Annexure-C
4. Treated Effluent Analysis Report, Annexure-D
5. Returns Regarding Water Consumed, for the Month of June 2018, as Annexure-E
6. Production Report as Annexure-F

Thanking You,

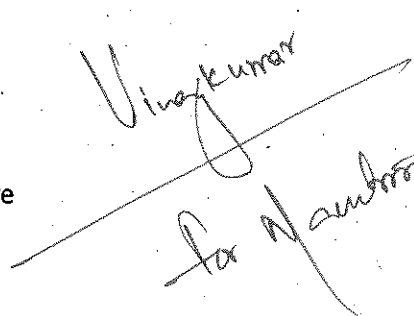
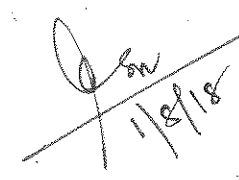

Shivaprakash
Manager (Env)

CC: Member Secretary, KSPCB, Bangalore

CC: Head (Technical), MSEZ

CC: CEO, OMPL for info

CC: COO, OMPL for info


for submission


ANNEXURE-A

Hubert Enviro Care Systems (P) Ltd.

C-45, Industrial Estate, Baikampady, Mangalore, Karnataka - 575011.
Ph: 0824 - 2408111, Email: kro@hecs.in, Website: www.hecs.in

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TEST REPORT OF AMBIENT AIR QUALITY MONITORING (JUNE 2018)

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	OMPL - East Side
Report Date	03.07.2018
Report No	HECS/AA/001/030718

CONSOLIDATED TEST RESULTS

JUNE '18 - Week		20-Week		21-Week		22-Week		23-Week		24-Week	Average Value
Parameters	NAAQ	01.06.18	05.06.18	08.06.18	12.06.18	15.06.18	18.06.18	22.06.18	25.06.18	29.06.18	
PM _{2.5} (µg/m ³)	60	15.4	15.2	15.5	15.3	15.0	15.7	15.4	15.8	15.2	15.39
PM ₁₀ (µg/m ³)	100	35.6	36.0	36.3	36.7	37.2	36.7	37.1	37.5	37.2	36.70
SO ₂ (µg/m ³)	80	2.2	2.0	2.3	2.0	2.2	2.1	2.0	2.3	2.4	2.17
NO ₂ (µg/m ³)	80	2.5	2.4	2.8	2.7	2.6	2.5	2.7	2.4	2.6	2.58
CO (mg/m ³)	2.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
O ₃ (µg/m ³)	100	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NH ₃ (µg/m ³)	400	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb (µg/m ³)	1.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
As (ng/m ³)	6.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni (ng/m ³)	20	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene (µg/m ³)	05	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
B(α)P (ng/m ³)	01	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note: BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m³); O₃-Ozone(DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(α)P- Benzo -α-pyrene (DL 0.1 ng/m³); ng/m³ - nanogram per cubic meter; µg/m³ - microgram per cubic meter

CONCLUSION: All the parameters meet the NAAQ Standards

*****End of Report *****

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Certificate No. TC-5786

TEST REPORT OF AMBIENT AIR QUALITY MONITORING (JUNE. 2018)

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	Shantigudda
Report Date	03.07.2018
Report No	HECS/AA/002/030718

CONSOLIDATED TEST RESULTS

JUNE '18 - Week		20-Week		21-Week		22-Week		23-Week		24-Week	Average Value
Parameters	NAAQ	01.06.18	05.06.18	08.06.18	12.06.18	15.06.18	18.06.18	22.06.18	25.06.18	29.06.18	
PM _{2.5} (µg/m ³)	60	15.6	15.2	15.0	15.7	15.5	15.3	15.7	15.9	15.4	15.48
PM ₁₀ (µg/m ³)	100	36.7	36.5	36.9	37.2	37.5	36.8	37.7	36.5	36.4	36.91
SO ₂ (µg/m ³)	80	2.3	2.0	2.1	2.4	2.2	2.3	2.0	2.4	2.2	2.21
NO ₂ (µg/m ³)	80	2.6	2.4	2.7	2.5	2.4	2.6	2.8	2.5	2.7	2.58
CO (mg/m ³)	2.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
O ₃ (µg/m ³)	100	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NH ₃ (µg/m ³)	400	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb (µg/m ³)	1.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
As (ng/m ³)	6.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni (ng/m ³)	20	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene (µg/m ³)	05	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
B(α)P (ng/m ³)	01	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note: BDL = Below detection limit; DL - Detection Limit; PM_{2.5} - Particulate matter size less than 2.5 Micron, PM₁₀ - Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide (DL 0.1 mg/m³); O₃ - Ozone (DL 10 µg/m³); NH₃ - Ammonia (DL 5 µg/m³); Pb - Lead (DL 0.05 µg/m³); As - Arsenic (DL 0.1 ng/m³); Ni - Nickel (DL 0.5 ng/m³); Benzene - (DL 1 µg/m³); B(α)P - Benzo-α-pyrene (DL 0.1 ng/m³); ng/m³ - nanogram per cubic meter; µg/m³ - microgram per cubic meter

CONCLUSION: All the parameters meet the NAAQ Standards

*****End of Report

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TEST REPORT OF AMBIENT AIR QUALITY MONITORING (JUNE. 2018)

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	Tenka Ekkar
Report Date	03.07.2018
Report No	HECS/AA/003/030718

CONSOLIDATED TEST RESULTS

JUNE '18 - Week		20-Week		21-Week		22-Week		23-Week		24-Week	Average Value
Parameters	NAAQ	01.06.18	05.06.18	08.06.18	12.06.18	15.06.18	18.06.18	22.06.18	25.06.18	29.06.18	
PM _{2.5} (µg/m ³)	60	15.4	15.7	15.2	15.0	15.7	15.9	15.5	15.2	15.6	15.47
PM ₁₀ (µg/m ³)	100	35.9	36.4	36.5	37.0	36.8	37.4	37.6	36.5	37.7	36.87
SO ₂ (µg/m ³)	80	2.4	2.2	2.3	2.0	2.3	2.2	2.1	2.2	2.0	2.19
NO ₂ (µg/m ³)	80	2.5	2.8	2.7	2.6	2.4	2.7	2.8	2.6	2.5	2.62
CO (mg/m ³)	2.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
O ₃ (µg/m ³)	100	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NH ₃ (µg/m ³)	400	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb (µg/m ³)	1.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
As (ng/m ³)	6.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni (ng/m ³)	20	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene (µg/m ³)	05	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
B(α)P (ng/m ³)	01	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note: BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m³); O₃-Ozone(DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(α)P- Benzo -α-pyrene (DL 0.1 ng/m³); ng/m³: nanogram per cubic meter; µg/m³ - microgram per cubic meter

CONCLUSION: All the parameters meet the NAAQ Standards

*****End of Report *****

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TEST REPORT OF AMBIENT AIR QUALITY MONITORING (JUNE, 2018)

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	Permude Village
Report Date	03.07.2018
Report No	HECS/AA/004/030718

CONSOLIDATED TEST RESULTS

JUNE '18 - Week		20-Week		21-Week		22-Week		23-Week		24-Week	Average Value
Parameters	NAAQS	01.06.18	05.06.18	08.06.18	12.06.18	15.06.18	18.06.18	22.06.18	25.06.18	29.06.18	
PM _{2.5} (µg/m ³)	60	15.51	15.7	15.4	15.7	15.6	15.8	15.2	15.9	15.7	15.61
PM ₁₀ (µg/m ³)	100	35.6	36.5	36.7	37.3	37.5	36.9	36.7	36.9	38.0	36.90
SO ₂ (µg/m ³)	80	2.2	2.3	2.4	2.1	2.3	2.2	2.0	2.1	2.2	2.20
NO ₂ (µg/m ³)	80	2.5	2.6	2.4	2.8	2.7	2.6	2.4	2.5	2.7	2.58
CO (mg/m ³)	2.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
O ₃ (µg/m ³)	100	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NH ₃ (µg/m ³)	400	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb (µg/m ³)	1.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
As (ng/m ³)	6.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni (ng/m ³)	20	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene (µg/m ³)	05	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
B(a)P (ng/m ³)	01	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note: BDL = Below detection limit; DL - Detection Limit; PM_{2.5} - Particulate matter size less than 2.5 Micron, PM₁₀ - Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide (DL 0.1 mg/m³); O₃ - Ozone (DL 10 µg/m³); NH₃ - Ammonia (DL 5 µg/m³); Pb - Lead (DL 0.05 µg/m³); As - Arsenic (DL 0.1 ng/m³); Ni - Nickel (DL 0.5 ng/m³); Benzene - (DL 1 µg/m³); B(a)P - Benzo - α - pyrene (DL 0.1 ng/m³); ng/m³ - nanogram per cubic meter; µg/m³ - microgram per cubic meter

CONCLUSION: All the parameters meet the NAAQ Standards

*****End of Report*****

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TEST REPORT OF AMBIENT AIR QUALITY MONITORING (JUNE. 2018)

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	OMPL - West Side
Report Date	03.07.2018
Report No	HECS/AA/005/030718

CONSOLIDATED TEST RESULTS

JUNE '18 - Week		20-Week		21-Week		22-Week		23-Week		24-Week	Average Value
Parameters	NAAQ	01.06.18	05.06.18	08.06.18	12.06.18	15.06.18	18.06.18	22.06.18	25.06.18	29.06.18	
PM _{2.5} (µg/m ³)	60	15.2	15.7	15.4	15.5	15.1	15.3	15.9	15.4	15.6	15.46
PM ₁₀ (µg/m ³)	100	36.0	36.4	36.8	37.1	37.5	36.9	37.3	37.5	37.9	37.04
SO ₂ (µg/m ³)	80	2.1	2.0	2.3	2.2	2.1	2.2	2.0	2.3	2.1	2.14
NO ₂ (µg/m ³)	80	2.4	2.5	2.7	2.8	2.6	2.4	2.7	2.6	2.8	2.61
CO (mg/m ³)	2.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
O ₃ (µg/m ³)	100	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NH ₃ (µg/m ³)	400	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb (µg/m ³)	1.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
As (ng/m ³)	6.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni (ng/m ³)	20	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene (µg/m ³)	05	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
B(a)P (ng/m ³)	01	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note: BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide (DL 0.1 mg/m³); O₃-Ozone (DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(a)P- Benzo -α-pyrene (DL 0.1 ng/m³); ng/m³: nanogram per cubic meter; µg/m³ - microgram per cubic meter

CONCLUSION: All the parameters meet the NAAQ Standards

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ANNEXURE - 13

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TEST REPORT OF GROUND WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	GW1 - Ground Water collected from Narayana Guru Community Hall, Permude
Date of Sampling	07.06.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.07.2018
Report No	HECS/W/001/030718

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	IS10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.74	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	1.0	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	34.2	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	8.2	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	85.4	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	9.1	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	5.5	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	121.0	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	11.0	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	0.33	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	7.7	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: GROUND WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

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TEST REPORT OF GROUND WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	GW2 - Ground Water collected from Gagtel Labor Colony
Date of Sampling	07.06.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.07.2018
Report No	HECS/W/002/030718

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	6.84	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	1.22	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	40.1	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	8.3	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	31.5	200 max
9.	Chloride as Cl ⁻	IS 3025 (Part-32) 1988	mg/L	12.4	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	5.6	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	83.6	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	6.5	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	1.31	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: GROUND WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report

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TEST REPORT OF GROUND WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	GW3- Ground Water collected from L&T New Labor Colony
Date of Sampling	07.06.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.07.2018
Report No	HECS/W/003/030718

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.94	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	1.22	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	6.5	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	13.7	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	60.4	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	14.3	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	7.6	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	127.0	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	8.5	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	1.24	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: GROUND WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

Prepared by

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TEST REPORT OF GROUND WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore – 574509
Sample Description	GW4-Ground Water collected Near OMPL – ETP
Date of Sampling	07.06.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.07.2018
Report No	HECS/W/004/030718

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.76	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	BDL (DL 0.1)	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	56.5	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	13.7	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	42.1	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	17.3	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	5.1	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	140.0	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	7.92	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	2.43	45 max
15.	Iron as Fe	IS 3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS 3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS 1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS 1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: GROUND WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report

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Shaila

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TEST REPORT OF OPEN WELL WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	OW1- Open Water collected from Tenka Ekkar
Date of Sampling	07.06.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.07.2018
Report No	HECS/W/005/030718

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.63	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	2.64	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	51.2	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	9.1	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	41.6	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	9.5	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	4.6	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	74.3	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	6.07	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	2.03	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

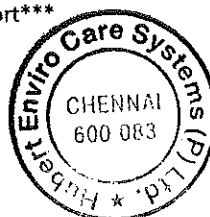
Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: OPENWELL WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

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TEST REPORT OF OPEN WELL WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	OW2 - Open Water collected from Shantigudda Village
Date of Sampling	07.06.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.07.2018
Report No	HECS/W/006/030718

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.62	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	2.81	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	BDL (DL 0.1)	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	41.3	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	8.64	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	60.2	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	13.6	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	4.7	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	76.1	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	6.4	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	2.15	45 max
15.	Iron as Fe	IS 3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS 3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS 1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS 1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: OPENWELL WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

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TEST REPORT OF OPEN WELL WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	OW3 - Open Water collected from Premude Village
Date of Sampling	07.06.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.07.2018
Report No	HECS/W/007/030718

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.31	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	2.72	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	43.4	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	7.3	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	23.5	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	12.9	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	4.2	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	46.3	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	4.2	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	4.3	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

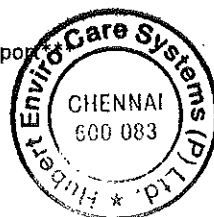
Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: OPENWELL WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

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TEST REPORT OF SURFACE WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	SW1 - Surface Water collected Near OMPL - Flare Area
Date of Sampling	07.06.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.07.2018
Report No	HECS/W/008/030718

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.62	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	2.10	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	138.0	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	52.3	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	95.9	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	14.7	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	9.5	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	400	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	65.4	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	0.36	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	2.43	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	0.26	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

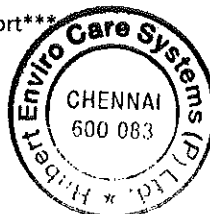
Note:- BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per liter; NA-Not Available

CONCLUSION: SURFACE WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

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TEST REPORT OF SURFACE WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	SW2 - Surface Water collected Near OMPL - Near Central Warehouse
Date of Sampling	07.06.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.07.2018
Report No	HECS/W/009/030718

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.34	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	4.5	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	82.0	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	12.8	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	33	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	70	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	8.2	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	145.7	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	54	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	4.16	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	0.23	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per liter

CONCLUSION: SURFACE WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

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ANNEXURE

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TEST REPORT OF NOISE MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Noise Monitoring
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	OMPL – North, South, East and West sides
Sampling Date	07.06.2018
Report Date	03.07.2018
Report No.	HECS/N/001/030718

NOISE MONITORING: JUNE 2018

S.No.	Sampling Location	MoEF requirements in dB		Avg. Noise level observed in dB	
		Day	Night	Day	Night
1.	OMPL-North	75	70	68.1	65.2
2.	OMPL-South			66.5	63.5
3.	OMPL-East			68.6	65.8
4.	OMPL-West			66.4	64.7

Note: dB: Decibel

CONCLUSION: All the parameters meet MoEF Standards

*****End of Report *****

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ANNEXURE-D

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TEST REPORT OF ETP EFFULENT MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Guard Pond Pump Discharge (ETP Effluent)
Date of Sampling	11.06.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.07.2018
Report No	HECS/W/011/030718

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	Permissible Limit
1.	Color	IS:3025:(Pt 4)1983 (Reaff 2006)	Hazen Units	3.0	All efforts should be made to remove colour and unpleasant odour as far as practicable
2.	Odour	IS 3025 (Part5)-1983, Reaff 2006	-	Agreeable	
3.	Total suspended Solids	2540D APHA 22nd Edn.. 2012	mg/L	9.4	100
4.	pH	IS:3025:(Pt 11):1983 (Reaff 2006)	-	6.93	6.0-8.5
5.	Temperature	IS 3025 (Pt 9):1983 (Reaff:2006)	°C	29.0	Shall not exceed 5 degree Centigrade above the receiving water temperature
6.	Oil & Grease	IS 3025,4(Pt 39):2000 (Reaff 2009)	mg/L	BDL(DL 1)	5
7.	Total Residual Chlorine as Cl ₂	IS:3025 (Pt26)1986 (Reaff 2009)	mg/L	BDL (DL 0.1)	1
8.	Ammonical Nitrogen as N	IS 3025 Part (34)1988	mg/L	8.9	50
9.	Total Kjeldhal Nitrogen as N	IS 3025 Part (34)1988	mg/L	32.1	100
10.	Free Ammonia as NH ₃	IS:3025 (Part34)1998 Reaff. 2003	mg/L	BDL(DL 0.02)	5
11.	BOD, 3 days @ 27°C as O ₂	IS:3025 (Pt 44)1993 (Reaff 2009)	mg/L	9.5	30
12.	COD as O ₂	IS 3025 Part (58)2006	mg/L	58.4	125
13.	Lead as Pb	IS:3025 (Pt 47)1994 (Reaff 2009)	mg/L	BDL(DL 0.1)	0.1
14.	Chromium (Hexavalent) as Cr ⁶⁺	IS 3025 Part (52):2003	mg/L	BDL(DL 0.01)	0.1
15.	Total Chromium as Cr	IS 3025(Pt52):2003 (Reaff 2009)	mg/L	BDL(DL 0.01)	2.0
16.	Copper as Cu	IS:3025:5,(Pt 42)1992 (Reaff 2009)	mg/L	BDL(DL 0.05)	1.0
17.	Zinc as Zn	IS:3025 (Part49)1994 (Reaff 2009)	mg/L	BDL(DL 0.1)	5.0

Hubert Enviro Care Systems (P) Ltd.

C-45, Industrial Estate, Baikampady, Mangalore, Karnataka - 575011.
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**Laboratory Services Division**

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ISO 9001, 14001 & OHSAS 18001 Certified.

Certificate No. TC-5786

TEST REPORT OF ETP EFFULENT MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Guard Pond Pump Discharge (ETP Effluent)
Date of Sampling	11.06.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.07.2018
Report No	HECS/W/011/030718

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	Permissible Limit
18.	Nickel as Ni	IS:3025 (Part54)2003 (Reaff 2009)	mg/L	BDL(DL 0.05)	1.0
19.	Fluoride as F-	IS 3025 part (60):2008	mg/L	BDL(DL 0.2)	1.0
20.	Sulphide as S ²⁻	IS:3025 (Pt 29)1986 (Reaff 2009)	mg/L	BDL(DL 0.04)	2.0
21.	Particle Size of Suspended solids	APHA 22nd Edition	-	Passed through 850 micron	850 micron
22.	Arsenic as As	IS:3025 (Part37)1988(Reaff 2009)	mg/L	BDL(DL 0.005)	0.2
23.	Mercury as Hg	IS:3025 (Part48)1994 RA 1999	mg/L	BDL(DL 0.001)	0.01
24.	Cadmium as Cd	IS:3025 (Part41)1991	mg/L	BDL(DL 0.01)	0.1
25.	Selenium as Se	IS:3025 (Part56)2003	mg/L	BDL(DL 0.005)	0.05
26.	Cyanide as CN	IS:3025 (Part27)1986 Reaff. 2009	mg/L	BDL(DL 0.01)	0.2
27.	Phenols as C ₆ H ₅ OH	IS 3025 Part (43)1992, RA 2009	mg/L	BDL(DL 0.001)	0.35
28.	Total Iron as Fe	IS 3025(Pt 53):2003(Reaff 2009)	mg/L	0.33	3
29.	Manganese	IS:3025:(Pt-59):2006	mg/L	BDL(DL 0.01)	2
30.	Total Phosphorous as P	IS 3025(Pt 31):1988(Reaff 2009)	mg/L	BDL(DL 0.01)	3
31.	Nitrate	IS 3025 (Pt 34):1988 (Reaff 2009)	mg/L	BDL(DL 1)	20
32.	Vanadium as V	IS:3025 (Part56)2003	mg/L	BDL(DL 0.01)	0.1
33.	Benzo(a)pyrene	USEPA 8270C	mg/L	BDL(DL 0.0001)	0.2
34.	Benzene	USEPA 8270C	mg/L	BDL(DL 0.0001)	0.1
35.	Bioassay Test	IS 6582(Part 2):2001	Tf	9:1	90% survival of fish after 96 hrs in 100% effluent

Note:-BDL - Below Detection Limit; D.L- Detection Limit; mg/L - Milligrams per liter

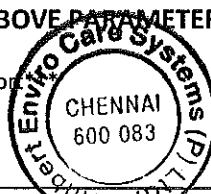
CONCLUSION: ETP OUTLET EFFULENT WATER AS ABOVE PARAMETERS ARE WITHIN STANDARDS

***End of Report

Prepared by

Checked by

Authorized Signatory



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Certificate No. TC-5786

TEST REPORT OF ETP EFFLUENT MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Guard Pond Pump Discharge (ETP Effluent)
Date of Sampling	21.06.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.07.2018
Report No	HECS/W/015/030718

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	Permissible Limit
1.	Color	IS:3025:(Pt 4):1983 (Reaff 2006)	Hazen Units	2.9	All efforts should be made to remove colour and unpleasant odour as far as practicable
2.	Odour	IS 3025 (Part5)-1983, Reaff 2006	-	Agreeable	
3.	Total suspended Solids	2540D APHA 22nd Edn.. 2012	mg/L	9.3	100
4.	pH	IS:3025:(Pt 11):1983 (Reaff 2006)	-	7.4	6.0-8.5
5.	Temperature	IS 3025 (Pt 9):1983 (Reaff:2006)	°C	28.0	Shall not exceed 5 degree Centigrade above the receiving water temperature
6.	Oil & Grease	IS 3025,4(Pt 39):2000 (Reaff 2009)	mg/L	BDL(DL 1)	5
7.	Total Residual Chlorine as Cl ₂	IS:3025 (Pt26)1986 (Reaff 2009)	mg/L	BDL (DL 0.1)	1
8.	Ammonical Nitrogen as N	IS 3025 Part (34)1988	mg/L	9.2	50
9.	Total Kjeldhal Nitrogen as N	IS 3025 Part (34)1988	mg/L	15.0	100
10.	Free Ammonia as NH ₃	IS:3025 (Part34)1998 Reaff. 2003	mg/L	BDL(DL 0.02)	5
11.	BOD, 3 days @ 27°C as O ₂	IS:3025 (Pt 44)1993 (Reaff 2009)	mg/L	9.2	30
12.	COD as O ₂	IS 3025 Part (58)2006	mg/L	52.0	125
13.	Lead as Pb	IS:3025 (Pt 47)1994 (Reaff 2009)	mg/L	BDL(DL 0.1)	0.1
14.	Chromium (Hexavalent) as Cr ⁶⁺	IS 3025 Part (52):2003	mg/L	BDL(DL 0.01)	0.1
15.	Total Chromium as Cr	IS 3025(Pt52):2003 (Reaff 2009)	mg/L	BDL(DL 0.01)	2.0
16.	Copper as Cu	IS:3025:5,(Pt 42)1992 (Reaff 2009)	mg/L	BDL(DL 0.05)	1.0
17.	Zinc as Zn	IS:3025 (Part49)1994 (Reaff 2009)	mg/L	BDL(DL 0.1)	5.0

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Certificate No. TC-5786

TEST REPORT OF ETP EFFLUENT MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore – 574509
Sample Description	Guard Pond Pump Discharge (ETP Effluent)
Date of Sampling	21.06.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.07.2018
Report No	HECS/W/015/030718

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	Permissible Limit
18.	Nickel as Ni	IS:3025 (Part54)2003 (Reaff 2009)	mg/L	BDL(DL 0.05)	1.0
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20.	Sulphide as S ²⁻	IS:3025 (Pt 29)1986 (Reaff 2009)	mg/L	BDL(DL 0.04)	2.0
21.	Particle Size of Suspended solids	APHA 22nd Edition	-	Passed through 850 micron	850 micron
22.	Arsenic as As	IS:3025 (Part37)1988(Reaff 2009)	mg/L	BDL(DL 0.005)	0.2
23.	Mercury as Hg	IS:3025 (Part48)1994 RA 1999	mg/L	BDL(DL 0.001)	0.01
24.	Cadmium as Cd	IS:3025 (Part41)1991	mg/L	BDL(DL 0.01)	0.1
25.	Selenium as Se	IS:3025 (Part56)2003	mg/L	BDL(DL 0.005)	0.05
26.	Cyanide as CN	IS:3025 (Part27)1986 Reaff. 2009	mg/L	BDL(DL 0.01)	0.2
27.	Phenolic Compounds as C6H5OH	IS 3025 Part (43)1992,RA 2009	mg/L	BDL(DL 0.001)	0.35
28.	Total Iron as Fe	IS 3025(Pt 53):2003(Reaff 2009)	mg/L	0.46	3
29.	Manganese	IS:3025:(Pt-59):2006	mg/L	BDL(DL 0.01)	2
30.	Total Phosphorous as P	IS 3025(Pt 31):1988(Reaff 2009)	mg/L	BDL(DL 0.01)	3
31.	Nitrate	IS 3025 (Pt 34):1988 (Reaff 2009)	mg/L	BDL(DL 1)	20
32.	Vanadium as V	IS:3025 (Part56)2003	mg/L	BDL(DL 0.01)	0.1
33.	Benzo(a)pyrene	USEPA 8270C	mg/L	BDL(DL 0.0001)	0.2
34.	Benzene	USEPA 8270C	mg/L	BDL(DL 0.0001)	0.1
35.	Bioassay Test	IS 6582(Part 2):2001	Tf	9:1	90% survival of fish after 96 hrs in 100% effluent

Note:-BDL - Below Detection Limit; D.L- Detection Limit; mg/L - Milligrams per liter

CONCLUSION: ETP OUTLET EFFULENT WATER AS ABOVE PARAMETERS ARE WITHIN STANDARDS

End of Report

Shacha
Prepared by

[Signature]
Checked by



[Signature]
Authorized Signatory

Form-1 (Rule 4)
Returns Regarding Water Consumed during the Month of June, 2018

Name and address of the Consumer	Purpose for which water consumed	Reading at the beginning of the first day of the calendar month under report	Reading at the end of the last day of the calendar month under report	Quantity of Water Consumed in Kilo Liters	If the meter was out of order, the monthly average consumption of water for the previous 3 months of the working period	Quantity of water qualifying for rebate according to the assessee	Remarks
M/s ONGC Mangalore Petrochemicals Limited, Mangalore Special Economic Zone, Pernurde, Mangalore -574 509	Industrial cooling, spraying in mine pits or boiler feed						
	Cooling Water	0	78,676	78676			
	Boiler Feed Water	0	67,434	67434			
	Fire Water	0	15811	15811			
	Domestic purpose						
	Drinking Water & Sanitation	0	5548	5548			
	Processing whereby water gets polluted and the pollutants are easily bio-degradable						
	Service Water		10147	10147			Subtracting total flow from BFW, CT & Drinking water consumption
	Total Consumption			1,77,616			

Signature of the Consumer

Name

Address


 Shivaprasad, Manager (Env)

M/s ONGC Mangalore Petrochemicals Limited, Mangalore Special Economic Zone, Pernurde, Mangalore -574 509

ANNEXURE-F

ONGC Mangalore Petrochemicals Limited

Production Details for June, 2018

Net Naptha Processed -1,31,669 MT

Sl. No.	Name of the Product	Quantity, MT
1	Paraxylene (Product)	63,184.5
2	Benzene (Co product)	21,005.8





ओ एन जी सी मंगलूर पेट्रोकेमिकल्स लिमिटेड

(मंगलूर रिफाइनरी एण्ड पेट्रोकेमिकल्स लिमिटेड की सहायक कंपनी)

ONGC Mangalore Petrochemicals Ltd.

(A Subsidiary of Mangalore Refinery and Petrochemicals Ltd.)

एमएसईजेड, पेमुदे, मंगलूर - ५७४ ५०९ MSEZ, Permude, Mangaluru - 574 509.

CIN : U40107KA2006GOI041258

दूरभाषा Direct Line :- 0824-2872000, फैक्स Fax:- 0824-2872005, Website: www.ompl.co.in

REF: OMPL/PCB/SP/2018-19/

Date:13/08/2018

To:

The Environmental Officer
Regional Office
KSPCB
Balkampady, Mangalore-11

Dear Sir,

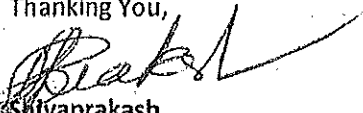
Sub: Submission of Environmental Monitoring Report for the Month of July 2018 and Production Report for July 2018

Ref: KSPCB Combined Consent Order No. AW-301949 dated 27th January, 2017

With respect to the above subject; we are herewith submitting the following Environmental Monitoring Reports and Production Reports for the Month of July 2018 respectively, enclosed herewith.

1. Ambient Air Quality Monitoring at 5 different locations in and around OMPL, enclosed as Annexure- A
2. Water Analysis Reports at 9 different locations in and around OMPL, as Annexure-B
3. Noise Level Monitoring Report at OMPL, as Annexure-C
4. Treated Effluent Analysis Report, Annexure-D
5. Stack Monitoring Analysis Report, Annexure-E
6. SO2 report as Annexure-F
7. Returns Regarding Water Consumed, for the Month of July 2018, as Annexure-G
8. Production Report as Annexure-H

Thanking You,

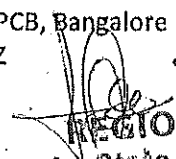

Shivaprakash
Manager (Env)

CC: Member Secretary, KSPCB, Bangalore

CC: Head (Technical), MSEZ

CC: CEO, OMPL for Info

CC: COO, OMPL for info

28/08/18

REGIONAL OFFICE
Karnataka State Pollution Control Board
Plot No.10-B, Balkampady Industrial Area
MANGALORE-575011

ANNEXURE-14

Hubert Enviro Care Systems (P) Ltd.

C-45, Industrial Estate, Baikampady, Mangalore, Karnataka - 575011.

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Certificate No. TC-5786

TEST REPORT OF AMBIENT AIR QUALITY MONITORING (JULY 2018)

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	OMPL - East Side
Report Date	03.08.2018
Report No	HECS/AA/001/030818

CONSOLIDATED TEST RESULTS

JULY '18 - Week		25-Week		26-Week		27-Week		28-Week		29-Week	Average Value
Parameters	NAAQ	02.07.18	05.07.18	09.07.18	12.07.18	16.07.18	19.07.18	23.07.18	26.07.18	30.07.18	
PM _{2.5} (µg/m ³)	60	14.2	14.8	16.1	14.9	15.6	14.2	15	16.4	16.2	15.27
PM ₁₀ (µg/m ³)	100	33.7	34	37.4	38.1	38.1	35.1	38.4	36.3	36.4	36.39
SO ₂ (µg/m ³)	80	2.1	2.4	2.2	2.8	2.2	2.4	2.6	2.2	2.7	2.40
NO ₂ (µg/m ³)	80	2.7	3.2	3.1	3.5	3.1	3.4	3.4	3.5	2.9	3.20
CO (mg/m ³)	2.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
O ₃ (µg/m ³)	100	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NH ₃ (µg/m ³)	400	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb (µg/m ³)	1.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
As (ng/m ³)	6.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni (ng/m ³)	20	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene (µg/m ³)	05	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
B(α)P (ng/m ³)	01	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

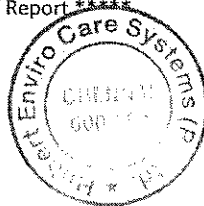
Note: BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m³); O₃-Ozone(DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(α)P- Benzo -α-pyrene (DL 0.1 ng/m³); ng/m³: nanogram per cubic meter; µg/m³ - microgram per cubic meter

CONCLUSION: All the parameters meet the NAAQ Standards

*****End of Report*****

Prepared by

Checked by



Authorized Signatory

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TEST REPORT OF AMBIENT AIR QUALITY MONITORING (JULY. 2018)

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	Permude Village
Report Date	03.08.2018
Report No	HECS/AA/004/030818

CONSOLIDATED TEST RESULTS

JULY '18 - Week		25-Week		26-Week		27-Week		28-Week		29-Week	Average Value
Parameters	NAAQS	02.07.18	05.07.18	09.07.18	12.07.18	16.07.18	19.07.18	23.07.18	26.07.18	30.07.18	
PM _{2.5} (µg/m ³)	60	16.1	15.9	15.6	15.1	15.4	15.6	15.8	16.2	14.9	15.62
PM ₁₀ (µg/m ³)	100	37.4	38.1	37.4	36.9	38.2	37.4	37.3	36.5	36.1	37.26
SO ₂ (µg/m ³)	80	2.9	3.1	3.2	3.4	3.2	3.5	3.2	3.1	3.5	3.23
NO ₂ (µg/m ³)	80	3.7	4.2	4.3	4.1	3.9	4.0	4.3	3.6	3.8	3.99
CO (mg/m ³)	2.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
O ₃ (µg/m ³)	100	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NH ₃ (µg/m ³)	400	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb (µg/m ³)	1.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
As (ng/m ³)	6.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni (ng/m ³)	20	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene (µg/m ³)	05	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
B(α)P (ng/m ³)	01	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

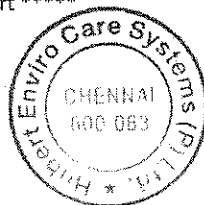
Note: BDL = Below detection limit; DL - Detection Limit; PM_{2.5} - Particulate matter size less than 2.5 Micron, PM₁₀ - Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide (DL 0.1 mg/m³); O₃ - Ozone (DL 10 µg/m³); NH₃ - Ammonia (DL 5 µg/m³); Pb - Lead (DL 0.05 µg/m³); As - Arsenic (DL 0.1 ng/m³); Ni - Nickel (DL 0.5 ng/m³); Benzene - (DL 1 µg/m³); B(α)P - Benzo - α-pyrene (DL 0.1 ng/m³); ng/m³ - nanogram per cubic meter; µg/m³ - microgram per cubic meter

CONCLUSION: All the parameters meet the NAAQ Standards

*****End of Report *****

Prepared by

Checked by



Authorized Signatory

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Hubert Enviro Care Systems (P) Ltd.

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**Laboratory Services Division**

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ISO 9001, 14001 & OHSAS 18001 Certified.

Certificate No. TC-5786

TEST REPORT OF AMBIENT AIR QUALITY MONITORING (JULY. 2018)

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	Shantigudda
Report Date	03.08.2018
Report No	HECS/AA/002/030818

CONSOLIDATED TEST RESULTS

JULY '18 - Week		25-Week		26-Week		27-Week		28-Week		29-Week	Average Value
Parameters	NAAQ	02.07.18	05.07.18	09.07.18	12.07.18	16.07.18	19.07.18	23.07.18	26.07.18	30.07.18	
PM _{2.5} (µg/m ³)	60	15.6	15.2	15.0	15.7	15.5	15.3	15.7	15.9	15.4	15.48
PM ₁₀ (µg/m ³)	100	36.7	36.5	36.9	37.2	37.5	36.8	37.7	36.5	36.4	36.91
SO ₂ (µg/m ³)	80	2.3	2.0	2.1	2.4	2.2	2.3	2.0	2.4	2.2	2.21
NO ₂ (µg/m ³)	80	2.6	2.4	2.7	2.5	2.4	2.6	2.8	2.5	2.7	2.58
CO (mg/m ³)	2.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
O ₃ (µg/m ³)	100	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NH ₃ (µg/m ³)	400	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb (µg/m ³)	1.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
As (ng/m ³)	6.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni (ng/m ³)	20	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene (µg/m ³)	05	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
B(a)P (ng/m ³)	01	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note: BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m³); O₃-Ozone(DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(a)P- Benzo-α-pyrene (DL 0.1 ng/m³); ng/m³ - nanogram per cubic meter; µg/m³ - microgram per cubic meter

CONCLUSION: All the parameters meet the NAAQ Standards

Shashi
Prepared by

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[Signature]
Checked by



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Certificate No. TC-5786

TEST REPORT OF AMBIENT AIR QUALITY MONITORING (JULY. 2018)

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	Tenka Ekkar
Report Date	03.08.2018
Report No	HECS/AA/003/030818

CONSOLIDATED TEST RESULTS

JULY '18 - Week		25-Week		26-Week		27-Week		28-Week		29-Week	Average Value
Parameters	NAAQ	02.07.18	05.07.18	09.07.18	12.07.18	16.07.18	19.07.18	23.07.18	26.07.18	30.07.18	
PM _{2.5} (µg/m ³)	60	15.2	14.9	15.4	15.1	15.7	15.5	15.9	16.2	15	15.43
PM ₁₀ (µg/m ³)	100	37.1	35.4	37.1	38	36.5	36.4	37.1	36.3	36.9	36.76
SO ₂ (µg/m ³)	80	2.7	2.3	2.6	2.5	2.4	2.8	2.1	2.6	2.9	2.54
NO ₂ (µg/m ³)	80	3.3	3.4	3.5	3.7	3.4	3.3	3	3.9	4.1	3.51
CO (mg/m ³)	2.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
O ₃ (µg/m ³)	100	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NH ₃ (µg/m ³)	400	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb (µg/m ³)	1.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
As (ng/m ³)	6.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni (ng/m ³)	20	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene (µg/m ³)	05	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
B(a)P (ng/m ³)	01	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note: BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m³); O₃-Ozone(DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(a)P- Benzo -α-pyrene (DL 0.1 ng/m³); ng/m³: nanogram per cubic meter; µg/m³ - microgram per cubic meter

CONCLUSION: All the parameters meet the NAAQ Standards

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Checked by



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TEST REPORT OF AMBIENT AIR QUALITY MONITORING (JULY. 2018)

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	OMPL - West Side
Report Date	03.08.2018
Report No	HECS/AA/005/030818

CONSOLIDATED TEST RESULTS

JULY '18 - Week		25-Week		26-Week		27-Week		28-Week		29-Week	Average Value
Parameters	NAAQ	02.07.18	05.07.18	09.07.18	12.07.18	16.07.18	19.07.18	23.07.18	26.07.18	30.07.18	
PM _{2.5} (µg/m ³)	60	15.4	15	15.6	15.9	15.6	15.9	16.3	16.4	15.7	15.76
PM ₁₀ (µg/m ³)	100	36	37.5	37.2	37.8	38.1	36.7	38.1	37.8	36.9	37.34
SO ₂ (µg/m ³)	80	2.5	2.7	2.7	2.5	2.4	2.9	3.1	3.4	3.5	2.86
NO ₂ (µg/m ³)	80	2.4	4.2	4.5	4.8	4.2	4.5	4.7	4.1	4.6	4.22
CO (mg/m ³)	2.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
O ₃ (µg/m ³)	100	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NH ₃ (µg/m ³)	400	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb (µg/m ³)	1.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
As (ng/m ³)	6.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni (ng/m ³)	20	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene (µg/m ³)	05	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
B(a)P (ng/m ³)	01	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note: BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m³); O₃-Ozone(DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(a)P- Benzo -a-pyrene (DL 0.1 ng/m³); ng/m³: nanogram per cubic meter; µg/m³ - microgram per cubic meter

CONCLUSION: All the parameters meet the NAAQ Standards

*****End of Report *****

Prepared by

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ANNEXURE-B

Hubert Enviro Care Systems (P) Ltd.

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TEST REPORT OF GROUND WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	GW1 - Ground Water collected from Narayana Guru Community Hall, Permude
Date of Sampling	07.07.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.08.2018
Report No	HECS/W/001/030818

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	IS10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.69	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	1.2	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	33.2	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	7.4	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	79.3	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	8.4	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	6.7	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	115.0	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	8.9	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	0.2	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	7.5	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

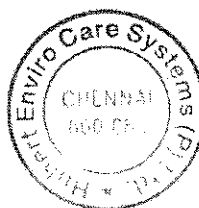
Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: GROUND WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

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TEST REPORT OF GROUND WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	GW4-Ground Water collected Near OMPL - ETP
Date of Sampling	07.07.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.08.2018
Report No	HECS/W/004/030818

RESULTS

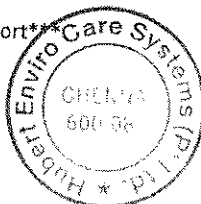
S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.81	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	BDL (DL 0.1)	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	57.4	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	12.8	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	43.5	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	16.3	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	4.9	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	136.5	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	6.7	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	2.6	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter; MPN- Most Probable Number; mL-Milliliter

CONCLUSION: GROUND WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

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Certificate No. TC-5786

TEST REPORT OF OPEN WELL WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	OW1- Open Water collected from Tenka Ekkar
Date of Sampling	07.07.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.08.2018
Report No	HECS/W/005/030818

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.73	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	2.5	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	49.9	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	8.4	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	40.6	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	8.3	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	5.1	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	72.4	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	7.5	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	2.7	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note: BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: OPENWELL WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

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**TEST REPORT OF GROUND WATER QUALITY MONITORING**

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	GW2 - Ground Water collected from Gagtel Labor Colony
Date of Sampling	07.07.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.08.2018
Report No	HECS/W/002/030818

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	6.82	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	1.4	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	39.5	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	7.9	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	30.0	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	11.1	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	4.2	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	90.0	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	7.2	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	1.6	45 max
15.	Iron as Fe	IS 3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS 3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS 1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS 1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: GROUND WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report

Prepared by

Checked by



Authorized Signatory

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Certificate No. TC-5786

TEST REPORT OF GROUND WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	GW3- Ground Water collected from L&T New Labor Colony
Date of Sampling	07.07.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.08.2018
Report No	HECS/W/003/030818

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.87	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	1.40	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	6.2	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	14.2	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	57.3	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	13.2	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	7.4	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	120.0	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	6.6	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	2.4	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: GROUND WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

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TEST REPORT OF GROUND WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	GW4-Ground Water collected Near OMPL - ETP
Date of Sampling	07.07.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.08.2018
Report No	HECS/W/004/030818

RESULTS

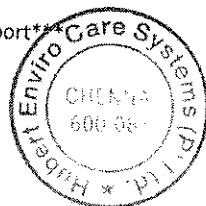
S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.81	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	BDL (DL 0.1)	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	57.4	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	12.8	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	43.5	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	16.3	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	4.9	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	136.5	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	6.7	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	2.6	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: GROUND WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

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**TEST REPORT OF OPEN WELL WATER QUALITY MONITORING**

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	OW1- Open Water collected from Tenka Ekkar
Date of Sampling	07.07.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.08.2018
Report No	HECS/W/005/030818

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.73	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	2.5	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	49.9	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	8.4	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	40.6	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	8.3	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	5.1	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	72.4	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	7.5	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	2.7	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:- BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: OPENWELL WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

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TEST REPORT OF OPEN WELL WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	OW2 - Open Water collected from Shantigudda Village
Date of Sampling	07.07.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.08.2018
Report No	HECS/W/006/030818

RESULTS

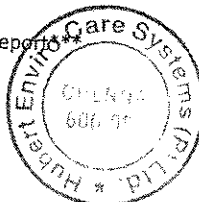
S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.74	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	2.7	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	BDL (DL 0.1)	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	36.7	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	7.8	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	57.5	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	12.7	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	3.9	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	75.6	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	5.8	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	2.9	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: OPENWELL WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

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TEST REPORT OF OPEN WELL WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	OW3 - Open Water collected from Permude Village
Date of Sampling	07.07.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.08.2018
Report No	HECS/W/007/030818

RESULTS

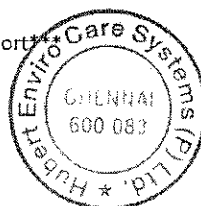
S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.6	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	2.9	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	45.5	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	7.8	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	24.6	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	13.7	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	4.8	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	45.4	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	4.6	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	4.3	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note: BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: OPENWELL WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

Prepared by

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TEST REPORT OF SURFACE WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	SW1 - Surface Water collected Near OMPL - Flare Area
Date of Sampling	07.07.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.08.2018
Report No	HECS/W/008/030818

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.5	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	2.4	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	130.0	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	47.5	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	92.5	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	12.6	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	8.5	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	384	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	63.4	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	0.27	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	3.2	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	0.20	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:- BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per liter; NA-Not Available

CONCLUSION: SURFACE WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

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Certificate No. TC-5786

TEST REPORT OF SURFACE WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	SW2 - Surface Water collected Near OMPL - Near Central Warehouse
Date of Sampling	07.07.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.08.2018
Report No	HECS/W/009/030818

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.5	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	2.9	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	76.0	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	10.4	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	32.5	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	64.6	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	7.7	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	155	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	49	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	3.8	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	0.22	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per liter

CONCLUSION: SURFACE WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

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ANNEXURE C

Hubert Enviro Care Systems (P) Ltd.

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Certificate No. TC-5786

TEST REPORT OF NOISE MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Noise Monitoring
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	OMPL - North, South, East and West sides
Sampling Date	07.07.2018
Report Date	03.08.2018
Report No.	HECS/N/001/030818

NOISE MONITORING: JULY 2018

S.No.	Sampling Location	MoEF requirements in dB		Avg. Noise level observed in dB	
		Day	Night	Day	Night
1.	OMPL-North	75	70	67.4	64.9
2.	OMPL-South			66.9	64.2
3.	OMPL-East			67.2	65.1
4.	OMPL-West			67.5	65.7

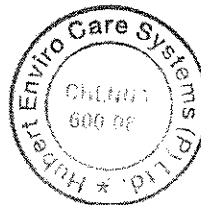
Note: dB: Decibel

CONCLUSION: All the parameters meet MoEF Standards

*****End of Report *****

Prepared by

Checked by



Authorized Signatory

ANNEXURE-D

Hubert Enviro Care Systems (P) Ltd.

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TEST REPORT OF ETP EFFULENT MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Guard Pond Pump Discharge (ETP Effluent)
Date of Sampling	11.07.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.08.2018
Report No	HECS/W/011/030818

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	Permissible Limit
1.	Color	IS:3025:(Pt 4)1983 (Reaff 2006)	Hazen Units	2.0	All efforts should be made to remove colour and unpleasant odour as far as practicable
2.	Odour	IS 3025 (Part5)-1983, Reaff 2006	-	Agreeable	
3.	Total suspended Solids	2540D APHA 22nd Edn.. 2012	mg/L	2.7	100
4.	pH	IS:3025:(Pt 11):1983 (Reaff 2006)	-	6.83	6.0-8.5
5.	Temperature	IS 3025 (Pt 9):1983 (Reaff:2006)	°C	27.0	Shall not exceed 5 degree Centigrade above the receiving water temperature
6.	Oil & Grease	IS 3025,4(Pt 39):2000 (Reaff 2009)	mg/L	BDL(DL 1)	5
7.	Total Residual Chlorine as Cl ₂	IS:3025 (Pt26)1986 (Reaff 2009)	mg/L	BDL (DL 0.1)	1
8.	Ammonical Nitrogen as N	IS 3025 Part (34)1988	mg/L	7.5	50
9.	Total Kjeldhal Nitrogen as N	IS 3025 Part (34)1988	mg/L	29.5	100
10.	Free Ammonia as NH ₃	IS:3025 (Part34)1998 Reaff. 2003	mg/L	BDL(DL 0.02)	5
11.	BOD, 3 days @ 27°C as O ₂	IS:3025 (Pt 44)1993 (Reaff 2009)	mg/L	5.0	30
12.	COD as O ₂	IS 3025 Part (58)2006	mg/L	28.5	125
13.	Lead as Pb	IS:3025 (Pt 47)1994 (Reaff 2009)	mg/L	BDL(DL 0.1)	0.1
14.	Chromium (Hexavalent) as Cr ⁶⁺	IS 3025 Part (52):2003	mg/L	BDL(DL 0.01)	0.1
15.	Total Chromium as Cr	IS 3025(Pt52):2003 (Reaff 2009)	mg/L	BDL(DL 0.01)	2.0
16.	Copper as Cu	IS:3025:5,(Pt 42)1992 (Reaff 2009)	mg/L	BDL(DL 0.05)	1.0
17.	Zinc as Zn	IS:3025 (Part49)1994 (Reaff 2009)	mg/L	BDL(DL 0.1)	5.0

1. The report in full or part shall not be used for any promotional or publicity purpose without written consent by HECS organization. 2. Samples are not drawn by HECS unless or otherwise mentioned. 3. Unless specifically requested by customer the test items will not be retained more than 15 days from the date of issue of test report. 4. Under no circumstances lab accepts any liability or loss / damage caused by use or misuse of test report after invoicing or issue of test report. 5. The test results relate only to the test items. 6. # not under scope of accreditation.

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TEST REPORT OF ETP EFFULENT MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Guard Pond Pump Discharge (ETP Effluent)
Date of Sampling	11.07.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.08.2018
Report No	HECS/W/011/030818

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	Permissible Limit
18.	Nickel as Ni	IS:3025 (Part54)2003 (Reaff 2009)	mg/L	BDL(DL 0.05)	1.0
19.	Fluoride as F-	IS 3025 part (60):2008	mg/L	BDL(DL 0.2)	1.0
20.	Sulphide as S ²⁻	IS:3025 (Pt 29)1986 (Reaff 2009)	mg/L	BDL(DL 0.04)	2.0
21.	Particle Size of Suspended solids	APHA 22nd Edition	-	Passed through 850 micron	850 micron
22.	Arsenic as As	IS:3025 (Part37)1988(Reaff 2009)	mg/L	BDL(DL 0.005)	0.2
23.	Mercury as Hg	IS:3025 (Part48)1994 RA 1999	mg/L	BDL(DL 0.001)	0.01
24.	Cadmium as Cd	IS:3025 (Part41)1991	mg/L	BDL(DL 0.01)	0.1
25.	Selenium as Se	IS:3025 (Part56)2003	mg/L	BDL(DL 0.005)	0.05
26.	Cyanide as CN	IS:3025 (Part27)1986 Reaff. 2009	mg/L	BDL(DL 0.01)	0.2
27.	Phenols as C ₆ H ₅ OH	IS 3025 Part (43)1992, RA 2009	mg/L	BDL(DL 0.001)	0.35
28.	Total Iron as Fe	IS 3025(Pt 53):2003(Reaff 2009)	mg/L	0.2	3
29.	Manganese	IS:3025:(Pt-59):2006	mg/L	BDL(DL 0.01)	2
30.	Total Phosphorous as P	IS 3025(Pt 31):1988(Reaff 2009)	mg/L	BDL(DL 0.01)	3
31.	Nitrate	IS 3025 (Pt 34):1988 (Reaff 2009)	mg/L	BDL(DL 1)	20
32.	Vanadium as V	IS:3025 (Part56)2003	mg/L	BDL(DL 0.01)	0.1
33.	Benzo(a)pyrene	USEPA 8270C	mg/L	BDL(DL 0.0001)	0.2
34.	Benzene	USEPA 8270C	mg/L	BDL(DL 0.0001)	0.1
35.	Bioassay Test	IS 6582(Part 2):2001	Tf	9:1	90% survival of fish after 96 hrs in 100% effluent

Note:-BDL - Below Detection Limit; D.L- Detection Limit; mg/L - Milligrams per liter

CONCLUSION: ETP OUTLET EFFULENT WATER AS ABOVE PARAMETERS ARE WITHIN STANDARDS

***End of Report

Prepared by

Checked by

Authorized Signatory

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ANNEXURE - E

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TEST REPORT OF EMISSION AIR FROM STACK/ CHIMNEY MONITORING (JULY - 2018)

Page No. 1 of 9

Name of the Industry	M/s ONGC Mangalore Petrochemicals Limited
Address of the Industry	Mangalore SEZ, Permude Village, Mangalore-574509, Karnataka, India.
Stack ID	NHT Charge heater
Sample Description	Manual Stack Emission Monitoring
Sampling Date	04.07.2018
Sample Receipt	05.07.2018
Equipment Used	Vayubodhan VSS1
Method of Sampling & Analysis	IS 11255:1995 Methods for Measurement of Emission from Stationary Sources
Sample Drawn by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.08.2018
Report No	HECS-OMPL/SEM/001/030818

General Details	
Ambient Temperature (°C)	27
Stack Diameter (m)	1.94
Stack Height (m)	65
Stack Temperature (°C)	249
Flue Gas Velocity (m/s)	9.4
Flue gas flow rate (Nm ³ /hr)	54352.0

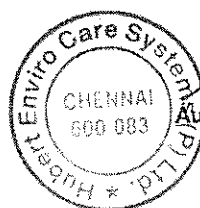
Parameter monitored	Protocol	Results(mg/Nm ³)	Standard Norms(mg/Nm ³)
SPM	IS 11255(Part 1)-1985	3.7	5
Sulphur Dioxide (SO ₂)	IS 11255(Part 3)-1985	39	50
Oxides of Nitrogen(NO _x)	IS 11255(Part 7)-2005	70	250
Carbon monoxide (CO)	IS 5182(Part 10)-1999	BDL	100

Note: mg/Nm³: milligram per normal cubic meter; SPM: Suspended Particulate Matter;
m/s – Meter per second; Nm³/hr – Normal cubic meter per hour

Inference: - STACK EMISSIONS AS ABOVE PARAMETERS ARE WITHIN STANDARDS

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TEST REPORT OF EMISSION AIR FROM STACK/ CHIMNEY MONITORING (JULY - 2018)

Page No. 2 of 9

Name of the Industry	M/s ONGC Mangalore Petrochemicals Limited
Address of the Industry	Mangalore SEZ, Permude Village, Mangalore-574509, Karnataka, India.
Stack ID	Isomer Charge Heater
Sample Description	Manual Stack Emission Monitoring
Sampling Date	05.07.2018
Sample Receipt	06.07.2018
Equipment Used	Vayubodhan VSS1
Method of Sampling & Analysis	IS 11255:1995 Methods for Measurement of Emission from Stationary Sources
Sample Drawn by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.08.2018
Report No	HECS-OMPL/SEM/002/030818

General Details	
Ambient Temperature (°C)	28
Stack Diameter (m)	2.3
Stack Height (m)	65
Stack Temperature (°C)	175
Flue Gas Velocity (m/s)	4.2
Flue gas flow rate (Nm ³ /hr)	39856.3

Parameter monitored	Protocol	Results(mg/Nm ³)	Standard Norms(mg/Nm ³)
SPM	IS 11255(Part 1)-1985	3.7	5
Sulphur Dioxide(SO ₂)	IS 11255(Part 3)-1985	23	50
Oxides of Nitrogen(NO _x)	IS 11255(Part 7)-2005	59	250
Carbon monoxide (CO)	IS 5182(Part 10)-1999	BDL	100

Note: mg/Nm³: milligram per normal cubic meter; SPM: Suspended Particulate Matter;
m/s – Meter per second; Nm³/hr – Normal cubic meter per hour

Inference: - STACK EMISSIONS AS ABOVE PARAMETERS ARE WITHIN STANDARDS

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TEST REPORT OF EMISSION AIR FROM STACK/ CHIMNEY MONITORING (JULY - 2018)

Page No. 3 of 9

Name of the Industry	M/s ONGC Mangalore Petrochemicals Limited
Address of the Industry	Mangalore SEZ, Permude Village, Mangalore-574509, Karnataka, India.
Stack ID	CPP (GTG-HRSG) - 1
Sample Description	Manual Stack Emission Monitoring
Sampling Date	04.07.2018
Sample Receipt	05.07.2018
Equipment Used	Vayubodhan VSS1
Method of Sampling & Analysis	IS 11255:1995 Methods for Measurement of Emission from Stationary Sources
Sample Drawn by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.08.2018
Report No	HECS-OMPL/SEM/003/030818

General Details	
Ambient Temperature (°C)	26
Stack Diameter (m)	2.8
Stack Height (m)	70
Stack Temperature (°C)	109
Flue Gas Velocity (m/s)	12.0
Flue gas flow rate (Nm ³ /hr)	18942.0

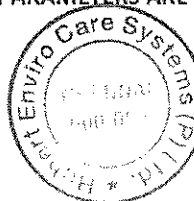
Parameter monitored	Protocol	Results(mg/Nm ³)	Standard Norms(mg/Nm ³)
SPM	IS 11255(Part 1)-1985	34	50
Sulphur Dioxide(SO ₂)	IS 11255(Part 3)-1985	147	850
Oxides of Nitrogen(NO _x)	IS 11255(Part 7)-2005	198	350
Carbon monoxide (CO)	IS 5182(Part 10)-1999	BDL	150

Note: mg/Nm³: milligram per normal cubic meter; SPM: Suspended Particulate Matter;
m/s - Meter per second; Nm³/hr - Normal cubic meter per hour

Inference: - STACK EMISSIONS AS ABOVE PARAMETERS ARE WITHIN STANDARDS

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TEST REPORT OF EMISSION AIR FROM STACK/ CHIMNEY MONITORING (JULY – 2018)

Page No. 4 of 9

Name of the Industry	M/s ONGC Mangalore Petrochemicals Limited
Address of the Industry	Mangalore SEZ, Permude Village, Mangalore-574509, Karnataka, India.
Stack ID	Plat former Unit Charge Heater
Sample Description	Manual Stack Emission Monitoring
Sampling Date	04.07.2018
Sample Receipt	05.07.2018
Equipment Used	Vayubodhan VSS1
Method of Sampling & Analysis	IS 11255:1995 Methods for Measurement of Emission from Stationary Sources
Sample Drawn by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.08.2018
Report No	HECS-OMPL/SEM/004/030818

General Details	
Ambient Temperature (°C)	27
Stack Diameter (m)	4.1
Stack Height (m)	94
Stack Temperature (°C)	164
Flue Gas Velocity (m/s)	5.1
Flue gas flow rate (Nm ³ /hr)	178432.0

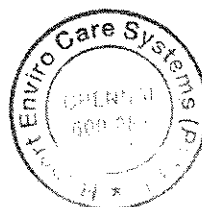
Parameter monitored	Protocol	Results(mg/Nm ³)	Standard Norms(mg/Nm ³)
SPM	IS 11255(Part 1)-1985	3.3	5
Sulphur Dioxide (SO ₂)	IS 11255(Part 3)-1985	37.5	50
Oxides of Nitrogen(NO _x)	IS 11255(Part 7)-2005	122	250
Carbon monoxide (CO)	IS 5182(Part 10)-1999	BDL	100

Note: mg/Nm³: milligram per normal cubic meter; SPM: Suspended Particulate Matter;
m/s – Meter per second; Nm³/hr – Normal cubic meter per hour

Inference: - STACK EMISSIONS AS ABOVE PARAMETERS ARE WITHIN STANDARDS,

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TEST REPORT OF EMISSION AIR FROM STACK/ CHIMNEY MONITORING (JULY – 2018)

Page No. 5 of 9

Name of the Industry	M/s ONGC Mangalore Petrochemicals Limited
Address of the Industry	Mangalore SEZ, Permude Village, Mangalore-574509, Karnataka, India.
Stack ID	CPP Utility Boiler
Sample Description	Manual Stack Emission Monitoring
Sampling Date	05.07.2018
Sample Receipt	06.07.2018
Equipment Used	Vayubodhan VSS1
Method of Sampling & Analysis	IS 11255:1995 Methods for Measurement of Emission from Stationary Sources
Sample Drawn by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.08.2018
Report No	HECS-OMPL/SEM/005/030818

General Details	
Ambient Temperature (°C)	27
Stack Diameter (m)	2.74
Stack Height (m)	70
Stack Temperature (°C)	165
Flue Gas Velocity (m/s)	14.2
Flue gas flow rate (Nm ³ /hr)	195321.0

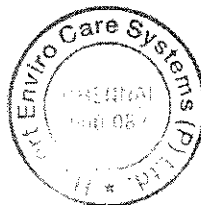
Parameter monitored	Protocol	Results(mg/Nm ³)	Standard Norms(mg/Nm ³)
SPM	IS 11255(Part 1)-1985	23.5	50
Sulphur Dioxide(SO ₂)	IS 11255(Part 3)-1985	70.6	850
Oxides of Nitrogen(NO _x)	IS 11255(Part 7)-2005	154	350
Carbon monoxide (CO)	IS 5182(Part 10)-1999	BDL	150

Note: mg/Nm³: milligram per normal cubic meter; SPM: Suspended Particulate Matter;
m/s – Meter per second; Nm³/hr – Normal cubic meter per hour

Inference: - STACK EMISSIONS AS ABOVE PARAMETERS ARE WITHIN STANDARDS

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TEST REPORT OF EMISSION AIR FROM STACK/ CHIMNEY MONITORING (JULY – 2018)

Page No. 6 of 9

Name of the Industry	M/s ONGC Mangalore Petrochemicals Limited
Address of the Industry	Mangalore SEZ, Permude Village, Mangalore-574509, Karnataka, India.
Stack ID	Tatory Charge Heater
Sample Description	Manual Stack Emission Monitoring
Sampling Date	05.07.2018
Sample Receipt	06.07.2018
Equipment Used	Vayubodhan VSS1
Method of Sampling & Analysis	IS 11255:1995 Methods for Measurement of Emission from Stationary Sources
Sample Drawn by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.08.2018
Report No	HECS-OMPL/SEM/006/030818

General Details	
Ambient Temperature (°C)	26
Stack Diameter (m)	1.75
Stack Height (m)	65
Stack Temperature (°C)	164
Flue Gas Velocity (m/s)	5.0
Flue gas flow rate (Nm ³ /hr)	30953.0

Parameter monitored	Protocol	Results(mg/Nm ³)	Standard Norms(mg/Nm ³)
SPM	IS 11255(Part 1)-1985	3.2	5
Sulphur Dioxide(SO ₂)	IS 11255(Part 3)-1985	21.6	50
Oxides of Nitrogen(NO _x)	IS 11255(Part 7)-2005	189	250
Carbon monoxide (CO)	IS 5182(Part 10)-1999	BDL	100

Note: mg/Nm³: milligram per normal cubic meter; SPM: Suspended Particulate Matter;
m/s – Meter per second; Nm³/hr – Normal cubic meter per hour

INFERENCE: - STACK EMISSIONS AS ABOVE PARAMETERS ARE WITHIN STANDARDS

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TEST REPORT OF EMISSION AIR FROM STACK/ CHIMNEY MONITORING (JULY – 2018)

Page No. 7 of 9

Name of the Industry	M/s ONGC Mangalore Petrochemicals Limited
Address of the Industry	Mangalore SEZ, Permude Village, Mangalore-574509, Karnataka, India.
Stack ID	Xylene Column Reboiler Heater(Part A)
Sample Description	Manual Stack Emission Monitoring
Sampling Date	06.07.2018
Sample Receipt	07.07.2018
Equipment Used	Vayubodhan VSS1
Method of Sampling & Analysis	IS 11255:1995 Methods for Measurement of Emission from Stationary Sources
Sample Drawn by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.08.2018
Report No	HECS-OMPL/SEM/007/030818

General Details	
Ambient Temperature (°C)	26
Stack Diameter (m)	3.69
Stack Height (m)	98
Stack Temperature (°C)	197
Flue Gas Velocity (m/s)	5.4
Flue gas flow rate (Nm ³ /hr)	146532.6

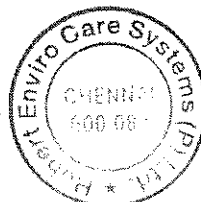
Parameter monitored	Protocol	Results(mg/Nm ³)	Standard Norms(mg/Nm ³)
SPM	IS 11255(Part 1)-1985	7	50
Sulphur Dioxide(SO ₂)	IS 11255(Part 3)-1985	14	850
Oxides of Nitrogen(NO _x)	IS 11255(Part 7)-2005	52	350
Carbon monoxide (CO)	IS 5182(Part 10)-1999	BDL	150

Note: mg/Nm³: milligram per normal cubic meter; SPM: Suspended Particulate Matter;
m/s – Meter per second; Nm³/hr – Normal cubic meter per hour

Inference: - STACK EMISSIONS AS ABOVE PARAMETERS ARE WITHIN STANDARDS

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TEST REPORT OF EMISSION AIR FROM STACK/ CHIMNEY MONITORING (JULY – 2018)

Page No. 8 of 9

Name of the Industry	M/s ONGC Mangalore Petrochemicals Limited
Address of the Industry	Mangalore SEZ, Permude Village, Mangalore-574509, Karnataka, India.
Stack ID	Xylene Column Reboiler Heater(Part B)
Sample Description	Manual Stack Emission Monitoring
Sampling Date	06.07.2018
Sample Receipt	07.07.2018
Equipment Used	Vayubodhan VSS1
Method of Sampling & Analysis	IS 11255:1995 Methods for Measurement of Emission from Stationary Sources
Sample Drawn by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.08.2018
Report No	HECS-OMPL/SEM/008/030818

General Details	
Ambient Temperature (°C)	27
Stack Diameter (m)	3.69
Stack Height (m)	98
Stack Temperature (°C)	192
Flue Gas Velocity (m/s)	5.4
Flue gas flow rate (Nm ³ /hr)	148524.5

Parameter monitored	Protocol	Results(mg/Nm ³)	Standard Norms(mg/Nm ³)
SPM	IS 11255(Part 1)-1985	7	50
Sulphur Dioxide(SO ₂)	IS 11255(Part 3)-1985	14	850
Oxides of Nitrogen(NO _x)	IS 11255(Part 7)-2005	49	350
Carbon monoxide (CO)	IS 5182(Part 10)-1999	BDL	150

Note: mg/Nm³: milligram per normal cubic meter; SPM: Suspended Particulate Matter;
m/s – Meter per second; Nm³/hr – Normal cubic meter per hour

Inference: - STACK EMISSIONS AS ABOVE PARAMETERS ARE WITHIN STANDARDS

Prepared by

Verified by

Authorized Signatory

Hubert Enviro Care Systems (P) Ltd.

C-45, Industrial Estate, Baikampady, Mangalore, Karnataka - 575011.

Ph: 0824 - 2408111, Email: kro@hecs.in, Website: www.hecs.in

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ISO 9001, 14001 & OHSAS 18001 Certified.

Certificate No. TC-5786

TEST REPORT OF EMISSION AIR FROM STACK/ CHIMNEY MONITORING (JULY - 2018)

Page No. 9 of 9

Name of the Industry	M/s ONGC Mangalore Petrochemicals Limited
Address of the Industry	Mangalore SEZ, Permude Village, Mangalore-574509, Karnataka, India.
Stack ID	BTF (Toluene Column Reboiler Heater)
Sample Description	Manual Stack Emission Monitoring
Sampling Date	06.07.2018
Sample Receipt	07.07.2018
Equipment Used	Vayubodhan VSS1
Method of Sampling & Analysis	IS 11255:1995 Methods for Measurement of Emission from Stationary Sources
Sample Drawn by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.08.2018
Report No	HECS-OMPL/SEM/009/030818

General Details	
Ambient Temperature (°C)	27
Stack Diameter (m)	3.29
Stack Height (m)	80
Stack Temperature (°C)	161
Flue Gas Velocity (m/s)	5.3
Flue gas flow rate (Nm ³ /hr)	89452.4

Parameter monitored	Protocol	Results (mg/Nm ³)	Standard Norms (mg/Nm ³)
SPM	IS 11255(Part 1)-1985	6	50
Sulphur Dioxide(SO ₂)	IS 11255(Part 3)-1985	10	850
Oxides of Nitrogen(NO _x)	IS 11255(Part 7)-2005	36	350
Carbon monoxide (CO)	IS 5182(Part 10)-1999	BDL	150

Note: mg/Nm³: milligram per normal cubic meter; SPM: Suspended Particulate Matter;
m/s – Meter per second; Nm³/hr – Normal cubic meter per hour

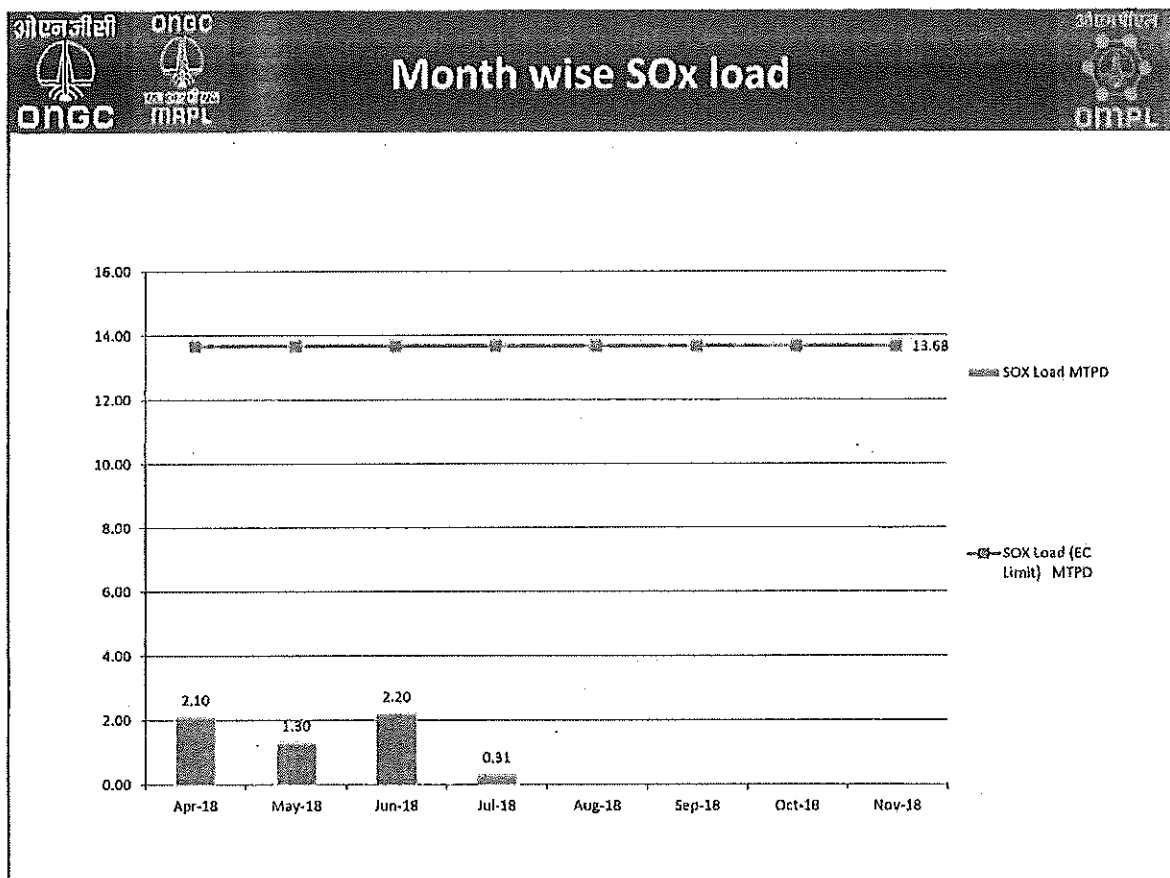
Inference: - STACK EMISSIONS AS ABOVE PARAMETERS ARE WITHIN STANDARDS

Prepared by

Verified by



Authorized Signatory



ANNEXURE - 6

Form-1 (Rule 4)
Returns Regarding Water Consumed during the Month of July, 2018

Name and address of the Consumer	Purpose for which water consumed	Reading at the beginning of the first day of the calendar month under report	Reading at the end of the last day of the calendar month under report	Quantity of Water Consumed in Kilo Liters	If the meter was out of order, the monthly average consumption of water for the previous 3 months of the working period	Quantity of water qualifying for rebate according to the assessee	Remarks
M/s ONGC Mangalore Petrochemicals Limited, Mangalore Special Economic Zone, Permude, Mangalore -574 509	Industrial cooling, spraying in mine pits or boiler feed						
	Cooling Water	0	78,676	78,676			
	Boiler Feed Water	0	67,434	67,434			
	Fire Water	0	15,811	15,811			
	Domestic purpose						
	Drinking Water & Sanitation	0	5,548	5,548			
	Processing whereby water gets polluted and the pollutants are easily bio-degradable						
	Service Water		10,147	10,147			Subtracting total flow from BRW, CT & Drinking water consumption
Total Consumption				1,77,616			

Signature of the Consumer : 
Name : Shiva Prakash, Manager (Env)
Address : M/s ONGC Mangalore Petrochemicals Limited, Mangalore Special Economic Zone, Permude, Mangalore -574 509

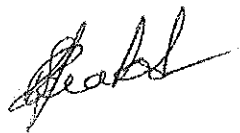
ANNEXURE - H

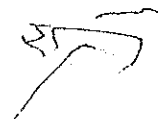
ONGC Mangalore Petrochemicals Limited

Production Details for July, 2018

Net Naptha Processed -1,29,711 MT

Sl. No.	Name of the Product	Quantity, MT
1	Paraxylene (Product)	60,654.17
2	Benzene (Co product)	19,845.34







ओ एन जी सी मंगलूर पेट्रोकेमिकल्स लिमिटेड

(मंगलूर रिफाइनरी एण्ड पेट्रोकेमिकल्स लिमिटेड की सहायक कंपनी)

ONGC Mangalore Petrochemicals Ltd.

(A Subsidiary of Mangalore Refinery and Petrochemicals Ltd.)

एमएसईजेड, पेमुदे, मंगलूर - ५७४ ५०९ MSEZ, Permude, Mangaluru - 574 509.

CIN : U40107KA2006GOI041258

दूरभाष Direct Line :- 0824-2872000, फैक्स Fax:- 0824-2872005, Website: www.ompl.co.in

REF: OMPL/PCB/SP/2018-19/

Date: 20/09/2018

To:

The Environmental Officer

Regional Office

KSPCB

Baikampady, Mangalore-11



25/9/18

Dear Sir,

Sub: Submission of Environmental Monitoring Report for the Month of August, 2018 and Production Report for August, 2018

Ref: KSPCB Combined Consent Order No. AW-301949 dated 27th January, 2017

With respect to the above subject; we are herewith submitting the following Environmental Monitoring Reports and Production Reports for the Month of August, 2018 respectively, enclosed herewith.

1. Ambient Air Quality Monitoring at 5 different locations in and around OMPL, enclosed as Annexure- A
2. Water Analysis Reports at 9 different locations in and around OMPL, as Annexure-B
3. Noise Level Monitoring Report at OMPL, as Annexure-C
4. Treated Effluent Analysis Report, Annexure-D
5. Returns Regarding Water Consumed, for the Month of August, 2018, as Annexure-E
6. Production Report as Annexure-F

Thanking You,

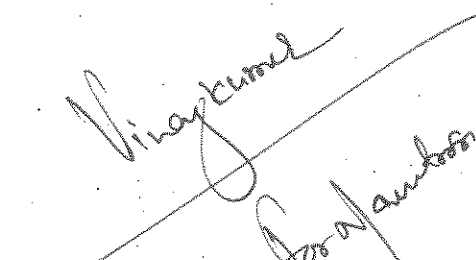

Shivaprakash
Manager (Env)

CC: Member Secretary, KSPCB, Bangalore

CC: Head (Technical), MSEZ

CC: CEO, OMPL for info

CC: COO, OMPL for info


Vinay Kumar
25/9

Hubert Enviro Care Systems (P) Ltd.

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Certificate No. TC-5786

TEST REPORT OF AMBIENT AIR QUALITY MONITORING (AUGUST 2018)

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	OMPL - East Side
Report Date	05.09.2018
Report No	HECS/AA/001/050918

CONSOLIDATED TEST RESULTS

AUGUST'18 - Week		30-Week		31-Week		32-Week		33-Week		34-Week		Average Value
Parameters	NAAQ	01.08.18	03.08.18	05.08.18	09.08.18	13.08.18	16.08.18	20.08.18	23.08.18	27.08.18	30.08.18	
PM _{2.5} (µg/m ³)	60	12.2	12.8	14.1	14.7	13.6	12.2	13.0	16.2	14.2	14.6	13.76
PM ₁₀ (µg/m ³)	100	31.7	32	35.4	36.1	36.1	33.1	36.4	34.3	34.4	33.5	34.3
SO ₂ (µg/m ³)	80	1.9	2.2	2.0	2.6	2.0	2.2	2.4	2.0	2.5	2.4	2.22
NO ₂ (µg/m ³)	80	2.5	3.0	3.0	3.3	2.9	3.2	3.2	3.3	2.7	3.0	3.01
CO (mg/m ³)	2.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
O ₃ (µg/m ³)	100	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NH ₃ (µg/m ³)	400	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb (µg/m ³)	1.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
As (ng/m ³)	6.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni (ng/m ³)	20	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene (µg/m ³)	05	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
B(α)P (ng/m ³)	01	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note: BDL = Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide (DL 0.1 mg/m³); O₃-Ozone (DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(α)P- Benzo -α-pyrene (DL 0.1 ng/m³); ng/m³: nanogram per cubic meter; µg/m³ - microgram per cubic meter

CONCLUSION: All the parameters meet the NAAQ Standards

*****End of Report *****



Authorized Signatory

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Certificate No. TC-5786

TEST REPORT OF AMBIENT AIR QUALITY MONITORING (AUGUST 2018)

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	Shantigudda
Report Date	05.09.2018
Report No	HECS/AA/002/050918

CONSOLIDATED TEST RESULTS

AUGUST'18 - Week		30-Week		31-Week		32-Week		33-Week		34-Week		Average Value
meters	NAAQ	01.08.18	03.08.18	06.08.18	09.08.18	13.08.18	16.08.18	20.08.18	23.08.18	27.08.18	30.08.18	
PM _{2.5} (µg/m ³)	60	13.5	13.1	13.0	13.6	13.4	13.2	13.6	13.8	13.2	13.0	13.34
PM ₁₀ (µg/m ³)	100	34.6	34.4	34.8	35.1	35.4	34.6	35.6	34.4	34.3	33.6	34.68
SO ₂ (µg/m ³)	80	2.1	1.8	1.9	2.2	2.0	2.1	1.9	2.2	2.0	2.2	2.04
NO ₂ (µg/m ³)	80	2.4	2.2	2.5	2.3	2.2	2.4	2.6	2.3	2.5	2.4	2.38
CO (mg/m ³)	2.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
O ₃ (µg/m ³)	100	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NH ₃ (µg/m ³)	400	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb (µg/m ³)	1.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
As (ng/m ³)	6.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni (ng/m ³)	20	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene (µg/m ³)	05	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
B(α)P (ng/m ³)	01	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note: BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m³); O₃-Ozone(DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(α)P- Benzo -α-pyrene (DL 0.1 ng/m³); ng/m³: nanogram per cubic meter; µg/m³ - microgram per cubic meter

CONCLUSION: All the parameters meet the NAAQ Standards

*****End of Report *****



Authorized Signatory

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Certificate No. TC-5786

TEST REPORT OF AMBIENT AIR QUALITY MONITORING (AUGUST 2018)

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	Tenka Ekkar
Report Date	05.09.2018
Report No	HECS/AA/003/050918

CONSOLIDATED TEST RESULTS

AUGUST'18 - Week		30-Week		31-Week		32-Week		33-Week		34-Week		Average Value
Parameters	NAAQ	01.08.18	03.08.18	06.08.18	09.08.18	13.08.18	16.08.18	20.08.18	23.08.18	27.08.18	30.08.18	
PM _{2.5} (µg/m ³)	60	13.1	12.7	13.3	13.0	13.6	13.4	13.8	14.1	13.0	14.3	13.43
PM ₁₀ (µg/m ³)	100	35.0	35.2	35.0	36	34.4	34.3	35.1	34.2	34.8	35.4	34.94
SO ₂ (µg/m ³)	80	2.5	2.1	2.4	2.3	2.2	2.6	1.9	2.4	2.8	2.6	2.38
NO ₂ (µg/m ³)	80	3.1	3.2	3.3	3.5	3.2	3.1	2.0	3.7	2.1	2.8	3.0
CO (mg/m ³)	2.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
O ₃ (µg/m ³)	100	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NH ₃ (µg/m ³)	400	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb (µg/m ³)	1.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
As (ng/m ³)	6.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni (ng/m ³)	20	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene (µg/m ³)	05	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
B(a)P (ng/m ³)	01	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note: BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m³); O₃-Ozone(DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(a)P- Benzo -α-pyrene (DL 0.1 ng/m³); ng/m³: nanogram per cubic meter; µg/m³ - microgram per cubic meter

CONCLUSION: All the parameters meet the NAAQ Standards

*****End of Report *****



[Signature]
Authorized Signatory

1. The report in full or part shall not be used for any promotional or publicity purpose without written consent by HECS organization. 2. Samples are not drawn by HECS unless or otherwise mentioned. 3. Unless specifically requested by customer the test items will not be retained more than 15 days from the date of issue of test report. 4. Under no circumstances lab accepts any liability or loss / damage caused by use or misuse of test report after invoicing or issue of test report. 5. The test results relate only to the test items. 6. Not under scope of accreditation.

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Certificate No. TC-5786

TEST REPORT OF AMBIENT AIR QUALITY MONITORING (AUGUST 2018)

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	Permude Village
Report Date	05.09.2018
Report No	HECS/AA/004/050918

CONSOLIDATED TEST RESULTS

AUGUST'18 - Week		30-Week		31-Week		32-Week		33-Week		34-Week		Average Value
Parameters	NAAQ	01.08.18	03.08.18	06.08.18	09.08.18	13.08.18	16.08.18	20.08.18	23.08.18	27.08.18	30.08.18	
PM _{2.5} (µg/m ³)	60	14.0	13.8	13.5	13.0	13.3	15.4	13.6	14.1	12.8	13.7	13.72
PM ₁₀ (µg/m ³)	100	34.3	36.0	35.3	34.8	36.1	37.2	35.2	34.4	34.1	35.6	35.3
SO ₂ (µg/m ³)	80	2.7	2.9	3.0	3.2	3.0	3.3	3.0	2.9	3.3	3.2	3.05
NO ₂ (µg/m ³)	80	3.5	4.0	4.1	3.9	3.7	3.8	4.1	3.4	3.6	4.0	3.81
CO (mg/m ³)	2.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
O ₃ (µg/m ³)	100	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NH ₃ (µg/m ³)	400	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb (µg/m ³)	1.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
As (ng/m ³)	6.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni (ng/m ³)	20	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene (µg/m ³)	05	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
B(α)P (ng/m ³)	01	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note: BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m³); O₃-Ozone(DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(α)P- Benzo -α-pyrene (DL 0.1 ng/m³); ng/m³: nanogram per cubic meter; µg/m³ - microgram per cubic meter

CONCLUSION: All the parameters meet the NAAQ Standards

*****End of Report *****



[Signature]
Authorized Signatory

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Certificate No. TC-5786

TEST REPORT OF AMBIENT AIR QUALITY MONITORING (AUGUST 2018)

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	OMPL - West Side
Report Date	05.09.2018
Report No	HECS/AA/005/050918

CONSOLIDATED TEST RESULTS

AUGUST'18 - Week		30-Week		31-Week		32-Week		33-Week		34-Week		Average Value
Parameters	NAAQ	01.08.18	03.08.18	06.08.18	09.08.18	13.08.18	16.08.18	20.08.18	23.08.18	27.08.18	30.08.18	
PM _{2.5} (µg/m ³)	60	13.4	13.0	13.5	13.8	13.5	13.8	14.1	14.3	13.6	14.0	13.7
PM ₁₀ (µg/m ³)	100	34.0	34.4	35.1	35.7	36.1	34.6	36.0	35.7	34.8	35.5	35.19
SO ₂ (µg/m ³)	80	2.3	2.5	2.5	2.3	2.2	2.8	2.9	3.2	3.3	3.5	2.75
NO ₂ (µg/m ³)	80	4.2	4.0	4.3	4.7	4.0	4.2	4.6	3.9	4.4	4.1	4.24
CO (mg/m ³)	2.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
O ₃ (µg/m ³)	100	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NH ₃ (µg/m ³)	400	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb (µg/m ³)	1.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
As (ng/m ³)	6.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni (ng/m ³)	20	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene (µg/m ³)	05	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
B(α)P (ng/m ³)	01	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note: BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide(DL 0.1 mg/m³); O₃-Ozone(DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(α)P- Benzo -α-pyrene (DL 0.1 ng/m³); ng/m³ - nanogram per cubic meter; µg/m³ - microgram per cubic meter

CONCLUSION: All the parameters meet the NAAQ Standards

*****End of Report *****



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1. The report in full or part shall not be used for any promotional or publicity purpose without written consent by HECS organization. 2. Samples are not drawn by HECS unless or otherwise mentioned. 3. Unless specifically requested by customer the test items will not be retained more than 15 days from the date of issue of test report. 4. Under no circumstances lab accepts any liability or loss / damage caused by use or misuse of test report after invoicing or issue of test report. 5. The test results relate only to the test items. 6. #not under scope of accreditation.

ANNEXURE-B

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Certificate No. TC-5786

TEST REPORT OF GROUND WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	GW1 - Ground Water collected from Narayana Guru Community Hall, Permude
Date of Sampling	06.08.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	05.09.2018
Report No	HECS/W/001/050918

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	IS10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.68	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	1.0	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	31.2	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	7.2	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	77.3	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	8.2	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	6.4	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	100.0	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	8.7	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	0.1	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	7.3	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: GROUND WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report



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Certificate No. TC-5786

TEST REPORT OF GROUND WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	GW2 - Ground Water collected from Gagnet Labor Colony
Date of Sampling	06.08.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	05.09.2018
Report No	HECS/W/002/050918

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	6.81	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	1.2	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	37.5	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	7.7	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	28.0	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	9.1	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	4.0	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	87.0	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	7.0	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	1.4	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: GROUND WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

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TEST REPORT OF GROUND WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	GW3- Ground Water collected from L&T New Labor Colony
Date of Sampling	06.08.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	05.09.2018
Report No	HECS/W/003/050918

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.86	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	1.38	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	6.0	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	12.2	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	55.3	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	11.2	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	7.2	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	105.0	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	6.4	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	2.2	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: GROUND WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report



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TEST REPORT OF GROUND WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	GW4-Ground Water collected Near OMPL - ETP
Date of Sampling	06.08.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	05.09.2018
Report No	HECS/W/004/050918

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.80	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	BDL (DL 0.1)	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	55.4	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	10.8	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	41.5	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	14.2	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	4.7	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	122.5	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	6.5	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	2.4	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note: BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: GROUND WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

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TEST REPORT OF OPEN WELL WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	OW1- Open Water collected from Tenka Ekkar
Date of Sampling	06.08.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	05.09.2018
Report No	HECS/W/005/050918

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.72	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	2.3	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	47.9	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	8.1	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	38.4	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	8.1	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	4.8	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	70.4	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	7.3	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	2.4	45 max
15.	Iron as Fe	IS 3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS 3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS 1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS 1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: OPENWELL WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report



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TEST REPORT OF OPEN WELL WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	OW2 - Open Water collected from Shantigudda Village
Date of Sampling	06.08.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	05.09.2018
Report No	HECS/W/006/050918

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.73	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	2.5	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	BDL (DL 0.1)	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	34.2	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	7.5	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	55.5	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	10.7	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	3.7	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	73.6	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	5.6	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	2.6	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: OPENWELL WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report



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1. The report in full or part shall not be used for any promotional or publicity purpose without written consent by HECS organization. 2. Samples are not drawn by HECS unless or otherwise mentioned. 3. Unless specifically requested by customer the test items will not be retained more than 15 days from the date of issue of test report. 4. Under no circumstances lab accepts any liability or loss / damage caused by use or misuse of test report after invoicing or issue of test report. 5. The test results relate only to the test items. 6. #not under scope of accreditation.

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TEST REPORT OF OPEN WELL WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	OW3 - Open Water collected from Premude Village
Date of Sampling	06.08.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	05.09.2018
Report No	HECS/W/007/050918

RESULTS

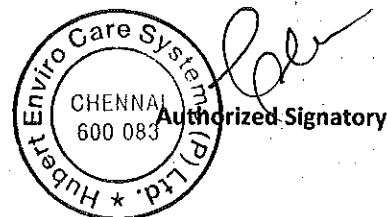
S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.5	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	2.6	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	43.5	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	7.6	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	22.6	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	10.7	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	4.6	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	43.4	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	4.4	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	4.1	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;

MPN- Most Probable Number; mL-Milliliter

CONCLUSION: OPENWELL WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report



Hubert Enviro Care Systems (P) Ltd.

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TEST REPORT OF SURFACE WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	SW1 - Surface Water collected Near OMPL - Flare Area
Date of Sampling	06.08.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	05.09.2018
Report No	HECS/W/008/050918

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.4	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	2.2	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	115.0	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	45.5	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	90.5	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	10.6	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	8.3	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	369	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	61.4	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	0.25	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	3.0	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	0.18	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per liter; NA-Not Available

CONCLUSION: SURFACE WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report



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TEST REPORT OF SURFACE WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	SW2 - Surface Water collected Near OMPL - Near Central Warehouse
Date of Sampling	06.08.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	05.09.2018
Report No	HECS/W/009/050918

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.4	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	2.7	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	74.0	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	8.4	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	30.5	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	62.6	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	7.5	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	140	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	47	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	3.5	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	0.20	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per liter

CONCLUSION: SURFACE WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report



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TEST REPORT OF NOISE MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Noise Monitoring
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	OMPL - North, South, East and West sides
Sampling Date	06.08.2018
Report Date	05.09.2018
Report No.	HECS/N/001/050918

NOISE MONITORING: August 2018

S.No.	Sampling Location	MoEF requirements in dB		Avg. Noise level observed in dB	
		Day	Night	Day	Night
1.	OMPL-North	75	70	67.2	64.7
2.	OMPL-South			66.7	64.0
3.	OMPL-East			67.0	64.9
4.	OMPL-West			67.3	65.5

Note: dB: Decibel

CONCLUSION: All the parameters meet MoEF Standards

*****End of Report *****



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ANNEXURE-D

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TEST REPORT OF ETP EFFLUENT MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Guard Pond Pump Discharge (ETP Effluent)
Date of Sampling	10.08.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	05.09.2018
Report No	HECS/W/011/050918

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	Permissible Limit
1.	Color	IS:3025:(Pt 4)1983 (Reaff 2006)	Hazen Units	Colourless	All efforts should be made to remove colour and unpleasant odour as far as practicable
2.	Odour	IS 3025 (Part5)-1983, Reaff 2006	-	Agreeable	
3.	Total Suspended Solids	2540D APHA 22nd Edn.. 2012	mg/L	BDL (DL 4)	100
4.	pH	IS:3025:(Pt 11):1983 (Reaff 2006)	-	7.04	6.0-8.5
5.	Temperature	IS 3025 (Pt 9):1983 (Reaff:2006)	°C	29.0	Shall not exceed 5 degree Centigrade above the receiving water temperature
6.	Oil & Grease	IS 3025,4(Pt 39):2000 (Reaff 2009)	mg/L	BDL(DL 2)	5
7.	Total Residual Chlorine as Cl ₂	IS:3025 (Pt26)1986 (Reaff 2009)	mg/L	BDL (DL 0.1)	1
8.	Ammonical Nitrogen as N	IS 3025 Part (34)1988	mg/L	7.3	50
9.	Total Kjeldhal Nitrogen as N	IS 3025 Part (34)1988	mg/L	27.5	100
10.	Free Ammonia as NH ₃	IS:3025 (Part34)1998 Reaff. 2003	mg/L	BDL(DL 0.02)	5
11.	BOD, 3 days @ 27°C as O ₂	IS:3025 (Pt 44)1993 (Reaff 2009)	mg/L	BDL (DL 2)	30
12.	COD as O ₂	IS 3025 Part (58)2006	mg/L	3.6	125
13.	Lead as Pb	IS:3025 (Pt 47)1994 (Reaff 2009)	mg/L	BDL(DL 0.1)	0.1
14.	Chromium (Hexavalent) as Cr ⁶⁺	IS 3025 Part (52):2003	mg/L	BDL(DL 0.01)	0.1
15.	Total Chromium as Cr	IS 3025(Pt52):2003 (Reaff 2009)	mg/L	BDL(DL 0.01)	2.0
16.	Copper as Cu	IS:3025:5,(Pt 42)1992 (Reaff 2009)	mg/L	BDL(DL 0.05)	1.0
17.	Zinc as Zn	IS:3025 (Part49)1994 (Reaff 2009)	mg/L	BDL(DL 0.1)	5.0

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TEST REPORT OF ETP EFFLUENT MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Guard Pond Pump Discharge (ETP Effluent)
Date of Sampling	10.08.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	05.09.2018
Report No	HECS/W/011/050918

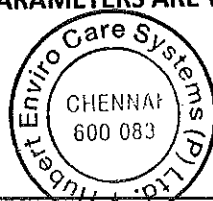
RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	Permissible Limit
18.	Nickel as Ni	IS:3025 (Part54):2003 (Reaff 2009)	mg/L	BDL(DL 0.05)	1.0
19.	Fluoride as F-	IS 3025 part (60):2008	mg/L	BDL(DL 0.2)	1.0
20.	Sulphide as S ²⁻	IS:3025 (Pt 29):1986 (Reaff 2009)	mg/L	BDL(DL 0.04)	2.0
21.	Particle Size of Suspended solids	APHA 22nd Edition	-	Passed through 850 micron	850 micron
22.	Arsenic as As	IS:3025 (Part37):1988(Reaff 2009)	mg/L	BDL(DL 0.005)	0.2
23.	Mercury as Hg	IS:3025 (Part48):1994 RA 1999	mg/L	BDL(DL 0.001)	0.01
24.	Cadmium as Cd	IS:3025 (Part41):1991	mg/L	BDL(DL 0.01)	0.1
25.	Selenium as Se	IS:3025 (Part56):2003	mg/L	BDL(DL 0.005)	0.05
26.	Cyanide as CN	IS:3025 (Part27):1986 Reaff. 2009	mg/L	BDL(DL 0.01)	0.2
27.	Phenols as C ₆ H ₅ OH	IS 3025 Part (43):1992, RA 2009	mg/L	BDL(DL 0.001)	0.35
28.	Total Iron as Fe	IS 3025(Pt 53):2003(Reaff 2009)	mg/L	0.107	3
29.	Manganese	IS:3025:(Pt-59):2006	mg/L	BDL(DL 0.01)	2
30.	Total Phosphorous as P	IS 3025(Pt 31):1988(Reaff 2009)	mg/L	BDL(DL 0.01)	3
31.	Nitrate	IS 3025 (Pt 34):1988 (Reaff 2009)	mg/L	BDL(DL 1)	20
32.	Vanadium as V	IS:3025 (Part56):2003	mg/L	BDL(DL 0.01)	0.1
33.	Benzo(a)pyrene	USEPA 8270C	mg/L	BDL(DL 0.0001)	0.2
34.	Benzene	USEPA 8270C	mg/L	BDL(DL 0.0001)	0.1
35.	Bioassay Test	IS 6582(Part 2):2001	Tf	9:1	90% survival of fish after 96 hrs in 100% effluent

Note:-BDL - Below Detection Limit; D.L- Detection Limit; mg/L - Milligrams per liter

CONCLUSION: ETP OUTLET EFFLUENT WATER AS ABOVE PARAMETERS ARE WITHIN STANDARDS

End of Report



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TEST REPORT OF ETP EFFLUENT MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Guard Pond Pump Discharge (ETP Effluent)
Date of Sampling	21.08.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	05.09.2018
Report No	HECS/W/015/050918

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	Permissible Limit
1.	Color	IS:3025:(Pt 4)1983 (Reaff 2006)	Hazen Units	Colourless	All efforts should be made to remove colour and unpleasant odour as far as practicable
2.	Odour	IS 3025 (Part5)-1983, Reaff 2006	-	Agreeable	
3.	Total suspended Solids	2540D APHA 22nd Edn.. 2012	mg/L	BDL (DL 4)	100
4.	pH	IS:3025:(Pt 11):1983 (Reaff 2006)	-	7.07	6.0-8.5
5.	Temperature	IS 3025 (Pt 9):1983 (Reaff:2006)	°C	28.6	Shall not exceed 5 degree Centigrade above the receiving water temperature
6.	Oil & Grease	IS 3025,4(Pt 39):2000 (Reaff 2009)	mg/L	BDL (DL 2)	5
7.	Total Residual Chlorine as Cl ₂	IS:3025 (Pt26)1986 (Reaff 2009)	mg/L	BDL (DL 0.1)	1
8.	Ammonical Nitrogen as N	IS 3025 Part (34)1988	mg/L	3.9	50
9.	Total Kjeldhal Nitrogen as N	IS 3025 Part (34)1988	mg/L	8.9	100
10.	Free Ammonia as NH ₃	IS:3025 (Part34)1998 Reaff. 2003	mg/L	BDL(DL 0.02)	5
11.	BOD, 3 days @ 27°C as O ₂	IS:3025 (Pt 44)1993 (Reaff 2009)	mg/L	BDL (DL 2)	30
12.	COD as O ₂	IS 3025 Part (58)2006	mg/L	3.4	125
13.	Lead as Pb	IS:3025 (Pt 47)1994 (Reaff 2009)	mg/L	BDL(DL 0.1)	0.1
14.	Chromium (Hexavalent) as Cr ⁶⁺	IS 3025 Part (52):2003	mg/L	BDL(DL 0.01)	0.1
15.	Total Chromium as Cr	IS 3025(Pt52):2003 (Reaff 2009)	mg/L	BDL(DL 0.01)	2.0
16.	Copper as Cu	IS:3025:5,(Pt 42)1992 (Reaff 2009)	mg/L	BDL(DL 0.05)	1.0
17.	Zinc as Zn	IS:3025 (Part49)1994 (Reaff 2009)	mg/L	BDL(DL 0.1)	5.0

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TEST REPORT OF ETP EFFLUENT MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Guard Pond Pump Discharge (ETP Effluent)
Date of Sampling	21.08.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	05.09.2018
Report No	HECS/W/015/050918

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	Permissible Limit
18.	Nickel as Ni	IS:3025 (Part54)2003 (Reaff 2009)	mg/L	BDL(DL 0.05)	1.0
19.	Fluoride as F-	IS 3025 part (60):2008	mg/L	BDL(DL 0.2)	1.0
20.	Sulphide as S ²⁻	IS:3025 (Pt 29)1986 (Reaff 2009)	mg/L	BDL(DL 0.04)	2.0
21.	Particle Size of Suspended solids	APHA 22nd Edition	-	Passed through 850 micron	850 micron
22.	Arsenic as As	IS:3025 (Part37)1988(Reaff 2009)	mg/L	BDL(DL 0.005)	0.2
23.	Mercury as Hg	IS:3025 (Part48)1994 RA 1999	mg/L	BDL(DL 0.001)	0.01
24.	Cadmium as Cd	IS:3025 (Part41)1991	mg/L	BDL(DL 0.01)	0.1
25.	Selenium as Se	IS:3025 (Part56)2003	mg/L	BDL(DL 0.005)	0.05
26.	Cyanide as CN	IS:3025 (Part27)1986 Reaff. 2009	mg/L	BDL(DL 0.01)	0.2
27.	Phenolic Compounds as C ₆ H ₅ OH	IS 3025 Part (43)1992,RA 2009	mg/L	BDL(DL 0.001)	0.35
28.	Total Iron as Fe	IS 3025(Pt 53):2003(Reaff 2009)	mg/L	0.35	3
29.	Manganese	IS:3025:(Pt-59):2006	mg/L	BDL(DL 0.01)	2
30.	Total Phosphorous as P	IS 3025(Pt 31):1988(Reaff 2009)	mg/L	BDL(DL 0.01)	3
31.	Nitrate	IS 3025 (Pt 34):1988 (Reaff 2009)	mg/L	BDL(DL 1)	20
32.	Vanadium as V	IS:3025 (Part56)2003	mg/L	BDL(DL 0.01)	0.1
33.	Benzo(a)pyrene	USEPA 8270C	mg/L	BDL(DL 0.0001)	0.2
34.	Benzene	USEPA 8270C	mg/L	BDL(DL 0.0001)	0.1
35.	Bioassay Test	IS 6582(Part 2):2001	Tf	9:1	90% survival of fish after 96 hrs in 100% effluent

Note:-BDL - Below Detection Limit; D.L- Detection Limit; mg/L - Milligrams per liter

CONCLUSION: ETP OUTLET EFFULENT WATER AS ABOVE PARAMETERS ARE WITHIN STANDARDS

End of Report



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Form-1 (Rule 4)
Returns Regarding Water Consumed during the Month of August, 2018

Name and address of the Consumer	Purpose for which water consumed	Reading at the beginning of the first day of the calendar month under report	Reading at the end of the last day of the calendar month under report	Quantity of Water Consumed in Kilo Liters	If the meter was out of order, the monthly average consumption of water for the previous 3 months of the working period	Quantity of water qualifying for rebate according to the assessee	Remarks
M/s ONGC Mangalore Petrochemicals Limited, Mangalore Special Economic Zone, Permude, Mangalore -574 509	Industrial cooling, spraying in mine pits or boiler feed						
	Cooling Water	0	57,444	57,444			
	Boiler Feed Water	0	75,370	75,370			
	Fire Water	0	44,017	44,017			
	Domestic purpose						
	Drinking Water & Sanitation	0	60,45.5	60,45.5			
	Processing whereby water gets polluted and the pollutants are easily bio-degradable						
	Service Water		4,483	4,483			
Total Consumption				1,87,352			

Signature of the Consumer

Name

Address


 Shivprakash, Manager(Env)

M/s ONGC Mangalore Petrochemicals Limited, Mangalore Special Economic Zone, Permude, Mangalore -574 509

ANNEXURE-F

ONGC Mangalore Petrochemicals Limited

Production Details for August, 2018

Net Naptha Processed –85,800 MT

Sl. No.	Name of the Product	Quantity, MT
1	Paraxylene (Product)	37,606.17
2	Benzene (Co product)	10,614.55



ओ एन जी सी मंगलूर पेट्रोकेमिकल्स लिमिटेड
(मंगलूर रिफाइनरी एण्ड पेट्रोकेमिकल्स लिमिटेड की सहायक कंपनी)
ONGC Mangalore Petrochemicals Ltd.

(A Subsidiary of Mangalore Refinery and Petrochemicals Ltd.)

एमएसईजेड, पेरुमुदे, मंगलूर - 574 509, MSEZ, Perumde, Mangaluru - 574 509

दूरभाष Direct Line :- 0824-2872000, फैक्स Fax:- 0824-2872005, Website: www.ompl.co.in

REF: OMPL/PCB/SP/2018-19/

Date: 20/10/2018

To:
The Environmental Officer
Regional Office
KSPCB
Baikampady, Mangalore-11

Dear Sir,

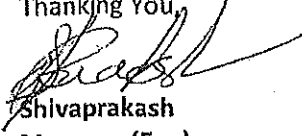
Sub: Submission of Environmental Monitoring Report for the Month of September, 2018 and Production Report for September, 2018

Ref: KSPCB Combined Consent Order No. AW-301949 dated 27th January, 2017

With respect to the above subject; we are herewith submitting the following Environmental Monitoring Reports and Production Report for the Month of September, 2018 respectively, enclosed herewith.

1. Ambient Air Quality Monitoring at 5 different locations in and around OMPL, enclosed as Annexure-A
2. Water Analysis Reports at 9 different locations in and around OMPL, as Annexure-B
3. Noise Level Monitoring Report at OMPL, as Annexure-C
4. Treated Effluent Analysis Report, Annexure-D
5. Stack Monitoring Analysis Report, Annexure-E
6. Returns Regarding Water Consumed, for the Month of September, 2018, as Annexure-F
7. SO2 report as Annexure-G
8. Production Report as Annexure-H

Thanking You,


Shivaprakash
Manager (Env)

CC: Member Secretary, KSPCB, Bangalore
CC: Head (Technical), MSEZ
CC: CEO, OMPL for info
CC: COO, OMPL for info

Hubert Enviro Care Systems (P) Ltd.

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**Laboratory Services Division**

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Certificate No. T-3180

AMBIENT AIR QUALITY MONITORING TEST REPORT - SEPTEMBER 2018

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	Shantigudda
Report Date	04.10.2018
Report No	HECS/AA/002/041018

CONSOLIDATED TEST RESULTS

SEPTEMBER '18 - Week		25-Week		26-Week		27-Week		28-Week		Average Value
Parameters	NAAQ	03.09.18	06.09.18	10.09.18	14.09.18	17.09.18	20.09.18	24.09.18	27.09.18	
PM _{2.5} (µg/m ³)	60	15.7	15.2	15.1	15.8	15.6	15.4	15.7	15.9	15.53
PM ₁₀ (µg/m ³)	100	36.8	36.5	36.8	37.2	37.6	36.8	37.6	36.5	36.91
SO ₂ (µg/m ³)	80	2.2	2.0	2.2	2.5	2.3	2.3	2.0	2.4	2.24
NO ₂ (µg/m ³)	80	2.7	2.5	2.7	2.5	2.4	2.7	2.8	2.6	2.62
CO (mg/m ³)	2.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
O ₃ (µg/m ³)	100	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NH ₃ (µg/m ³)	400	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb (µg/m ³)	1.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
As (ng/m ³)	6.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni (ng/m ³)	20	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene (µg/m ³)	05	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
B(α)P (ng/m ³)	01	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Test Methods Followed:

PM₁₀ : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)
PM_{2.5} : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
SO₂ : IS 5182 (Pt 2): 2001 (RA 2017) (Improved wet and Geake method)
NO₂ : IS 5182 (Pt 6): 2006 (RA 2017) (Jacob and Hochheiser modified method)
O₃ : HECS/AIR/SOP/005 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
NH₃ : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)
CO : IS 5182 (Pt 10): 1999 (RA 2013)
Pb, As, Ni : In-house method based on CPCB guidelines vol. I (2011)
C₆H₆ : GC FID/ GC MS based on IS: 5182 (Pt 11) based on CPCB guidelines vol. I (2011)
B(α)P : In-house validated method based on CPCB guidelines vol. I (2011)

Note: BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide (DL 0.1 mg/m³); O₃-Ozone(DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(α)P- Benzo -α-pyrene (DL 0.5 ng/m³); ng/m³: nanogram per cubic meter; µg/m³ - microgram per cubic meter.

CONCLUSION: ALL THE PARAMETERS MEET THE NAAQ STANDARDS

*****End of Report *****




(Dr K GANESAN)
Authorized Signatory

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Certificate No. T-3180

AMBIENT AIR QUALITY MONITORING TEST REPORT - SEPTEMBER 2018

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	Premude Village
Report Date	04.10.2018
Report No	HECS/AA/004/041018

CONSOLIDATED TEST RESULTS

SEPTEMBER '18 - Week		25-Week		26-Week		27-Week		28-Week		Average Value
Parameters	NAAQS	03.09.18	06.09.18	10.09.18	14.09.18	17.09.18	20.09.18	24.09.18	27.09.18	
PM _{2.5} (µg/m ³)	60	16.2	15.8	15.6	15.1	15.5	15.6	15.8	16.2	15.63
PM ₁₀ (µg/m ³)	100	37.4	38.2	37.4	36.9	38.2	37.4	37.3	36.5	37.27
SO ₂ (µg/m ³)	80	2.9	3.1	3.1	3.5	3.2	3.5	3.2	3.1	3.22
NO ₂ (µg/m ³)	80	3.6	4.2	4.3	4.2	3.8	4.1	4.3	3.5	3.97
CO (mg/m ³)	2.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
O ₃ (µg/m ³)	100	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NH ₃ (µg/m ³)	400	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb (µg/m ³)	1.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
As (ng/m ³)	6.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni (ng/m ³)	20	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene (µg/m ³)	05	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
B(α)P (ng/m ³)	01	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Test Methods Followed:

PM₁₀ : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)
 PM_{2.5} : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
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 O₃ : HECS/AIR/SOP/005 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
 NH₃ : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)
 CO : IS 5182 (Pt 10): 1999 (RA 2013)
 Pb, As, Ni : In-house method based on CPCB guidelines vol. I (2011)
 C₆H₆ : GC FID/ GC MS based on IS: 5182 (Pt 11) based on CPCB guidelines vol. I (2011)
 B(α)P : In-house validated method based on CPCB guidelines vol. I (2011)

Note: BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide (DL 0.1 mg/m³); O₃-Ozone (DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(α)P- Benzo -α-pyrene (DL 0.5 ng/m³); ng/m³: nanogram per cubic meter; µg/m³ - microgram per cubic meter.

CONCLUSION: ALL THE PARAMETERS MEET THE NAAQ STANDARDS

*****End of Report *****



(Signature)
 (Dr K GANESAN)
 Authorized Signatory

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TEST REPORT OF GROUND WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	GW2 - Ground Water collected from Gagnet Labor Colony
Date of Sampling	06.09.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	04.10.2018
Report No	HECS/W/002/041018

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	6.82	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	1.4	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	39.5	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	7.9	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	30.0	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	11.1	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	4.2	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	90.0	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	7.2	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	1.6	45 max
15.	Iron as Fe	IS 3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS 3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS 1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS 1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:- BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: GROUND WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report




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Authorized Signatory

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TEST REPORT OF GROUND WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	GW4-Ground Water collected Near OMPL - ETP
Date of Sampling	06.09.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	04.10.2018
Report No	HECS/W/004/041018

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.81	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	BDL (DL 0.1)	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	57.4	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	12.8	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	43.5	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	16.3	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	4.9	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	136.5	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	6.7	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	2.6	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note: BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: GROUND WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report



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TEST REPORT OF OPEN WELL WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	OW3 - Open Water collected from Premude Village
Date of Sampling	06.09.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	04.10.2018
Report No	HECS/W/007/041018

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.6	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	2.9	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	45.5	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	7.8	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	24.6	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	13.7	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	4.8	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	45.4	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	4.6	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	4.3	45 max
15.	Iron as Fe	IS 3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS 3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS 1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS 1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:- BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: OPENWELL WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report




(Dr K GANESAN)
Authorized Signatory

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TEST REPORT OF SURFACE WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore – 574509
Sample Description	SW2 - Surface Water collected Near OMPL - Near Central Warehouse
Date of Sampling	06.09.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	04.10.2018
Report No	HECS/W/009/041018

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.5	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	2.9	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	76.0	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	10.4	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	32.5	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	64.6	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	7.7	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	155	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	49	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	3.8	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	0.22	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per liter

CONCLUSION: SURFACE WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report




(Dr K GANESAN)
Authorized Signatory

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Hubert Enviro Care Systems (P) Ltd.

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**Laboratory Services Division**

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TEST REPORT OF OPEN WELL WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	OW1- Open Water collected from Tenka Ekkar
Date of Sampling	06.09.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	04.10.2018
Report No	HECS/W/005/041018

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.73	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	2.5	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	49.9	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	8.4	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	40.6	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	8.3	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	5.1	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	72.4	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	7.5	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	2.7	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: OPENWELL WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report



(Dr K GANESAN)
Authorized Signatory

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TEST REPORT OF ETP EFFLUENT MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Guard Pond Pump Discharge (ETP Effluent)
Date of Sampling	21.09.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	04.10.2018
Report No	HECS/W/015/041018

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	Permissible Limit
1.	Color	IS:3025:(Pt 4)1983 (Reaff 2006)	Hazen Units	2.4	All efforts should be made to remove colour and unpleasant odour as far as practicable
2.	Odour	IS 3025 (Part5)-1983, Reaff 2006	-	Agreeable	
3.	Total suspended Solids	2540D APHA 22nd Edn.. 2012	mg/L	5.7	100
4.	pH	IS:3025:(Pt 11):1983 (Reaff 2006)	-	7.2	6.0-8.5
5.	Temperature	IS 3025 (Pt 9):1983 (Reaff:2006)	°C	27.5	Shall not exceed 5 degree Centigrade above the receiving water temperature
6.	Oil & Grease	IS 3025,4(Pt 39):2000 (Reaff 2009)	mg/L	BDL(DL 1)	5
7.	Total Residual Chlorine as Cl ₂	IS:3025 (Pt26)1986 (Reaff 2009)	mg/L	BDL (DL 0.1)	1
8.	Ammonical Nitrogen as N	IS 3025 Part (34)1988	mg/L	4.1	50
9.	Total Kjeldhal Nitrogen as N	IS 3025 Part (34)1988	mg/L	10.9	100
10.	Free Ammonia as NH ₃	IS:3025 (Part34)1998 Reaff. 2003	mg/L	BDL(DL 0.02)	5
11.	BOD, 3 days @ 27°C as O ₂	IS:3025 (Pt 44)1993 (Reaff 2009)	mg/L	5.7	30
12.	COD as O ₂	IS 3025 Part (58)2006	mg/L	28.0	125
13.	Lead as Pb	IS:3025 (Pt 47)1994 (Reaff 2009)	mg/L	BDL(DL 0.1)	0.1
14.	Chromium (Hexavalent) as Cr ⁶⁺	IS 3025 Part (52):2003	mg/L	BDL(DL 0.01)	0.1
15.	Total Chromium as Cr	IS 3025(Pt52):2003 (Reaff 2009)	mg/L	BDL(DL 0.01)	2.0
16.	Copper as Cu	IS:3025:5,(Pt 42)1992 (Reaff 2009)	mg/L	BDL(DL 0.05)	1.0
17.	Zinc as Zn	IS:3025 (Part49)1994 (Reaff 2009)	mg/L	BDL(DL 0.1)	5.0

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EMISSION AIR FROM STACK/ CHIMNEY MONITORING TEST REPORT OF - SEPTEMBER 2018

Page No. 2 of 9

Name of the Industry	M/s ONGC Mangalore Petrochemicals Limited
Address of the Industry	Mangalore SEZ, Permude Village, Mangalore-574509, Karnataka, India.
Stack ID	Isomer Charge Heater
Sample Description	Manual Stack Emission Monitoring
Sampling Date	18.09.2018
Sample Receipt	19.09.2018
Equipment Used	Vayubodhan VSS1
Method of Sampling & Analysis	IS 11255:1995 Methods for Measurement of Emission from Stationary Sources
Sample Drawn by	Hubert Enviro Care Systems (P) Ltd
Report Date	04.09.2018
Report No	HECS-OMPL/SEM/002/041018

General Details	
Ambient Temperature (°C)	26
Stack Diameter (m)	2.3
Stack Height (m)	65
Stack Temperature (°C)	177
Flue Gas Velocity (m/s)	4.4
Flue gas flow rate (Nm ³ /hr)	40058.4

Parameter monitored	Protocol	Results(mg/Nm ³)	Standard Norms(mg/Nm ³)
SPM	IS 11255(Part 1)-1985	3.4	5
Sulphur Dioxide(SO ₂)	IS 11255(Part 3)-1985	21	50
Oxides of Nitrogen (NO _x)	IS 11255(Part 7)-2005	174	250
Carbon monoxide (CO)	IS 5182(Part 10)-1999	BDL (DL 1)	100

Note: mg/Nm³: milligram per normal cubic meter; SPM: Suspended Particulate Matter;
m/s – Meter per second; Nm³/hr – Normal cubic meter per hour

Inference: - STACK EMISSIONS AS ABOVE PARAMETERS ARE WITHIN STANDARDS




(Dr K GANESAN)
Authorized Signatory



EMISSION AIR FROM STACK/ CHIMNEY MONITORING TEST REPORT OF - SEPTEMBER 2018

Page No. 4 of 9

Name of the Industry	M/s ONGC Mangalore Petrochemicals Limited
Address of the Industry	Mangalore SEZ, Permude Village, Mangalore-574509, Karnataka, India.
Stack ID	Plat former Unit Charge Heater
Sample Description	Manual Stack Emission Monitoring
Sampling Date	17.09.2018
Sample Receipt	18.09.2018
Equipment Used	Vayubodhan VSS1
Method of Sampling & Analysis	IS 11255:1995 Methods for Measurement of Emission from Stationary Sources
Sample Drawn by	Hubert Enviro Care Systems (P) Ltd
Report Date	04.10.2018
Report No	HECS-OMPL/SEM/004/041018

General Details	
Ambient Temperature (°C)	26
Stack Diameter (m)	4.1
Stack Height (m)	94
Stack Temperature (°C)	166
Flue Gas Velocity (m/s)	5.3
Flue gas flow rate (Nm ³ /hr)	180432.0

Parameter monitored	Protocol	Results(mg/Nm ³)	Standard Norms(mg/Nm ³)
SPM	IS 11255(Part 1)-1985	3.1	5
Sulphur Dioxide (SO ₂)	IS 11255(Part 3)-1985	35.5	50
Oxides of Nitrogen(NO _x)	IS 11255(Part 7)-2005	120	250
Carbon monoxide (CO)	IS 5182(Part 10)-1999	BDL (DL 1)	100

Note: mg/Nm³: milligram per normal cubic meter; SPM: Suspended Particulate Matter;
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EMISSION AIR FROM STACK/ CHIMNEY MONITORING TEST REPORT OF - SEPTEMBER 2018

Page No. 6 of 9

Name of the Industry	M/s ONGC Mangalore Petrochemicals Limited
Address of the Industry	Mangalore SEZ, Permude Village, Mangalore-574509, Karnataka, India.
Stack ID	Tatory Charge Heater
Sample Description	Manual Stack Emission Monitoring
Sampling Date	18.09.2018
Sample Receipt	19.09.2018
Equipment Used	Vayubodhan VSS1
Method of Sampling & Analysis	IS 11255:1995 Methods for Measurement of Emission from Stationary Sources
Sample Drawn by	Hubert Enviro Care Systems (P) Ltd
Report Date	04.10.2018
Report No	HECS-OMPL/SEM/006/041018

General Details	
Ambient Temperature (°C)	25
Stack Diameter (m)	1.75
Stack Height (m)	65
Stack Temperature (°C)	166
Flue Gas Velocity (m/s)	5.3
Flue gas flow rate (Nm ³ /hr)	31154.2

Parameter monitored	Protocol	Results (mg/Nm ³)	Standard Norms (mg/Nm ³)
SPM	IS 11255(Part 1)-1985	3.0	5
Sulphur Dioxide(SO ₂)	IS 11255(Part 3)-1985	19.6	50
Oxides of Nitrogen(NO _x)	IS 11255(Part 7)-2005	187	250
Carbon monoxide (CO)	IS 5182(Part 10)-1999	BDL (DL 1)	100

Note: mg/Nm³: milligram per normal cubic meter; SPM: Suspended Particulate Matter;m/s – Meter per second; Nm³/hr – Normal cubic meter per hour**INFERENCE: - STACK EMISSIONS AS ABOVE PARAMETERS ARE WITHIN STANDARDS**
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EMISSION AIR FROM STACK/ CHIMNEY MONITORING TEST REPORT OF - SEPTEMBER 2018

Page No. 8 of 9

Name of the Industry	M/s ONGC Mangalore Petrochemicals Limited
Address of the Industry	Mangalore SEZ, Permude Village, Mangalore-574509, Karnataka, India.
Stack ID	Xylene Column Reboiler Heater(Part B)
Sample Description	Manual Stack Emission Monitoring
Sampling Date	19.09.2018
Sample Receipt	20.09.2018
Equipment Used	Vayubodhan VSS1
Method of Sampling & Analysis	IS 11255:1995 Methods for Measurement of Emission from Stationary Sources
Sample Drawn by	Hubert Enviro Care Systems (P) Ltd
Report Date	04.10.2018
Report No	HECS-OMPL/SEM/008/041018

General Details	
Ambient Temperature (°C)	26
Stack Diameter (m)	3.69
Stack Height (m)	98
Stack Temperature (°C)	194
Flue Gas Velocity (m/s)	5.6
Flue gas flow rate (Nm ³ /hr)	148725.6

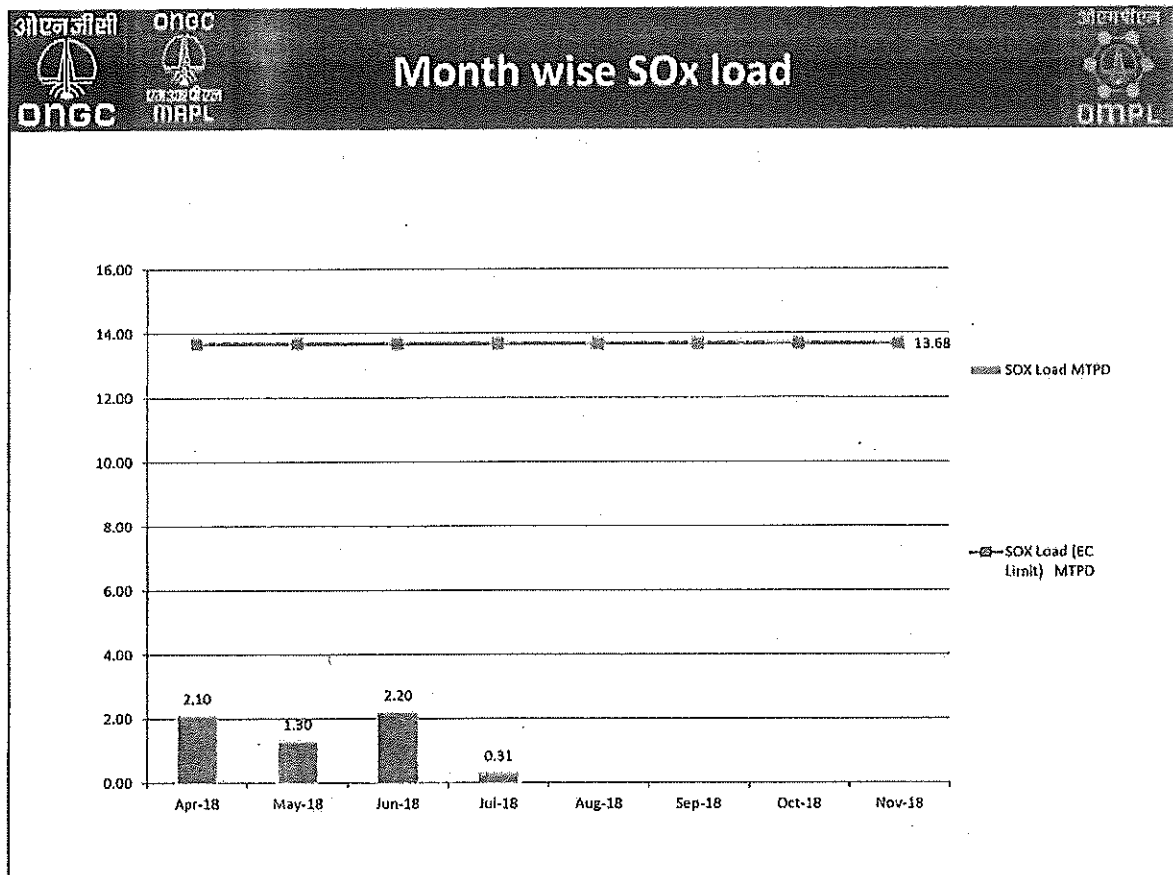
Parameter monitored	Protocol	Results (mg/Nm ³)	Standard Norms (mg/Nm ³)
SPM	IS 11255(Part 1)-1985	6.8	50
Sulphur Dioxide(SO ₂)	IS 11255(Part 3)-1985	12	850
Oxides of Nitrogen(NO _x)	IS 11255(Part 7)-2005	47	350
Carbon monoxide (CO)	IS 5182(Part 10)-1999	BDL (DL 1)	150

Note: mg/Nm³: milligram per normal cubic meter; SPM: Suspended Particulate Matter;
m/s – Meter per second; Nm³/hr – Normal cubic meter per hour

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ANNEXURE -6

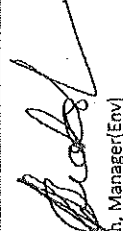
Form-1 (Rule 4)
Returns Regarding Water Consumed during the Month of July, 2018

Name and address of the Consumer	Purpose for which water consumed	Reading at the beginning of the first day of the calendar month under report	Reading at the end of the last day of the calendar month under report	Quantity of Water Consumed in Kilo Liters	If the meter was out of order, the monthly average consumption of water for the previous 3 months of the working period	Quantity of water qualifying for rebate according to the assessee	Remarks
M/s ONGC Mangalore Petrochemicals Limited, Mangalore Special Economic Zone, Permude, Mangalore -574 509	Industrial cooling, spraying in mine pits or boiler feed						
	Cooling Water	0	78,676	78676			
	Boiler Feed Water	0	67,434	67434			
	Fire Water	0	15811	15811			
	Domestic purpose						
	Drinking Water & Sanitation	0	5548	5548			
	Processing whereby water gets polluted and the pollutants are easily bio-degradable						
	Service Water						Subtracting total flow from BFW, CT & Drinking water consumption
Total Consumption			10147	10147		1,77,616	

Signature of the Consumer

Name

Address

: 
Shivaprakash, Manager (Env)

M/s ONGC Mangalore Petrochemicals Limited, Mangalore Special Economic Zone, Permude, Mangalore -574 509

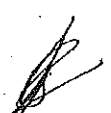
ANNEXURE- ~~H~~

ONGC Mangalore Petrochemicals Limited

Production Details for September, 2018

Net Naptha Processed -1,11,250 MT

Sl. No.	Name of the Product	Quantity, MT
1	Paraxylene (Product)	61,402
2	Benzene (Co product)	16,276





ओ एन जी सी मंगलूर पेट्रोकेमिकल्स लिमिटेड

(मंगलूर रिफाइनरी एण्ड पेट्रोकेमिकल्स लिमिटेड की सहायक कंपनी)

ONGC Mangalore Petrochemicals Ltd.

(A Subsidiary of Mangalore Refinery and Petrochemicals Ltd.)

एमएसईजेड, पेरुदे, मंगलूर - ५७४ ५०९ MSEZ, Perumde, Mangaluru - 574 509.

CIN: U30107KA2006GOI041250

दूरभाष Direct Line :- 0824-2872000, फैक्स Fax:- 0824-2872005, Website: www.ompl.co.in

REF: OMPL/PCB/SP/2018-19/

Date: 13/11/2018

To:

The Environmental Officer

Regional Office

KSPCB

Baikampady, Mangalore-11



Dear Sir,

Sub: Submission of Environmental Monitoring Report for the Month of October, 2018 and Production Report for October, 2018

Ref: KSPCB Combined Consent Order No. AW-301949 dated 27th January, 2017

With respect to the above subject; we are herewith submitting the following Environmental Monitoring Reports and Production Report for the Month of October, 2018 respectively, enclosed herewith.

1. Ambient Air Quality Monitoring at 5 different locations in and around OMPL, enclosed as Annexure- A
2. Water Analysis Reports at 9 different locations in and around OMPL, as Annexure-B
3. Noise Level Monitoring Report at OMPL, as Annexure-C
4. Treated Effluent Analysis Report, Annexure-D
5. Returns Regarding Water Consumed, for the Month of October, 2018, as Annexure-E
6. Production Report as Annexure-F

Thanking You,

Shivaprakash
Manager (Env)

Vinay Kumar
Check / Done in case of
any compliances -
22/11/18

CC: Member Secretary, KSPCB, Bangalore

CC: Head (Technical), MSEZ

CC: CEO, OMPL for info

CC: COO, OMPL for info

ANNEXURE - A

Hubert Enviro Care Systems (P) Ltd.
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Certificate No. TC-5786

AMBIENT AIR QUALITY MONITORING TEST REPORT - OCTOBER 2018

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	OMPL - East Side
Report Date	03.11.2018
Report No	HECS/AA/001/031118

CONSOLIDATED TEST RESULTS

OCTOBER '18 - Week		29-Week		30-Week		31-Week		32-Week		Average Value
Parameters	NAAQ	03.10.18	05.10.18	08.10.18	12.10.18	15.10.18	19.10.18	23.10.18	29.10.18	
PM _{2.5} (µg/m ³)	60	15.7	16.3	17.6	16.2	17.1	15.5	16.4	17.9	16.59
PM ₁₀ (µg/m ³)	100	35.2	35.4	38.9	39.6	39.6	36.5	39.8	37.7	37.84
SO ₂ (µg/m ³)	80	3.5	3.8	3.7	4.2	3.6	3.9	4.0	3.6	3.79
NO ₂ (µg/m ³)	80	4.2	4.6	4.5	5.0	4.6	4.9	4.8	4.9	4.69
CO (mg/m ³)	2.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
O ₃ (µg/m ³)	100	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NH ₃ (µg/m ³)	400	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb (µg/m ³)	1.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
As (ng/m ³)	6.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni (ng/m ³)	20	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene (µg/m ³)	05	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
B(α)P (ng/m ³)	01	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

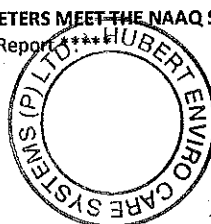
Test Methods Followed:

PM₁₀ : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)
PM_{2.5} : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
SO₂ : IS 5182 (Pt 2): 2001 (RA 2017) (Improved wet and Geake method)
NO₂ : IS 5182 (Pt 6): 2006 (RA 2017) (Jacob and Hochheiser modified method)
O₃ : HECS/AIR/SOP/005 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
NH₃ : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)
CO : IS 5182 (Pt 10): 1999 (RA 2013)
Pb, As, Ni : In-house method based on CPCB guidelines vol. I (2011)
C₆H₆ : GC FID/ GC MS based on IS: 5182 (Pt 11) based on CPCB guidelines vol. I (2011)
B(α)P : In-house validated method based on CPCB guidelines vol. I (2011)

Note: BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide (DL 0.1 mg/m³); O₃-Ozone(DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(α)P- Benzo -α-pyrene (DL0.5 ng/m³); ng/m³: nanogram per cubic meter; µg/m³ - microgram per cubic meter.

CONCLUSION: ALL THE PARAMETERS MEET THE NAAQ STANDARDS

*****End of Report*****



Authorized Signatory
(Dr K Ganesan - Lab Manager)

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Certificate No. TC-5786

AMBIENT AIR QUALITY MONITORING TEST REPORT - OCTOBER 2018

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	Shantigudda
Report Date	03.11.2018
Report No	HECS/AA/002/031118

CONSOLIDATED TEST RESULTS

OCTOBER '18 - Week		29-Week		30-Week		31-Week		32-Week		Average Value
Parameters	NAAQ	03.10.18	05.10.18	08.10.18	12.10.18	15.10.18	19.10.18	23.10.18	29.10.18	
PM _{2.5} (µg/m ³)	60	15.7	15.2	15.1	15.8	15.6	15.4	15.7	15.9	16.75
PM ₁₀ (µg/m ³)	100	36.8	36.5	36.8	37.2	37.6	36.8	37.6	36.5	38.18
SO ₂ (µg/m ³)	80	2.2	2.0	2.2	2.5	2.3	2.3	2.0	2.4	3.44
NO ₂ (µg/m ³)	80	2.7	2.5	2.7	2.5	2.4	2.7	2.8	2.6	3.81
CO (mg/m ³)	2.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
O ₃ (µg/m ³)	100	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NH ₃ (µg/m ³)	400	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb (µg/m ³)	1.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
As (ng/m ³)	6.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni (ng/m ³)	20	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene (µg/m ³)	05	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
B(α)P (ng/m ³)	01	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Test Methods Followed:

PM₁₀ : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)
PM_{2.5} : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
SO₂ : IS 5182 (Pt 2): 2001 (RA 2017) (Improved wet and Geake method)
NO₂ : IS 5182 (Pt 6): 2006 (RA 2017) (Jacob and Hochheiser modified method)
O₃ : HECS/AIR/SOP/005 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
NH₃ : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)
CO : IS 5182 (Pt 10): 1999 (RA 2013)
Pb, As, Ni : In-house method based on CPCB guidelines vol. I (2011)
C₆H₆ : GC FID/ GC MS based on IS: 5182 (Pt 11) based on CPCB guidelines vol. I (2011)
B(α)P : In-house validated method based on CPCB guidelines vol. I (2011)

Note: BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide (DL 0.1 mg/m³); O₃-Ozone(DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(α)P- Benzo -α-pyrene (DL0.5 ng/m³); ng/m³: nanogram per cubic meter; µg/m³ - microgram per cubic meter.

CONCLUSION: ALL THE PARAMETERS MEET THE NAAQ STANDARDS

*****End of Report *****

Authorized Signatory
(Dr K Ganesan - Lab Manager)

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AMBIENT AIR QUALITY MONITORING TEST REPORT - OCTOBER 2018

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	Tenka Ekkar
Report Date	03.11.2018
Report No	HECS/AA/003/031118

CONSOLIDATED TEST RESULTS

OCTOBER '18 - Week		29-Week		30-Week		31-Week		32-Week		Average Value
Parameters	NAAQ	03.10.18	05.10.18	08.10.18	12.10.18	15.10.18	19.10.18	23.10.18	29.10.18	
PM _{2.5} (µg/m ³)	60	16.5	16.0	16.7	16.3	16.8	16.7	17.1	17.3	16.68
PM ₁₀ (µg/m ³)	100	38.3	36.5	38.3	39.2	37.6	37.5	38.3	37.4	37.89
SO ₂ (µg/m ³)	80	3.8	3.5	3.8	3.6	3.6	3.9	3.3	3.8	3.66
NO ₂ (µg/m ³)	80	4.6	4.6	4.7	4.8	4.6	4.5	4.2	5.1	4.64
CO (mg/m ³)	2.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
O ₃ (µg/m ³)	100	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NH ₃ (µg/m ³)	400	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb (µg/m ³)	1.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
As (ng/m ³)	6.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni (ng/m ³)	20	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene (µg/m ³)	05	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
B(α)P (ng/m ³)	01	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

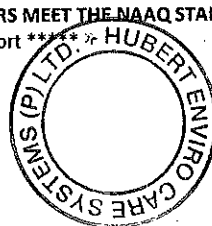
Test Methods Followed:

PM₁₀ : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)
PM_{2.5} : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
SO₂ : IS 5182 (Pt 2): 2001 (RA 2017) (Improved wet and Geake method)
NO₂ : IS 5182 (Pt 6): 2006 (RA 2017) (Jacob and Hochheiser modified method)
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NH₃ : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)
CO : IS 5182 (Pt 10): 1999 (RA 2013)
Pb, As, Ni : In-house method based on CPCB guidelines vol. I (2011)
C₆H₆ : GC FID/ GC MS based on IS: 5182 (Pt 11) based on CPCB guidelines vol. I (2011)
B(α)P : In-house validated method based on CPCB guidelines vol. I (2011)

Note: BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂-Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide (DL 0.1 mg/m³); O₃-Ozone (DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(α)P- Benzo -α-pyrene (DL 0.5 ng/m³); ng/m³: nanogram per cubic meter; µg/m³ - microgram per cubic meter.

CONCLUSION: ALL THE PARAMETERS MEET THE NAAQ STANDARDS

*****End of Report*****



Authorized Signatory
(Dr K Ganesan - Lab Manager)

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AMBIENT AIR QUALITY MONITORING TEST REPORT - OCTOBER 2018

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	Permude Village
Report Date	03.11.2018
Report No	HECS/AA/004/031118

CONSOLIDATED TEST RESULTS

OCTOBER '18 - Week		29-Week		30-Week		31-Week		32-Week		Average Value
Parameters	NAAQS	03.10.18	05.10.18	08.10.18	12.10.18	15.10.18	19.10.18	23.10.18	29.10.18	
PM _{2.5} (µg/m ³)	60	17.3	16.9	16.7	16.2	16.6	16.7	16.9	17.3	16.83
PM ₁₀ (µg/m ³)	100	38.5	39.3	38.5	38	39.3	38.5	38.4	37.6	38.51
SO ₂ (µg/m ³)	80	4.0	4.2	4.2	4.6	4.3	4.6	4.3	4.2	4.30
NO ₂ (µg/m ³)	80	4.7	5.3	5.4	5.3	4.9	5.2	5.4	4.6	5.10
CO (mg/m ³)	2.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
O ₃ (µg/m ³)	100	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NH ₃ (µg/m ³)	400	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb (µg/m ³)	1.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
As (ng/m ³)	6.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni (ng/m ³)	20	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene (µg/m ³)	05	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
B(α)P (ng/m ³)	01	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

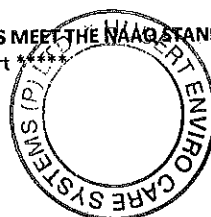
Test Methods Followed:

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PM_{2.5} : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
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NO₂ : IS 5182 (Pt 6): 2006 (RA 2017) (Jacob and Hochheiser modified method)
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NH₃ : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)
CO : IS 5182 (Pt 10): 1999 (RA 2013)
Pb, As, Ni : In-house method based on CPCB guidelines vol. I (2011)
C₆H₆ : GC FID/ GC MS based on IS: 5182 (Pt 11) based on CPCB guidelines vol. I (2011)
B(α)P : In-house validated method based on CPCB guidelines vol. I (2011)

Note: BDL = Below detection limit; DL - Detection Limit; PM_{2.5} - Particulate matter size less than 2.5 Micron, PM₁₀ - Particulate matter size less than 10 Micron; SO₂ - Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide (DL 0.1 mg/m³); O₃ - Ozone (DL 10 µg/m³); NH₃ - Ammonia (DL 5 µg/m³); Pb - Lead (DL 0.05 µg/m³); As - Arsenic (DL 0.1 ng/m³); Ni - Nickel (DL 0.5 ng/m³); Benzene - (DL 1 µg/m³); B(α)P - Benzo - α-pyrene (DL 0.5 ng/m³); ng/m³ - nanogram per cubic meter; µg/m³ - microgram per cubic meter.

CONCLUSION: ALL THE PARAMETERS MEET THE NAAQS STANDARDS

*****End of Report *****



Authorized Signatory

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AMBIENT AIR QUALITY MONITORING TEST REPORT - OCTOBER 2018

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	OMPL - West Side
Report Date	03.11.2018
Report No	HECS/AA/005/031118

CONSOLIDATED TEST RESULTS

OCTOBER '18 - Week		29-Week		30-Week		31-Week		32-Week		Average Value
Parameters	NAAQ	03.10.18	05.10.18	08.10.18	12.10.18	15.10.18	19.10.18	23.10.18	29.10.18	
PM _{2.5} (µg/m ³)	60	16.4	16.1	16.7	16.9	16.8	17.0	17.4	17.5	16.85
PM ₁₀ (µg/m ³)	100	37.1	38.7	38.2	38.9	39.2	37.9	39.2	38.9	38.51
SO ₂ (µg/m ³)	80	3.5	3.8	3.8	3.5	3.5	4.0	4.2	4.5	3.85
NO ₂ (µg/m ³)	80	3.5	5.4	5.6	5.8	5.3	5.5	5.9	5.3	5.29
CO (mg/m ³)	2.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
O ₃ (µg/m ³)	100	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NH ₃ (µg/m ³)	400	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb (µg/m ³)	1.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
As (ng/m ³)	6.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni (ng/m ³)	20	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene (µg/m ³)	05	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
B(α)P (ng/m ³)	01	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

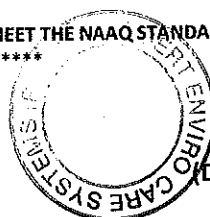
Test Methods Followed:

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PM_{2.5} : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
SO₂ : IS 5182 (Pt 2): 2001 (RA 2017) (Improved wet and Geake method)
NO₂ : IS 5182 (Pt 6): 2006 (RA 2017) (Jacob and Hochheiser modified method)
O₃ : HECS/AIR/SOP/005 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
NH₃ : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)
CO : IS 5182 (Pt 10): 1999 (RA 2013)
Pb, As, Ni : In-house method based on CPCB guidelines vol. I (2011)
C₆H₆ : GC FID/ GC MS based on IS: 5182 (Pt 11) based on CPCB guidelines vol. I (2011)
B(α)P : In-house validated method based on CPCB guidelines vol. I (2011)

Note: BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide (DL 0.1 mg/m³); O₃-Ozone (DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(α)P- Benzo -α-pyrene (DL 0.5 ng/m³); ng/m³: nanogram per cubic meter; µg/m³ - microgram per cubic meter.

CONCLUSION: ALL THE PARAMETERS MEET THE NAAQ STANDARDS

*****End of Report *****



Authorized Signatory
(Dr K Ganesan - Lab Manager)

1. The report in full or part shall not be used for any promotional or publicity purpose without written consent by HECS organization. 2. Samples are not drawn by HECS unless or otherwise mentioned. 3. Unless specifically requested by customer the test items will not be retained more than 15 days from the date of issue of test report. 4. Under no circumstances lab accepts any liability or loss / damage caused by use or misuse of test report after invoicing or issue of test report. 5. The test results relate only to the test items. 6. # not under scope of accreditation.

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ANNEXURE-B

TEST REPORT OF GROUND WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	GW1 - Ground Water collected from Narayana Guru Community Hall, Permude
Date of Sampling	05.10.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.11.2018
Report No	HECS/W/001/031118

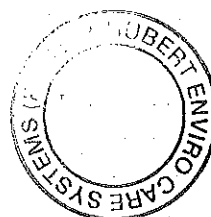
RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	IS10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.72	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	1.3	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	34.2	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	7.6	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	80.2	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	8.5	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	6.9	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	117.0	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	9.2	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	0.3	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	7.7	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: GROUND WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report



Authorized Signatory
(Dr K Ganesan - Lab Manager)

1. The report in full or part shall not be used for any promotional or publicity purpose without written consent by HECS organization. 2. Samples are not drawn by HECS unless or otherwise mentioned. 3. Unless specifically requested by customer the test items will not be retained more than 15 days from the date of issue of test report. 4. Under no circumstances lab accepts any liability or loss / damage caused by use or misuse of test report after invoicing or issue of test report. 5. The test results relate only to the test items. 6. # not under scope of accreditation.

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Certificate No. TC-5786

TEST REPORT OF GROUND WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	GW2 - Ground Water collected from Gagnet Labour Colony
Date of Sampling	05.10.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.11.2018
Report No	HECS/W/002/031118

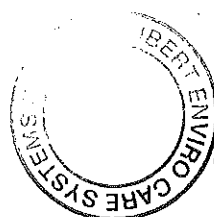
RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	6.91	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	1.6	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	40.8	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	8.2	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	31.8	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	11.6	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	4.5	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	91.1	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	7.5	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	1.8	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: GROUND WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report



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Certificate No. TC-5786

Laboratory Services Division

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TEST REPORT OF GROUND WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	GW3- Ground Water collected from L&T New Labor Colony
Date of Sampling	05.10.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.11.2018
Report No	HECS/W/003/031118

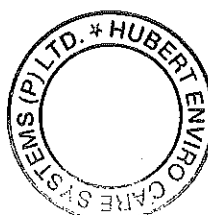
RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.89	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	1.43	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	6.5	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	16.2	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	59.4	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	14.4	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	7.6	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	122.0	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	6.8	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	2.6	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: GROUND WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report



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Laboratory Services DivisionAccredited by NABL in the fields of Chemical
ISO 9001, 14001 & OHSAS 18001 Certified.**TEST REPORT OF GROUND WATER QUALITY MONITORING**

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	GW4-Ground Water collected Near OMPL - ETP
Date of Sampling	05.10.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.11.2018
Report No	HECS/W/004/031118

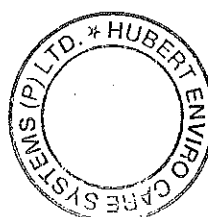
RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.89	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	BDL (DL 0.1)	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	59.2	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	13.9	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	44.8	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	18.1	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	5.4	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	138.6	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	6.9	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	2.8	45 max
15.	Iron as Fe	IS 3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS 3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS 1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS 1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: GROUND WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report



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TEST REPORT OF OPEN WELL WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	OW1- Open Water collected from Tenka Ekkar
Date of Sampling	05.10.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.11.2018
Report No	HECS/W/005/031118

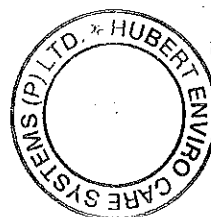
RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	6.85	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	1.8	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	46.8	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	7.2	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	38.7	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	6.9	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	4.1	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	74.4	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	5.5	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	1.6	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: OPENWELL WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report



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TEST REPORT OF OPEN WELL WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	OW2 - Open Water collected from Shantigudda Village
Date of Sampling	05.10.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.11.2018
Report No	HECS/W/006/031118

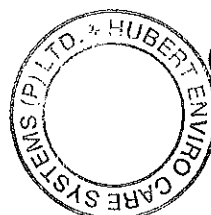
RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	6.95	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	1.8	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	BDL (DL 0.1)	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	35.8	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	6.7	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	56.6	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	11.8	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	3.1	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	74.4	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	4.7	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	1.9	45 max
15.	Iron as Fe	IS 3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS 3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS 1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS 1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: OPENWELL WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report



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TEST REPORT OF OPEN WELL WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore – 574509
Sample Description	OW3 - Open Water collected from Premude Village
Date of Sampling	05.10.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.11.2018
Report No	HECS/W/007/031118

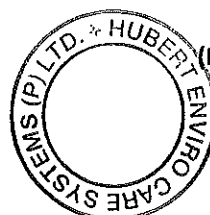
RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	6.8	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	2.1	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	44.6	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	6.9	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	23.7	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	12.8	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	3.9	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	44.6	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	5.3	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	3.5	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: OPENWELL WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report



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TEST REPORT OF SURFACE WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	SW1 - Surface Water collected Near OMPL - Flare Area
Date of Sampling	05.10.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.11.2018
Report No	HECS/W/008/031118

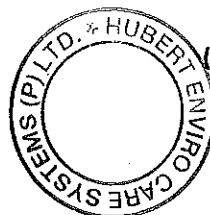
RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	6.6	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	1.5	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	125.4	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	46.7	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	91.8	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	11.5	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	7.6	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	386	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	62.1	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	0.28	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	3.1	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	0.22	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per liter; NA-Not Available

CONCLUSION: SURFACE WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report




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TEST REPORT OF SURFACE WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	SW2 - Surface Water collected Near OMPL - Near Central Warehouse
Date of Sampling	05.10.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.11.2018
Report No	HECS/W/009/031118

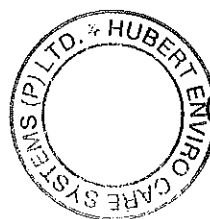
RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	8.1	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	3.2	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	77.0	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	11.6	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	33.7	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	66.5	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	8.8	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	159	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	51	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	4.3	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	0.23	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per liter

CONCLUSION: SURFACE WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report



Authorized Signatory
Dr K Ganesan - Lab Manager

Hubert Enviro Care Systems (P) Ltd.

C-45, Industrial Estate, Baikampady, Mangalore, Karnataka - 575011.
Ph: 0824 - 2408111, Email: kro@hecs.in, Website: www.hecs.in

H.O.: # 18, 92nd Street, Ashok Nagar, Chennai - 600 083.
Ph: 42985555 Fax : 42985500 E-mail : labsales@hecs.in



Laboratory Services Division
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ISO 9001, 14001 & OHSAS 18001 Certified.

Certificate No. TC-5786

NOISE MONITORING TEST REPORT – OCTOBER 2018

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Noise Monitoring
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	OMPL – North, South, East and West sides
Sampling Date	05.10.2018
Report Date	03.11.2018
Report No.	HECS/N/001/031118

RESULTS

S.No.	Sampling Location	MoEF requirements in dB		Avg. Noise level observed in dB	
		Day	Night	Day	Night
1.	OMPL-North	75	70	68.5	66.8
2.	OMPL-South			68.2	65.5
3.	OMPL-East			68.7	66.7
4.	OMPL-West			68.9	66.9

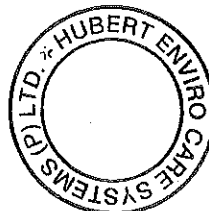
Note: dB: Decibel

Limits: **Industrial Area: Day Time-75 dB (A), Night Time-70 dB (A).** Commercial Area: Day Time-65 dB (A), Night Time-55 dB (A).
Residential Area: Day Time-55 dB (A), Night Time-45 dB (A). Silence Zone: Day Time-50 dB (A), Night Time-40 dB (A).

Note: Leq- Equivalent Noise Level (hourly); Reference: The Noise Pollution (Regulation and Control) Rules, 2000, CPCB, New Delhi

INFERENCE: The observed noise levels are within the limits as per The Noise Pollution (Regulation and Control) Rules, 2000 under the Environment (Protection) Act, 1986

*****End of Report *****



[Signature]
Authorized Signatory
(Dr K Ganesan - Lab Manager)

ANNEXURE - D

Hubert Enviro Care Systems (P) Ltd.C-45, Industrial Estate, Baikampady, Mangalore, Karnataka - 575011.
Ph: 0824 - 2408111, Email: kro@hecs.in, Website: www.hecs.inH.O.: # 18, 92nd Street, Ashok Nagar, Chennai - 600 083.
Ph: 42985555 Fax: 42985500 E-mail: labsales@hecs.in**Laboratory Services Division**Accredited by NABL in the fields of Chemical
ISO 9001, 14001 & OHSAS 18001 Certified.

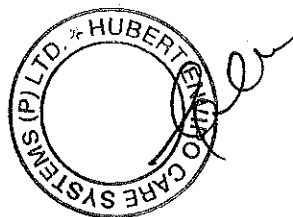
Certificate No. TC-5786

TEST REPORT OF ETP EFFULENT MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Guard Pond Pump Discharge (ETP Effluent)
Date of Sampling	08.10.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.11.2018
Report No	HECS/W/011/031118

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	Permissible Limit
1.	Color	IS:3025:(Pt 4):1983 (Reaff 2006)	Hazen Units	1.8	All efforts should be made to remove colour and unpleasant odour as far as practicable
2.	Odour	IS 3025 (Part5)-1983, Reaff 2006	-	Agreeable	
3.	Total suspended Solids	2540D APHA 22nd Edn.. 2012	mg/L	2.9	100
4.	pH	IS:3025:(Pt 11):1983 (Reaff 2006)	-	6.92	6.0-8.5
5.	Temperature	IS 3025 (Pt 9):1983 (Reaff:2006)	°C	28.1	Shall not exceed 5 degree Centigrade above the receiving water temperature
6.	Oil & Grease	IS 3025,4(Pt 39):2000 (Reaff 2009)	mg/L	BDL(DL 1)	5
7.	Total Residual Chlorine as Cl ₂	IS:3025 (Pt26):1986 (Reaff 2009)	mg/L	BDL (DL 0.1)	1
8.	Ammonical Nitrogen as N	IS 3025 Part (34):1988	mg/L	7.7	50
9.	Total Kjeldhal Nitrogen as N	IS 3025 Part (34):1988	mg/L	30.2	100
10.	Free Ammonia as NH ₃	IS:3025 (Part34):1998 Reaff. 2003	mg/L	BDL(DL 0.02)	5
11.	BOD, 3 days @ 27°C as O ₂	IS:3025 (Pt 44):1993 (Reaff 2009)	mg/L	6.1	30
12.	COD as O ₂	IS 3025 Part (58):2006	mg/L	29.3	125
13.	Lead as Pb	IS:3025 (Pt 47):1994 (Reaff 2009)	mg/L	BDL(DL 0.1)	0.1
14.	Chromium (Hexavalent) as Cr ⁶⁺	IS 3025 Part (52):2003	mg/L	BDL(DL 0.01)	0.1
15.	Total Chromium as Cr	IS 3025(Pt52):2003 (Reaff 2009)	mg/L	BDL(DL 0.01)	2.0
16.	Copper as Cu	IS:3025:5,(Pt 42):1992 (Reaff 2009)	mg/L	BDL(DL 0.05)	1.0
17.	Zinc as Zn	IS:3025 (Part49):1994 (Reaff 2009)	mg/L	BDL(DL 0.1)	5.0



1. The report in full or part shall not be used for any promotional or publicity purpose without written consent by HECS organization. 2. Samples are not drawn by HECS unless or otherwise mentioned. 3. Unless specifically requested by customer the test items will not be retained more than 15 days from the date of issue of test report. 4. Under no circumstances lab accepts any liability or loss / damage caused by use or misuse of test report after invoicing or issue of test report. 5. The test results relate only to the test items. 6. # not under scope of accreditation.



Certificate No. TC-5786

TEST REPORT OF ETP EFFULENT MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore – 574509
Sample Description	Guard Pond Pump Discharge (ETP Effluent)
Date of Sampling	08.10.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.11.2018
Report No	HECS/W/011/031118

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	Permissible Limit
18.	Nickel as Ni	IS:3025 (Part54)2003 (Reaff 2009)	mg/L	BDL(DL 0.05)	1.0
19.	Fluoride as F-	IS 3025 part (60):2008	mg/L	BDL(DL 0.2)	1.0
20.	Sulphide as S ²⁻	IS:3025 (Pt 29)1986 (Reaff 2009)	mg/L	BDL(DL 0.04)	2.0
21.	Particle Size of Suspended solids	APHA 22nd Edition	-	Passed through 850 micron	850 micron
22.	Arsenic as As	IS:3025 (Part37)1988(Reaff 2009)	mg/L	BDL(DL 0.005)	0.2
23.	Mercury as Hg	IS:3025 (Part48)1994 RA 1999	mg/L	BDL(DL 0.001)	0.01
24.	Cadmium as Cd	IS:3025 (Part41)1991	mg/L	BDL(DL 0.01)	0.1
25.	Selenium as Se	IS:3025 (Part56)2003	mg/L	BDL(DL 0.005)	0.05
26.	Cyanide as CN	IS:3025 (Part27)1986 Reaff. 2009	mg/L	BDL(DL 0.01)	0.2
27.	Phenols as C ₆ H ₅ OH	IS 3025 Part (43)1992, RA 2009	mg/L	BDL(DL 0.001)	0.35
28.	Total Iron as Fe	IS 3025(Pt 53):2003(Reaff 2009)	mg/L	0.3	3
29.	Manganese	IS:3025:(Pt-59):2006	mg/L	BDL(DL 0.01)	2
30.	Total Phosphorous as P	IS 3025(Pt 31):1988(Reaff 2009)	mg/L	BDL(DL 0.01)	3
31.	Nitrate	IS 3025 (Pt 34):1988 (Reaff 2009)	mg/L	BDL(DL 1)	20
32.	Vanadium as V	IS:3025 (Part56)2003	mg/L	BDL(DL 0.01)	0.1
33.	Benzo(a)pyrene	USEPA 8270C	mg/L	BDL(DL 0.0001)	0.2
34.	Benzene	USEPA 8270C	mg/L	BDL(DL 0.0001)	0.1
35.	Bioassay Test	IS 6582(Part 2):2001	Tf	9:1	90% survival of fish after 96 hrs in 100% effluent

Note:-BDL - Below Detection Limit; D.L- Detection Limit; mg/L - Milligrams per liter

CONCLUSION: ETP OUTLET EFFULENT WATER AS ABOVE PARAMETERS ARE WITHIN STANDARDS

End of Report



Authorized Signatory
for K Ganesan - Lab Manager)



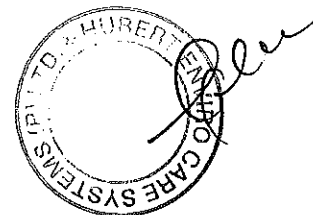
Certificate No. TC-5786

TEST REPORT OF ETP EFFLUENT MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore – 574509
Sample Description	Guard Pond Pump Discharge (ETP Effluent)
Date of Sampling	22.10.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.11.2018
Report No	HECS/W/015/031118

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	Permissible Limit
1.	Color	IS:3025:(Pt 4)1983 (Reaff 2006)	Hazen Units	2.8	All efforts should be made to remove colour and unpleasant odour as far as practicable
2.	Odour	IS 3025 (Part5)-1983, Reaff 2006	-	Agreeable	
3.	Total suspended Solids	2540D APHA 22nd Edn.. 2012	mg/L	6.2	100
4.	pH	IS:3025:(Pt 11):1983 (Reaff 2006)	-	7.8	6.0-8.5
5.	Temperature	IS 3025 (Pt 9):1983 (Reaff:2006)	°C	27.7	Shall not exceed 5 degree Centigrade above the receiving water temperature
6.	Oil & Grease	IS 3025,4(Pt 39):2000 (Reaff 2009)	mg/L	BDL(DL 1)	5
7.	Total Residual Chlorine as Cl ₂	IS:3025 (Pt26)1986 (Reaff 2009)	mg/L	BDL (DL 0.1)	1
8.	Ammonical Nitrogen as N	IS 3025 Part (34)1988	mg/L	3.8	50
9.	Total Kjeldhal Nitrogen as N	IS 3025 Part (34)1988	mg/L	9.9	100
10.	Free Ammonia as NH ₃	IS:3025 (Part34)1998 Reaff. 2003	mg/L	BDL(DL 0.02)	5
11.	BOD, 3 days @ 27°C as O ₂	IS:3025 (Pt 44)1993 (Reaff 2009)	mg/L	4.6	30
12.	COD as O ₂	IS 3025 Part (58)2006	mg/L	27.1	125
13.	Lead as Pb	IS:3025 (Pt 47)1994 (Reaff 2009)	mg/L	BDL(DL 0.1)	0.1
14.	Chromium (Hexavalent) as Cr ⁶⁺	IS 3025 Part (52):2003	mg/L	BDL(DL 0.01)	0.1
15.	Total Chromium as Cr	IS 3025(Pt52):2003 (Reaff 2009)	mg/L	BDL(DL 0.01)	2.0
16.	Copper as Cu	IS:3025:5,(Pt 42)1992 (Reaff 2009)	mg/L	BDL(DL 0.05)	1.0
17.	Zinc as Zn	IS:3025 (Part49)1994 (Reaff 2009)	mg/L	BDL(DL 0.1)	5.0





Certificate No. TC-5786

TEST REPORT OF ETP EFFLUENT MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore – 574509
Sample Description	Guard Pond Pump Discharge (ETP Effluent)
Date of Sampling	22.10.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	03.11.2018
Report No	HECS/W/015/031118

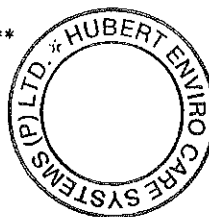
RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	Permissible Limit
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21.	Particle Size of Suspended solids	APHA 22nd Edition	-	Passed through 850 micron	850 micron
22.	Arsenic as As	IS:3025 (Part37):1988(Reaff 2009)	mg/L	BDL(DL 0.005)	0.2
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25.	Selenium as Se	IS:3025 (Part56):2003	mg/L	BDL(DL 0.005)	0.05
26.	Cyanide as CN	IS:3025 (Part27):1986 Reaff. 2009	mg/L	BDL(DL 0.01)	0.2
27.	Phenolic Compounds as C ₆ H ₅ OH	IS 3025 Part (43):1992,RA 2009	mg/L	BDL(DL 0.001)	0.35
28.	Total Iron as Fe	IS 3025(Pt 53):2003(Reaff 2009)	mg/L	0.39	3
29.	Manganese	IS:3025:(Pt-59):2006	mg/L	BDL(DL 0.01)	2
30.	Total Phosphorous as P	IS 3025(Pt 31):1988(Reaff 2009)	mg/L	BDL(DL 0.01)	3
31.	Nitrate	IS 3025 (Pt 34):1988 (Reaff 2009)	mg/L	BDL(DL 1)	20
32.	Vanadium as V	IS:3025 (Part56):2003	mg/L	BDL(DL 0.01)	0.1
33.	Benzo(a)pyrene	USEPA 8270C	mg/L	BDL(DL 0.0001)	0.2
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35.	Bioassay Test	IS 6582(Part 2):2001	Tf	9:1	90% survival of fish after 96 hrs in 100% effluent

Note:-BDL - Below Detection Limit; D.L- Detection Limit; mg/L - Milligrams per liter

CONCLUSION: ETP OUTLET EFFULENT WATER AS ABOVE PARAMETERS ARE WITHIN STANDARDS

End of Report



Authorized Signatory
(Dr K Ganesan - Lab Manager)

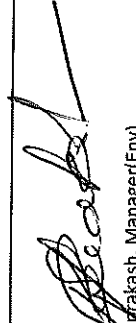
Form-1 (Rule 4)
Returns Regarding Water Consumed during the Month of October, 2018

Name and address of the Consumer	Purpose for which water consumed	Reading at the beginning of the first day of the calendar month under report	Reading at the end of the last day of the calendar month under report	Quantity of Water Consumed in Kilo Liters	If the meter was out of order, the monthly average consumption of water for the previous 3 months of the working period	Quantity of water qualifying for rebate according to the assessee	Remarks
M/s ONGC Mangalore Petrochemicals Limited, Mangalore Special Economic Zone, Permude, Mangalore -574 509	Industrial cooling, spraying in mine pits or boiler feed						
	Cooling Water	0	62,090	62090			
	Boiler Feed Water	0	73,094	73094			
	Fire Water	0	59550	59550			
	Domestic purpose						
	Drinking Water & Sanitation	0	5826	5826			
	Processing whereby water gets polluted and the pollutants are easily bio-degradable						
	Service Water						
Total Consumption			3778	3778			
				2,04,338			

Signature of the Consumer

Name

Address


 Shivayaprakash, Manager(Env)

M/s ONGC Mangalore Petrochemicals Limited, Mangalore Special Economic Zone, Permude, Mangalore -574 509

ANNEXURE - F

ONGC Mangalore Petrochemicals Limited

Production Details for October, 2018

Net Naptha Processed -1,32,058 MT

Sl. No.	Name of the Product	Quantity, MT
1	Paraxylene (Product)	68,060
2	Benzene (Co product)	18,214



ओ एन जी सी मंगलूर पेट्रोकेमिकल्स लिमिटेड

(मंगलूर रिफाइनरी एण्ड पेट्रोकेमिकल्स लिमिटेड की सहायक कंपनी)

ONGC Mangalore Petrochemicals Ltd.

(A Subsidiary of Mangalore Refinery and Petrochemicals Ltd.)

एमएसईजेड, पेमुदे, मंगलूर - ५७४ ५०९ MSEZ, Permude, Mangaluru - 574 509.

CON: U40107KA2006601041298 दूरभाष Direct Line :- 0824-2872000, फैक्स Fax:- 0824-2872005, Website: www.ompl.co.in

REF: OMPL/PCB/SP/2018-19/

Date: 20/12/2018

To:

The Environmental Officer
Regional Office
KSPCB
Baikampady, Mangalore-11



Dear Sir,

Sub: Submission of Environmental Monitoring Report for the Month of November, 2018 and Production Report for November, 2018

Ref: KSPCB Combined Consent Order No. AW-301949 dated 27th January, 2017

With respect to the above subject; we are herewith submitting the following Environmental Monitoring Reports and Production Report for the Month of November, 2018 respectively, enclosed herewith.

1. Ambient Air Quality Monitoring at 5 different locations in and around OMPL, enclosed as Annexure- A
2. Water Analysis Reports at 9 different locations in and around OMPL, as Annexure-B
3. Noise Level Monitoring Report at OMPL, as Annexure-C
4. Treated Effluent Analysis Report, Annexure-D
5. Stack Monitoring Analysis Report, Annexure-E
6. Returns Regarding Water Consumed, for the Month of November, 2018, as Annexure-F
7. Production Report as Annexure-G

Thanking You,

Shivaprakash
Manager (Env)

Vinay Kumar
for Management
29/12/18

CC: Member Secretary, KSPCB, Bangalore

CC: Head (Technical), MSEZ

CC: CEO, OMPL for info

CC: COO, OMPL for info

Hubert Enviro Care Systems (P) Ltd.

C-45, Industrial Estate, Balkampady, Mangalore, Karnataka - 575011.

Ph: 0824 - 2408111, Email: kro@hecs.in, Website: www.hecs.in

H.O.: # 18, 92nd Street, Ashok Nagar, Chennai - 600 083.

Ph: 42985555 Fax : 42985500 E-mail : labsales@hecs.in



ANNEXURE A

Laboratory Services DivisionAccredited by NABL in the fields of Chemical
ISO 9001, 14001 & OHSAS 18001 Certified.

Certificate No. TC-5786

AMBIENT AIR QUALITY MONITORING TEST REPORT - NOVEMBER 2018

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	OMPL - East Side
Report Date	06.12.2018
Report No	HECS/AA/001/061218

CONSOLIDATED TEST RESULTS

OCTOBER '18 - Week		29-Week		30-Week		31-Week		32-Week		33-Week	Avg Value
Parameters	NAAQ	02.11.18	05.11.18	09.11.18	12.11.18	16.11.18	19.11.18	23.11.18	26.11.18	30.11.18	
PM _{2.5} (µg/m ³)	60	19.1	17.9	19.2	17.7	18.6	17.6	18.4	19.1	18.2	16.59
PM ₁₀ (µg/m ³)	100	37.3	37.6	40.8	41.7	41.9	38.8	41.6	39.8	39.4	37.84
SO ₂ (µg/m ³)	80	3.8	4.1	4.0	4.5	3.9	4.2	4.3	3.9	4.4	3.79
NO ₂ (µg/m ³)	80	4.5	4.9	4.8	5.3	4.9	5.2	5.2	5.3	4.6	4.69
CO (mg/m ³)	2.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
O ₃ (µg/m ³)	100	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NH ₃ (µg/m ³)	400	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb (µg/m ³)	1.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
As (ng/m ³)	6.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni (ng/m ³)	20	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene (µg/m ³)	05	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
B(α)P (ng/m ³)	01	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Test Methods Followed:

PM₁₀ : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)
 PM_{2.5} : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
 SO₂ : IS 5182 (Pt 2): 2001 (RA 2017) (Improved west and Geake method)
 NO₂ : IS 5182 (Pt 6): 2006 (RA 2017) (Jacob and Hochheiser modified method)
 O₃ : HECS/AIR/SOP/005 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
 NH₃ : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)
 CO : IS 5182 (Pt 10): 1999 (RA 2013)
 Pb, As, Ni : In-house method based on CPCB guidelines vol. I (2011)
 C₆H₆ : GC FID/ GC MS based on IS: 5182 (Pt 11) based on CPCB guidelines vol. I (2011)
 B(α)P : In-house validated method based on CPCB guidelines vol. I (2011)

Note: BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide (DL 0.1 mg/m³); O₃-Ozone(DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(α)P- Benzo -α-pyrene (DL 0.5 ng/m³); ng/m³: nanogram per cubic meter; µg/m³ - microgram per cubic meter.

CONCLUSION: ALL THE PARAMETERS MEET THE NAAQ STANDARDS

*****End of Report *****

Authorized Signatory
(Dr K Ganesan - Lab Manager)

1. The report in full or part shall not be used for any promotional or publicity purpose without written consent by HECS organization 2. Samples are not drawn by HECS unless or otherwise mentioned 3. Unless specifically requested by customer the test items will not be retained more than 15 days from the date of issue of test report. 4. Under no circumstances lab accepts any liability or loss / damage caused by use or misuse of test report after invoicing or issue of test report. 5. The test results relate only to the test items. 6. # not under scope of accreditation.

Hubert Enviro Care Systems (P) Ltd.

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**Laboratory Services Division**

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Certificate No. TC-5786

AMBIENT AIR QUALITY MONITORING TEST REPORT - NOVEMBER 2018

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	Shantigudda
Report Date	06.12.2018
Report No	HECS/AA/002/061218

OCTOBER '18 - Week		29-Week		30-Week		31-Week		32-Week		33-Week	Avg Value
Parameters	NAAQ	02.11.18	05.11.18	09.11.18	12.11.18	16.11.18	19.11.18	23.11.18	26.11.18	30.11.18	
PM _{2.5} (µg/m ³)	60	16.9	16.4	16.3	17.0	16.8	16.6	16.9	17.1	16.5	16.75
PM ₁₀ (µg/m ³)	100	38.9	38.6	38.7	39.4	39.7	38.7	39.8	38.5	39.5	38.18
SO ₂ (µg/m ³)	80	2.5	2.3	2.5	2.8	2.6	2.7	2.3	2.7	2.4	3.44
NO ₂ (µg/m ³)	80	2.9	2.7	2.9	2.8	2.6	3.0	3.1	2.8	2.7	3.81
CO (mg/m ³)	2.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
O ₃ (µg/m ³)	100	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NH ₃ (µg/m ³)	400	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb (µg/m ³)	1.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
As (ng/m ³)	6.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni (ng/m ³)	20	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene (µg/m ³)	05	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
B(α)P (ng/m ³)	01	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

CONSOLIDATED TEST RESULTS**Test Methods Followed:**

PM₁₀ : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)
PM_{2.5} : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
SO₂ : IS 5182 (Pt 2): 2001 (RA 2017) (Improved west and Geake method)
NO₂ : IS 5182 (Pt 6): 2006 (RA 2017) (Jacob and Hochheiser modified method)
O₃ : HECS/AIR/SOP/005 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
NH₃ : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)
CO : IS 5182 (Pt 10): 1999 (RA 2013)
Pb, As, Ni : In-house method based on CPCB guidelines vol. I (2011)
C₆H₆ : GC FID/ GC MS based on IS: 5182 (Pt 11) based on CPCB guidelines vol. I (2011)
B(α)P : In-house validated method based on CPCB guidelines vol. I (2011)

Note: BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron;
SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide (DL 0.1 mg/m³); O₃-Ozone (DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(α)P- Benzo-α-pyrene (DL 0.5 ng/m³); ng/m³: nanogram per cubic meter; µg/m³ - microgram per cubic meter.

CONCLUSION: ALL THE PARAMETERS MEET THE NAAQ STANDARDS

*****End of Report *****

Authorized Signatory
(Dr K Ganesan - Lab Manager)

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Certificate No. TC-5786

AMBIENT AIR QUALITY MONITORING TEST REPORT-NOVEMBER 2018

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	Tenka Ekkar
Report Date	06.12.2018
Report No	HECS/AA/003/061218

CONSOLIDATED TEST RESULTS

OCTOBER '18 - Week		29-Week		30-Week		31-Week		32-Week		33-Week	Avg Value
Parameters	NAAQ	02.11.18	05.11.18	09.11.18	12.11.18	16.11.18	19.11.18	23.11.18	26.11.18	30.11.18	
PM _{2.5} (µg/m ³)	60	18.4	18.1	18.5	18.4	18.7	18.9	19.3	18.9	18.3	16.68
PM ₁₀ (µg/m ³)	100	39.8	37.9	39.7	40.8	39.2	38.7	39.6	38.9	40.5	37.89
SO ₂ (µg/m ³)	80	4.1	3.8	4.0	3.9	3.8	4.2	3.6	4.1	3.7	3.66
NO ₂ (µg/m ³)	80	4.8	4.9	5.0	5.1	4.8	4.7	4.5	5.4	4.6	4.64
CO (mg/m ³)	2.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
O ₃ (µg/m ³)	100	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NH ₃ (µg/m ³)	400	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb (µg/m ³)	1.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
As (ng/m ³)	6.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni (ng/m ³)	20	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene (µg/m ³)	05	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
B(α)P (ng/m ³)	01	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Test Methods Followed:

- PM₁₀ : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)
 PM_{2.5} : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
 SO₂ : IS 5182 (Pt 2): 2001 (RA 2017) (Improved wet and Geake method)
 NO₂ : IS 5182 (Pt 6): 2006 (RA 2017) (Jacob and Hochheiser modified method)
 O₃ : HECS/AIR/SOP/005 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
 NH₃ : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)
 CO : IS 5182 (Pt 10): 1999 (RA 2013)
 Pb, As, Ni : In-house method based on CPCB guidelines vol. I (2011)
 C₆H₆ : GC FID/ GC MS based on IS: 5182 (Pt 11) based on CPCB guidelines vol. I (2011)
 B(α)P : In-house validated method based on CPCB guidelines vol. I (2011)

Note: BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron;
 SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide (DL 0.1 mg/m³); O₃-Ozone (DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(α)P- Benzo -α-pyrene (DL 0.5 ng/m³); ng/m³: nanogram per cubic meter; µg/m³ - microgram per cubic meter.

CONCLUSION: ALL THE PARAMETERS MEET THE NAAQ STANDARDS

*****End of Report *****

Authorized Signatory
(Dr K Ganesan - Lab Manager)

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Certificate No. TC-5786

AMBIENT AIR QUALITY MONITORING TEST REPORT - NOVEMBER 2018

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	Permude Village
Report Date	06.12.2018
Report No	HECS/AA/004/061218

CONSOLIDATED TEST RESULTS

OCTOBER '18 - Week		29-Week		30-Week		31-Week		32-Week		33-Week	Avg Value
Parameters	NAAQS	02.11.18	05.11.18	09.11.18	12.11.18	16.11.18	19.11.18	23.11.18	26.11.18	30.11.18	
PM _{2.5} (µg/m ³)	60	18.8	18.2	18.1	17.8	17.9	18.0	18.4	18.3	17.0	16.83
PM ₁₀ (µg/m ³)	100	39.8	40.7	39.9	39.6	40.0	40.2	39.9	38.9	39.5	38.51
SO ₂ (µg/m ³)	80	4.2	4.4	4.5	4.8	4.5	4.8	4.5	4.4	4.6	4.30
NO ₂ (µg/m ³)	80	4.9	5.5	5.6	5.5	5.2	5.5	5.7	4.9	5.0	5.10
CO (mg/m ³)	2.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
O ₃ (µg/m ³)	100	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NH ₃ (µg/m ³)	400	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb (µg/m ³)	1.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
As (ng/m ³)	6.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni (ng/m ³)	20	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene (µg/m ³)	05	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
B(a)P (ng/m ³)	01	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Test Methods Followed:

PM₁₀ : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)
PM_{2.5} : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
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NO₂ : IS 5182 (Pt 6): 2006 (RA 2017) (Jacob and Hochheiser modified method)
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NH₃ : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)
CO : IS 5182 (Pt 10): 1999 (RA 2013)
Pb, As, Ni : In-house method based on CPCB guidelines vol. I (2011)
C₆H₆ : GC FID/ GC MS based on IS: 5182 (Pt 11) based on CPCB guidelines vol. I (2011)
B(a)P : In-house validated method based on CPCB guidelines vol. I (2011)

Note: BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron; SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide (DL 0.1 mg/m³); O₃-Ozone(DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(a)P- Benzo -α-pyrene (DL 0.5 ng/m³); ng/m³: nanogram per cubic meter; µg/m³ - microgram per cubic meter.

CONCLUSION: ALL THE PARAMETERS MEET THE NAAQ STANDARDS

*****End of Report *****

Authorized Signatory
(Dr K Ganesan - Lab Manager)

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Certificate No. TC-5786

AMBIENT AIR QUALITY MONITORING TEST REPORT - NOVEMBER 2018

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Ambient Air Quality Monitoring (AAQ)
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	OMPL - West Side
Report Date	06.12.2018
Report No	HECS/AA/005/061218

CONSOLIDATED TEST RESULTS

OCTOBER '18 - Week		29-Week		30-Week		31-Week		32-Week		33-Week	Avg Value
Parameters	NAAQ	02.11.18	05.11.18	09.11.18	12.11.18	16.11.18	19.11.18	23.11.18	26.11.18	30.11.18	
PM _{2.5} (µg/m ³)	60	17.9	17.5	18.1	18.3	18.2	18.6	18.9	19.0	18.5	16.85
PM ₁₀ (µg/m ³)	100	38.5	39.9	39.7	40.3	40.9	39.4	40.7	40.5	40.2	38.51
SO ₂ (µg/m ³)	80	3.7	4.0	4.1	3.8	3.7	4.3	4.5	4.8	3.9	3.85
NO ₂ (µg/m ³)	80	4.0	5.7	5.9	6.0	5.6	5.8	6.2	5.6	5.9	5.29
CO (mg/m ³)	2.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
O ₃ (µg/m ³)	100	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NH ₃ (µg/m ³)	400	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb (µg/m ³)	1.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
As (ng/m ³)	6.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni (ng/m ³)	20	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene (µg/m ³)	05	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
B(α)P (ng/m ³)	01	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Test Methods Followed:

- PM₁₀ : IS 5182 (Pt 23): 2006 (RA 2017) (Gravimetric)
PM_{2.5} : HECS/AIR/SOP/002 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
SO₂ : IS 5182 (Pt 2): 2001 (RA 2017) (Improved wet and Geake method)
NO₂ : IS 5182 (Pt 6): 2006 (RA 2017) (Jacob and Hochheiser modified method)
O₃ : HECS/AIR/SOP/005 Issue 02 dt. 13.06.2018 based on CPCB guidelines vol. I (2011)
NH₃ : HECS/AIR/SOP/006 Issue 02 dt. 13.06.2018 as per CPCB guidelines vol. I (2011)
CO : IS 5182 (Pt 10): 1999 (RA 2013)
Pb, As, Ni : In-house method based on CPCB guidelines vol. I (2011)
C₆H₆ : GC FID/ GC MS based on IS: 5182 (Pt 11) based on CPCB guidelines vol. I (2011)
B(α)P : In-house validated method based on CPCB guidelines vol. I (2011)

Note: BDL =Below detection limit; DL - Detection Limit; PM_{2.5}-Particulate matter size less than 2.5 Micron, PM₁₀-Particulate matter size less than 10 Micron;
SO₂ Sulphur dioxide; NO₂ - Nitrogen-di-oxide; CO - Carbon Mono Oxide (DL 0.1 mg/m³); O₃-Ozone(DL 10 µg/m³); NH₃-Ammonia (DL 5 µg/m³); Pb-Lead (DL 0.05 µg/m³); As-Arsenic (DL 0.1 ng/m³); Ni-Nickel (DL 0.5 ng/m³); Benzene-(DL 1 µg/m³); B(α)P- Benzo -α-pyrene (DL 0.5 ng/m³); ng/m³: nanogram per cubic meter; µg/m³ - microgram per cubic meter.

CONCLUSION: ALL THE PARAMETERS MEET THE NAAQ STANDARDS
*****End of Report *****

Authorized Signatory
(Dr K Ganesan - Lab Manager)

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ANNEXURE - B

Laboratory Services Division

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TEST REPORT OF GROUND WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	GW1 - Ground Water collected from Narayana Guru Community Hall, Permude
Date of Sampling	24.11.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	06.12.2018
Report No	HECS/W/001/061218

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	IS10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	8.04	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	BDL (DL 0.1)	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	133.28	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	45.56	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	44.16	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	8.68	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	4.76	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	190	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	8.93	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	0.5	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	7.9	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:- BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: GROUND WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report

Authorized Signatory
(Dr K Ganesan - Lab Manager)

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Certificate No. TC-5786

TEST REPORT OF GROUND WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	GW2 - Ground Water collected from Gagnet Labour Colony
Date of Sampling	24.11.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	06.12.2018
Report No	HECS/W/002/061218

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.64	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	BDL (DL 0.1)	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	145.04	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	43.99	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	71.04	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	7.71	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	8.57	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	190	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	8.41	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	2.1	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter**CONCLUSION: GROUND WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012**

End of Report

Authorized Signatory
(Dr K Ganesan - Lab Manager)

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TEST REPORT OF GROUND WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	GW3- Ground Water collected from L&T New Labor Colony
Date of Sampling	24.11.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	06.12.2018
Report No	HECS/W/003/061218

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	6.54	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	BDL (DL 0.1)	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	66.64	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	18.85	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	21.12	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	14.46	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	4.76	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	116	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	12.03	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	2.8	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: GROUND WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report

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(Dr K Ganesan - Lab Manager)

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TEST REPORT OF GROUND WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	GW4-Ground Water collected Near OMPL - ETP
Date of Sampling	29.11.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	06.12.2018
Report No	HECS/W/004/061218

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.52	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	BDL (DL 0.1)	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	54.88	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	10.99	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	19.2	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	2.89	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	6.66	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	65	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	10.60	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	3.0	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:- BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: GROUND WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

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TEST REPORT OF OPEN WELL WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	OW1- Open Water collected from TenkaEkkar
Date of Sampling	24.11.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	06.12.2018
Report No	HECS/W/005/061218

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	7.00	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	BDL (DL 0.1)	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	70.56	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	14.14	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	28.8	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	9.64	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	8.57	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	121	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	9.055	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	1.8	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: OPENWELL WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report

Authorized Signatory
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TEST REPORT OF OPEN WELL WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	OW2 - Open Water collected from Shantigudda Village
Date of Sampling	24.11.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	06.12.2018
Report No	HECS/W/006/061218

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	8.20	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	Colourless	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	BDL (DL 0.1)	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	235.2	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	43.21	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	86.4	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	48.21	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	30.96	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	350	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	17.60	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	2.1	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: OPENWELL WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report


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TEST REPORT OF OPEN WELL WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	OW3 - Open Water collected from Premude Village
Date of Sampling	24.11.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	06.12.2018
Report No	HECS/W/007/061218

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	6.70	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	BDL (DL 0.1)	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	47.04	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	14.14	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	13.44	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	8.67	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	2.85	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	108	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	11.38	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	3.7	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	BDL (DL 0.02)	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note: BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per Liter;
MPN- Most Probable Number; mL-Milliliter

CONCLUSION: OPENWELL WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report

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TEST REPORT OF SURFACE WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	SW1 - Surface Water collected Near OMPL - Flare Area
Date of Sampling	24.11.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	06.12.2018
Report No	HECS/W/008/061218

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	6.6	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	1.5	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	125.4	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	46.7	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	91.8	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	11.5	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	7.6	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	386	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	62.1	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	0.28	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	3.1	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	0.22	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:-BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per liter; NA-Not Available

CONCLUSION: SURFACE WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report

Authorized Signatory
(Dr K Ganesan - Lab Manager)

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TEST REPORT OF SURFACE WATER QUALITY MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	SW2 - Surface Water collected Near OMPL - Near Central Warehouse
Date of Sampling	24.11.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	06.12.2018
Report No	HECS/W/009/061218

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	As per IS 10500:2012 Permissible Limit
1.	pH (at 25°C)	IS 3025 (Part-11) 1983	-	8.1	6.5-8.5
2.	Colour	IS 3025 (Part-4) 1983	Hazen unit	BDL (DL 1)	15
3.	Turbidity	IS 3025 (Part-10) 1984	NTU	3.2	5 max
4.	Odour	IS 3025 (Part-5) 1983	-	Agreeable	Agreeable
5.	Taste	IS 3025 (Part-8) 1984	-	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (Part-21) 1983	mg/L	77.0	600 max
7.	Calcium as Ca	IS 3025 (Part-40) 1991	mg/L	11.6	200 max
8.	Total Alkalinity as CaCO ₃	IS 3025 (Part-23) 1986	mg/L	33.7	200 max
9.	Chloride as Cl	IS 3025 (Part-32) 1988	mg/L	66.5	1000 max
10.	Magnesium as Mg	IS 3025 (Part-46) 1994	mg/L	8.8	100 max
11.	Total Dissolved Solids	IS 3025 (Part-16) 1984	mg/L	159	2000 max
12.	Sulphate as SO ₄	IS 3025 (Part-24) 1986	mg/L	51	400 max
13.	Fluoride	IS 3025 (Part-60) 2008	mg/L	BDL (DL 0.2)	1.5 max
14.	Nitrate as NO ₃	ASTM (Part-31) 1978	mg/L	4.3	45 max
15.	Iron as Fe	IS3025 (Part-53) 2003	mg/L	0.23	0.3 max
16.	Hexavalent Chromium Cr ⁶⁺	IS3025 (Part-52) 2003	mg/L	BDL (DL 0.01)	0.05 max
17.	Total coli form Bacteria	IS1622:1981(R.aff 2009)	MPN/100mL	Absent	Not Detectable
18.	Escherichia coli	IS1622:1981(R.aff 2009)	Per 100mL	Absent	Not Detectable

Note:- BDL - Below Detection Limit; D.L- Detection Limit; NTU-Nephelometric Turbidity Unit; mg/L - Milligrams per liter

CONCLUSION: SURFACE WATER AS ABOVE PARAMETERS MEETS DRINKING WATER GUIDELINES OF IS: 10500:2012

End of Report

Authorized Signatory
(Dr K Ganesan - Lab Manager)

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Certificate No. TC-5786

Laboratory Services Division

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NOISE MONITORING TEST REPORT – NOVEMBER 2018

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Noise Monitoring
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Sampling Location	OMPL – North, South, East and West sides
Sampling Date	05.11.2018
Report Date	06.12.2018
Report No.	HECS/N/001/061218

RESULTS

S.No.	Sampling Location	MoEF requirements in dB		Avg. Noise level observed in dB	
		Day	Night	Day	Night
1.	OMPL-North	75	70	68.7	67.0
2.	OMPL-South			68.4	65.7
3.	OMPL-East			68.9	66.9
4.	OMPL-West			70.1	67.1

Note: dB: Decibel

Limits: Industrial Area: Day Time-75 dB (A), Night Time-70 dB (A). Commercial Area: Day Time-65 dB (A), Night Time-55 dB (A). Residential Area: Day Time-55 dB (A), Night Time-45 dB (A). Silence Zone: Day Time-50 dB (A), Night Time-40 dB (A).

Note: Leq- Equivalent Noise Level (hourly); Reference: The Noise Pollution (Regulation and Control) Rules, 2000, CPCB, New Delhi

INFERENCE: The observed noise levels are within the limits as per The Noise Pollution (Regulation and Control) Rules, 2000 under the Environment (Protection) Act, 1986

*****End of Report *****

Authorized Signatory
(Dr K Ganesan - Lab Manager)

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ANNEXURE-D

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TEST REPORT OF ETP EFFLUENT MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Guard Pond Pump Discharge (ETP Effluent)
Date of Sampling	29.11.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	06.12.2018
Report No	HECS/W/015/061218

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	Permissible Limit
1.	Color	IS:3025:(Pt 4)1983 (Reaff 2006)	Hazen Units	Colourless	All efforts should be made to remove colour and unpleasant odour as far as practicable
2.	Odour	IS 3025 (Part5)-1983, Reaff 2006	-	Agreeable	
3.	Total suspended Solids	2540D APHA 22nd Edn.. 2012	mg/L	4.0	100
4.	pH	IS:3025:(Pt 11):1983 (Reaff 2006)	-	7.6	6.0-8.5
5.	Temperature	IS 3025 (Pt 9):1983 (Reaff:2006)	°C	30	Shall not exceed 5 degree Centigrade above the receiving water temperature
6.	Oil & Grease	IS 3025,4(Pt 39):2000 (Reaff 2009)	mg/L	4.86	5
7.	Total Residual Chlorine as Cl ₂	IS:3025 (Pt26)1986 (Reaff 2009)	mg/L	BDL (DL 0.1)	1
8.	Ammonical Nitrogen as N	IS 3025 Part (34)1988	mg/L	4.0	50
9.	Total Kjeldhal Nitrogen as N	IS 3025 Part (34)1988	mg/L	9.95	100
10.	Free Ammonia as NH ₃	IS:3025 (Part34)1998 Reaff. 2003	mg/L	BDL(DL 0.02)	5
11.	BOD, 3 days @ 27°C as O ₂	IS:3025 (Pt 44)1993 (Reaff 2009)	mg/L	15.6	30
12.	COD as O ₂	IS 3025 Part (58)2006	mg/L	39.84	125
13.	Lead as Pb	IS:3025 (Pt 47)1994 (Reaff 2009)	mg/L	BDL(DL 0.1)	0.1
14.	Chromium (Hexavalent) as Cr ⁶⁺	IS 3025 Part (52):2003	mg/L	BDL(DL 0.01)	0.1
15.	Total Chromium as Cr	IS 3025(Pt52):2003 (Reaff 2009)	mg/L	BDL(DL 0.01)	2.0
16.	Copper as Cu	IS:3025:5,(Pt 42)1992 (Reaff 2009)	mg/L	BDL(DL 0.05)	1.0
17.	Zinc as Zn	IS:3025 (Part49)1994 (Reaff 2009)	mg/L	BDL(DL 0.1)	5.0

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TEST REPORT OF ETP EFFLUENT MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Guard Pond Pump Discharge (ETP Effluent)
Date of Sampling	29.11.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	06.12.2018
Report No	HECS/W/015/061218

RESULTS

S.No.	Parameters monitored	Test method followed	Units	Results	Permissible Limit
18.	Nickel as Ni	IS:3025 (Part54)2003 (Reaff 2009)	mg/L	BDL(DL 0.05)	1.0
19.	Fluoride as F-	IS 3025 part (60):2008	mg/L	BDL(DL 0.2)	1.0
20.	Sulphide as S ²⁻	IS:3025 (Pt 29)1986 (Reaff 2009)	mg/L	BDL(DL 0.04)	2.0
21.	Particle Size of Suspended solids	APHA 22nd Edition	-	Passed through 850 micron	850 micron
22.	Arsenic as As	IS:3025 (Part37)1988(Reaff 2009)	mg/L	BDL(DL 0.005)	0.2
23.	Mercury as Hg	IS:3025 (Part48)1994 RA 1999	mg/L	BDL(DL 0.001)	0.01
24.	Cadmium as Cd	IS:3025 (Part41)1991	mg/L	BDL(DL 0.01)	0.1
25.	Selenium as Se	IS:3025 (Part56)2003	mg/L	BDL(DL 0.005)	0.05
26.	Cyanide as CN	IS:3025 (Part27)1986 Reaff. 2009	mg/L	BDL(DL 0.01)	0.2
27.	Phenolic Compounds as C ₆ H ₅ OH	IS 3025 Part (43)1992, RA 2009	mg/L	BDL(DL 0.001)	0.35
28.	Total Iron as Fe	IS 3025(Pt 53):2003(Reaff 2009)	mg/L	BDL(DL 0.02)	3
29.	Manganese	IS:3025:(Pt-59):2006	mg/L	BDL(DL 0.01)	2
30.	Total Phosphorous as P	IS 3025(Pt 31):1988(Reaff 2009)	mg/L	BDL(DL 0.01)	3
31.	Nitrate	IS 3025 (Pt 34):1988 (Reaff 2009)	mg/L	BDL(DL 1)	20
32.	Vanadium as V	IS:3025 (Part56)2003	mg/L	BDL(DL 0.01)	0.1
33.	Benzo(a)pyrene	USEPA 8270C	mg/L	BDL(DL 0.0001)	0.2
34.	Benzene	USEPA 8270C	mg/L	BDL(DL 0.0001)	0.1
35.	Bioassay Test	IS 6582(Part 2):2001	Tf	9:1	90% survival of fish after 96 hrs in 100% effluent

Note:-BDL - Below Detection Limit; D.L- Detection Limit; mg/L - Milligrams per liter

CONCLUSION: ETP OUTLET EFFULENT WATER AS ABOVE PARAMETERS ARE WITHIN STANDARDS

End of Report

Authorized Signatory
(Dr K Ganesan - Lab Manager)

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TEST REPORT OF ETP EFFULENT MONITORING

Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Guard Pond Pump Discharge (ETP Effluent)
Date of Sampling	12.11.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	06.12.2018
Report No	HECS/W/011/061218

RESULTS

No.	Parameters monitored	Test method followed	Units	Results	Permissible Limit
1.	Color	IS:3025:(Pt 4):1983 (Reaff 2006)	Hazen Units	Colourless	All efforts should be made to remove colour and unpleasant odour as far as practicable
2.	Odour	IS 3025 (Part5)-1983, Reaff 2006	-	Agreeable	
3.	Total suspended Solids	2540D APHA 22nd Edn.. 2012	mg/L	3.9	100
4.	pH	IS:3025:(Pt 11):1983 (Reaff 2006)	-	7.56	6.0-8.5
5.	Temperature	IS 3025 (Pt 9):1983 (Reaff:2006)	°C	29	Shall not exceed 5 degree Centigrade above the receiving water temperature
6.	Oil & Grease	IS 3025,4(Pt 39):2000 (Reaff 2009)	mg/L	4.73	5
7.	Total Residual Chlorine as Cl ₂	IS:3025 (Pt26)1986 (Reaff 2009)	mg/L	BDL (DL 0.1)	1
8.	Ammonical Nitrogen as N	IS 3025 Part (34)1988	mg/L	7.8	50
9.	Total Kjeldhal Nitrogen as N	IS 3025 Part (34)1988	mg/L	29.5	100
10.	Free Ammonia as NH ₃	IS:3025 (Part34)1998 Reaff. 2003	mg/L	BDL(DL 0.02)	5
11.	BOD, 3 days @ 27°C as O ₂	IS:3025 (Pt 44)1993 (Reaff 2009)	mg/L	15.3	30
12.	COD as O ₂	IS 3025 Part (58)2006	mg/L	38.82	125
13.	Lead as Pb	IS:3025 (Pt 47)1994 (Reaff 2009)	mg/L	BDL(DL 0.1)	0.1
14.	Chromium (Hexavalent) as Cr ⁶⁺	IS 3025 Part (52):2003	mg/L	BDL(DL 0.01)	0.1
15.	Total Chromium as Cr	IS 3025(Pt52):2003 (Reaff 2009)	mg/L	BDL(DL 0.01)	2.0
16.	Copper as Cu	IS:3025-5,(Pt 42)1992 (Reaff 2009)	mg/L	BDL(DL 0.05)	1.0
17.	Zinc as Zn	IS:3025 (Part49)1994 (Reaff 2009)	mg/L	BDL(DL 0.1)	5.0

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Name of the Industry	M/s. ONGC Mangalore Petrochemicals Limited (OMPL)
Address of the Industry	Mangalore SEZ, Premude Village, Mangalore - 574509
Sample Description	Guard Pond Pump Discharge (ETP Effluent)
Date of Sampling	12.11.2018
Sample Collected by	Hubert Enviro Care Systems (P) Ltd
Report Date	06.12.2018
Report No	HECS/W/011/061218

RESULTS

No.	Parameters monitored	Test method followed	Units	Results	Permissible Limit
18.	Nickel as Ni	IS:3025 (Part54):2003 (Reaff 2009)	mg/L	BDL(DL 0.05)	1.0
19.	Fluoride as F-	IS 3025 part (60):2008	mg/L	BDL(DL 0.2)	1.0
20.	Sulphide as S ²⁻	IS:3025 (Pt 29)1986 (Reaff 2009)	mg/L	BDL(DL 0.04)	2.0
21.	Particle Size of Suspended solids	APHA 22nd Edition	-	Passed through 850 micron	850 micron
22.	Arsenic as As	IS:3025 (Part37)1988(Reaff 2009)	mg/L	BDL(DL 0.005)	0.2
23.	Mercury as Hg	IS:3025 (Part48)1994 RA 1999	mg/L	BDL(DL 0.001)	0.01
24.	Cadmium as Cd	IS:3025 (Part41)1991	mg/L	BDL(DL 0.01)	0.1
25.	Selenium as Se	IS:3025 (Part56)2003	mg/L	BDL(DL 0.005)	0.05
26.	Cyanide as CN	IS:3025 (Part27)1986 Reaff. 2009	mg/L	BDL(DL 0.01)	0.2
27.	Phenols as C ₆ H ₅ OH	IS 3025 Part (43)1992,RA 2009	mg/L	BDL(DL 0.001)	0.35
28.	Total Iron as Fe	IS 3025(Pt 53):2003(Reaff 2009)	mg/L	BDL(DL 0.02)	3
29.	Manganese	IS:3025:(Pt-59):2006	mg/L	BDL(DL 0.01)	2
30.	Total Phosphorous as P	IS 3025(Pt 31):1988(Reaff 2009)	mg/L	BDL(DL 0.01)	3
31.	Nitrate	IS 3025 (Pt 34):1988 (Reaff 2009)	mg/L	BDL(DL 1)	20
32.	Vanadium as V	IS:3025 (Part56)2003	mg/L	BDL(DL 0.01)	0.1
33.	Benzo(a)pyrene	USEPA 8270C	mg/L	BDL(DL 0.0001)	0.2
34.	Benzene	USEPA 8270C	mg/L	BDL(DL 0.0001)	0.1
35.	Bioassay Test	IS 6582(Part 2):2001	Tf	9:1	90% survival of fish after 96 hrs in 100% effluent

Note:-BDL - Below Detection Limit; D.L- Detection Limit; mg/L - Milligrams per liter

CONCLUSION: ETP OUTLET EFFULENT WATER AS ABOVE PARAMETERS ARE WITHIN STANDARDS

End of Report


 Authorized Signatory
 (Dr K Ganesan - Lab Manager)

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EMISSION AIR FROM STACK/ CHIMNEY MONITORING TEST REPORT OF NOVEMBER 2018

Page No. 1 of 9

Name of the Industry	M/s ONGC Mangalore Petrochemicals Limited
Address of the Industry	Mangalore SEZ, Permude Village, Mangalore-574509, Karnataka, India.
Stack ID	NHT Charge heater
Sample Description	Manual Stack Emission Monitoring
Sampling Date	20.11.2018
Sample Receipt	21.11.2018
Equipment Used	Vayubodhan VSS1
Method of Sampling & Analysis	IS 11255:1995 Methods for Measurement of Emission from Stationary Sources
Sample Drawn by	Hubert Enviro Care Systems (P) Ltd
Report Date	06.12.2018
Report No	HECS-OMPL/SEM/001/061218

General Details	
Ambient Temperature (°C)	28
Stack Diameter (m)	1.96
Stack Height (m)	65
Stack Temperature (°C)	252
Flue Gas Velocity (m/s)	9.7
Flue gas flow rate (Nm ³ /hr)	54542.0

Parameter monitored	Protocol	Results (mg/Nm ³)	Standard Norms (mg/Nm ³)
SPM	IS 11255 (Part 1)-1985	3.9	5
Sulphur Dioxide (SO ₂)	IS 11255 (Part 3)-1985	42	50
Oxides of Nitrogen (NO _x)	IS 11255 (Part 7)-2005	70	250
Carbon monoxide (CO)	IS 5182 (Part 10)-1999	BDL (DL 1)	100

Note: mg/Nm³: milligram per normal cubic meter; SPM: Suspended Particulate Matter;
m/s – Meter per second; Nm³/hr – Normal cubic meter per hour

Inference: - STACK EMISSIONS AS ABOVE PARAMETERS ARE WITHIN STANDARDS


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EMISSION AIR FROM STACK/ CHIMNEY MONITORING TEST REPORT OF NOVEMBER 2018

Page No. 2 of 9

Name of the Industry	M/s ONGC Mangalore Petrochemicals Limited
Address of the Industry	Mangalore SEZ, Permude Village, Mangalore-574509, Karnataka, India.
Stack ID	Isomer Charge Heater
Sample Description	Manual Stack Emission Monitoring
Sampling Date	20.11.2018
Sample Receipt	21.11.2018
Equipment Used	Vayubodhan VSS1
Method of Sampling & Analysis	IS 11255:1995 Methods for Measurement of Emission from Stationary Sources
Sample Drawn by	Hubert Enviro Care Systems (P) Ltd
Report Date	06.12.2018
Report No	HECS-OMPL/SEM/002/061218

General Details	
Ambient Temperature (°C)	28
Stack Diameter (m)	2.4
Stack Height (m)	66
Stack Temperature (°C)	178
Flue Gas Velocity (m/s)	4.5
Flue gas flow rate (Nm ³ /hr)	40058.4

Parameter monitored	Protocol	Results(mg/Nm ³)	Standard Norms(mg/Nm ³)
SPM	IS 11255(Part 1)-1985	3.8	5
Sulphur Dioxide(SO ₂)	IS 11255(Part 3)-1985	24	50
Oxides of Nitrogen (NO _x)	IS 11255(Part 7)-2005	178	250
Carbon monoxide (CO)	IS 5182(Part 10)-1999	BDL (DL 1)	100

Note: mg/Nm³: milligram per normal cubic meter; SPM: Suspended Particulate Matter;
m/s – Meter per second; Nm³/hr – Normal cubic meter per hour

Inference: - STACK EMISSIONS AS ABOVE PARAMETERS ARE WITHIN STANDARDS


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EMISSION AIR FROM STACK/ CHIMNEY MONITORING TEST REPORT OF NOVEMBER2018

Page No. 3 of 9

Name of the Industry	M/s ONGC Mangalore Petrochemicals Limited
Address of the Industry	Mangalore SEZ, Permude Village, Mangalore-574509, Karnataka, India.
Stack ID	CPP (GTG-HRSG) - 1
Sample Description	Manual Stack Emission Monitoring
Sampling Date	17.11.2018
Sample Receipt	18.11.2018
Equipment Used	Vayubodhan VSS1
Method of Sampling & Analysis	IS 11255:1995 Methods for Measurement of Emission from Stationary Sources
Sample Drawn by	Hubert Enviro Care Systems (P) Ltd
Report Date	06.12.2018
Report No	HECS-OMPL/SEM/003/061218

General Details	
Ambient Temperature (°C)	25
Stack Diameter (m)	2.9
Stack Height (m)	70
Stack Temperature (°C)	112
Flue Gas Velocity (m/s)	12.2
Flue gas flow rate (Nm ³ /hr)	19143.2

Parameter monitored	Protocol	Results(mg/Nm ³)	Standard Norms(mg/Nm ³)
SPM	IS 11255(Part 1)-1985	33.9	50
Sulphur Dioxide(SO ₂)	IS 11255(Part 3)-1985	146	850
Oxides of Nitrogen(NO _x)	IS 11255(Part 7)-2005	199	350
Carbon monoxide (CO)	IS 5182(Part 10)-1999	BDL (DL 1)	150

Note: mg/Nm³: milligram per normal cubic meter; SPM: Suspended Particulate Matter;
m/s – Meter per second; Nm³/hr – Normal cubic meter per hour

Inference: - STACK EMISSIONS AS ABOVE PARAMETERS ARE WITHIN STANDARDS

(Dr K GANESAN)
Authorized Signatory

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EMISSION AIR FROM STACK/ CHIMNEY MONITORING TEST REPORT OF NOVEMBER 2018

Page No. 4 of 9

Name of the Industry	M/s ONGC Mangalore Petrochemicals Limited
Address of the Industry	Mangalore SEZ, Permude Village, Mangalore-574509, Karnataka, India.
Stack ID	Plat former Unit Charge Heater
Sample Description	Manual Stack Emission Monitoring
Sampling Date	17.11.2018
Sample Receipt	18.11.2018
Equipment Used	Vayubodhan VSS1
Method of Sampling & Analysis	IS 11255:1995 Methods for Measurement of Emission from Stationary Sources
Sample Drawn by	Hubert Enviro Care Systems (P) Ltd
Report Date	06.12.2018
Report No	HECS-OMPL/SEM/004/061218

General Details	
Ambient Temperature (°C)	28
Stack Diameter (m)	4.2
Stack Height (m)	95
Stack Temperature (°C)	166
Flue Gas Velocity (m/s)	5.3
Flue gas flow rate (Nm ³ /hr)	180432.0

Parameter monitored	Protocol	Results(mg/Nm ³)	Standard Norms(mg/Nm ³)
SPM	IS 11255(Part 1)-1985	3.2	5
Sulphur Dioxide (SO ₂)	IS 11255(Part 3)-1985	35.6	50
Oxides of Nitrogen(NO _x)	IS 11255(Part 7)-2005	122	250
Carbon monoxide (CO)	IS 5182(Part 10)-1999	BDL (DL 1)	100

Note: mg/Nm³: milligram per normal cubic meter; SPM: Suspended Particulate Matter;
m/s – Meter per second; Nm³/hr – Normal cubic meter per hour

Inference: - STACK EMISSIONS AS ABOVE PARAMETERS ARE WITHIN STANDARDS,


(Dr K GANESAN)
Authorized Signatory

Hubert Enviro Care Systems (P) Ltd.

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EMISSION AIR FROM STACK/ CHIMNEY MONITORING TEST REPORT OF NOVEMBER 2018

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Name of the Industry	M/s ONGC Mangalore Petrochemicals Limited
Address of the Industry	Mangalore SEZ, Permude Village, Mangalore-574509, Karnataka, India.
Stack ID	CPP Utility Boiler
Sample Description	Manual Stack Emission Monitoring
Sampling Date	18.11.2018
Sample Receipt	19.11.2018
Equipment Used	Vayubodhan VSS1
Method of Sampling & Analysis	IS 11255:1995 Methods for Measurement of Emission from Stationary Sources
Sample Drawn by	Hubert Enviro Care Systems (P) Ltd
Report Date	06.12.2018
Report No	HECS-OMPL/SEM/005/061218

General Details	
Ambient Temperature (°C)	28
Stack Diameter (m)	2.75
Stack Height (m)	70
Stack Temperature (°C)	167
Flue Gas Velocity (m/s)	14.5
Flue gas flow rate (Nm ³ /hr)	195523.0

Parameter monitored	Protocol	Results (mg/Nm ³)	Standard Norms (mg/Nm ³)
SPM	IS 11255(Part 1)-1985	23.5	50
Sulphur Dioxide(SO ₂)	IS 11255(Part 3)-1985	68.7	850
Oxides of Nitrogen(NO _x)	IS 11255(Part 7)-2005	155	350
Carbon monoxide (CO)	IS 5182(Part 10)-1999	BDL (DL 1)	150

Note: mg/Nm³: milligram per normal cubic meter; SPM: Suspended Particulate Matter;
m/s – Meter per second; Nm³/hr – Normal cubic meter per hour

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Name of the Industry	M/s ONGC Mangalore Petrochemicals Limited
Address of the Industry	Mangalore SEZ, Permude Village, Mangalore-574509, Karnataka, India.
Stack ID	Tatory Charge Heater
Sample Description	Manual Stack Emission Monitoring
Sampling Date	18.11.2018
Sample Receipt	19.11.2018
Equipment Used	Vayubodhan VSS1
Method of Sampling & Analysis	IS 11255:1995 Methods for Measurement of Emission from Stationary Sources
Sample Drawn by	Hubert Enviro Care Systems (P) Ltd
Report Date	06.12.2018
Report No	HECS-OMPL/SEM/006/061218

General Details	
Ambient Temperature (°C)	26
Stack Diameter (m)	1.75
Stack Height (m)	65
Stack Temperature (°C)	166
Flue Gas Velocity (m/s)	5.3
Flue gas flow rate (Nm ³ /hr)	31154.2

Parameter monitored	Protocol	Results (mg/Nm ³)	Standard Norms (mg/Nm ³)
SPM	IS 11255(Part 1)-1985	3.6	5
Sulphur Dioxide(SO ₂)	IS 11255(Part 3)-1985	19.8	50
Oxides of Nitrogen(NO _x)	IS 11255(Part 7)-2005	189	250
Carbon monoxide (CO)	IS 5182(Part 10)-1999	BDL (DL 1)	100

Note: mg/Nm³: milligram per normal cubic meter; SPM: Suspended Particulate Matter;
m/s – Meter per second; Nm³/hr – Normal cubic meter per hour

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Name of the Industry	M/s ONGC Mangalore Petrochemicals Limited
Address of the Industry	Mangalore SEZ, Permude Village, Mangalore-574509, Karnataka, India.
Stack ID	Xylene Column Reboiler Heater(Part A)
Sample Description	Manual Stack Emission Monitoring
Sampling Date	19.11.2018
Sample Receipt	20.11.2018
Equipment Used	Vayubodhan VSS1
Method of Sampling & Analysis	IS 11255:1995 Methods for Measurement of Emission from Stationary Sources
Sample Drawn by	Hubert Enviro Care Systems (P) Ltd
Report Date	06.12.2018
Report No	HECS-OMPL/SEM/007/061218

General Details	
Ambient Temperature (°C)	25
Stack Diameter (m)	3.69
Stack Height (m)	98
Stack Temperature (°C)	199
Flue Gas Velocity (m/s)	5.6
Flue gas flow rate (Nm ³ /hr)	146732.7

Parameter monitored	Protocol	Results (mg/Nm ³)	Standard Norms (mg/Nm ³)
SPM	IS 11255(Part 1)-1985	6.9	50
Sulphur Dioxide(SO ₂)	IS 11255(Part 3)-1985	14	850
Oxides of Nitrogen(NO _x)	IS 11255(Part 7)-2005	52	350
Carbon monoxide (CO)	IS 5182(Part 10)-1999	BDL (DL 1)	150

Note: mg/Nm³: milligram per normal cubic meter; SPM: Suspended Particulate Matter;
m/s – Meter per second; Nm³/hr – Normal cubic meter per hour

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Name of the Industry	M/s ONGC Mangalore Petrochemicals Limited
Address of the Industry	Mangalore SEZ, Permude Village, Mangalore-574509, Karnataka, India.
Stack ID	Xylene Column Reboiler Heater(Part B)
Sample Description	Manual Stack Emission Monitoring
Sampling Date	19.11.2018
Sample Receipt	20.11.2018
Equipment Used	Vayubodhan VSS1
Method of Sampling & Analysis	IS 11255:1995 Methods for Measurement of Emission from Stationary Sources
Sample Drawn by	Hubert Enviro Care Systems (P) Ltd
Report Date	06.12.2018
Report No	HECS-OMPL/SEM/008/061218

General Details	
Ambient Temperature (°C)	26
Stack Diameter (m)	3.69
Stack Height (m)	98
Stack Temperature (°C)	194
Flue Gas Velocity (m/s)	5.6
Flue gas flow rate (Nm ³ /hr)	148725.6

Parameter monitored	Protocol	Results (mg/Nm ³)	Standard Norms (mg/Nm ³)
SPM	IS 11255(Part 1)-1985	6.9	50
Sulphur Dioxide(SO ₂)	IS 11255(Part 3)-1985	14	850
Oxides of Nitrogen(NO _x)	IS 11255(Part 7)-2005	49	350
Carbon monoxide (CO)	IS 5182(Part 10)-1999	BDL (DL 1)	150

Note: mg/Nm³: milligram per normal cubic meter; SPM: Suspended Particulate Matter;
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EMISSION AIR FROM STACK/ CHIMNEY MONITORING TEST REPORT OF - NOVEMBER2018

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Name of the Industry	M/s ONGC Mangalore Petrochemicals Limited
Address of the Industry	Mangalore SEZ, Permude Village, Mangalore-574509, Karnataka, India.
Stack ID	BTF (Toluene Column Reboiler Heater)
Sample Description	Manual Stack Emission Monitoring
Sampling Date	20.11.2018
Sample Receipt	21.11.2018
Equipment Used	Vayubodhan VSS1
Method of Sampling & Analysis	IS 11255:1995 Methods for Measurement of Emission from Stationary Sources
Sample Drawn by	Hubert Enviro Care Systems (P) Ltd
Report Date	06.12.2018
Report No	HECS-OMPL/SEM/009/061218

General Details	
Ambient Temperature (°C)	28
Stack Diameter (m)	3.29
Stack Height (m)	80
Stack Temperature (°C)	163
Flue Gas Velocity (m/s)	5.5
Flue gas flow rate (Nm ³ /hr)	89653.6

Parameter monitored	Protocol	Results (mg/Nm ³)	Standard Norms (mg/Nm ³)
SPM	IS 11255(Part 1)-1985	5.9	50
Sulphur Dioxide(SO ₂)	IS 11255(Part 3)-1985	8.2	850
Oxides of Nitrogen(NO _x)	IS 11255(Part 7)-2005	36	350
Carbon monoxide (CO)	IS 5182(Part 10)-1999	BDL (DL 1)	150

Note: mg/Nm³ : milligram per normal cubic meter; SPM: Suspended Particulate Matter;
m/s – Meter per second; Nm³/hr – Normal cubic meter per hour

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Form-1 (Rule 4)
Returns Regarding Water Consumed during the Month of November, 2018.

Name and address of the Consumer	Purpose for which water consumed	Reading at the beginning of the first day of the calendar month under report	Reading at the end of the last day of the calendar month under report	Quantity of Water Consumed in Kilo Liters	If the meter was out of order, the monthly average consumption of water for the previous 3 months of the working period	Quantity of water qualifying for rebate according to the assessee	Remarks
M/s ONGC Mangalore Petrochemicals Limited, Mangalore Special Economic Zone, Permude, Mangalore -574 509	Industrial cooling, spraying in mine pits or boiler feed						
	Cooling Water	0	55,649	55649			
	Boiler Feed Water	0	62,215	62215			
	Fire Water	0	33786	33786			
	Domestic purpose						
	Drinking Water & Sanitation	0	4972	4972			
	Processing whereby water gets polluted and the pollutants are easily bio-degradable						
	Service Water		4841	4841			
	Total Consumption			1,61,463			

Signature of the Consumer

Name

Address



Shivaprakash, Manager (Env)

M/s ONGC Mangalore Petrochemicals Limited, Mangalore Special Economic Zone, Permude, Mangalore -574 509

ANNEXURE-G

ONGC Mangalore Petrochemicals Limited

Production Details for November, 2018

Net Naptha Processed -1,47,777 MT

Sl. No.	Name of the Product	Quantity, MT
1	Paraxylene (Product)	76,998
2	Benzene (Co product)	21,076