

## Piyush Gupta

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**From:** Piyush Gupta  
**Sent:** 26 November 2019 19:05  
**To:** rosz.bng-mefcc@gov.in  
**Cc:** monitoring-ec@nic.in; zobangalore.cpcb@nic.in; goapcb@gspcb.in; goacoastalzone@gmail.com; mptgoa@mptgoa.com; envcellmpt@gmail.com  
**Subject:** EP-12.1/0/2013-14/Goa/1129-April-2019 to September-2019.  
**Attachments:** EC & CRZ Compliance\_AMPTPL\_Apr to Sep-2019.pdf  
  
**Importance:** High

Respected Sir/ Madam,

Please find attached the Half Yearly EC & CRZ Compliance Report for “Adani Mormugao Port Terminal Pvt. Ltd.”, Goa for the period “April-2019 to September-2019”.

Thanks & Regards

Piyush Gupta

Assistant Manager

Environment Dept. | Adani Mormugao Port Terminal Pvt Ltd

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[www.adanigroup.com](http://www.adanigroup.com)

Adani Mormugao Port Terminal Pvt Ltd, Substation Building,

Near Gate No.2 Mormugao Port Trust

Mormugao, Goa 403 803



Thinking big  
Doing better

Our values: Courage, Trust and Commitment

Ref: AMPTPL/2019/267

Date: 26.11. 2019

To

✓ **Additional Chief Conservator of Forests (C),**  
Ministry of Environment, Forest and Climate Change,  
Regional Office (SZ), Kendriya Sadan,  
4<sup>th</sup> Floor, E&F Wings, 17<sup>th</sup> Main Road,  
Koramangala II Block, Bangalore-560034 (Karnataka)  
[rosz.bng-mefcc@gov.in](mailto:rosz.bng-mefcc@gov.in)

Dear Sir,

**Sub : Half yearly Compliance report of Environment and CRZ clearance for modernization and operation of Berth – 07 in M/s Mormugao Port for the period of April 2019 to September 2019 – Reg.**

**Ref :** Environment and CRZ clearance for modernization of Berth No. – 07 for coal handling granted to M/s Mormugao Port Trust vide letter dated 30<sup>th</sup> December 2013 bearing F. No. 10-39/2009-IA.III.

Adani Mormugao Port Terminal Private Limited is concessionaire of M/s Mormugao Port Trust for Berth No. – 7. Please find enclosed herewith the compliance report to the conditions stipulated in the cited reference for the Half Yearly period **April 2019 to September 2019** in soft copy for your kind reference.

Thanking You

Yours Faithfully,

For **M/s Adani Mormugao Port Terminal Private Limited**

  
Authorized Signatory

**Encl:** CD of Compliance Report


**Copy to:**


1. **The Director (Monitoring-IA-III Division),** Ministry of Environment, Forest & Climate Change, Indira Paryavaran Bhawan, Jor Bagh, New Delhi – 110003.
2. **The Zonal Officer,** Central Pollution Control Board, 1<sup>st</sup> & 2<sup>nd</sup> Floor, Nisaraga Bhawan, A Block, Thimmaiah Main Road, 7<sup>th</sup> D Cross, Shivanagar, opposite Pushpanjali theatre, Bengaluru – 560010
3. **The Member Secretary,** Goa State Pollution Control Board, Nr. Pilerne Industrial Estate, Opp. Saligao Seminary, Saligao – Bardez, Goa – 403511
4. **The Member Secretary,** Goa Coastal Zone Management Authority (GCZMA) 1<sup>st</sup> Floor, Pt. Deendayal Upadhyay Bhavan, Behind Pundalik Devasthan, Parvorim.
5. **The Chairman,** Mormugao Port Trust, Administrative Office, Headland Sada, Mormugao, Goa – 403804.


Adani Mormugao Port Terminal Pvt Ltd.  
Sub Station Building  
Near Gate No-2 of MPT  
Mormugao Harbour 403 803  
Goa , India

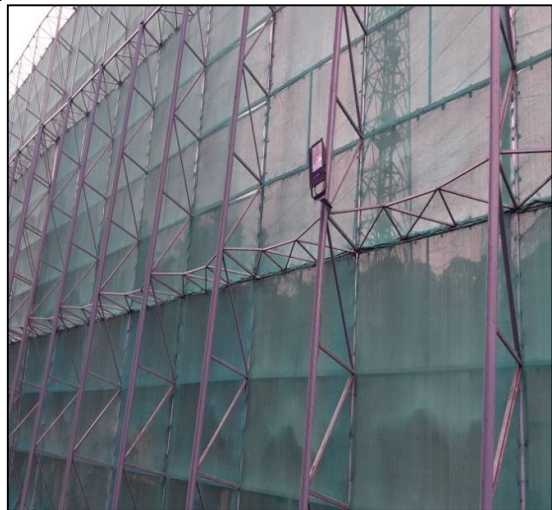
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DESFACTCHER  
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Ministry of Environment, Forests & Climate Change  
क्षेत्रीय कार्यालय, दक्षिण क्लस्टर  
Regional Office, Southern Zone  
केंद्रीय सदन, चौथा तल, कोरमंगला  
Kendriya Sadan, 4th Floor, Koramangala  
बैंगलूरु/Bengaluru-560 034


	Adani Murmugao Port Terminal Pvt. Ltd.	From : April 2019 To: September 2019
Compliance to the conditions stipulated in Environment and CRZ clearance.		

Half yearly Compliance report for Environment and CRZ Clearance for the modernization of Berth No. 7 for coal handling at Murmugao Port, Goa vide F No. 10-39/2009-IA.III dt. 30.12.2013		
Sr. No.	Conditions	Compliance
6	<b>Specific Conditions</b>	
i	"Consent for Establishment" shall be obtained from Goa Pollution Control Board under Air and Water Act and a copy shall be submitted to the Ministry before start of any construction work at the site.	<b>Complied,</b> Copy of Consent for Establishment (CTE) submitted as annexure in six monthly compliance report dated 25 <sup>th</sup> November, 2014. All construction works completed and terminal is in operation with valid Consent from GSPCB (No.5/356/10-PCB/CI-4314, dated 06/07/2018 valid up to 31/01/2020)
ii	The project proponent shall provide lining for collection of run off from coal stockyard and the leachate shall be treated before disposal.	<b>Complied,</b> Runoff from Coal Stock Yard is being collected in RCC dump pond provided with proper lining. Settled water from dump pond is being reused for dust suppression and settled coal solid particles are sent back to coal stock piles.
iii	The project proponent shall provide dry fog and sprinkling systems for effective dust suppression.	<b>Complied</b> For effective dust suppression following measures are provided: <ul style="list-style-type: none"> <li>• 224 Nos. of dry fog dust suppression system have been provided in conveyor system and at all transfer points.</li> <li>• 43 Nos. Automatic Water Sprinklers have been provided at coal stock yard for dust suppression.</li> <li>• 02 Nos. Mist Canon provided. (one is mobile canon and other one tyre mounted)</li> </ul> 
iv	Entire transportation of coal shall be in closed conveyor.	<b>Complied,</b> The coal is being transported through covered conveyor from jetty to silo/ stock yard. AMPTPL has provided 2700 meters long covered conveyor system from jetty to silo including 11 closed Transfer Points provided with Dry Fog Dust Suppression (DFDS) nozzles.


	Adani Murmugao Port Terminal Pvt. Ltd.	From : April 2019 To: September 2019
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Half yearly Compliance report for Environment and CRZ Clearance for the modernization of Berth No. 7 for coal handling at Murmugao Port, Goa vide F No. 10-39/2009-IA.III dt. 30.12.2013		
Sr. No.	Conditions	Compliance
v	There shall be no washing of conveyor belt	<b>Complied</b> No washing of Conveyor belt is done.
vi	The project proponent shall provide wind screen min 15 m height fabric HDPE all along the periphery. The height shall be designed taking into account the wind velocity modelling etc. Also explore creepers in consultation with forest department.	<b>Complied</b> Wind screen of MS structure along with HDPE fabric/ perforated sheet of 15 metres height has been provided along the coal stacking yard facility taking into account the wind velocity. Wind screen has been covered with agronet. 
vii	Coal shall be kept under moist conditions using water sprinklers. Transportation shall be in closed conveyors with water spray.	<b>Complied</b> The coal is being stored under the moist condition. Jet Sprinklers are provided for the same. Coal is being transported through covered conveyors with inbuilt dry fog dust suppression system.
viii	All the conditions stipulated by Goa Coastal Zone Management Authority (GCZMA) vide letter No. GCZMA/S/13-14/09/360 dated 07.06.2013, shall be complied with.	<b>Complied.</b>
ix	Periodical study on shore line changes shall be conducted and mitigation carried out if necessary. The details shall be submitted along with the six monthly monitoring reports.	<b>Not applicable</b> This is an old berth within the existing premises of MPT and only modernization activity has been done.







	Adani Murmugao Port Terminal Pvt. Ltd.	From : April 2019 To: September 2019
Compliance to the conditions stipulated in Environment and CRZ clearance.		


**Half yearly Compliance report for Environment and CRZ Clearance for the modernization of Berth No. 7 for coal handling at Murmugao Port, Goa vide F No. 10-39/2009-IA.III dt. 30.12.2013**

Sr. No.	Conditions	Compliance
x	Oil spills if any shall be properly collected and disposed as per the Rules. Proper Oil Contingency Management Plan shall be put in place.	<b>Complied.,</b> AMPTPL is handling dry cargo only such as coal. However, AMPTPL is abiding by the Oil Spill Contingency Management Plan prepared by M/s MPT. (No such incident occurred till date)
xi	All the conditions stipulated in the earlier Clearances including the recommendations of Environment Management Plan, Disaster Management Plan shall be strictly complied with	<b>Noted and being complied.</b> Compliance of earlier clearance is being submitted by M/s MPT. All recommendations made in the Environment Management Plan as contained in the Environment Impact Assessment of the project are covered and effectively implemented.
xii	Cargo shall be unloaded directly into hopper from the ship and transported to the stack yards through closed conveyor system only. Inbuilt dust suppression systems shall be provided at hoppers and all the transfer points / storage yards. Cargo shall not be unloaded directly onto the Berth. Water meters shall be provided at different locations to record the consumption of water used for dust suppression and daily log shall be maintained.	<p><b>Complied,</b> Coal is being unloaded directly into hopper from the ship and transported to the stack yards through closed conveyor system. Inbuilt dust suppression system has been provided in hoppers, transfer towers and storage yards to avoid fugitive emissions. Coal cargo is not being unloaded directly onto the berth.</p> <p>AMPTPL has installed water meters and log sheet is being maintained to record water consumption in dust suppression system.</p> <div data-bbox="828 1272 1424 1512">  </div>


	Adani Murmugao Port Terminal Pvt. Ltd.	From : April 2019 To: September 2019
Compliance to the conditions stipulated in Environment and CRZ clearance.		

**Half yearly Compliance report for Environment and CRZ Clearance for the modernization of Berth No. 7 for coal handling at Murmugao Port, Goa vide F No. 10-39/2009-IA.III dt. 30.12.2013**

Sr. No.	Conditions	Compliance
xiii	At least 15 m width of green belt along the periphery and 15 m width along the stockyard shall be undertaken including plantation of mangroves in consultation with Forest Department.	<p><b>Complied/Being Complied</b></p> <p>Green belt with suitable native species has been developed, along the periphery and coal stock yard. Till date about <b>28,335</b> nos. (13,400 nos. planted during this compliance period) plants have been planted in port premises and survival rate is well maintained. The plant species includes Conocarpus, Coconut, Palm, etc. There are no mangroves in the vicinity of Berth No. 7.</p>    
iv	The dredge material shall be reused for low level rising wherever possible and excess shall be dumped into sea at the designated dumping areas identified based on mathematical model studies.	<p><b>Complied,</b></p> <p>Construction of the project already completed and currently terminal is in operation.</p>

	Adani Murmugao Port Terminal Pvt. Ltd.	From : April 2019 To: September 2019
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Half yearly Compliance report for Environment and CRZ Clearance for the modernization of Berth No. 7 for coal handling at Murmugao Port, Goa vide F No. 10-39/2009-IA.III dt. 30.12.2013		
Sr. No.	Conditions	Compliance
xv	To prevent discharge of sewage and other liquid wastes including ballast into marine environment, adequate system for collection, treatment and disposal of liquid wastes must be provided.	<b>Complied</b> There is no discharge of sewage and other liquid waste into marine environment. The domestic sewage is being collected in septic tanks provided within the premises of AMPTPL and sent to Sewage Treatment Plant of PWD at Baina for further treatment. Ballast water is not being taken by AMPTPL.
xvi	Necessary arrangements for the treatment of the effluents and solid wastes must be made and it must be ensured that the untreated effluents and solid wastes are not discharged into the water or on the beach; and no effluent or solid wastes shall be discharged on the beach.	<b>Complied,</b> The domestic sewage is being collected in septic tanks provided within the premises of AMPTPL and sent to Sewage Treatment Plant of PWD at Baina for further treatment. Solid waste generated is properly segregated, stored and disposed to local authorities in line to Solid Waste Management Rules 2016 as amended. No effluent or solid wastes is being discharged into the water or on the beach.
xvii	The quality of treated effluents, solid wastes, emissions and noise levels and the like, from project area must conform to the standards laid down by the competent authorities including the Central or State Pollution Control Board under the Environment (Protection) Act 1986	<b>Complied</b> Regular Environmental Monitoring is carried out, to assess the quality of treated effluents from STP, Ambient Air Quality, Noise level, DG set through NABL accredited and MoEF&CC recognized laboratory. Results for all the monitoring parameters are within the prescribed limit. Summary of the monitoring report for the period April-2019 to September-2019 is enclosed as <b>Annexure-1</b>
xviii	All the mitigation measures submitted in the EIA report shall be prepared in a matrix format and the compliance for each mitigation plan shall be submitted to MoEF along with half yearly compliance report to MoEF-RO.	<b>Complied</b> Compliance submitted along with the Half Yearly compliance report for the period April 2018 to September 2018.
xix	The funds earmarked for environment management plan shall be included in the budget and this shall not be diverted for any other purpose.	<b>Complied,</b> Separate budget for implementation of Environment Management Plan is in place and it is not diverted for any other purpose. Budget allocated for implementation of EMP for FY 19-20 is 39.00 Lakhs. A brief summary of environmental expenditure during the compliance period is given below.

	Adani Murmugao Port Terminal Pvt. Ltd.	From : April 2019 To: September 2019
Compliance to the conditions stipulated in Environment and CRZ clearance.		


**Half yearly Compliance report for Environment and CRZ Clearance for the modernization of Berth No. 7 for coal handling at Murmugao Port, Goa vide F No. 10-39/2009-IA.III dt. 30.12.2013**

Sr. No.	Conditions	Compliance			
		S. No	Description of Work	Dept	Budget Spent lakhs (Rs.)
		1	Environment Quality Monitoring (Pollucon)	Env.	9.34
		2	Broad Band for CAAQMS connectivity.	Env.	0.20
		3	O & M and repair of CAAQMS	Env.	8.1
		4	Green belt Maintenance & Development	Env.	3.03
		5	Electricity charges of CAAQMS	Env.	0.12
		6	Environmental related training	Env.	0.3
		7	Environmental day celebrations	Env.	0.28
xx	The project proponent shall set up separate environmental management cell for effective implementation of the stipulated environmental safeguards under the supervision of a Senior Executive	<b>Complied</b> AMPTPL is having well structured Environment Management Cell staffed with qualified manpower and well supported by team at Head Office in Ahmedabad for effective implementation of the stipulated environmental safeguards under the supervision of a Senior Executive.			
<b>7. General Conditions</b>					
i	Appropriate measures must be taken while undertaking digging activities to avoid any likely degradation of water quality.	<b>Compiled,</b> There was no digging activity during the compliance period. Construction activity is completed and project is in operational phase.			
ii	Full support shall be extended to the officers of this Ministry/Regional Office at Bangalore by the project proponent during inspection of the project for monitoring purposes by furnishing full details and action plan including action taken reports in respect of mitigation measures and other environmental protection activities.	<b>Complied.</b> Full support is being extended to the officers of Ministry/Regional Office, as well as officers of Central and State Pollution Control Board during their visit. Dr. Karunakaran, of CPCB visited our terminal on 25.07.2019 during the Compliance period. Full support was extended during his visit. The same shall be continued in future as well.			
iii	A six-monthly monitoring report shall need to be submitted by the project proponents to the Regional Office of this Ministry at Bangalore regarding the implementation of the stipulated conditions.	<b>Complied</b> Six monthly EC & CRZ clearance Compliance reports of the stipulated conditions are regularly submitted to Regional Office of Ministry at Bengaluru, and other authorities (CPCB, GSPCB, MoEF&CC, GCZMA, MPT etc.). Last Compliance report for the period October 2018-March 2019 was submitted vide letter no. AMPTPL/2019/115 dated 27.05.2019.			




	Adani Murmugao Port Terminal Pvt. Ltd.	From : April 2019 To: September 2019
Compliance to the conditions stipulated in Environment and CRZ clearance.		

Half yearly Compliance report for Environment and CRZ Clearance for the modernization of Berth No. 7 for coal handling at Murmugao Port, Goa vide F No. 10-39/2009-IA.III dt. 30.12.2013		
Sr. No.	Conditions	Compliance
iv	Ministry of Environment & Forests or any other competent authority may stipulate any additional conditions or modify the existing ones, if necessary in the interest of environment and the same shall be complied with.	<b>Noted for Compliance.</b>
v	The Ministry reserves the right to revoke this clearance if any of the conditions stipulated are not complied with the satisfaction of the Ministry.	<b>Noted.</b>
vi	In the event of a change in project profile or change in the implementation agency, a fresh reference shall be made to the Ministry of Environment and Forests.	<b>Noted.</b> There is no change in project profile or implementation agency.
vii	The project proponents shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of start of land development work.	<b>Complied</b> Financial Closure Date: 14 <sup>th</sup> May, 2010 Concession agreement date with MPT: 22 <sup>nd</sup> September, 2009
viii	A copy of the clearance letter shall be marked to concern Panchayat/local NGO, if any, from whom any suggestion/representation have been made, received while processing the proposal.	<b>Complied</b> Complied by Mormugao Port Trust (MPT).
ix	Goa State Pollution Control Board shall display a copy of the clearance letter at the Regional Office, District Industries Center and Collector's Office/Tehsildar's office for 30 days.	<b>Noted.</b> This condition does not pertain to project proponent. However, it is learnt that Goa State Pollution Control Board has complied with the same.
8.	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 1994, including the amendments and rules made thereafter.	<b>Noted for Compliance.</b>

	Adani Murmugao Port Terminal Pvt. Ltd.	From : April 2019 To: September 2019
Compliance to the conditions stipulated in Environment and CRZ clearance.		

Half yearly Compliance report for Environment and CRZ Clearance for the modernization of Berth No. 7 for coal handling at Murmugao Port, Goa vide F No. 10-39/2009-IA.III dt. 30.12.2013		
Sr. No.	Conditions	Compliance
9.	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 respective competent authorities.	<b>Complied</b> All applicable clearances from the concerned statutory authorities have been obtained.
10.	The project proponent shall advertise in at least two local Newspapers widely circulated in the region, one of which shall be in the vernacular language informing that the project has been accorded Environmental and CRZ Clearance and copies of clearance letters are available with the Goa State Pollution Control Board and may also be seen on the website of the Ministry of Environment and Forests at <a href="http://www.envfor.nic.in">http://www.envfor.nic.in</a> . The advertisement should be made within 10 days from the date of receipt of the Clearance letter and a copy of the same should be forwarded to the Regional office of this Ministry at Bangalore.	<b>Complied</b> MPT has given advertisement on 11 <sup>th</sup> January, 2014 in the newspapers mentioned below. 1) Sunaparant 2) Times of India, Goa. Copy of the same has already been submitted to RO-MoEF&CC (Bangalore).
11.	This Clearance is subject to final order of the Hon'ble Supreme Court of India in the matter of Goa Foundation Vs. Union of India in Writ Petition (Civil) No. 460 of 2004 as may be applicable to this project.	<b>Noted.</b>
12.	Status of compliance to the various stipulated environmental conditions and environmental safeguards will be uploaded by the project proponent in its website.	<b>Complied</b> Copy of six monthly EC&CRZ compliance report is being regularly uploaded by AMPTPL on company website at <a href="https://www.adaniports.com/ports-downloads?port=Murmugao-Terminal">https://www.adaniports.com/ports-downloads?port=Murmugao-Terminal</a>
13.	Any appeal against this clearance shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.	<b>Noted.</b>

	Adani Murmugao Port Terminal Pvt. Ltd.	From : April 2019 To: September 2019
Compliance to the conditions stipulated in Environment and CRZ clearance.		

Half yearly Compliance report for Environment and CRZ Clearance for the modernization of Berth No. 7 for coal handling at Murmugao Port, Goa vide F No. 10-39/2009-IA.III dt. 30.12.2013		
Sr. No.	Conditions	Compliance
14.	A copy of the clearance letter shall be sent by the proponent to concerned Panchayat, Zilla Parisaad/Municipal Corporation, Urban Local Body and the Local NGO, if any, from whom suggestions/representations, if any were received while processing the proposal. The clearance letter shall also be put on the website of the company by proponent.	<b>Complied</b> The same has been Complied by Mormugao Port Trust.
15.	The proponent shall upload the status of compliance of the stipulated Clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of MoEF, the respective Zonal Office of CPCB and the SPCB.	<b>Complied</b> AMPTPL is regularly uploading the status of compliance of the stipulated clearance condition including results of monitored data in the company website. The same can be viewed at <a href="https://www.adaniports.com/ports-downloads?port=Murmugao-Terminal">https://www.adaniports.com/ports-downloads?port=Murmugao-Terminal</a> Six monthly compliance report is regularly submitted to Regional office of MoEF&CC at Bangalore, CPCB Zonal office, SPCB and other authorities. Last compliance report for the period October 2018 – March 2019 was submitted vide letter no. AMPTPL/2019/115 dated 27.05.2019.
16.	The environmental statement for each financial year ending 31 <sup>st</sup> March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of Clearance conditions and shall also be sent to the respective Regional Offices of MoEF by e-mail.	<b>Complied</b> Environment Statement in Form V is submitted to Goa State Pollution Control Board for each financial year. Environment Statement for the year FY 2018-19 has been submitted online on 25.09.2019 vide Application No. 327865 and has also been uploaded on company website. Copy of the same is enclosed as <b>Annexure-2</b> .  Copy of the same is available on company website at <a href="https://www.adaniports.com/ports-downloads?port=Murmugao-Terminal">https://www.adaniports.com/ports-downloads?port=Murmugao-Terminal</a>

# "ENVIRONMENTAL MONITORING REPORT" FOR



**ADANI MURMUGAO PORT TERMINAL PVT. LTD. (AMPTPL),  
GROUND FLOOR, PORT USERS COMPLEX, NEAR STATE BANK OF INDIA,  
MORMUGAO HARBOUR, GOA 403802 INDIA – TEL 0832 2594253**

**APRIL-2019 TO SEPTEMBER-2019**

**PREPARED BY:**



**M/s POLLUCON LABORATORIES PVT. LTD.**

**PLOT NO.5/6 "POLLUCON HOUSE",**

**OPP. BALAJI INDUSTRIAL SOCIETY,**

**OLD SHANTINATH MILL LANE,**

**NEAR GAYTRI FARSAN, NAVJIVAN CIRCLE,**

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**TC-5945**



**ISO 9001:2015**



**ISO 14001:2015**



**OHSAS 18001:2007**

# "ENVIRONMENT MONITORING REPORT"

FOR



**ADANI MURMUGAO PORT TERMINAL PVT. LTD. (AMPTPL),  
GROUND FLOOR, PORT USERS COMPLEX, NEAR STATE BANK OF INDIA,  
MORMUGAO HARBOUR, GOA 403802 INDIA – TEL 0832 2594253**

**For and on behalf of Pollucon Laboratories Pvt. Ltd., Surat**

**Approved by** : Dr. Arun Bajpai

**Signed** :

**Designation** : Lab Manager (Q)

This report has been prepared by Pollucon laboratories Pvt. Ltd. with all reasonable skills, care and diligence, incorporating our General Terms and Conditions of Business and taking account of the resources devoted, flow chart, diagram etc. is provided by the client itself.



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## **CHAPTER – 1**

### **AMBIENT AIR QUALITY MONITORING**

**MONITORING PERIOD: APRIL-2019 TO SEPTEMBER-2019**

**Results of AAQM for Sada Village [APRIL-2019 TO SEPTEMBER-2019]**

Sr. No.	Date of sampling	Particulate Matter (PM <sub>10</sub> ) µg/m <sup>3</sup>	Particulate Matter (PM <sub>2.5</sub> ) µg/m <sup>3</sup>	Lead as Pb µg/m <sup>3</sup>	Benzo (a) Pyrene (BaP)-particulate phase only ng/m <sup>3</sup>	Arsenic as As ng/m <sup>3</sup>	Nickel as Ni ng/m <sup>3</sup>	Carbon Monoxide as CO mg/m <sup>3</sup>	Benzene as C <sub>6</sub> H <sub>6</sub> µg/m <sup>3</sup>	Ammonia (NH <sub>3</sub> ) µg/m <sup>3</sup>	Sulphur Dioxide (SO <sub>2</sub> ) µg/m <sup>3</sup>	Oxides of Nitrogen (NO <sub>2</sub> ) µg/m <sup>3</sup>	Ozone (O <sub>3</sub> ) µg/m <sup>3</sup>
1	01/04/2019	45.27	20.58	BDL*	BDL*	BDL*	BDL*	0.38	BDL*	22.44	14.22	18.67	18.33
2	04/04/2019	67.90	31.98	BDL*	BDL*	BDL*	BDL*	0.24	BDL*	25.42	16.56	22.45	15.67
3	08/04/2019	56.56	24.85	BDL*	BDL*	BDL*	BDL*	0.41	BDL*	15.67	9.54	15.57	22.65
4	11/04/2019	74.36	40.32	BDL*	BDL*	BDL*	BDL*	0.33	BDL*	17.97	13.45	25.62	16.88
5	15/04/2019	60.34	34.85	BDL*	BDL*	BDL*	BDL*	0.53	BDL*	13.54	8.66	20.62	24.55
6	18/04/2019	71.56	37.54	BDL*	BDL*	BDL*	BDL*	0.15	BDL*	28.68	6.58	14.98	14.64
7	22/04/2019	51.86	21.65	BDL*	BDL*	BDL*	BDL*	0.47	BDL*	12.65	10.67	19.25	20.56
8	25/04/2019	76.86	32.81	BDL*	BDL*	BDL*	BDL*	0.13	BDL*	26.35	12.47	23.48	25.65
9	29/04/2019	66.31	29.41	BDL*	BDL*	BDL*	BDL*	0.23	BDL*	10.38	7.85	17.49	17.33
10	02/05/2019	52.37	27.55	BDL*	BDL*	BDL*	BDL*	0.21	BDL*	20.48	12.36	24.33	21.58
11	06/05/2019	70.30	41.85	BDL*	BDL*	BDL*	BDL*	0.40	BDL*	12.83	8.42	15.65	16.56
12	09/05/2019	58.36	36.52	BDL*	BDL*	BDL*	BDL*	0.14	BDL*	16.54	14.35	25.62	20.36
13	13/05/2019	48.54	25.65	BDL*	BDL*	BDL*	BDL*	0.47	BDL*	25.38	9.57	21.34	15.55
14	16/05/2019	63.62	33.75	BDL*	BDL*	BDL*	BDL*	0.23	BDL*	14.36	13.56	23.76	19.55
15	20/05/2019	47.32	19.66	BDL*	BDL*	BDL*	BDL*	0.60	BDL*	29.38	11.32	18.57	23.72
16	23/05/2019	69.38	39.20	BDL*	BDL*	BDL*	BDL*	0.25	BDL*	15.76	6.54	14.34	17.57
17	27/05/2019	54.33	28.67	BDL*	BDL*	BDL*	BDL*	0.33	BDL*	22.38	10.32	17.56	18.63
18	30/05/2019	68.56	35.45	BDL*	BDL*	BDL*	BDL*	0.17	BDL*	17.56	7.56	16.86	13.84
19	03/06/2019	78.56	42.51	BDL*	BDL*	BDL*	BDL*	0.14	BDL*	18.68	15.57	26.58	17.55
20	06/06/2019	58.64	36.44	BDL*	BDL*	BDL*	BDL*	0.30	BDL*	22.61	11.57	29.57	26.46
21	10/06/2019	45.76	26.56	BDL*	BDL*	BDL*	BDL*	0.27	BDL*	12.38	6.23	14.38	25.33
22	13/06/2019	52.76	24.41	BDL*	BDL*	BDL*	BDL*	0.11	BDL*	26.53	8.67	17.66	21.67
23	17/06/2019	65.76	20.66	BDL*	BDL*	BDL*	BDL*	0.39	BDL*	10.33	10.20	21.51	14.37
24	20/06/2019	56.37	29.33	BDL*	BDL*	BDL*	BDL*	0.25	BDL*	16.53	13.45	24.27	18.23
25	24/06/2019	61.38	33.50	BDL*	BDL*	BDL*	BDL*	0.18	BDL*	21.66	7.66	13.64	19.55
26	27/06/2019	40.36	27.51	BDL*	BDL*	BDL*	BDL*	0.49	BDL*	11.34	9.56	15.67	15.61
27	01/07/2019	65.89	43.25	BDL*	BDL*	BDL*	BDL*	0.40	BDL*	15.66	16.63	25.61	11.67
28	04/07/2019	46.34	19.33	BDL*	BDL*	BDL*	BDL*	0.53	BDL*	24.33	10.48	19.36	21.81
29	08/07/2019	62.76	31.60	BDL*	BDL*	BDL*	BDL*	0.44	BDL*	30.46	15.38	16.35	14.59
30	11/07/2019	57.56	26.27	BDL*	BDL*	BDL*	BDL*	0.26	BDL*	22.43	11.36	20.66	19.33
31	15/07/2019	45.36	21.19	BDL*	BDL*	BDL*	BDL*	0.14	BDL*	37.25	8.56	17.56	12.69
32	18/07/2019	32.68	15.33	BDL*	BDL*	BDL*	BDL*	0.39	BDL*	14.26	6.55	15.36	15.72
33	22/07/2019	48.64	23.63	BDL*	BDL*	BDL*	BDL*	0.55	BDL*	26.48	13.22	21.63	18.85
34	25/07/2019	64.38	37.59	BDL*	BDL*	BDL*	BDL*	0.24	BDL*	19.38	7.26	24.55	13.53

35	29/07/2019	50.46	20.86	BDL*	BDL*	BDL*	BDL*	0.21	BDL*	23.68	12.31	18.62	20.20
36	01/08/2019	55.34	19.62	BDL*	BDL*	BDL*	BDL*	0.30	BDL*	22.64	7.39	24.56	18.57
37	05/08/2019	41.53	15.66	BDL*	BDL*	BDL*	BDL*	0.45	BDL*	10.62	8.69	16.62	10.37
38	08/08/2019	64.34	24.37	BDL*	BDL*	BDL*	BDL*	0.14	BDL*	14.58	14.35	21.56	19.56
39	12/08/2019	50.34	29.41	BDL*	BDL*	BDL*	BDL*	0.33	BDL*	18.64	12.34	25.33	23.45
40	15/08/2019	48.34	16.86	BDL*	BDL*	BDL*	BDL*	0.52	BDL*	13.45	11.64	29.45	25.76
41	19/08/2019	72.64	25.32	BDL*	BDL*	BDL*	BDL*	0.17	BDL*	19.35	9.39	17.33	14.54
42	22/08/2019	66.58	22.64	BDL*	BDL*	BDL*	BDL*	0.24	BDL*	16.46	10.33	22.48	13.84
43	26/08/2019	52.46	30.53	BDL*	BDL*	BDL*	BDL*	0.32	BDL*	23.76	15.78	18.23	20.35
44	29/08/2019	46.45	20.41	BDL*	BDL*	BDL*	BDL*	0.23	BDL*	26.52	6.57	15.64	11.33
45	02/09/2019	57.58	20.24	BDL*	BDL*	BDL*	BDL*	0.29	BDL*	11.67	8.51	18.63	14.44
46	05/09/2019	44.61	18.67	BDL*	BDL*	BDL*	BDL*	0.39	BDL*	14.59	6.48	15.70	16.54
47	09/09/2019	54.40	28.50	BDL*	BDL*	BDL*	BDL*	0.33	BDL*	22.49	10.48	22.64	21.42
48	12/09/2019	62.47	35.36	BDL*	BDL*	BDL*	BDL*	0.44	BDL*	16.47	13.58	26.41	17.65
49	16/09/2019	49.65	26.27	BDL*	BDL*	BDL*	BDL*	0.34	BDL*	21.66	9.52	28.47	18.61
50	19/09/2019	38.37	17.60	BDL*	BDL*	BDL*	BDL*	0.24	BDL*	35.52	7.56	16.84	13.57
51	23/09/2019	71.64	21.61	BDL*	BDL*	BDL*	BDL*	0.17	BDL*	15.39	12.41	24.36	20.73
52	26/09/2019	53.53	23.51	BDL*	BDL*	BDL*	BDL*	0.14	BDL*	25.33	16.62	19.67	12.67

BDL\*: - Below Detection Limit: Ozone as O<sub>3</sub> (µg/m<sup>3</sup>): 10

BDL\*: - Below Detection Limit - Lead as Pb (µg/m<sup>3</sup>): 0.5

BDL\*: - Below Detection Limit - Carbon Monoxide as CO (mg/m<sup>3</sup>): 0.01

BDL\*: - Below Detection Limit - Ammonia NH<sub>3</sub> (µg/m<sup>3</sup>): 10

BDL\*: - Below Detection Limit - Benzene as C<sub>6</sub>H<sub>6</sub> (µg/m<sup>3</sup>): 2

BDL\*: - Below Detection Limit - Benzo (a) Pyrene (BaP) - Particulate Phase only (ng/m<sup>3</sup>): 0.5

BDL\*: - Below Detection Limit - Arsenic as As (ng/m<sup>3</sup>): 2

BDL\*: - Below Detection Limit - Nickel as Ni (ng/m<sup>3</sup>): 10

## **CHAPTER – 2**

### **SEA WATER AND SEA SEDIMENTS MONITORING MONITORING PERIOD: APRIL-2019 TO SEPTEMBER-2019**



## Results of Sea water Monitoring

SR. NO.	PARAMETERS	UNIT	RESULTS					
Sampling Location			Near Jetty					
GPS Location			15° 24.748'N, 73° 47.938'E					
Date of sampling			12/04/2019		14/05/2019		11/06/2019	
			Surface	Bottom	Surface	Bottom	Surface	Bottom
1	pH	--	8.16	8.04	8.14	8.11	8.18	8.06
2	Temperature	°C	31.1	30.6	31.5	31	31.6	30
3	Total Suspended Solids	mg/L	248	262	220	239	284	253
4	BOD (3 Days @ 27 °C)	mg/L	5.2	BDL*	4.6	BDL*	4	BDL*
5	Dissolved Oxygen	mg/L	5.8	6	5.9	6.1	5.3	5.9
6	Salinity	ppt	35.6	35.9	35.4	35.6	34.7	35.2
7	Oil & Grease	mg/L	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*
8	Nitrate as NO <sub>3</sub>	μmol/L	2.77	1.76	1.01	1.23	1.32	1.56
9	Nitrite as NO <sub>2</sub>	μmol/L	1.18	1.02	1.09	1.15	0.84	0.98
10	Ammonical Nitrogen as NH <sub>3</sub>	μmol/L	1.49	1.41	1.26	1.21	1.12	1.24
11	Phosphates as PO <sub>4</sub>	μmol/L	1.82	1.34	1.75	1.36	2.1	2.2
12	Total Nitrogen	μmol/L	5.44	4.19	3.31	3.65	3.28	3.78
13	Petroleum Hydrocarbon	μg/L	13.6	BDL*	12.4	BDL*	BDL*	BDL*
14	Total Dissolved Solids	mg/L	37842	38298	37416	37784	36319	36872
15	COD	mg/L	21.6	7.8	15.4	6.8	10.3	7.2
17	Flora and Fauna							
17.1	Primary Productivity	mgC/L/day	4.5	2.47	4.28	3.15	10.3	7.2
18	Phytoplankton							
18.1	Chlorophyll	mg/m <sup>3</sup>	3.31	3.25	3.1	2.34	3.68	3.09
18.2	Phaeophytin	mg/m <sup>3</sup>	1.85	1.42	2.21	2.96	1.25	1.69
18.3	Cell Count	No,x 10 <sup>3</sup> /L	204	82	190	72	204	82
18.4	Name of Group Number and name of group species of each group	--	Rhizosoleni a sp. Thalassiosi ra sp. Nitzschia sp. Cyclotella sp.	Navicula sp. Coscinodisc us sp. Nitzschia sp. --	Coscinodisc us sp. ceratium sp Cheatocero us sp. Nitzschia sp.	Navicula sp. Thalassiosi ra sp. Cheatocero us sp. --	Cheatocero us sp. Coscinodisc us sp. ceratium sp Rhizosoleni a sp.	Nitzschia sp. Thalassio sira sp. Pleurosig ma sp. --
19	Zooplanktons							
19.1	Abundance (Population)	Nox10 <sup>3</sup> /100m <sup>3</sup>	83		77		69	
19.2	Name of Group Number and name of group species of each group	--	Copepods Polychaete worms Mysids		Copepods Harpacticoida Bivalves Calanoida		Copepods Crustaceans Polychaetes	
19.3	Total Biomass	mL/100 m <sup>3</sup>	6.05		4.3		4.25	
20	Microbiological Parameters							

20.1	Total Bacterial Count	CFU/mL	1860	1840	1780
20.2	Total Coliform	/mL	Absent	Absent	Absent
20.3	E.coli	/mL	Absent	Absent	Absent
20.4	Enterococcus species	/mL	Absent	Absent	Absent
20.5	Salmonella species	/mL	Absent	Absent	Absent
20.6	Shigella species	/mL	Absent	Absent	Absent
20.7	Vibrio species	/mL	Absent	Absent	Absent

BDL\*: Below Detection Limit

## Results of Sea water Monitoring

SR. NO.	PARAMETERS	UNIT	RESULTS					
Sampling Location			Near Jetty					
GPS Location			15° 24.748' N, 73° 47.938' E					
Date of sampling			12/07/2019		16/08/2019		13/09/2019	
			Surface	Bottom	Surface	Bottom	Surface	Bottom
1	pH	--	8.36	8.14	8.1	7.98	8.12	8.05
2	Temperature	°C	30	29.6	29	29.2	29.8	29.6
3	Total Suspended Solids	mg/L	264	243	238	215	190	208
4	BOD (3 Days @ 27 °C)	mg/L	3.9	BDL*	BDL*	BDL*	BDL*	BDL*
5	Dissolved Oxygen	mg/L	5.7	6	6	6.1	6	6.2
6	Salinity	ppt	34.8	35	33.6	34.2	33.1	33.7
7	Oil & Grease	mg/L	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*
8	Nitrate as NO <sub>3</sub>	µmol/L	1.24	1.46	0.98	1.13	1.16	1.28
9	Nitrite as NO <sub>2</sub>	µmol/L	0.67	0.84	0.52	0.69	0.7	0.84
10	Ammonical Nitrogen as NH <sub>3</sub>	µmol/L	1.23	1.4	1	1.18	1.32	1.19
11	Phosphates as PO <sub>4</sub>	µmol/L	1.73	1.94	1.58	1.64	1.2	1.37
12	Total Nitrogen	µmol/L	3.14	3.7	2.5	3	3.18	3.31
13	Petroleum Hydrocarbon	µg/L	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*
14	Total Dissolved Solids	mg/L	36543	36878	35812	35978	35972	36016
15	COD	mg/L	8.2	BDL*	9.4	6.8	11.8	7.6
17	Flora and Fauna							
17.1	Primary Productivity	mgC/L/day	9.23	7.87	8.55	7.65	7.09	6.41
18	Phytoplankton							
18.1	Chlorophyll	mg/m <sup>3</sup>	3.47	2.67	3.36	2.93	2.94	2.34
18.2	Phaeophytin	mg/m <sup>3</sup>	1.72	2.41	1.91	2.3	2.11	2.29
18.3	Cell Count	No.x 10 <sup>3</sup> /L	192	76	162	78	150	64
18.4	Name of Group Number and name of group species of each group	--	Coscinodiscus sp. Thallasiosira sp. Pleurosigma sp. Synedra sp.	Nitzschia sp. Thallasiosira sp. Rhizosolenia sp.	Skeletonema sp. Coscinodiscus sp. Cheatoceros sp. ceratium sp	Tricodesmium Nitzschia sp. Pleurosigma sp.	Rhizosolenia sp. Cyclotella sp. Cheatoceros sp. Nitzschia sp.	Navicula sp. Odontella sp. Thalassiosira sp.
19	Zooplanktons							
19.1	Abundance (Population)	Nox10 <sup>3</sup> /100m <sup>3</sup>	60		57		49	
19.2	Name of Group Number and name of group species of each group	--	Polychaetes Gastropods Foraminiferans		Calanoida Copepods Crustaceans		Crustaceans Gastropods Polychaetes	
19.3	Total Biomass	mL/100 m <sup>3</sup>	3.7		2.8		2	
20	Microbiological Parameters							
20.1	Total Bacterial Count	CFU/mL	1790		1820		1650	
20.2	Total Coliform	/mL	Absent		Absent		Absent	

20.3	E.coli	/mL	Absent	Absent	Absent
20.4	Enterococcus species	/mL	Absent	Absent	Absent
20.5	Salmonella species	/mL	Absent	Absent	Absent
20.6	Shigella species	/mL	Absent	Absent	Absent
20.7	Vibrio species	/mL	Absent	Absent	Absent

BDL\*: Below Detection Limit

## Results of Sea Sediment Monitoring

SR. NO.	PARAMETERS	UNIT	RESULTS					
Sampling Location			Near Jetty					
GPS Location			N 15° 24.748', E 73° 47.938'					
Date of sampling			12/04/2019	14/05/2019	11/06/2019	12/07/2019	16/08/2019	13/09/2019
1	Organic Matter	%	0.62	0.44	0.69	0.84	0.72	0.64
2	Phosphorus as P	µg/g	670	490	324	270	419	520
3	Texture	--	Sandy	Sandy	Sandy	Sandy	Sandy	Sandy
4	Petroleum Hydrocarbon	µg/g	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*
5	<b>Heavy Metals</b>							
5.1	Aluminum as Al	%	5.12	4.7	4.98	4.69	4.52	4.84
5.2	Total Chromium as Cr+3	µg/g	234	136	183	240	199	290
5.3	Manganese as Mn	µg/g	1256	1764	1430	1183	1084	928
5.4	Iron as Fe	%	4.68	4.12	4.86	4.92	4.2	4.38
5.5	Nickel as Ni	µg/g	24.3	51.4	64	51.4	38.6	26.4
5.6	Copper as Cu	µg/g	27.8	48.2	56.2	39.6	21.4	32.9
5.7	Zinc as Zn	µg/g	230	264	304	270	174	207
5.8	Lead as Pb	µg/g	1.96	1.56	3.23	3.74	1.27	1.83
5.9	Mercury as Hg	µg/g	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*
6	<b>Benthic Organisms</b>							
6.1	Macrobenthos (No and name of groups present, No and name of species of each group present)	--	Polychates Gastropods	Polychates Crustacean s Gastropods	Bivalves Gastropods	Crustacean s Gastropods	Polychaetes Crustacean s Bivalves	Polychates Crustacean s
6.2	MeioBenthos (No and name of groups present, No and name of species of each group present)	--	Foraminifer ans Ostracods	--	Foraminifer ans	Nematodes Ostracods	--	Nematods Ostracods
6.3	Population	no/m <sup>2</sup>	880	792	735	853	618	706

BDL\*: Below Detection Limit



## **CHAPTER – 3**

### **STP WATER MONITORING**

**MONITORING PERIOD: APRIL-2019 TO SEPTEMBER-2019**

## Results of STP water quality monitoring

SR. NO.	PARAMETERS	UNIT	RESULTS					
Sampling Location			Baina Sewerage Plant STP Inlet					
Date of sampling			13/04/2019	15/05/2019	19/06/2019	11/07/2019	16/08/2019	14/09/2019
1	pH	--	7.58	7.08	7.12	7.45	7.36	7.56
2	Total Suspended Solids	mg/L	95	117	98	71	86	98
3	BOD (3 Days @ 27 °C)	mg/L	22	25	21	32	27	33
4	COD	mg/L	74	98	84	98	106	118
5	Oil & Grease	mg/L	6.4	5.2	6.2	7.2	9.2	8.4
6	Residual Free Chlorine	mg/L	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2

SR. NO.	PARAMETERS	UNIT	RESULTS					
Sampling Location			Baina Sewerage Plant STP Outlet					
Date of sampling			13/04/2019	15/05/2019	19/06/2019	11/07/2019	16/08/2019	14/09/2019
1	pH	--	7.49	7.25	7.3	7.52	7.46	7.34
2	Total Suspended Solids	mg/L	28	18	26	21	30	28
3	BOD (3 Days @ 27 °C)	mg/L	18	12	10	7	12	10
4	COD	mg/L	56	68	56	48	40	34
5	Oil & Grease	mg/L	3.1	2.4	2.2	< 1.0	< 1.0	< 1.0
6	Residual Free Chlorine	mg/L	0.6	0.8	0.6	0.8	0.6	0.8

## **CHAPTER – 4**

### **DUMP POND WATER QUALITY MONITORING MONITORING PERIOD: APRIL-2019 TO SEPTEMBER-2019**

## Results of Dump Pond Water quality monitoring

SR. NO.	PARAMETERS	UNIT	RESULT					
			Dump Pond-1 Near CT 08		Dump Pond-2 Near Pump House		Dump Pond-3 - Nr. Jetty	
	Sampling Location							
	Date of sampling		17/06/19	12/09/19	17/06/19	12/09/19	17/06/19	12/09/19
1	pH	--	8.1	8.34	8.07	8.14	8.2	8.27
2	Total Dissolved Solids	mg/L	468	483	482	496	512	530
3	Total Suspended Solids	mg/L	54	39	39	32	56	64
4	Turbidity	NTU	4.64	3.26	4.26	3.84	5.6	4.92
5	BOD (3 Days @ 27 °C)	mg/L	12	9	12	10	10	12
6	Dissolved Oxygen	mg/L	6.1	6	5.8	5.9	5.2	5.5
7	COD	mg/L	52	42	40	36	36	40
8	Salinity	ppt	0.133	0.14	0.12	0.12	0.14	0.14
9	Oil & Grease	mg/L	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*
10	Total Hardness as CaCO <sub>3</sub>	mg/L	170	176	178	180	184	190
11	Fluoride as F	mg/L	0.62	0.52	0.6	0.53	0.55	0.52
12	Chloride as Cl	mg/L	74	78	64	69.97	70	82
13	Zinc as Zn	mg/L	0.28	0.35	0.2	0.25	0.16	0.29
14	Cadmium as Cd	mg/L	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*
15	Lead as Pb	mg/L	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*
16	Mercury as Hg	mg/L	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*

BDL\*: Below Detection Limit

## **CHAPTER – 5**

### **DRINKING WATER QUALITY MONITORING**

**MONITORING PERIOD: APRIL-2019 TO SEPTEMBER-2019**



## Results of Drinking water quality monitoring

SR. NO.	PARAMETERS	UNIT	RESULT			
Sampling Location		Sub Station Building Canteen		Near AMPTPL Exit Gate		
Date of sampling		18/06/2019	12/09/2019	18/06/2019	12/09/2019	
1	Colour	Hazen	1	1	1	1
2	Turbidity	NTU	0.24	0.27	0.38	0.36
3	Conductivity	µmho/cm	294	296	311	296
4	pH	--	7.12	7.16	7.01	7.09
5	Chloride as Cl	mg/L	60	60	70	72
6	Total Dissolved Solids	mg/L	192	194	219	210
7	Total Hardness as CaCO <sub>3</sub>	mg/L	56	58	70	68
8	Iron as Fe	mg/L	0.016	< 0.15	0.025	< 0.15
9	Sulphate as SO <sub>4</sub>	mg/L	15	18	29	28
10	Residual Free Chlorine	mg/L	< 0.2	< 0.2	< 0.2	< 0.2
11	Calcium as Ca	mg/L	18	20	22	16.8
12	Magnesium as Mg	mg/L	2.64	1.92	3.6	6.24
13	Fluoride as F	mg/L	0.6	0.33	0.51	0.38
14	Nitrate as NO <sub>3</sub>	mg/L	0.8	1.18	0.45	0.9
15	Manganese as Mn	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
16	Copper as Cu	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
17	Cadmium as Cd	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
18	Arsenic as As	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
19	Mercury as Hg	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
20	Lead as Pb	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
21	Zinc as Zn	mg/L	< 0.06	< 0.06	< 0.06	< 0.06
22	Coliform	/100 mL	Absent	Absent	Absent	Absent
23	E-Coli	/100 mL	Absent	Absent	Absent	Absent

BDL\*: Below Detection Limit.

## Results of Drinking water quality monitoring

Sr. No.	Parameters	Unit	Result			
Sampling Location			Near Workshop Area		Near Amenity Building	
Date of sampling			18/06/2019	12/09/2019	18/06/2019	12/09/2019
1	Colour	Hazen	1	1	2	1
2	Turbidity	NTU	0.28	0.3	0.65	0.34
3	Conductivity	µmho/cm	302	284	312	262
4	pH	--	7.09	7.04	7.25	7.26
5	Chloride as Cl	mg/L	64	65	79	53
6	Total Dissolved Solids	mg/L	196	189	210	176
7	Total Hardness as CaCO3	mg/L	60	63	85	68
8	Iron as Fe	mg/L	0.02	< 0.15	0.035	< 0.15
9	Sulphate as SO4	mg/L	18	16.2	30	23
10	Residual Free Chlorine	mg/L	< 0.2	< 0.2	< 0.2	< 0.2
11	Calcium as Ca	mg/L	20	18.4	25	18.8
12	Magnesium as Mg	mg/L	2.4	4.08	5.4	5.04
13	Fluoride as F	mg/L	0.58	0.31	0.55	0.35
14	Nitrate as NO3	mg/L	0.5	0.48	0.44	0.76
15	Manganese as Mn	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
16	Copper as Cu	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
17	Cadmium as Cd	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
18	Arsenic as As	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
19	Mercury as Hg	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
20	Lead as Pb	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
21	Zinc as Zn	mg/L	< 0.06	< 0.06	< 0.06	< 0.06
22	Coliform	/100 mL	Absent	Absent	Absent	Absent
23	E-Coli	/100 mL	Absent	Absent	Absent	Absent

BDL\*: Below Detection Limit

## **CHAPTER – 6**

### **SOIL QUALITY MONITORING**

**MONITORING PERIOD: APRIL-2019 TO SEPTEMBER-2019**

## Results of Soil quality monitoring

SR. NO.	PARAMETERS	UNIT	RESULTS			
Sampling Location			NEAR CT-1		NEAR ADANI SITE	
Date of sampling			18/06/2019	13/09/2019	18/06/2019	13/09/2019
1	Type	--	Sandy loam	Sandy loam	Sandy loam	Sandy loam
2	Gravel	%	1	1.2	1	1.2
3	Coarse Sand	%	2	2.8	4	3.8
4	Medium Sand	%	20	22	15	14
5	Fine Sand	%	24	25	26	28
6	Total Sand	%	47	51	46	47
7	Silt & Clay	%	53	49	54	53
8	pH (1:5)	--	8.3	8.64	8.32	8.46
9	Electricity Conductivity	µmho/cm	810	839	1104	1058
10	Alkali matter	mg/kg	598	618	638	710
11	Cation Exchange Capacity	meq/100 g	10.4	10.73	10.6	10.99
12	Sodium Absorption Ratio	--	12.6	17.52	12.5	18.17
13	Organic Matter	mg/kg	0.68	0.74	0.59	0.63
14	Available Nitrogen	meq/100 g	0.24	0.3	0.4	0.42
15	Available Potassium	mg/kg	33	39	18	24
16	Available Phosphorus	mg/kg	0.4	0.32	0.3	0.36
17	Available Sodium	%	2.1	1.8	1.98	1.8
18	Permeability	%	0.58	0.56	0.5	0.52

## **CHAPTER – 7**

### **NOISE LEVEL MONITORING**

**MONITORING PERIOD: APRIL-2019 TO SEPTEMBER-2019**

**Results of Day Time Noise level monitoring**

April 2019					
Day Time dB(A)					
SR. NO.	Sampling Time	Near fire station	Near security tower	Adani Site Office Near Gate No.02	Sada village
		09/04/2019	05/04/2019	15/04/2019	03/04/2019
1	6:00-7:00	43.5	44.9	46.7	45.4
2	7:00-8:00	44.6	46.3	48	47.6
3	8:00-9:00	46.2	47	49.2	48.5
4	9:00-10:00	49.1	49.3	51.7	49.9
5	10:00-11:00	50.4	48.2	52.4	50.3
6	11:00-12:00	52.5	50.5	53.7	52.6
7	12:00-13:00	53.1	52.2	54.8	53.8
8	13:00-14:00	54.7	51.3	56.5	55.7
9	14:00-15:00	55.1	53.4	55.4	57.9
10	15:00-16:00	53.9	55.6	55.8	54.9
11	16:00-17:00	52.3	58.8	54.6	53.3
12	17:00-18:00	50.7	55.2	52	52.1
13	18:00-19:00	49.5	53.2	51.8	50.2
14	19:00-20:00	48.7	51.5	50.6	49.8
15	20:00-21:00	49.6	49	49.4	46.8
16	21:00-22:00	46.1	48.3	48.4	47.7
Day Time Limit		75 dB(A) Leq			55 dB(A) Leq

**Results of Night Time Noise level monitoring**

April 2019					
Night Time dB(A)					
SR. NO.	Sampling Time	Near fire station	Near security tower	Adani Site Office Near Gate No.02	Sada village
		09/04/2019 & 10/04/2019	05/04/2019 & 06/04/2019	15/04/2019 & 16/04/2019	03/04/2019 & 04/04/2019
1	22:00-23:00	42.8	47.2	47.7	49
2	23:00-00:00	48.3	45.1	52.4	47.5
3	00:00-01:00	50.6	46.3	46.1	48.7
4	01:00-02:00	47.4	40.1	42.4	43.3
5	02:00-03:00	46.8	44.5	41.2	42.3
6	03:00-04:00	45.2	42.5	43.1	44.9
7	04:00-05:00	44	41.4	44.7	46.5
8	05:00-06:00	43.4	43.6	45.9	45.8
Night Time Limit		70 dB(A) Leq			45 dB(A) Leq

**Results of Day Time Noise level monitoring**

May 2019					
Day Time dB(A)					
SR. NO.	Sampling Time	Near fire station	Near security tower	Adani Site Office Near Gate No.02	Sada village
		10/05/2019	07/05/2019	21/05/2019	04/05/2019
1	6:00-7:00	48.9	47.3	46.1	49.1
2	7:00-8:00	49.3	49.4	48.5	49.6
3	8:00-9:00	50.3	49.5	49.9	50
4	9:00-10:00	51.8	50.6	51.1	52.2
5	10:00-11:00	53.7	53.2	52	53.6
6	11:00-12:00	52.1	55.2	54.4	52.4
7	12:00-13:00	54.3	57.9	55.4	55
8	13:00-14:00	56	58.7	53.4	54.5
9	14:00-15:00	58.5	59.7	54.1	53.5
10	15:00-16:00	59.1	60.7	55.9	54.6
11	16:00-17:00	60.1	62.9	53.8	52.6
12	17:00-18:00	58.4	58.2	51	51.3
13	18:00-19:00	56.7	56.6	50.7	50.4
14	19:00-20:00	55.5	54	52.3	49.7
15	20:00-21:00	52.5	51.4	51.2	48.3
16	21:00-22:00	50.2	49.8	49.2	48.1
Day Time Limit		75 dB(A) Leq			55 dB(A) Leq

**Results of Night Time Noise level monitoring**

May 2019					
Night Time dB(A)					
SR. NO.	Sampling Time	Near fire station	Near security tower	Adani Site Office Near Gate No.02	Sada village
		10/05/2019 & 11/05/2019	07/05/2019 & 08/05/2019	21/05/2019 & 22/05/2019	04/05/2019 & 05/05/2019
1	22:00-23:00	48.3	49.3	47.3	48.5
2	23:00-00:00	47.2	47.6	46.3	47
3	00:00-01:00	46.5	48.4	44.7	47.8
4	01:00-02:00	47.5	46.2	43.2	46.9
5	02:00-03:00	48.7	47.1	45.9	44.4
6	03:00-04:00	47.9	45	46	46.8
7	04:00-05:00	45.5	44.3	48.1	45.1
8	05:00-06:00	46.4	46.7	47.4	44.1
Night Time Limit		70 dB(A) Leq			45 dB(A) Leq



**Results of Day Time Noise level monitoring**

June 2019					
Day Time dB(A)					
SR. NO.	Sampling Time	Near fire station	Near security tower	Adani Site Office Near Gate No.02	Sada village
		21/06/2019	11/06/2019	03/06/2019	05/06/2019
1	6:00-7:00	49.2	46.3	48.1	47.0
2	7:00-8:00	48.8	48.6	49.1	48.5
3	8:00-9:00	48.0	47.1	50.3	49.9
4	9:00-10:00	50.2	49.7	51.8	50.7
5	10:00-11:00	51.7	50.4	52.3	52.2
6	11:00-12:00	52.0	51.6	54.3	53.0
7	12:00-13:00	53.4	53.8	54.6	52.5
8	13:00-14:00	54.9	54.2	54.0	54.4
9	14:00-15:00	57.8	55.3	53.2	46.1
10	15:00-16:00	54.5	54.7	54.1	53.5
11	16:00-17:00	53.7	55.4	52.9	52.1
12	17:00-18:00	51.1	52.8	51.3	51.2
13	18:00-19:00	50.6	51.5	50.8	49.3
14	19:00-20:00	49.8	49.4	48.3	48.2
15	20:00-21:00	49.0	48.4	46.0	47.4
16	21:00-22:00	49.5	46.2	45.1	44.1
Day Time Limit		75 dB(A) Leq			55 dB(A) Leq

**Results of Night Time Noise level monitoring**

June 2019					
Night Time dB(A)					
SR. NO.	Sampling Time	Near fire station	Near security tower	Adani Site Office Near Gate No.02	Sada village
		21/06/2019 & 22/06/2019	11/06/2019 & 12/06/2019	03/06/2019 & 04/06/2019	05/06/2019 & 06/06/2019
1	22:00-23:00	47.4	48.5	46.6	44.3
2	23:00-00:00	46.3	46.2	47.8	41.3
3	00:00-01:00	47.7	45.7	47.9	42.0
4	01:00-02:00	45.9	44.6	46.7	43.7
5	02:00-03:00	49.3	43.8	44.9	40.1
6	03:00-04:00	46.0	44.5	45.4	41.2
7	04:00-05:00	47.3	45.6	44.1	40.5
8	05:00-06:00	45.1	46.4	46.1	43.5
Night Time Limit		70 dB(A) Leq			45 dB(A) Leq

**Results of Day Time Noise level monitoring**

July 2019					
Day Time dB(A)					
SR. NO.	Sampling Time	Near fire station	Near security tower	Adani Site Office Near Gate No.02	Sada village
		19/07/2019	09/07/2019	16/07/2019	03/07/2019
1	6:00-7:00	46.8	48.6	47.8	49
2	7:00-8:00	48.3	49.8	49.3	50.5
3	8:00-9:00	49.2	50.2	50.8	51.3
4	9:00-10:00	50.1	51.6	52.4	52.7
5	10:00-11:00	51.2	53.7	54.5	53.5
6	11:00-12:00	52.3	55.4	54	54.6
7	12:00-13:00	54.1	56.7	53.4	56.8
8	13:00-14:00	56.3	56.2	51.5	55.6
9	14:00-15:00	57	55.2	53.3	54.8
10	15:00-16:00	56.6	53.2	50.9	52
11	16:00-17:00	55.3	54.7	51.4	51.1
12	17:00-18:00	54.4	52.1	52.6	50.7
13	18:00-19:00	52.9	51.9	49.1	49.4
14	19:00-20:00	50.6	50.4	47	48.4
15	20:00-21:00	49.6	49.7	46.4	47.4
16	21:00-22:00	47.1	48.5	45.5	47.9
Day Time Limit		75 dB(A) Leq			55 dB(A) Leq

**Results of Night Time Noise level monitoring**

July 2019					
Night Time dB(A)					
SR. NO.	Sampling Time	Near fire station	Near security tower	Adani Site Office Near Gate No.02	Sada village
		19/07/2019 & 20/07/2019	09/07/2019 & 10/07/2019	16/07/2019 & 17/07/2019	03/07/2019 & 04/07/2019
1	22:00-23:00	46.9	47.6	43.2	45.8
2	23:00-00:00	45.7	48.7	43.9	46.8
3	00:00-01:00	44.4	46	41.5	44.7
4	01:00-02:00	44.8	45	44	42.3
5	02:00-03:00	43.5	42	44.1	43.8
6	03:00-04:00	44.3	44.2	42.8	45.2
7	04:00-05:00	43	46.7	43.6	44.9
8	05:00-06:00	45.6	45.1	44.5	44.6
Night Time Limit		70 dB(A) Leq			45 dB(A) Leq

**Results of Day Time Noise level monitoring**

<b>August 2019</b>					
<b>Day Time dB(A)</b>					
<b>SR. NO.</b>	<b>Sampling Time</b>	<b>Near fire station</b>	<b>Near security tower</b>	<b>Adani Site Office Near Gate No.02</b>	<b>Sada village</b>
		<b>13/08/2019</b>	<b>06/08/2019</b>	<b>09/08/2019</b>	<b>03/08/2019</b>
1	6:00-7:00	48.4	47.2	47.3	46.0
2	7:00-8:00	49.4	48.5	48.1	48.1
3	8:00-9:00	47.1	49.8	49.0	47.1
4	9:00-10:00	50.8	49.9	52.1	47.6
5	10:00-11:00	53.2	50.4	51.3	50.1
6	11:00-12:00	52.7	51.5	52.9	52.0
7	12:00-13:00	52.2	52.3	53.4	54.6
8	13:00-14:00	58.3	59.6	54.8	54.1
9	14:00-15:00	54.1	52.6	55.1	53.0
10	15:00-16:00	53.8	54.9	56.5	52.0
11	16:00-17:00	55.6	51.0	57.7	50.1
12	17:00-18:00	51.6	51.1	55.9	51.0
13	18:00-19:00	52.8	49.7	54.2	48.6
14	19:00-20:00	50.9	48.3	53.5	48.0
15	20:00-21:00	49.2	47.8	52.4	46.0
16	21:00-22:00	46.8	46.2	50.2	47.0
<b>Day Time Limit</b>		<b>75 dB(A) Leq</b>			<b>55 dB(A) Leq</b>

**Results of Night Time Noise level monitoring**

<b>August 2019</b>					
<b>Night Time dB(A)</b>					
<b>SR. NO.</b>	<b>Sampling Time</b>	<b>Near fire station</b>	<b>Near security tower</b>	<b>Adani Site Office Near Gate No.02</b>	<b>Sada village</b>
		<b>13/08/2019 &amp; 14/08/2019</b>	<b>06/08/2019 &amp; 07/08/2019</b>	<b>09/08/2019 &amp; 10/08/2019</b>	<b>03/08/2019 &amp; 04/08/2019</b>
1	22:00-23:00	47.8	45.2	49.1	43.8
2	23:00-00:00	44.8	45.4	47.4	42.6
3	00:00-01:00	44.1	44.3	46.9	44.1
4	01:00-02:00	45.6	43.5	46.5	42.8
5	02:00-03:00	44.2	45.8	48.2	43.1
6	03:00-04:00	48.5	46.1	47.6	43.6
7	04:00-05:00	46.3	47	46.8	41.3
8	05:00-06:00	44.7	46.7	45.3	44.6
<b>Night Time Limit</b>		<b>70 dB(A) Leq</b>			<b>45 dB(A) Leq</b>

**Results of Day Time Noise level monitoring**

September 2019					
Day Time dB(A)					
SR. NO.	Sampling Time	Near fire station	Near security tower	Adani Site Office Near Gate No.02	Sada village
		20/09/2019	11/09/2019	17/09/2019	04/09/2019
1	6:00-7:00	49.2	45.8	47.3	48.8
2	7:00-8:00	48.2	47.9	48.1	45.1
3	8:00-9:00	49.8	49	49	47
4	9:00-10:00	51.6	50.1	52.1	49
5	10:00-11:00	52.1	51.1	51.3	50.1
6	11:00-12:00	51.1	52	52.9	51
7	12:00-13:00	53	51.1	53.4	52.8
8	13:00-14:00	54.1	58.4	54.8	49.5
9	14:00-15:00	55.1	53.2	55.1	52.6
10	15:00-16:00	54.1	55.1	56.5	54.1
11	16:00-17:00	56.8	56.2	57.7	52.1
12	17:00-18:00	54	54.9	55.9	51
13	18:00-19:00	52.3	53.8	54.2	50.1
14	19:00-20:00	51.2	52.1	53.5	49.1
15	20:00-21:00	49.1	50	52.4	48
16	21:00-22:00	48.6	48.1	50.2	47.1
Day Time Limit		75 dB(A) Leq			55 dB(A) Leq

**Results of Night Time Noise level monitoring**

September 2019					
Night Time dB(A)					
SR. NO.	Sampling Time	Near fire station	Near security tower	Adani Site Office Near Gate No.02	Sada village
		20/09/2019 & 21/09/2019	11/09/2019 & 12/09/2019	17/09/2019 & 18/09/2019	04/09/2019 & 05/09/2019
1	22:00-23:00	45.4	44.8	48.1	44.2
2	23:00-00:00	43.8	46.1	49.1	43.2
3	00:00-01:00	46.4	44.6	47.6	40.1
4	01:00-02:00	43.4	43.1	45.2	42.3
5	02:00-03:00	44.1	45.8	46.3	42.8
6	03:00-04:00	45.4	47.1	46.1	44.1
7	04:00-05:00	48.1	46.1	48.3	43.9
8	05:00-06:00	49.8	48.4	47.1	42.1
Night Time Limit		70 dB(A) Leq			45 dB(A) Leq

## **CHAPTER – 8**

### **D.G. STACK & D.G. STACK NOISE MONITORING**

**MONITORING PERIOD: APRIL-2019 TO SEPTEMBER-2019**

**D.G. Stack Monitoring Results**

SR. NO.	TEST PARAMETER	UNIT	DG Stack - 1 (2000 KVA) Make Cummins Sr. No.:25388675		LIMIT
			04/06/2019	24/09/2019	
			RESULTS	RESULTS	
1	Particulate Matter	mg/Nm <sup>3</sup>	21.33	19.41	75
2	Sulfur Dioxide as SO <sub>2</sub>	ppm	6.53	7.41	--
3	Oxides of Nitrogen as NOX	ppm	33.49	38.45	710
4	Non Methyl Hydro Carbon (NMHC)	mg/Nm <sup>3</sup>	BDL*	BDL*	100
5	Carbon Monoxide (CO)	mg/Nm <sup>3</sup>	21.32	16.03	150
6	Sulfur Content in fuel	%	0.018	0.019	< 2.0

BDL\*: Below Detection Limit, Results on 15 % O2 Correction when Oxygen is greater than 15 %

SR. NO.	TEST PARAMETER	UNIT	DG Stack - 2 (2000 KVA) Cummins Sr. No.: 25390869		LIMIT
			04/06/2019	24/09/2019	
			RESULTS	RESULTS	
1	Particulate Matter	mg/Nm <sup>3</sup>	18.23	15.72	75
2	Sulfur Dioxide as SO <sub>2</sub>	ppm	4.66	6.47	--
3	Oxides of Nitrogen as NOX	ppm	29.31	35.46	710
4	Non Methyl Hydro Carbon (NMHC)	mg/Nm <sup>3</sup>	BDL*	BDL*	100
5	Carbon Monoxide (CO)	mg/Nm <sup>3</sup>	19.63	13.98	150
6	Sulfur Content in fuel	%	0.015	0.017	< 2.0

BDL\*: Below Detection Limit, Results on 15 % O2 Correction when Oxygen is greater than 15 %

SR. NO.	TEST PARAMETER	UNIT	DG Stack – 3 (380 KVA) Cummins Sr. No.: 25386499		LIMIT
			04/06/2019	24/09/2019	
			RESULTS	RESULTS	
1	Particulate Matter	g/kw-hr	0.0015	0.0011	0.3
2	Sulfur Dioxide (SO <sub>2</sub> )	Kg/hr	0.0005	0.0006	1.8
3	Oxides of Nitrogen as NOX	g/kw-hr	0.0047	0.0048	9.2
4	Hydro Carbon (HC)	g/kw-hr	BDL*	BDL*	1.3
5	Carbon Monoxide (CO)	g/kw-hr	0.0014	0.0009	3.5

BDL\*: Below Detection Limit, Results on 15 % O2 Correction when Oxygen is greater than 15 %

**D.G. Stack Noise Level Monitoring Results**

SR. NO.	SAMPLING LOCATION	Outside DG Room 1 m distance	
		04/06/2019	24/09/2019
		RESULTS	RESULTS
1	DG Stack - 1 (2000 KVA) Make Cummins Sr. No.:25388675	72.8	72.6
2	DG Stack - 2 (2000 KVA) Cummins Sr. No.: 25390869	73.6	73.8
3	DG Stack – 3 (380 KVA) Cummins Sr. No.: 25386499	73.6	73.5
LIMIT**		75 dB(A)	

\*\*as per Noise limit for diesel generator sets (upto 1000 KVA) manufactured on or after the 1<sup>st</sup> January, 2005

**CHAPTER – 9**  
**WEATHER DATA MONITORING**  
**MONITORING PERIOD: APRIL-2019 TO SEPTEMBER-2019**



Date	Avg wind Speed (m/s)	Avg wind Direction (deg)	Temperature (°C)	RH %	Precip. (mm)
01/04/2019	3.97	164.68	29.61	82.91	0.00
02/04/2019	6.73	233.06	28.83	80.16	0.00
03/04/2019	8.22	239.56	28.69	81.64	0.00
04/04/2019	4.54	194.94	29.70	80.82	0.00
05/04/2019	4.36	191.81	29.83	80.15	0.00
06/04/2019	7.41	230.11	29.31	83.24	0.00
07/04/2019	9.09	233.13	29.23	81.07	0.00
08/04/2019	5.33	211.13	29.46	82.40	0.00
09/04/2019	5.78	189.94	29.62	81.16	0.00
10/04/2019	5.14	195.19	29.18	81.20	0.00
11/04/2019	5.83	196.50	29.57	83.08	0.00
12/04/2019	5.08	184.88	29.50	84.25	0.09
13/04/2019	5.53	188.44	30.72	81.94	0.00
14/04/2019	4.24	184.88	31.04	82.73	0.00
15/04/2019	4.17	169.88	30.90	81.85	0.00
16/04/2019	4.73	183.38	30.63	79.48	0.03
17/04/2019	11.54	252.38	29.54	81.50	1.36
18/04/2019	14.80	241.31	28.60	74.95	0.99
19/04/2019	11.39	240.94	28.70	83.78	0.00
20/04/2019	7.23	234.19	29.28	80.57	0.00
21/04/2019	6.85	196.69	29.91	78.25	2.99
22/04/2019	12.90	255.75	29.35	81.34	0.40
23/04/2019	7.35	224.81	29.77	85.07	2.19
24/04/2019	13.38	272.44	29.46	87.13	0.75
25/04/2019	12.23	241.07	29.36	84.78	0.00
26/04/2019	5.19	224.81	29.97	85.25	0.15
27/04/2019	4.33	193.50	31.09	83.60	0.00
28/04/2019	4.19	191.81	31.70	83.79	0.00
29/04/2019	3.62	180.94	31.63	81.92	0.03
30/04/2019	2.02	160.13	31.24	82.43	0.00
01/05/2019	0.97	178.31	30.67	78.66	0.00
02/05/2019	1.34	180.75	29.93	78.38	0.00
03/05/2019	1.29	164.44	30.12	73.16	0.00
04/05/2019	1.49	172.88	29.99	75.58	0.00
05/05/2019	2.62	245.44	29.70	79.84	0.00
06/05/2019	3.49	247.13	29.71	81.98	0.00
07/05/2019	1.89	213.75	30.44	79.74	0.00
08/05/2019	2.19	197.81	30.28	77.13	0.00
09/05/2019	2.87	224.44	29.91	76.91	0.00
10/05/2019	3.84	276.00	29.47	81.18	0.00
11/05/2019	4.13	241.13	29.60	82.58	0.00
12/05/2019	3.42	243.56	29.64	82.21	0.00
13/05/2019	2.39	236.06	29.69	82.34	0.00
14/05/2019	2.54	249.94	29.91	81.71	0.01
15/05/2019	3.05	241.50	29.72	81.77	0.00
16/05/2019	3.54	241.88	29.52	82.54	0.10
17/05/2019	3.99	252.94	29.22	85.06	0.00
18/05/2019	3.86	248.25	29.45	88.05	0.00
19/05/2019	2.11	179.44	30.08	87.60	0.00
20/05/2019	1.93	195.06	30.44	86.49	0.00
21/05/2019	1.58	222.38	30.30	85.19	0.00

22/05/2019	3.22	226.50	29.99	87.43	0.00
23/05/2019	2.12	217.31	29.60	86.11	0.01
24/05/2019	1.64	189.56	30.98	82.75	0.00
25/05/2019	2.16	194.06	30.24	86.21	0.00
26/05/2019	2.17	231.75	30.18	84.67	0.00
27/05/2019	2.53	215.25	30.41	84.39	0.00
28/05/2019	3.16	241.88	30.38	85.28	0.00
29/05/2019	2.80	235.50	30.35	84.30	0.00
30/05/2019	2.36	231.56	30.25	85.38	0.00
31/05/2019	1.87	187.88	30.95	81.73	0.00
01/06/2019	1.26	192.38	30.06	85.24	0.00
02/06/2019	1.39	191.81	31.34	81.77	0.00
03/06/2019	0.98	203.44	29.81	87.59	0.00
04/06/2019	2.10	202.88	29.91	88.33	0.25
05/06/2019	2.00	194.63	30.48	87.52	23.11
06/06/2019	1.98	194.44	28.18	92.01	27.94
07/06/2019	1.57	172.50	27.99	95.78	0.00
08/06/2019	2.24	193.61	31.25	84.54	0.00
09/06/2019	1.94	172.88	31.71	84.69	0.00
10/06/2019	2.87	162.00	31.23	79.29	66.55
11/06/2019	3.22	183.00	28.03	91.53	104
12/06/2019	2.18	175.31	27.40	93.24	50.80
13/06/2019	2.38	169.98	29.29	91.72	36.07
14/06/2019	1.87	169.79	27.13	89.89	3.05
15/06/2019	2.46	174.75	31.46	86.21	2.03
16/06/2019	1.91	189.38	32.12	82.79	2.54
17/06/2019	1.59	168.56	31.61	84.43	9.91
18/06/2019	1.58	167.44	31.13	85.91	38.86
19/06/2019	1.36	152.44	30.74	88.72	122
20/06/2019	1.23	193.88	26.96	96.55	36.07
21/06/2019	1.06	169.22	29.18	90.58	105
22/06/2019	1.21	167.44	27.83	92.03	285
23/06/2019	1.16	192.19	26.89	96.59	68.83
24/06/2019	0.94	168.75	23.53	89.13	35.05
25/06/2019	0.82	173.25	27.74	92.08	314
26/06/2019	1.04	181.13	26.51	98.23	44.96
27/06/2019	1.14	156.38	21.48	90.93	194
28/06/2019	1.04	178.69	26.00	98.62	106
29/06/2019	1.54	173.44	28.62	98.12	20.57
30/06/2019	1.38	132.38	32.48	90.09	25.65
01/07/2019	1.34	139.13	28.56	83.43	2.03
02/07/2019	1.16	129.94	28.42	84.72	23.88
03/07/2019	1.17	165.56	27.78	86.24	62.99
04/07/2019	1.62	176.81	28.47	79.65	80.77
05/07/2019	2.01	162.94	28.29	89.54	20.32
06/07/2019	2.60	180.75	27.40	85.84	21.84
07/07/2019	2.87	178.13	28.04	79.64	14.48
08/07/2019	2.55	184.88	27.08	81.68	41.40
09/07/2019	2.27	169.50	28.50	80.95	100
10/07/2019	2.04	180.19	27.53	82.39	353
11/07/2019	1.73	180.19	28.50	87.92	93.47
12/07/2019	0.73	175.13	26.54	95.67	149
13/07/2019	1.06	169.69	27.50	88.52	63.25

14/07/2019	0.85	157.88	27.04	88.00	61.72
15/07/2019	0.76	151.50	27.59	85.17	213
16/07/2019	1.23	172.88	26.20	86.52	34.54
17/07/2019	0.70	168.00	28.06	84.60	11.68
18/07/2019	1.44	180.00	27.20	86.43	285
19/07/2019	1.07	191.25	25.46	85.34	40.21
20/07/2019	2.29	326.25	26.25	86.06	16.75
21/07/2019	2.13	162.11	26.41	86.10	63.24
22/07/2019	1.14	172.98	27.25	84.93	235
23/07/2019	1.09	150.32	24.02	88.76	102
24/07/2019	0.76	161.80	26.04	84.31	60.45
25/07/2019	1.01	171.16	27.22	79.14	41.87
26/07/2019	0.87	186.39	24.41	79.31	25.63
27/07/2019	1.80	168.83	26.67	88.78	20.21
28/07/2019	1.48	131.27	25.14	81.80	9.67
29/07/2019	1.41	164.47	28.12	82.59	74.69
30/07/2019	1.98	184.39	26.83	79.17	24.01
31/07/2019	1.17	171.39	27.41	82.18	25.98
01/08/2019	6.82	254.36	27.42	83.69	12
02/08/2019	7.63	240.12	27.34	84.23	52
03/08/2019	8.04	248.47	27.39	84.72	106
04/08/2019	7.85	237.35	27.50	85.36	181
05/08/2019	8.37	272.74	26.68	86.47	154
06/08/2019	7.99	280.36	27.45	84.92	42
07/08/2019	9.23	264.56	27.32	84.86	12
08/08/2019	9.85	260.63	27.77	82.10	6
09/08/2019	9.67	224.66	27.46	83.24	16
10/08/2019	8.71	265.87	27.23	82.68	11
11/08/2019	7.34	242.30	26.90	82.45	8
12/08/2019	6.33	292.58	27.05	84.92	3
13/08/2019	5.09	286.94	27.98	83.67	2
14/08/2019	5.35	308.64	26.89	83.45	1
15/08/2019	6.29	296.10	27.75	84.23	14
16/08/2019	5.33	270.36	26.84	85.69	3
17/08/2019	4.03	278.92	27.32	80.32	1
18/08/2019	2.88	312.69	27.26	82.45	1
19/08/2019	3.12	298.42	28.10	79.78	0
20/08/2019	2.74	210.66	28.32	81.36	0
21/08/2019	4.69	322.27	28.45	82.13	2
22/08/2019	4.27	305.84	28.03	79.98	5
23/08/2019	4.02	293.49	27.56	80.23	33
24/08/2019	4.63	269.12	28.32	83.21	16
25/08/2019	2.94	254.36	27.40	78.36	10
26/08/2019	3.43	262.94	27.63	76.85	12
27/08/2019	4.91	215.45	28.34	79.32	18
28/08/2019	5.03	225.12	28.20	82.67	17
29/08/2019	4.87	267.36	27.98	83.19	22
30/08/2019	5.43	258.64	28.22	85.43	7
31/08/2019	5.13	274.21	27.67	82.68	7
01/09/2019	3.40	252.64	25.98	89.54	39
02/09/2019	4.07	230.52	27.35	82.67	35
03/09/2019	5.51	271.48	26.87	85.45	152
04/09/2019	6.61	286.24	26.54	86.14	61

05/09/2019	7.01	300.45	27.10	85.69	36
06/09/2019	8.43	264.34	27.32	84.23	44
07/09/2019	8.37	236.78	27.24	83.47	199
08/09/2019	7.12	245.67	26.78	85.34	178
09/09/2019	6.94	260.66	27.10	84.78	26
10/09/2019	4.90	267.57	27.84	85.69	1
11/09/2019	4.56	275.89	27.63	83.05	6
12/09/2019	3.75	222.43	28.12	80.89	6
13/09/2019	4.08	293.74	27.36	82.66	15
14/09/2019	4.40	302.48	26.96	84.54	5
15/09/2019	3.23	289.56	27.48	81.90	28
16/09/2019	3.96	310.67	26.45	85.44	8
17/09/2019	4.42	298.12	27.62	83.67	0
18/09/2019	3.66	316.80	26.86	87.49	11
19/09/2019	3.46	253.43	27.21	88.32	41
20/09/2019	3.99	221.59	27.78	84.57	14
21/09/2019	3.52	182.65	28.12	83.80	18
22/09/2019	2.71	169.37	27.98	87.95	0
23/09/2019	2.48	267.14	28.32	79.34	0
24/09/2019	3.16	318.45	27.61	84.78	4
25/09/2019	2.65	326.85	27.26	83.67	94
26/09/2019	4.44	178.56	27.30	85.91	17
27/09/2019	4.58	156.80	26.65	82.54	23
28/09/2019	2.09	180.98	27.58	80.47	1
29/09/2019	1.91	226.87	28.12	83.61	0
30/09/2019	3.87	27.40	27.89	81.22	0



## GOA STATE POLLUTION CONTROL BOARD

### FORM V

(See Rule 14)

Environmental Statement for the financial year ending on 31st March on or before 30th of September every year.

### PART A

- (i) Name and address of the owner/ occupier of the industry operation or process : ADANI MURMUGAO PORT TERMINAL PVT. LTD
- (ii) Industry category Primary-(STC Code) : RED, Ports and harbour, jetties and dredging operations  
Secondary-(STC Code)
- (iii) Production capacity : 4.8 Million Tonnes

Production Name	Production Capacity	Production Unit
Handling of Coal	4.8	Million Tonnes/Year

(iv) Year of establishment :

(v) Date of the last environment statement submitted :

### PART B

1. Water consumption m<sup>3</sup>/ d

Process : NIL

Cooling : 315

Domestic : 34

Name of products	Process water consumption per unit of product output	
	During the previous financial year	During the current financial year
Handling of Coal	0.086 m <sup>3</sup> / MT	0.030 m <sup>3</sup> / MT

2. Raw material consumption

Name of raw materials	Name of products	Consumption of raw material per unit	
		During the previous financial year	During the current financial year
NIL	NA	NIL	NIL

\*Industry may use codes if disclosing details of raw materials would violate contractual obligations, otherwise all industries have to name the raw material used.

### PART C

Pollution discharged to environment/ unit of output.

<b>Pollution</b>	<b>Quantity of pollutants discharged(mass/day)</b>	<b>Concentration of pollutants in discharges(mass/volume)</b>	<b>Percentage of variation from prescribed standards with reasons</b>
<b>Water</b>	<b>No effluent discharged to environment</b>		
Water	No effluent discharged to the environment	-	-
<b>Air</b>			
Air	DG sets are provided as standby power source and were used during power failure. The Height of DG stacks as per CPCB/GSPCB Standards. All the monitored parameters are within standards.		
Air	DG STACK 1 (2000 KVA)- June-2018	PM-22.75 mg/Nm <sup>3</sup> , NO <sub>x</sub> - 39.05 ppm, CO- 18.32 mg/Nm <sup>3</sup> , NMHC- BDL, Sulfur in fuel- 0.015%	
Air	DG STACK 1 (2000 KVA)- Sep-2018	PM-25.85 mg/Nm <sup>3</sup> , NO <sub>x</sub> - 32.58 ppm, CO- 16.03 mg/Nm <sup>3</sup> , NMHC- BDL, Sulfur in fuel- 0.015%	
Air	DG STACK 1 (2000 KVA)- Dec-2018	PM-21.82 mg/Nm <sup>3</sup> , NO <sub>x</sub> - 35.23 ppm, CO- 15.56 mg/Nm <sup>3</sup> , NMHC- BDL, Sulfur in fuel- 0.018%	
Air	DG STACK 3 (380 KVA)- Mar-2019	PM- 0.0012 g/kw-hr, NO <sub>x</sub> -0.0018 g/kw-hr, CO-0.0010 g/kw-hr, HC- BDL, SO <sub>2</sub> - 0.0007 Kg/hr	
Air	DG STACK 1 (2000 KVA)- Mar-2019	PM-17.86 mg/Nm <sup>3</sup> , NO <sub>x</sub> - 29.34 ppm, CO- 18.74 mg/Nm <sup>3</sup> , NMHC- BDL, Sulfur in fuel- 0.018%	
Air	DG STACK 2 (2000 KVA)- Sep-2018	M-19.40 mg/Nm <sup>3</sup> , NO <sub>x</sub> - 35.32 ppm, CO- 13.74 mg/Nm <sup>3</sup> , NMHC- BDL, Sulfur in fuel- 0.013%	

Air	DG STACK 2 (2000 KVA)- Dec-2018	PM-26.63 mg/Nm <sup>3</sup> , NO <sub>x</sub> - 30.35 ppm, CO- 18.50 mg/Nm <sup>3</sup> , NMHC- BDL, Sulfur in fuel- 0.015%	
Air	DG STACK 3 (380 KVA)- Sep-2018	PM- 0.0008 g/kw-hr, NO <sub>x</sub> -0.0018 g/kw-hr, CO-0.0007 g/kw-hr, HC- BDL, SO <sub>2</sub> - 0.0004 Kg/hr	
Air	DG STACK 3 (380 KVA)- Dec-2018	PM- 0.0013 g/kw-hr, NO <sub>x</sub> -0.0021 g/kw-hr, CO-0.0011 g/kw-hr, HC- BDL, SO <sub>2</sub> - 0.0003 Kg/hr	
Air	DG STACK 2 (2000 KVA)- June-2018	PM-27.91 mg/Nm <sup>3</sup> , NO <sub>x</sub> - 37.30 ppm, CO- 16.03 mg/Nm <sup>3</sup> , NMHC- BDL, Sulfur in fuel- 0.013%	
Air	DG STACK 2 (2000 KVA)- Mar-2019	PM-23.82 mg/Nm <sup>3</sup> , NO <sub>x</sub> - 26.45 ppm, CO- 16.30 mg/Nm <sup>3</sup> , NMHC- BDL, Sulfur in fuel- 0.015%	
Air	DG STACK 3 (380 KVA)- June-2018	PM- 0.0010 g/kw-hr, NO <sub>x</sub> -0.0024 g/kw-hr, CO-0.0009 g/kw-hr, HC- BDL, SO <sub>2</sub> - 0.0005 Kg/hr	

## PART D Hazardous Wastes

(as specified under Hazardous Wastes (Management and Handling) Rules, 1989)

Hazardous Wastes	Total Quantity (Kg)	
	During the previous financial year	During the current financial year
(a) From process	2 MT Used Oil	1.08 MT Used Oil
(b) From pollution control facilities	NA	NA

## PART E Solid Wastes

	Total Quantity	
	During the previous financial year	During the current financial year
(a) From process	NIL	NIL
(b) From pollution control facility	NIL	NIL
(c)(1) Quantity recycled or re-utilised within the unit	NIL	NIL
(2) Sold	NIL	NIL
(3) Disposed	NIL	NIL



## **PART F**

Please specify the characterization (in terms of composition and quantum) of hazardous as well as solid wastes and indicate disposal practice adopted for both these categories of wastes • Hazardous waste includes used oil and cotton waste contaminated with oil. Used oil and the oil soaked cotton waste generated during various maintenance activities are collected in barrels kept in earmarked covered hazardous waste storage area & disposed of through GSPCB authorized – registered recycler.

- The used batteries and E -waste also stored in workshop storage area and disposed of through approved vendor.
- Hazardous waste return in Form 4 was submitted in line with the Hazardous and Other Wastes (Management & Trans boundary Movement) Rules, 2016.
- E-waste return in Form 3 was submitted in line with the E-waste Management Rules 2016
- Solid Waste includes mainly domestic waste (office & kitchen waste) which is disposed through authorized vendor.

## **PART G**

Impact of the pollution abatement measures taken on conservation of natural resources and on the cost of production All the domestic waste water generated at site is treated at existing sewage treatment plant located at Headland Sada. The treated water is being reused within port premises. Unit has developed adequate green belt within port premises. .

## **PART H**

Additional measures/ investment proposal for environmental protection abatement of pollution, prevention of pollution • Unit is undertaking Regular Environmental Monitoring of port & surrounding area through MoEF&CC recognized laboratory. All the required environmental parameters are well within specified limit & the details of monitored data is regularly submitting to GSPCB, CPCB, MoEF&CC and other concerned authorities.

- Unit has also installed Continuous Ambient Air Quality Monitoring System (CAAQMS) for the parameters SO<sub>2</sub>, NO<sub>x</sub>, PM<sub>10</sub> & PM<sub>2.5</sub> and the monitored real time data are being connected with GSPCB server.
- Coal Stacks are kept covered with tarpaulin at all time, except during loading and unloading and adequate Sprinkling is carried out continuously during loading and unloading.
- Unit has installed multimedia filter system which receives the treated water from MPT Sewage tank. The filtered water is used for plantation & gardening activities. Unit has also provided dump pond and conveyance channel for collection of runoff generated from coal yard.
- Unit has provided Sprinklers at coal yard & conveyor system and carrying out regular water sprinkling to control the dust exposure. Wind screen covered with agronet/ jute cloth is provided around the periphery of coal yard.
- Unit has installed 2 cameras in coal stack yard and its online connectivity has been provided to GSPCB.
- As a precautionary measure an anemometer has been installed along with a hooter on Substation building and three different alert levels have been configured in PLC based on the Wind speed as follows:
  - For 25km/h to 27.99km/h - Hooter blows for 5 Seconds followed by a 1 Second Stop and the same repeats.
  - For 28km/h to 29.99km/h - The Hooter blows for 2 Seconds followed by a 1 second stop and the same repeats.
  - For Above 30km/h - The Hooter continuously blows without any stop.
- Unit has taken continuous steps for developing green belt area within port premises. Vertical garden has also been developed as part of Environment Initiatives.

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## **PART I**

Any other particulars for improving the quality of the environment • Integrated housekeeping management is undertaken at top priority to maintain neat and clean working environment in the plant area.

- Working towards achieving “Zero Waste Inventory” as per our Group Environment Policy and all wastes are being handled in line with 5R Principle.

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