

**Half Yearly EC Compliance Report Submission - APSEZ, Mundra - WFDP 2009 (Apr'20 to Sep'20)**

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Wed 11/25/2020 12:21 PM

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📎 1 attachments (15 MB)

5. EC Compliance Report\_WFDP-2009\_Apr'20 to Sep'20.pdf;

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Integrated Regional Office  
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय,  
Ministry of Environment, Forest & Climate Change,  
भारत सरकार, भोपाल/Govt of India, Bhopal.



Ports and  
Logistics

**APSEZL/EnvCell/2020-21/095**

**Date:** 25.11.2020

To

**Deputy Director General of Forest (Central),**  
Ministry of Environment, Forest and Climate Change,  
Regional Office (WZ), E-5, Kendriya  
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- Sub** : Half yearly Compliance report for Environment and CRZ Clearance for "Water Front Development Project at Mundra, Dist. Kutch, Gujarat.
- Ref** : i) Environment and CRZ clearance granted to M/s Adani Ports & SEZ Limited vide letter dated 12<sup>th</sup> January, 2009 and 19<sup>th</sup> January, 2009 bearing MoEF letter No. 10-47/2008-IA.III.  
ii) Environment and CRZ clearance Extension order granted to Water Front Development Project at Mundra in Kutchh District (Gujarat) vide letter dated 7<sup>th</sup> October, 2015 bearing MoEF letter No. 10-47/2008- IA.III.  
iii) Ministry's Order dated 18.09.2015

**Dear Sir,**

Please refer to the above cited reference for the said subject matter. In connection to the same, it is to state that copy of the compliance report for the Environmental and CRZ Clearance for the period of April-2020 to September-2020 is being submitted through soft copy (e-mail communication).

Kindly consider above submission and acknowledge.

Thank you,

Yours Faithfully,

For, **M/s Adani Ports and Special Economic Zone Limited**

**Douglas Charles Smith**  
**Chief Executive Officer**  
**Mundra & Tuna Port**

**Encl: As above**

**Copy to:**

- 1) The Director (IA Division), Ministry of Environment, Forests & Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi-110003
- 2) Zonal Officer, Regional Office, CPCB – Western Region, Parivesh Bhawan, Opp. VMC Ward Office No. 10, Subhanpura, Vadodara – 390 023
- 3) Member Secretary, GPCB – Head Office, Paryavaran Bhawan, Sector 10 A, Gandhi Nagar – 382 010
- 4) The Director, Forests & Environment Department, Block – 14, 8<sup>th</sup> floor, Sachivalaya, Gandhi Nagar – 382 010
- 5) Regional Officer, Regional Office GPCB (Kutch-East), Gandhidham, 370201

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# Environmental Clearance Compliance Report



Waterfront Development Project,  
Mundra, Dist. Kutch, Gujarat

Adani Ports and SEZ Limited  
Mundra, Kutch

For the period of  
April-2020 to September-2020

	<b>Adani Ports and Special Economic Zone Limited, Mundra.</b>	<b>From : Apr'20 To : Sep'20</b>
<b>Status of the conditions stipulated in Environment and CRZ Clearance</b>		

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**Adani Ports and Special Economic  
Zone Limited, Mundra.**

**From : Apr'20  
To : Sep'20**

**Status of the conditions stipulated in Environment and CRZ Clearance**

# **Compliance Report of Environmental and CRZ Clearance**

	<b>Adani Ports and Special Economic Zone Limited, Mundra.</b>	<b>From : Apr'20 To : Sep'20</b>
<b>Status of the conditions stipulated in Environment and CRZ Clearance</b>		

Activities/facilities approved, major components completed and proposed future activities as per Environment and CRZ Clearance are as below:

Description (Type of Facility or Berth)	Approved Berths or Length as per Environmental & CRZ Clearance	So far Developed and In Operation
	Nos. of Berths or Length	Nos. of Berths
Multipurpose	4 (550 m + 2 Berths)	4
Container	16 (2680 m + 2000 m)	7 (2110 m)
Ro-Ro	2	-
Coal	6	4
Dry-Bulk Cargo	5	-
Liquid/POL	9*	-
LNG	2	Developed and operated by GSPC LNG Limited as per NOC given by APSEZ)
Light & Heavy Engineering	2	-
Port Craft	1 (330 m)	-
Shipyard	2	-

\* Liquefied Petroleum Gas (LPG) Terminal has been developed under Waterfront Development Project of Adani Ports and SEZ Limited and LPG is being handled at existing Multipurpose Terminal APSEZ. LPG terminal, by M/s. Mundra LPG Terminal Pvt. Ltd., which is 100% subsidiary of APSEZ.

In addition to above berths or facilities, following components were also approved.

1. Dredging Quantity: 210 Mm<sup>3</sup>. Overall dredging to the tune of 123 Mm<sup>3</sup> is completed till date.
2. Back-up area, back-up facilities like railway line, rail slidings, rail truck loading, open paved areas, associated buildings, utilities, amenities, etc. and connectivity to rail and road corridor for each port were approved and majority of them are constructed and in operation. Remaining facilities will be developed based on future requirements.
3. Seawater intake channel and outfall channel for power plants, desalination plants (47 MLD is operational out of 300 MLD) and other industrial requirements approved and is already in operation.

	<b>Adani Ports and Special Economic Zone Limited, Mundra.</b>	<b>From : Apr'20 To : Sep'20</b>
<b>Status of the conditions stipulated in Environment and CRZ Clearance</b>		

**Note:**

- APSEZ has applied for EC & CRZ Clearance for expansion of Water Front Development Project vide dated 7<sup>th</sup> March, 2019.
- MoEF&CC has issued Terms of Reference (ToR) vide Ref. – F. No. 10-24/2019-IA-III dated 17<sup>th</sup> May, 2019 and it is further amended on 27<sup>th</sup> Sep, 2019 & 10<sup>th</sup> April, 2020.

**Status of the conditions stipulated in Environment and CRZ Clearance**

Half yearly Compliance report for Environment and CRZ Clearance for the project “Water Front Development Project (WFDP) at Mundra, Dist. Kachchh, Gujarat of M/s. Adani Ports and SEZ Limited”

Sr. No.	Condition as per clearance letter	Compliance Status as on 30-09-2020
<b>Specific Conditions</b>		
i	No existing mangroves shall be destroyed during construction / operation of the Project.	<p>Complied.</p> <p>Project is being developed as per permissions granted.</p> <p>Conservation of mangroves:</p> <ul style="list-style-type: none"> <li>• In and around APSEZ, approx. 1800 ha. Mangrove area was identified by NIO in an EIA report prepared in the year 1998.</li> <li>• Out of this 1800 ha area, 1254 ha area was further demarcated as potential mangrove conservation by NIO in the year 2008 (as part of the EIA report of WFDP).</li> <li>• It may be noted that the entire area of 1254 ha is not covered with mangroves.</li> <li>• Entire area is being conserved and there is no disturbance to the mangroves in this area. Measures such as restricted entry and regular surveillance have resulted in overall growth of mangroves within this area.</li> <li>• As per MoEF&amp;CC directive, APSEZ entrusted NCSCM to demarcate mangroves in and around APSEZ area. As per their study, presently, mangrove cover in and around APSEZ is over 2340 ha. The analysis of the comparison between 2011 and 2016-17 has shown an overall growth of 246 ha.</li> </ul> <p>NCSCM final report on comprehensive and integrated plan for preservation and conservation of mangroves and associated creeks in and around. Details of the same were submitted along with half yearly EC Compliance report for the period Apr'19 to Sep'19. The action plan for conservation of creeks and mangrove areas is prepared by NCSCM and the same was submitted to GCZMA and MoEF&amp;CC for their examination and recommendation. Presentation on the findings of the report was made to GCZMA committee on 4<sup>th</sup> October 2019 and the recommendation for the</p>

**Status of the conditions stipulated in Environment and CRZ Clearance**

		<p>same has been received vide email dtd 22<sup>nd</sup> Sept 2020 from GCZMA with following conditions:</p> <ul style="list-style-type: none"> <li>✓ The APSEZL shall carry out annual compliance monitoring of the mangrove conservation area.</li> <li>✓ The APSEZL shall explore the possibility for taking necessary adequate measures to reduce the erosion near Bocha Island.</li> <li>✓ The approval of mangrove conservation plan shall not be considered as any permission under CRZ Notification for dredging activity.</li> <li>✓ There should not be blockage of any drainage line and free flow of water is to be maintained, as flushing of mangrove areas is very essential.</li> <li>✓ The APSEZL shall carry out mangrove monitoring every two years and submit the data to Forest Department/GCZMA and MOEF&amp;CC, GOI.</li> </ul> <p>APSEZ is under the process of complying above recommendations -</p> <ul style="list-style-type: none"> <li>• Inline to the compliance of the action plan "Monitoring of mangrove cover in Jan/Mar, 2020 using latest satellite images and validation with field observations", Work has already been already been assigned to NSCSM, for amount of INR. 23,56,000/- vide PO no 4800050718, dtd. 31<sup>st</sup> December 2019 and same is under progress.</li> </ul>
ii	There shall be no filling up of the creek and reclamation of the creeks.	<p>Complied.</p> <p>Conservation of creeks:</p> <ul style="list-style-type: none"> <li>• The prominent creek system (main creeks and small branches of creeks) in and around APSEZ are: (1) Kotdi (2) Baradimata (3) Navinal (4) Bocha (5) Mundra (Oldest port (Juna Bandar) leading to Bhukhi river).</li> <li>• All above creek mouths are open allowing free flow of water in to the creeks and surrounding areas and there is no filling or reclamation of any creek area.</li> <li>• This aspect is also confirmed from the recent study of NCSCM, which highlights the bathymetry data of the entire coast around APSEZ.</li> <li>• From the bathymetry data it can be concluded that there are sufficient depths at the creek mouths and all creek mouths are open allowing flushing of water.</li> <li>• APSEZ has so far constructed 19 culverts having total length of approx. 1100 m with total cost of INR 20 Crores. Three RCC Bridges have also been constructed</li> </ul>



**Status of the conditions stipulated in Environment and CRZ Clearance**

		over Kotdi creek with total length of 230 m and cost of INR 10 Crores. Photographs showing the same were submitted along with half yearly compliance report for the period Apr'17 to Sep'17.
iii	The Project proponent shall comply with all the Orders/directions of the Honorable High Court of Gujarat and Supreme Court in the matter.	Complied.  There are three ongoing matters pending (Two pending at High Court and other pending at Supreme Court). Details of the same were submitted along with half yearly compliance report for the period Apr'19 to Sep'19. And there is no further change.
iv	Adequate safety measures for the offshore structure and ship navigation shall be taken in view of the High Current in the area.	Complied.  The hydrodynamic study for the waterfront area has been carried out by HR Wallingford, a maritime design expert. As per the recommendations in their report, the following safety measures are implemented. 1. The alignment of the berth has been kept in line with the current flow in order to reduce the effect of current on vessels moored alongside. 2. The breasting dolphins have been designed in such a configuration so as to provide appropriate lead to the vessels mooring ropes. 3. The berth being in line with the current flow will facilitate Pilotage operation and provide better maneuverability of vessels. 4. The strength of the berth structure has been calculated to absorb the energy transferred to fenders while berthing of tanker vessels at the terminal. 5. Navigational buoys and lead lights marking the channel and clearing distance off the breakwater are installed. 6. The strength of the fenders at the berth and the SWL of the bollards / winches are sufficient to absorb the forces of vessels alongside keeping in mind the monsoon weather conditions. 7. Sufficient depths are maintained at all times to ensure 10% UKC at the time of berthing / un-berthing. 8. The capstans / winches / bollards are of adequate strength with respect to the vessels being handled. 9. The berth has been designed at an appropriate distance from the existing berths at MMPT-1 in order to safely allow berthing / un-berthing of vessels at MMPT-1 with vessels berthed at the South Port tanker terminal.

**Status of the conditions stipulated in Environment and CRZ Clearance**

		10. Berths have been planned close to the breakwater as there is a reduced strength of current along the coastline.
v	The shore line changes in the area shall be monitored periodically and the report submitted every 6 months to Regional Office Bhopal.	<p>Complied.</p> <p>Shore line change aspect has been studied in detail as part of following two studies;</p> <ul style="list-style-type: none"> <li>• Bathymetry &amp; Topography study, preparation of plan for protection of creeks/ mangrove area including buffer zone, mapping of co-ordinates, running length, HTL, CRZ boundary.</li> <li>• A Regional Impact Assessment study to identify impacts of all the existing as well as proposed project activities in Mundra region.</li> </ul> <p>Based on the study outcome, it is recommended to map the coastal morphology (shoreline change) at least once in three years. The said recommendation will be implemented and the next shoreline change assessment will be carried out during 2020-21.</p> <p>Please refer <b>Annexure – B</b> (Compliance of MoEF&amp;CC Order dated 18<sup>th</sup> Sep, 2015) for further details regarding the mentioned studies.</p>
vi	The recommendations of the risk assessment shall be implemented; any change in the design of the project shall come before the committee for seeking necessary approval.	<p>Complied.</p> <p>Risk Assessment was carried out at the time of preparation of the EIA report for the Liquid Berths and LNG terminal. However, it may be noted that liquid berths are not yet developed. Hence recommendations of Risk Assessment will be implemented once the liquid berths &amp; pipelines are developed by APSEZ.</p> <p>The LNG terminal is constructed by GSPC LNG Ltd. and a separate Environment and CRZ clearance is obtained by them. Please refer general condition no ix below for details regarding the same.</p> <p>LPG is being handled from the existing multipurpose terminal. A detailed risk assessment study as per MoEF&amp;CC letter no. F. No. 10-47/2008-IA-III dated 31<sup>st</sup> May, 2016 was carried out by iFluids Engineering for handling as well as</p>

**Status of the conditions stipulated in Environment and CRZ Clearance**

		<p>storage activities. Recommendations of the risk assessment have been implemented as part of the construction activity and details of the same were submitted along with half yearly compliance report for the period Oct'18 to Mar'19. Reports of the same were submitted to MoEF &amp; CC along with half yearly compliance report for the period Apr'17 to Sep'17.</p> <p>Implantation report of risk assessment study during operation phase was submitted along with last half yearly compliance report for the period Oct'19 to Mar'20.</p>
vii	<p>Mangrove plantation of 200 ha to be done in consultation with GEER / GEC of Forest Department, a detailed plan shall be submitted within six months from the date of receipt of this letter.</p>	<p>Complied.</p> <p>APSEZ has consulted Gujarat Institute of Desert Ecology (GUIDE) as they are one of the authorized agencies of Dept. of Forest &amp; Env., Govt. of Gujarat for carrying out mangrove afforestation. GUIDE has completed mangrove plantation in an area of 200 ha at Jakhau, Gujarat during the year 2012-13. Copy of the mangrove plantation completion certificate was submitted along with EC compliance report for the period Apr'18 to Sep'18. Total expenditure for the said work was INR 40 lakh.</p> <p>It may be noted that to enhance the marine biodiversity, till date APSEZ has carried out mangrove afforestation in 2890 ha. area across the coast of Gujarat. Total expenditure for the same till date is INR 832 lakh. Details on mangroves afforestation &amp; Green belt development carried out by APSEZ till date is annexed as <b>Annexure – 1</b>.</p>
viii	<p>It shall be ensured that during construction and post construction of the proposed jetty the movement of fishermen vessel of the local communities are not interfered with.</p>	<p>Complied.</p> <p>During project proposal, APSEZ proposed to provide four (4) dedicated accesses at Juna Bandar, Luni, Bavdi Bandar and Zarpara for the fishermen to approach the sea for fishing activity. However, during construction as well as operation, through fishermen consultative process, so far APSEZ has provided seven (7) access roads instead of four (4). Total length of all the approach roads is approx. 23 Kms and expenditure involved is Rs. 637 Lacs. There is no hindrance to the movement of fisherman boats.</p> <p>Further, APSEZ is actively working with local community (including fishermen community) around the project area and provides required support for their livelihood and other</p>

**Status of the conditions stipulated in Environment and CRZ Clearance**

concerns through the CSR arm – Adani Foundation. Following activities have been carried out during the period FY 2020-21 (Till Sep'20). Brief information about activities in the main five persuasions is mentioned below. Other than with five persuasion, Adani Foundation has also worked for fight against COVID – 19 pandemic situation during this compliance period Activities carried out for the same are summarized as below.

Area	Activity
Fight Against COVID-19	<ul style="list-style-type: none"> <li>• <b>24 villages</b> of Mundra block Sanitized.</li> <li>• <b>45000+</b> Mask prepared by SHG group.</li> <li>• <b>1800+</b> food packet per day two time for the workers, drivers and labours of APSEZ and AWL Cost free Fresh Food Support (Breakfast, Lunch and Dinner)</li> <li>• <b>9000+r</b> ation kit support Ration Kit support to Daily Wedge Labours and Needy people</li> <li>• Mobile health care unit is providing primary treatment to community at door step and also creating awareness to fight against Corona virus - <b>150+ beneficiaries</b> covered</li> <li>• <b>12500 people</b> connected By Awaz De software creating awareness in people in local kutchhi language.</li> <li>• <b>1400+</b> patient covered - AHMPL is providing all services IPD and OPD during lockdown period.</li> <li>• Important of handwashing &amp; hygiene by Sangini</li> <li>• <b>57 senior citizens</b> of old age home - During lockdown period our team providing medical facility to senior citizens at old age home in Mandvi and Gundala</li> </ul>
Community Health	<p><b>Community Health – Mundra</b></p> <ul style="list-style-type: none"> <li>• 11 Rural Clinic – 8 from Mundra &amp; 3 from Anjar block treated; <b>8196 patients</b>.</li> <li>• <b>31 villages</b> covered, with <b>109 types</b> of general and lifesaving medicines through Mobile healthcare unit <b>6879 patients</b> benefited during six month.</li> <li>• Provided dialysis treatment to <b>6 patients</b> of kidney failure <b>236 times</b>.</li> <li>• <b>Citizen project - 8672 Card holders</b> of <b>68 villages</b> get benefit under this project.</li> <li>• <b>2921 sr. citizen patients</b> benefited during six month - <b>8000 limit</b> for three year per patients</li> <li>• <b>470</b> Needy patients had been facilitated with Medical Support OPD &amp; IPD treatment with token charges during this six month.</li> <li>• <b>1150</b> health calendar were distributed to various PHC, CHC and ICDS department of Mundra, Mandvi, Nakhtrana, Lakhpat, Abadasa, Anjar &amp; Gandidham block.</li> <li>• <b>594 Protein Powder packet</b> distributed to ANC woman of Utthan villages and TB patient of Mundra block.</li> <li>• Total <b>18698 &amp; 10380</b> IPD / OPD facilities provided project wise and AHMPL subsequently during six months.</li> </ul>

**Status of the conditions stipulated in Environment and CRZ Clearance**

		<table border="1"> <tr> <td> <p>Sustainable Livelihood Fisher folk –</p> </td> <td> <ul style="list-style-type: none"> <li>• Average <b>70 KL</b> of water was supplied to <b>717</b> households at 4 fisherman vasahat on a daily basis under Machhimar Shudhh Jal Yojana.</li> <li>• <b>55 Higher secondary Fishermen students</b> of Sekhadiya, Navinal, Zarpara &amp; Junabandar benefitted with book support. Mother meeting and telephone Discussion for their wards discussion.</li> <li>• <b>4830 Man-days</b> work was provided over <b>236 Fishermen family</b> during this six months.</li> <li>• To avail Fishermen Government scheme (Fishermen Credit card) one day program was arranged with social distancing and all precaution. <b>30 KCC</b> form fill-up at Navinal. Created awareness with Telephonic about same.</li> <li>• To create option livelihood over fishermen with co-ordination of VRTI. Pilot phase – <b>3500 Kg sea weed</b> was harvested</li> <li>• Total <b>85 Acre Gauchar Land</b> was approved by GP for Development by decision taken in Gram Sabha. Among them <b>72 Acre</b> land Has been Sowed and Remaining land would be Grow with Wild Grass.</li> <li>• Government Scheme Facilitation - Facilitate widows, senior Citizens and Divyang to various schemes of government like widow pension, free bus pass, Senior citizen pension scheme sankat mocha sahay etc. support for process and documentation – Total <b>66 Nos.</b> of beneficiaries.</li> <li>• <b>60,000+</b> three layer mask has been prepared and sold by Umang SHG group @ <b>Rs.10.00</b> per mask.</li> <li>• <b>5-SHG</b> had been facilitated for <b>Rs 1.0 lac</b> bank loan through DRDA to start-up new business for women empowerment.</li> <li>• Fodder support in <b>20 villages</b> of Mundra and Anjar block. Dry fodder <b>6.70 lacs kg</b> &amp; Green fodder <b>11.60 lacs kg</b>.</li> <li>• To Doubling the farmer income by aviling "Barahi Varities Tissue plant" has good productivity <b>850 plants</b> have been distributed to <b>34 farmers 25 plants / Farmers</b> cost of a plants is <b>Rs. 3500</b>.</li> <li>• Installation of <b>53 Home Bio-gas</b> with SOP Awareness and trouble shoot of problem as well.</li> <li>• <b>10,000 dragon food sapling</b>, Pole and wire have been supported to 5 farmers.</li> </ul> </td> </tr> <tr> <td> <p>Education</p> </td> <td> <ul style="list-style-type: none"> <li>• Apart from CPD Utthan Sahayks attended <b>30+ educational webinar</b> during lockdown.</li> <li>• Arrange various competition and celebration for Priya VidyarthiSchool Visit and Home Visit by Utthan Sahayak.</li> <li>• Conduct meeting with Principal / Teacher of Utthan schools, TPEO, BRC, CSR Head, Education Coordinator, Project Officer and Utthan Sahayaks through Microsoft Team.</li> <li>• Adani Vidya Mandir Bhadreshwar provide "cost-free" education to meritorious students coming from challenging economic background, who have priceless treasures but have been under achievers due to situation. In year 2020-21 <b>490 students</b> are studying. <b>82.60%</b> - Result SSC Board Exam</li> </ul> </td> </tr> </table>	<p>Sustainable Livelihood Fisher folk –</p>	<ul style="list-style-type: none"> <li>• Average <b>70 KL</b> of water was supplied to <b>717</b> households at 4 fisherman vasahat on a daily basis under Machhimar Shudhh Jal Yojana.</li> <li>• <b>55 Higher secondary Fishermen students</b> of Sekhadiya, Navinal, Zarpara &amp; Junabandar benefitted with book support. Mother meeting and telephone Discussion for their wards discussion.</li> <li>• <b>4830 Man-days</b> work was provided over <b>236 Fishermen family</b> during this six months.</li> <li>• To avail Fishermen Government scheme (Fishermen Credit card) one day program was arranged with social distancing and all precaution. <b>30 KCC</b> form fill-up at Navinal. Created awareness with Telephonic about same.</li> <li>• To create option livelihood over fishermen with co-ordination of VRTI. 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Dry fodder <b>6.70 lacs kg</b> &amp; Green fodder <b>11.60 lacs kg</b>.</li> <li>• To Doubling the farmer income by aviling "Barahi Varities Tissue plant" has good productivity <b>850 plants</b> have been distributed to <b>34 farmers 25 plants / Farmers</b> cost of a plants is <b>Rs. 3500</b>.</li> <li>• Installation of <b>53 Home Bio-gas</b> with SOP Awareness and trouble shoot of problem as well.</li> <li>• <b>10,000 dragon food sapling</b>, Pole and wire have been supported to 5 farmers.</li> </ul>	<p>Education</p>	<ul style="list-style-type: none"> <li>• Apart from CPD Utthan Sahayks attended <b>30+ educational webinar</b> during lockdown.</li> <li>• Arrange various competition and celebration for Priya VidyarthiSchool Visit and Home Visit by Utthan Sahayak.</li> <li>• Conduct meeting with Principal / Teacher of Utthan schools, TPEO, BRC, CSR Head, Education Coordinator, Project Officer and Utthan Sahayaks through Microsoft Team.</li> <li>• Adani Vidya Mandir Bhadreshwar provide "cost-free" education to meritorious students coming from challenging economic background, who have priceless treasures but have been under achievers due to situation. 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**Status of the conditions stipulated in Environment and CRZ Clearance**

			<ul style="list-style-type: none"> <li>• Tablet provide to students of std. 10<sup>th</sup> for online study through Employee Volunteering Programme</li> <li>• Admission process of std 1 students through draw system. 80 students selected out of 91. remain 11 students in waiting list</li> <li>• Online Class through WhatsApp and you tube video</li> </ul>
		Rural Infrastructure	<p><b><u>WORK COMPLETED</u></b></p> <ul style="list-style-type: none"> <li>• Development of Prisha Park at Mundra.</li> <li>• Pond Bund strengthening at Zarpara Village</li> </ul> <p><b><u>WORK IN PROGRESS</u></b></p> <ul style="list-style-type: none"> <li>• Drainage Line and Chamber work at Bhopavandh.</li> <li>• Drainage Maintenance &amp; JCB Hiring &amp; Other Mis. Work.</li> <li>• Road Repairing at Kutdi Bandar.</li> <li>• Road Repairing at Zarapra Fisherman Vashat.</li> <li>• Road Repairing at Luni Pagadiya Fisherman</li> </ul> <p><b><u>WATER CONSERVATION PROJECTS</u></b></p> <ul style="list-style-type: none"> <li>• A large number of water harvesting structure (<b>18 Nos. of check dams</b> in coordination with salinity department)</li> <li>• Ground recharge activities (<b>pond deepening work for more than 52 ponds</b>) individually and 26 ponds under Sujlam Suflam Jal Abhiyan leading to a significant increase in water table and higher returns to the farmers</li> <li>• <b>Roof Top Rain Water Harvesting 54 Nos.</b> which is having <b>10,000 litre</b> storage which is sufficient for one year drinking water purpose for 5 people family.</li> <li>• Recharge Bore well <b>75 Nos</b> which is best ever option to conserve ground water Drip Irrigation 823 Farmers benefitted in coordination with Gujrat Green Revolution Company</li> <li>• Participatory Ground Water Management in ten villages with holistic approach for Kankavati Sandstone Aquifer Programme</li> <li>• As per Average Calculation more than <b>450 hac. area</b> benefitted with increased in <b>109 MCFT</b> water Quantity.</li> </ul> <p><b><u>Bio Diversity Park – Mundra</u></b></p> <ul style="list-style-type: none"> <li>• Adani Foundation, Mundra-Kutchh proposed a biodiversity park at 5 acres Nandi Sarovar area and approached to Sahjeevan, Bhuj for technical support for same.</li> <li>• Sahjeevan team visited this proposed site for development of greenbelt to support biodiversity and enhancement of overall ecological food web existing in and around the landscape in first phase.</li> </ul>
		Skill Development	<ul style="list-style-type: none"> <li>• Adani Skill Development Centre (ASDC) is playing a pivotal role in implementing sustainable development in the state. The objective of this Centre is to impart different kinds of training to the students of 10<sup>th</sup>, 12<sup>th</sup>, college or ITI from surrounding areas.</li> <li>• During this year Total 440 people trained in various trainings to enhance socio economic development.</li> <li>• 324 students Enrolled in Online Training.</li> </ul>

**Status of the conditions stipulated in Environment and CRZ Clearance**

		<ul style="list-style-type: none"> <li>The students of DDU-GKY (GDA) creating awareness regarding COVID-19 in their own village through various activity. 27students get placement in GAIMS (sodexo), Alilance Hospital, Shreeji Hospital, Bhuj Fire Academy, Divine Hospital etc. 3 students are working in COVID-19 Hospital.</li> </ul> <p>Please refer <b>Annexure – 2</b> for full details of CSR activities carried out by Adani Foundation in the Mundra region. Budget for CSR Activity for the FY 2020-21 is to the tune of INR 1429.3 lakh. Out of which, Approx. INR 416.7 lakh are spent during the year FY 2020-21 (Till Sep'20).</p>																																														
ix	Relocation of the fishermen community if any shall be done strictly in accordance with the norms prescribed by the State Government.	<p>Not Applicable</p> <p>The project was conceptualized in such a way that there are no fishermen settlements in the project proposal. Hence there is no relocation of fishermen communities required.</p>																																														
x	Marine ecology monitoring shall be done regularly during construction of breakwater and dredging /disposal operation.	<p>Completed.</p> <p>Constructions as well as dredging operations are ongoing activities. Marine monitoring is being carried out once in a month by NABL and MoEF&amp;CC accredited agency namely M/s. Pollucon Laboratory Pvt. Ltd. Summary of the same for duration from Apr'20 to Sep'20 is mentioned below.</p> <p><b>Total Sampling Locations &amp; frequency: 09 Nos. (Frequency: Once a month)</b></p> <table border="1"> <thead> <tr> <th rowspan="2">Parameter</th> <th rowspan="2">Unit</th> <th colspan="2">Surface</th> <th colspan="2">Bottom</th> </tr> <tr> <th>Max</th> <th>Min</th> <th>Max</th> <th>Min</th> </tr> </thead> <tbody> <tr> <td>pH</td> <td>--</td> <td>8.29</td> <td>8.25</td> <td>8.25</td> <td>8.19</td> </tr> <tr> <td>TSS</td> <td>mg/L</td> <td>245</td> <td>212</td> <td>270</td> <td>216</td> </tr> <tr> <td>BOD (3 Days @ 27 °C)</td> <td>mg/L</td> <td>4.1</td> <td>3.2</td> <td>ND*</td> <td>ND*</td> </tr> <tr> <td>DO</td> <td>mg/L</td> <td>6.1</td> <td>5.9</td> <td>5.9</td> <td>5.7</td> </tr> <tr> <td>Salinity</td> <td>ppt</td> <td>36.8</td> <td>35.5</td> <td>37.1</td> <td>35.7</td> </tr> <tr> <td>TDS</td> <td>mg/L</td> <td>38280</td> <td>36570</td> <td>38554</td> <td>36724</td> </tr> </tbody> </table> <p>*ND = Not Detectable</p> <p>Please refer <b>Annexure – 3</b> for detailed analysis reports. Approx. INR 8.46 Lakh is spent for all environmental monitoring activities during the FY 2020-21 (Till Sep'20).</p> <p>The environmental monitoring within Adani Ports &amp; SEZ Limited has been stopped from 23<sup>rd</sup> March, 2020 to 12<sup>th</sup></p>	Parameter	Unit	Surface		Bottom		Max	Min	Max	Min	pH	--	8.29	8.25	8.25	8.19	TSS	mg/L	245	212	270	216	BOD (3 Days @ 27 °C)	mg/L	4.1	3.2	ND*	ND*	DO	mg/L	6.1	5.9	5.9	5.7	Salinity	ppt	36.8	35.5	37.1	35.7	TDS	mg/L	38280	36570	38554	36724
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May, 2020 considering COVID-19 Pandemic lockdown and the same has already been intimated to the regulatory authorities vide our e-mail dated 06.04.2020 & 13.05.2020. The details of the same is attached as **Annexure – 4**.

Marine monitoring for west port area has been carried out by M/s. Adani Power (Mundra) Limited. Monitoring reports are also enclosed as **Annexure – 3**.

Summary of ecological parameters is given below:

**Plankton Diversity:** A total of five stations were distributed throughout the sampling effort. Samples were collected during September 2017. A maximum 24 genera of Amphidinium, Amphora, Bacteriastrum, Cerataulina, Ceratium, Chaetoceros, Coscinodiscus, Cylindrotheca, Ditylum, Fragilaria, Gunardia, Hemialus, Lauderia, Melosira, Navicula, Odontella, Pleurosigma, Pseudonitzschia, Rhizosolenia, Scrippsiella, Skeletonema, Surella, Thalassionema and Thalassiosira identified from station 3 during the period of investigation and a minimum 18 genera of phytoplankton Cerataulina, Chaetoceros, Coscinodiscus, Cylindrotheca, Ditylum, Dinophysis, Fragilaria, Leptocylindrus, Melosira, Meuneria, Navicula, Odontella, Pleurosigma, Protoperidinium, Rhizosolenia, Skeletonema, Thalassionema and Thalassiosira identified from station 2 & 4. The phytoplankton abundance in the study region was ranged from 10000 to 41952 cells L-1. Highest phytoplankton abundance was observed at the ST-3 Surface water. However, lowest phytoplankton abundance was observed at the ST-5 Surface water. The maximum number of groups (24) found at ST-3.

**Benthic Diversity:** Benthic invertebrates in the present study area were distributed on the surface of bed forms i.e. sandy and Silty clay in nature. The abundance and diversity, species composition of benthic invertebrates were recorded which is the indicators of changing environmental conditions. A total 5 sub tidal stations and 3 intertidal transect were distributed throughout the sampling effort. Samples were collected during December 2017. Sub tidal: A maximum 4 group of Bivalvia, Polychaeta, Amphipoda, and Sipuncula identified from station 1 & 5 during the period of investigation and a

**Status of the conditions stipulated in Environment and CRZ Clearance**

		<p>minimum 2 Polychaeta and Amphipoda Benthic fauna recorded from station 2. In the sub tidal region macro benthos abundance was higher at ST-1 (575 no. m-2), whereas lowest abundance was recorded at ST-2 (100 no. m-2). Benthic group count was ranged from 2 to 4, with maximum groups at ST-1&amp;5. High biomass was recorded at ST-5 (8.63mg. m-2) as compared to other stations.</p>																																								
xi	<p>Regular Monitoring of air quality shall be done in the settlement areas around the Project site and appropriate safeguard measures shall be taken.</p>	<p>Complied.</p> <p>Ambient Air Quality and Noise monitoring are being carried out by NABL accredited and MoEF&amp;CC authorized agency namely M/s. Pollucon Laboratory Pvt. Ltd. Summary of the same for duration from Apr'20 to Sep'20 is mentioned below.</p> <p><b>Air sampling locations &amp; frequency: 10 nos. (twice a week) &amp; Noise sampling locations &amp; frequency: 7 nos. (once in a month)</b></p> <table border="1"> <thead> <tr> <th>Parameter</th> <th>Unit</th> <th>Max</th> <th>Min</th> <th>Perm. Limit<sup>§</sup></th> </tr> </thead> <tbody> <tr> <td>PM<sub>10</sub></td> <td>µg/m<sup>3</sup></td> <td>92.46</td> <td>35.34</td> <td>100</td> </tr> <tr> <td>PM<sub>2.5</sub></td> <td>µg/m<sup>3</sup></td> <td>53.6</td> <td>12.13</td> <td>60</td> </tr> <tr> <td>SO<sub>2</sub></td> <td>µg/m<sup>3</sup></td> <td>32.54</td> <td>6.18</td> <td>80</td> </tr> <tr> <td>NO<sub>2</sub></td> <td>µg/m<sup>3</sup></td> <td>42.67</td> <td>12.50</td> <td>80</td> </tr> <tr> <th>Noise</th> <th>Unit</th> <th>Max</th> <th>Min</th> <th>Perm. Limit</th> </tr> <tr> <td>Day Time</td> <td>dB(A)</td> <td>74.1</td> <td>58.3</td> <td>75</td> </tr> <tr> <td>Night Time</td> <td>dB(A)</td> <td>69.8</td> <td>58.7</td> <td>70</td> </tr> </tbody> </table> <p><sup>§</sup> as per NAAQ standards, 2009 Values recorded confirms to the stipulated standards.</p> <p>Please refer <b>Annexure – 3</b> for detailed analysis reports. Approx. INR 8.46 Lakh is spent for all environmental monitoring activities during the FY 2020-21 (Till Sep'20). Ambient air quality monitoring in surrounding villages is being carried out by M/s. Adani Power (Mundra) Limited, Mundra and monitoring reports of the same are also enclosed in <b>Annexure – 3</b>.</p> <p>Following safeguard measures are taken for abatement of dust emissions.</p> <ul style="list-style-type: none"> <li>• Regular sprinkling on road and other open area</li> <li>• Regular cleaning of roads</li> </ul>	Parameter	Unit	Max	Min	Perm. Limit <sup>§</sup>	PM <sub>10</sub>	µg/m <sup>3</sup>	92.46	35.34	100	PM <sub>2.5</sub>	µg/m <sup>3</sup>	53.6	12.13	60	SO <sub>2</sub>	µg/m <sup>3</sup>	32.54	6.18	80	NO <sub>2</sub>	µg/m <sup>3</sup>	42.67	12.50	80	Noise	Unit	Max	Min	Perm. Limit	Day Time	dB(A)	74.1	58.3	75	Night Time	dB(A)	69.8	58.7	70
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		<ul style="list-style-type: none"> <li>• Dry fog Dust Suppression System (DSS) in hopper, transfer towers and conveyor belts</li> <li>• Use of water mist canon</li> <li>• Closed type conveyor belts</li> <li>• Regular sprinkling on coal heaps</li> <li>• Covering other types of dry bulk cargo heaps</li> <li>• Installation of wind breaking wall</li> <li>• Development of greenbelt along the periphery of the storage yards/back up area</li> <li>• Mechanized handling system for coal and other dry bulk cargo</li> <li>• Wagon loading and truck loading through closed silo</li> </ul>												
xii	<p>Sewage arising in the Port area shall be disposed off after adequate treatment to conform to the standards stipulated by Gujarat State Pollution Control Board and shall be utilized / recycled for Gardening, Plantation and Irrigation.</p>	<p>Complied.</p> <p>Entire quantity of sewage generated is being treated in designated ETP / STP and treated sewage is used for Horticulture purposes.</p> <table border="1"> <thead> <tr> <th>Location</th> <th>Capacity</th> <th>Quantity of Treated water (Avg. Apr'20 to Sep'20)</th> <th>Type of ETP / STP</th> </tr> </thead> <tbody> <tr> <td>LT</td> <td>265 KLD</td> <td>82 KLD</td> <td>Activated Sludge</td> </tr> <tr> <td>West port</td> <td>55 KLD</td> <td>15 KLD</td> <td>FAB</td> </tr> </tbody> </table> <p>However there is some minor modification work is going on in ETP (LT) for biological treatment from Dec'19. During this time entire effluent + sewage is being sent to CETP operated by MPSEZ Utilities Ltd. (MUL) for treatment and final disposal on land for horticulture purpose within APSEZ premises. The same has already been informed to the state pollution control board. The details of the same is attached as <b>Annexure – 5</b>.</p> <p>The treated water from CETP is being utilized on land for horticulture purpose within APSEZ premises after achieving permissible norms prescribed in Consent order.</p> <p>Third party analysis of the treated water is being carried out once in a month at CETP &amp; twice in a month at West Port by NABL and MoEF&amp;CC accredited agency namely M/s. Pollucon Laboratory Pvt. Ltd. Summary of the same for duration from Apr'20 to Sep'20 is mentioned below.</p>	Location	Capacity	Quantity of Treated water (Avg. Apr'20 to Sep'20)	Type of ETP / STP	LT	265 KLD	82 KLD	Activated Sludge	West port	55 KLD	15 KLD	FAB
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**Status of the conditions stipulated in Environment and CRZ Clearance**

Parameter	Unit	Max	Min	Perm. Limit <sup>s</sup>
<b>Industrial Effluent / Sewage (For CETP)</b>				
pH	--	7.88	7.68	6.0 to 9.0
TSS	mg/L	59	41	100
TDS	mg/L	2078	1730	2100
COD	mg/L	249	165	250
BOD (3 Days @ 27°C)	mg/L	68	32	100
<b>Domestic Sewage</b>				
pH	--	7.11	7.84	6.5 – 9.0
TSS	mg/L	10	29	100
BOD (3 Days @ 27 °C)	mg/L	8	19	30
Residual Chlorine	ppm	0.4	0.8	Min 0.5
Fecal Coliform	Nos.	70	320	<1000

<sup>s</sup> as per CC&A granted by GPCB  
Values recorded confirms to the stipulated standards.

Please refer **Annexure – 3** for detailed analysis reports. Approx. INR 8.46 Lakh is spent for all environmental monitoring activities during the FY 2020-21 (Till Sep'20).

xii i	Adequate Plantation shall be carried out along the roads of the Port premises and a green belt shall be developed.	<p>Complied.</p> <p>The species such as <i>Ficus Infectoria</i>, <i>Ficus religiosa</i>, <i>Terminalia arjuna</i>, <i>Cocos nucifera</i>, <i>Washingtonia fillifera</i>, <i>Casurina spp.</i>, <i>Azadirachta Indica</i>, <i>Eucalyptus spp.</i>, <i>Jatropha curacus</i>, <i>Ficus bengalensis</i>, <i>Subabool spp.</i>, <i>Casia fistula</i>, <i>Date Palm</i> and <i>Delonix regia</i> are grown within APSEZ area.</p> <p>Within the port areas approx. 153 hectare of greenbelt having 3,92,145 trees with the density of 2567 trees per hectare is developed till date within port premises. So, far APSEZ has developed 469 ha. area as greenbelt with plantation of more than 8.82 Lacs saplings within the APSEZ area.</p> <p>Please refer <b>Annexure – 1</b> for further details regarding greenbelt development, mangrove afforestation and updated green belt development plan. Total expenditures of the horticulture dept. for the financial year of 2020-21 (Till Sep'20) have been INR 490 lakh.</p>
xiv	There shall be no withdrawal of Ground	Complied.

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	Water in CRZ area for this Project.	APSEZ does not draw any ground water for the water requirement. Present source of water for various project activities is desalination plant of APSEZ and/or Narmada water through Gujarat Water Infrastructure Limited. Average water consumption for entire APSEZ area is 4.3 MLD during the compliance period Apr'20 to Sep'20.
xv	Specific arrangements for rain water harvesting shall be made in the Project design and the rain water so harvested shall be optimally utilized. Details in this regard shall be furnished to this Ministry's Regional Office at Bhopal within 3 months.	<p>Complied.</p> <p>Groundwater recharge cannot be done at the project site since the entire project is in the intertidal / sub tidal areas. Rain water within project area is managed through storm water drainage.</p> <p>We have installed Rain water recharge bore well (4 Nos.) within our township to recharge ground water. Details of the same were submitted along with half yearly EC compliance report for the period Apr'19 to Sep'19. During last compliance period Approx. 6.5 ML of rain water has been recharged to increase the ground water table.</p> <p>We have also connected roof top rain water duct of operational building (Tug berth building within MPT) with u/g water tank for utilization of collected rain water for gardening / horticulture purpose. Details of the same were submitted along with EC Compliance report for the period Oct'18 to Mar'19.</p> <p>However, APSEZ has carried out rainwater harvesting activities in the nearby villages for benefit of the locals. Following measures are taken for the same during the year 2011 – 13 and the same have benefited to the local farmers.</p> <ol style="list-style-type: none"> <li>1. Pond deepening activities at villages</li> <li>2. 18 check dams were constructed under the 'Sardar Patel Sahbhagi Jalsanchay Yojna'</li> </ol> <p>Total cost of these efforts was approx. INR 320 lakh.</p> <p>Since 10 years considerable Water Conservation Work carried out in Mundra Taluka. Due to satisfactory rain in current year 1.11 mtr ground water table increased as per Government Figures.</p> <p><b>Our water conservation work is as Below.</b></p>

**Status of the conditions stipulated in Environment and CRZ Clearance**

		<ul style="list-style-type: none"> <li>• A large number of water harvesting structure ( 18 Nos. of check dams in coordination with salinity department)</li> <li>• Ground recharge activities (pond deepening work for more than 52 ponds) individually and 26 ponds under Sujlam Suflam Jal Abhiyan were built leading to a significant increase in water table and higher returns to the farmers</li> <li>• Roof Top Rain Water Harvesting 54 Nos. which is having 10,000 litre storage which is sufficient for one year drinking water purpose for 5 people family.</li> <li>• Recharge Bore well 75 Nos which is best ever option to conserve ground water</li> <li>• Drip Irrigation 823 Farmers benefitted in coordination with Gujrat Green Revolution Company</li> <li>• Participatory Ground Water Management in ten villages with holistic approach for Kankavati Sandstone Aquifer Programme</li> <li>• As per Average Calculation more than 450 hac. area benefitted with increased in 109 MCFT water Quantity.</li> </ul> <p>With the objective of to preserve the rain water to reduce the impact of salinity and recharge the ground water (the main source of water) to facilitate the Agricultural activities as well as for drinking water.</p> <p>Under UTHHAN MODEL VILLAGE PROJECT, Salinity ingress issue is well taken with pond deepening, recharge bore well technique and roof top rain water harvesting. Total ground water recharged due to this project 1878 ML.</p> <p>Please refer <b>Annexure – 2</b> for full details of CSR activities carried out by Adani Foundation in the Mundra region. Budget for CSR Activity for the FY 2020-21 is to the tune of INR 1429.3 lakh. Out of which, Approx. INR 416.7 lakh are spent during the year FY 2020-21 (Till Sep'20).</p>
xvi	Land Reclamation shall be carried out only to the extent that it is essential for this Project.	<p>Complied.</p> <p>Out of approved reclamation area of 1138 ha for west port, 695 ha area is reclaimed and out of approved reclamation area of 700 ha for south port, 665 ha area is reclaimed. Details of the same were submitted along with last compliance report submission for the period Apr'17 to Sep'17 and there is no further change.</p>

**Status of the conditions stipulated in Environment and CRZ Clearance**

xvi i	No Product other than those permissible in the Coastal Regulation Zone Notification, 1991 shall be stored in the Coastal Regulation Zone area.	Complied.  No products other than those permissible in the CRZ Notification 1991 are stored in the CRZ area.
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**General Conditions**

i	Construction of Proposed structures, if any in the Coastal Regulation Zone area shall be undertaken meticulously confirming to the existing Central/local rules and regulations including Coastal Regulation Zone Notification 1991 and its amendments. All the construction designs/drawings relating to the proposed construction activities must have approvals of the concerned State Government Departments/ Agencies.	<p>Complied.</p> <p>All construction activities are carried out confirming to the existing rules and regulation and as per the CRZ notification.</p> <p>Further, the requisite permissions from Gujarat Maritime Board (GMB), for carrying out construction activities are taken from time to time. Details of the same are mentioned below:</p> <ul style="list-style-type: none"> <li>• Permission for starting construction work for South port vide letter no GMB/N/PVT/711/870 dated 26.02.2009</li> <li>• Permission for starting construction work for West port vide letter no GMB/N/PVT/711/871 dated 26.02.2009</li> </ul> <p>The copies of these letters were submitted as part of the compliance report submission for the period Apr'16 to Sep'16.</p> <p>The project has been developed as per Consent to Establish (CtE) and Consent to Operate (CtO) granted by SPCB. The present in-force CtE &amp; CtO are mentioned below.</p> <table border="1"> <thead> <tr> <th>S. No.</th> <th>Permission</th> <th>Project</th> <th>Ref. No. / Order No.</th> <th>Valid till</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>CtO – Renewal</td> <td>Mundra Port Terminal</td> <td>AWH-83561</td> <td>20.11.21</td> </tr> <tr> <td>2</td> <td>CtO – Renewal</td> <td>West Port – WFDP</td> <td>AWH-79241</td> <td>23.06.21</td> </tr> <tr> <td>3</td> <td>CtO - Amendment</td> <td>Mundra Port Terminal</td> <td>WH-88317</td> <td>20.11.21</td> </tr> <tr> <td>4</td> <td>CtE – Fresh</td> <td>LPG Terminal</td> <td>CTE – 88079</td> <td>04.07.22</td> </tr> <tr> <td>5</td> <td>CtO – Amendment</td> <td>West Port – WFDP</td> <td>AWH-91678</td> <td>01.02.22</td> </tr> <tr> <td>6</td> <td>CtE –</td> <td>LPG Terminal</td> <td>PC/CCA-</td> <td>04.07.22</td> </tr> </tbody> </table>	S. No.	Permission	Project	Ref. No. / Order No.	Valid till	1	CtO – Renewal	Mundra Port Terminal	AWH-83561	20.11.21	2	CtO – Renewal	West Port – WFDP	AWH-79241	23.06.21	3	CtO - Amendment	Mundra Port Terminal	WH-88317	20.11.21	4	CtE – Fresh	LPG Terminal	CTE – 88079	04.07.22	5	CtO – Amendment	West Port – WFDP	AWH-91678	01.02.22	6	CtE –	LPG Terminal	PC/CCA-	04.07.22
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**Status of the conditions stipulated in Environment and CRZ Clearance**

		Amendment		KUTCH-1437/GPCB ID: 53331/468197	
		CtO - Amendment	Mundra Port Terminal	GPCB/CCA-Kutch - 39(5)/ ID-17739/473575	20.11.21
		CtE – Amendment	LPG Terminal	PC/CCA-KUTCH-1437/PCB ID-53331/473995	03.10.25
		CtO - Amendment	Mundra Port Terminal	H-98086	20.11.21
		CtO - Amendment	Mundra Port Terminal	H-105708	20.11.21
		CtE – Amendment	WFDP	17739 / 15618	18.05.27
		<p>The permissions (Sr. No. 1 to 10) were submitted along with the previous half yearly compliance report and the copy of updated CtO-Amendment (Sr. No. 11) is attached as <b>Annexure – 6</b>.</p>			
ii	Adequate provision for infrastructure facilities such as water supply, fuel, sanitation etc. shall be ensured for construction workers during the construction phase of the project so as to avoid felling of trees/mangroves and pollution of water and the surroundings.	<p>Not applicable</p> <p>Most of the construction labours reside in the nearby villages where all basic facilities are easily available. There are no housing requirements for labours inside the project area.</p>			
iii	The project authorities must make necessary arrangements for disposal of solid wastes and for the treatment of effluents by providing a proper wastewater treatment plant outside the CRZ area. The quality of treated effluents, solid waste, and noise level etc. must	<p>Complied.</p> <p>Monitoring of environmental attributes viz. Air, Water, Noise, Soil, etc. is being carried out on regular basis by NABL and MoEF&amp;CC accredited agency namely M/s. Pollucon Laboratory Pvt. Ltd. Approx. INR 8.46 Lakh is spent for all environmental monitoring activities during the FY 2020-21 (Till Sep'20).</p>			



**Status of the conditions stipulated in Environment and CRZ Clearance**

<p>conform to the standards laid down by the competent authorities including the Central/ State Pollution Control Board and the Union Ministry of Environment and Forests under the Environment (Protection) Act, 1986, whichever are more stringent.</p>	<p><b>Waste Management</b> – APSEZ has adopted 5R concept for environmentally sound management of different types of solid &amp; liquid wastes. Please refer below details about management of each type of waste.</p>
	<p><b><u>Municipal Solid Waste:</u></b> A well-established system for segregation of dry &amp; wet waste is in place. All wet waste (Organic waste) is being segregated &amp; utilized for compost manufacturing and/or biogas generation for cooking purpose. The compost is further used by in house horticulture team for greenbelt development. Whereas dry recyclable waste is being sorted in various categories. Presently manual sorting is being done for sorting of different types of solid waste. Segregated recyclable materials such as Paper, Plastic, Cardboard, PET Bottles, Glass etc. are then sent to respective recycling units, whereas remaining non-recyclable waste is bailed and sent to cement plant (M/s. Sanghi Industries Ltd., Kutch and/or M/s. Ambuja Cement Ltd., Kodinar) for Co-processing as RDF (Refused Derived Fuel).</p>
	<p><b><u>Hazardous Waste:</u></b></p> <ul style="list-style-type: none"> <li>• E – Waste &amp; Used Batteries are being sold to GPCB registered recyclers namely M/s. e-Processing House and Sabnam Enterprise respectively.</li> <li>• Solid Hazardous Waste is being disposed through co-processing through common facility i.e. M/s. Saurashtra Enviro Projects Pvt. Ltd., Bhachau and/or cement industries of Sanghi Industries Ltd., Kutch and/or Ambuja Cement Ltd., Kodinar. Used/Waste Oil is being sold to GPCB authorized recyclers / re-processors namely M/s. Western India Petrochem Industry, Bhavnagar.</li> <li>• Solid hazardous waste i.e. Tank bottom sludge is being disposed through co-processing through common facility i.e. M/s. Saurashtra Enviro Projects Pvt. Ltd., Bhachau and/or cement industries of Ambuja Cement Ltd., Kodinar and/or being sold to authorized recycler namely M/s. Mundra Oil, Mundra.</li> <li>• Downgrade chemicals generated from cleaning of storage tanks / pipelines are being sold to authorized solvent recovery facilities namely M/s. Acquire Chemicals, Ankleshwar however during the compliance period, there was no disposal of downgrade chemicals.</li> </ul>

**Status of the conditions stipulated in Environment and CRZ Clearance**

		<ul style="list-style-type: none"> <li>Slop Oil received from vessels is treated to separate water and oil particles in Oil Water Separator system. Separated oil from the same is being sold to authorized recycler / reprocessor namely M/s. Western India Petrochem Industry, Bhavnagar and water is sent to ETP for further treatment. However during the compliance period, there was no disposal of Slope Oil.</li> </ul> <p>Details of permissions / agreements of hazardous waste authorized vendors were submitted along with half yearly EC Compliance Report for the period Apr'18 to Sep'18.</p> <p>The following table summarizes the waste management practice (from Apr'20 to Sep'20) for different types of wastes at APSEZ:</p> <table border="1"> <thead> <tr> <th>Type of Waste</th> <th>Quantity in MT</th> <th>Disposal method</th> </tr> </thead> <tbody> <tr> <td colspan="3"><b>Hazardous Waste</b></td> </tr> <tr> <td>Pig Waste</td> <td>3.90</td> <td rowspan="3">Co-processing at cement industries</td> </tr> <tr> <td>Oily Cotton waste</td> <td>24.82</td> </tr> <tr> <td>ETP Sludge</td> <td>Nil</td> </tr> <tr> <td>Tank Bottom Sludge</td> <td>Nil</td> <td>Co-processing at cement industries and/or Sell to registered recycler</td> </tr> <tr> <td>Used / Spent Oil</td> <td>30.935</td> <td rowspan="3">Sell to registered recycler</td> </tr> <tr> <td>Discarded Containers</td> <td>3.135</td> </tr> <tr> <td>Battery Waste</td> <td>Nil</td> </tr> <tr> <td>Bio Medical Waste</td> <td>2.224</td> <td>To approved CBWTF Site</td> </tr> <tr> <td colspan="3"><b>Municipal Solid Waste</b></td> </tr> <tr> <td>Recyclables</td> <td>487.642</td> <td>After recovery sent for recycling / Reuse within premises</td> </tr> <tr> <td>Refuse Derived Fuel</td> <td>61.86</td> <td>Co-processing at Cement Industries</td> </tr> <tr> <td>Wet Waste (Food waste + Organic waste)</td> <td>458.565</td> <td>Converted to Manure for Horticulture use / Biogas for cooking purpose</td> </tr> </tbody> </table>	Type of Waste	Quantity in MT	Disposal method	<b>Hazardous Waste</b>			Pig Waste	3.90	Co-processing at cement industries	Oily Cotton waste	24.82	ETP Sludge	Nil	Tank Bottom Sludge	Nil	Co-processing at cement industries and/or Sell to registered recycler	Used / Spent Oil	30.935	Sell to registered recycler	Discarded Containers	3.135	Battery Waste	Nil	Bio Medical Waste	2.224	To approved CBWTF Site	<b>Municipal Solid Waste</b>			Recyclables	487.642	After recovery sent for recycling / Reuse within premises	Refuse Derived Fuel	61.86	Co-processing at Cement Industries	Wet Waste (Food waste + Organic waste)	458.565	Converted to Manure for Horticulture use / Biogas for cooking purpose
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iv	The Proponent shall obtain the requisite consents for discharge of effluents and emissions under the Water (Prevention and Control of pollution) Act, 1974 and the Air (Prevention and Control of pollution) Act, 1981 from	Complied.  All construction activities are carried out confirming to the existing rules and regulation and as per the CRZ notification.																																						

**Status of the conditions stipulated in Environment and CRZ Clearance**

	the Gujarat Pollution Control Board before commissioning of the Project and copy of each of these shall be sent to this Ministry.	
v	The sand dunes, corals, and mangroves, if any, on the site shall not be disturbed in any way.	<p>Complied</p> <p>There are no sand dunes and corals at the project site. 1254 ha area identified as potential mangrove conservation is being conserved and there is no disturbance to the mangroves in this area.</p> <p>Please refer specific condition no i above for details regarding the same.</p>
vi	A copy of the clearance letter will be marked to the concerned Panchayat / Local NGO, if any from whom any suggestions /representations has been received while processing the proposal.	<p>Complied.</p> <p>Copy of the clearance letter was marked to the concerned panchayats. A typical proof of the same submitted to Mundra village Panchayat on 21.03.2009 was submitted as a part of compliance report submission for the period Apr'16 to Sep'16.</p>

**Status of the conditions stipulated in Environment and CRZ Clearance**

vii	<p>The funds earmarked for environment protection measures shall be maintained in a separate account and there shall be no diversion of these funds for any other purpose. A year wise expenditure on environmental safeguards shall be reported to this Ministry's Regional Office at Bhopal and the State Pollution Control Board.</p>	<p>Complied.</p> <p>Separate budget for the Environment protection measures is earmarked every year. All environment and horticulture activities are considered at corporate level and budget allocation is done accordingly. All the expenses are recorded in advanced accounting system of the organization.</p> <p>Budget for environmental management measures (including horticulture) for the FY 2020-21 is to the tune of INR 1401 lakh. Out of which, Approx. INR 679 lakh are spent during this compliance period. Detailed breakup of the expenditures for the past 3 years is attached as <b>Annexure – 7</b>.</p> <p>Details regarding the past six compliance report submissions are mentioned below:</p> <table border="1"> <thead> <tr> <th>Sr. no.</th> <th>Compliance period</th> <th>Date of submission</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Apr'17 to Sep'17</td> <td>01.12.2017</td> </tr> <tr> <td>2</td> <td>Oct'17 to Mar'18</td> <td>29.05.2018</td> </tr> <tr> <td>3</td> <td>Apr'18 to Sep'18</td> <td>30.11.2018</td> </tr> <tr> <td>4</td> <td>Oct'18 to Mar'19</td> <td>31.05.2019</td> </tr> <tr> <td>5</td> <td>Apr'19 to Sep'19</td> <td>28.11.2019</td> </tr> <tr> <td>6</td> <td>Oct'19 to Mar'20</td> <td>20.05.2020</td> </tr> </tbody> </table>	Sr. no.	Compliance period	Date of submission	1	Apr'17 to Sep'17	01.12.2017	2	Oct'17 to Mar'18	29.05.2018	3	Apr'18 to Sep'18	30.11.2018	4	Oct'18 to Mar'19	31.05.2019	5	Apr'19 to Sep'19	28.11.2019	6	Oct'19 to Mar'20	20.05.2020
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viii	<p>Full support shall be extended to the Officers of this Ministry's Regional Office at Bhopal and the Officers of the Central and State Pollution Control Boards by the Project Proponents during their inspection for monitoring purposes, by furnishing full details and action plans including the action taken reports in respect of mitigative measures and other environmental Protection activities.</p>	<p>Complied</p> <p>APSEZ is always extending full support to the regulatory authorities during their visit to the project site. All necessary documents are submitted as per the request of the visiting authorities.</p> <p>Last visit of Regional Office, GPCB was done on 25.09.2020 for Main port and West Port. APSEZL has submitted the reply to the site visit report vide letter dated 26.09.2020 incorporating details of action taken in respect of the observations of the GPCB representative. Details of the same are attached as <b>Annexure – 8</b>.</p> <p>Inline to the compliance certification process of Environment Clearance condition of Waterfront Development Plan, RO, MoEF&amp;CC Bhopal had visited the site on 27<sup>th</sup> &amp; 28<sup>th</sup> January, 2020 for compliance</p>																					

**Status of the conditions stipulated in Environment and CRZ Clearance**

		verification. APSEZ provided all requisite information and documents required by the Regional Officer MoEF&CC). During the said compliance verification visit and as per the compliance certification received, there was no major non-compliance observed.
ix	In case of deviation or alteration in the Project including the implementing agency, a fresh reference shall be made to this Ministry for modification in the clearance conditions or imposition of new ones for ensuring environmental protection.	Complied.  LNG terminal was initially approved under the Waterfront Development Project. However the same has been developed by GSPC LNG Ltd. for which, separate EC and CRZ clearance has already been obtained from MoEF&CC by them. Copy of the same was submitted along with compliance report submission for the period Oct'16 to Mar'17.  LPG terminal was initially approved under the Waterfront Development Project of Adani Ports and SEZ Limited and the same has been developed by M/s. Mundra LPG Terminal Pvt. Ltd., which is 100% subsidiary of APSEZ. Details of the same were submitted along with half yearly compliance report for the period Oct'17 to Mar'18.
x	The Ministry reserves the right to revoke this clearance, if any of the conditions stipulated are not complied with to the satisfaction of this Ministry.	Point noted and agreed.
xi	This Ministry or any other competent authority may stipulate any other additional conditions subsequently, if deemed necessary, for environmental protection which shall be complied with.	Complied  As part of the directions given by MoEF&CC vide order dated 18 <sup>th</sup> Sep, 2015, following studies were proposed. <ul style="list-style-type: none"> <li>• Bathymetry &amp; Topography study, preparation of plan for protection of creeks/ mangrove area including buffer zone, mapping of co-ordinates, running length, HTL, CRZ boundary.</li> <li>• A Regional Impact Assessment study to identify impacts of all the existing as well as proposed project activities in Mundra region.</li> </ul> Please refer <b>Annexure – B</b> for further details regarding the mentioned studies.
xii	The project proponent shall advertise at least in two	Complied.

**Status of the conditions stipulated in Environment and CRZ Clearance**

	<p>local newspapers widely circulated in the region around the Project, one of which shall be in the vernacular language of the locality concerned informing that the Project has been accorded Environmental Clearance and copies of clearance letters are available with the State Pollution Control Board and may also be seen at the website of the Ministry of Environment &amp; Forest at <a href="http://www.envfornic.in">http://www.envfornic.in</a>. The advertisement shall be made within 7 days from the date of issue of the clearance letter and a copy of the same shall be forwarded to the Regional Office of this Ministry at Bhopal.</p>	<p>The original copy of the EC and CRZ clearance was obtained on 10.03.2009 and advertisement (containing informing that the EC and CRZ clearance is accorded to the proposed project and a copy of clearance letter is available with the SPCB and may also be seen at the website of MoEF&amp;CC) was given in The Indian Express newspaper dated 18.03.2009. Copy of the same was submitted along with compliance report submission for the period Apr'16 to Sep'16.</p>
xii i	<p>The Project proponent shall inform the Regional Office at Bhopal 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.</p>	<p>Complied.</p> <p>APSEZ had informed the Regional Office of MoEF&amp;CC at Bhopal as well as MoEF&amp;CC, New Delhi regarding the date of financial closure and the date of start of land development work vide letter sent in August, 2009.</p>
xiv	<p>Any appeal against this environmental clearance shall lie with the National Environment Appellate Authority, if preferred, within period of 30 days as prescribed under section 11 of the National Environment Appellate Act, 1997.</p>	<p>Point noted and agreed.</p> <p>This EC and CRZ clearance was challenged in National Environment Appellate Authority. In this matter, Order has also been passed in favour of APSEZ. Copy of the same was submitted along with compliance report submission for the period Oct'16 to Mar'17.</p>

**Status of the conditions stipulated in Environment and CRZ Clearance**

4.	<p>The above mentioned stipulations will be enforced among others under the Water (Prevention &amp; Control of Pollution) Act 1974, the Air (Prevention &amp; Control of Pollution) Act 1981, the Environment (Protection) Act 1986, the Hazardous chemicals (Manufacture, Storage &amp; Import) Rules 1989, the Coastal Regulation Zone Notification 1991 and its subsequent amendments and the Public Liability Insurance Act 1991 and the rules made there under from time to time. The project proponent shall ensure that the proposal complies with the provisions of the approved Coastal Zone Management Plan of Gujarat state and the supreme court's order dated 18 April, 1996 in the writ petition No. 664 of 1993 to the extent the same are applicable to this proposal.</p>	<p>Point noted and Agreed</p> <p>APSEZ is being complied all the conditions said rules and regulations mentioned in EC point no. 4.</p> <p>APSEZ has valid insurance policy under PIL act 1991 up to 31.03.2021. The copy of policy is attached as <b>Annexure – 9</b>.</p>
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**Adani Ports and Special Economic  
Zone Limited, Mundra.**

**From : Apr'20  
To : Sep'20**

**Status of the conditions stipulated in Environment and CRZ Clearance**

# **ANNEXURE - A**

## **CRZ Recommendation Compliance Report of WFDP**

**Status of the conditions stipulated in Environment and CRZ Clearance**

**Compliance Status of CRZ Recommendation given by GCZMA for the Waterfront Development Project**

Sr. No.	Specific Conditions	Compliance Status as on 30-09-2020
<b>Specific Conditions</b>		
1	The provisions of the CRZ notification of 1991 and subsequent amendments issued from time to time shall be strictly adhered to by the MPSEZL. No activity in contradiction to the provisions of the CRZ Notification shall be carried out by the MPSEZL.	Complied.  All construction and operation activities are being carried out in line with the CRZ recommendation and permissions granted.
2	All necessary permissions from different Government Departments/ agencies shall be obtained by the MPSEZL before commencing any activities.	Complied.  Necessary permissions from competent authority have been obtained before commencing any the activities.  Please refer condition no. i & iv of General Conditions of the EC & CRZ Clearance above.
3	All major creeks shall be protected and no reclamation shall be done in these creeks and entire development along the creek shall be done after carrying out detailed engineering with an objective of environmental protection including protection of all major creeks to ensure adequate free flow of water and drainage of rain water during rainy seasons.	Complied.  All major creeks within the APSEZ area are protected.  Please refer specific condition no iii of the EC and CRZ clearance for details regarding this point.
4	The project proponent shall conserve the 1254 ha. of area as committed and proposed in their master plan and shall carry out plantation of various mangrove species in the said area.	Complied.  Mangrove conservation area of 1254 Ha is conserved as proposed in the master plan.  Please refer specific condition no i of the EC and CRZ clearance for details regarding this point.
5	Massive mangroves plantation activity in at least 300 ha. area shall be carried out within a time frame of 5 years as committed by the	Complied.  Mangrove plantation is already completed during the year 2012-13. Please refer specific condition no. vii

**Status of the conditions stipulated in Environment and CRZ Clearance**

Sr. No.	Specific Conditions	Compliance Status as on 30-09-2020
	project proponent. This would be in addition to the earlier commitment for 1200 ha. of mangroves plantation.	of the EC and CRZ clearance for further details.
6	No effluent or sewage shall be discharged in to the CRZ area and it shall be treated to conform to the norms prescribed by the Gujarat Pollution Control Board and would be discharged to the point suggested by the NIO in consultation with the GPCB.	Complied.  No effluent or sewage is discharged in to the CRZ area.  Please refer specific condition no xii of the EC and CRZ clearance for details regarding this point.
7	All the recommendations and suggestions given by NIO in their Environment Impact Assessment report for conservation / protection and betterment of environment shall be implemented strictly by MPSEZL.	Complied.  Compliance report of environmental management plan and mitigation measures proposed as part of the EIA report is attached as <b>Annexure – 10</b> .
8	The construction and operational activities as well as dredging and reclamation activities shall be carried out in such a way that there is no negative impact on mangroves and other coastal /marine habitat except the proposed approx. 63 ha of area for which the compensation (300 ha.) is proposed.	Complied.  All construction and operation activities as well as dredging and reclamation activities are being carried out as per the approvals.  1254 ha area identified as mangrove conservation area is being conserved by APSEZ.  Please refer specific condition no i of the EC and CRZ clearance for details regarding this point.
9	The construction activities and dredging shall be carried out under the supervision/monitoring of the NIO or any such institute of repute.	Complied.  Construction activities are carried out as per EIA study carried out by NIO with all mitigative measures as suggested. Requisite permissions are taken from competent authorities such as GMB and GPCB. Site visits are being carried out by govt. officers from time to time to ensure compliance of the conditions stipulated in respective permissions. No capital dredging activities are carried out during the Oct'19 to Mar'20 period.

**Status of the conditions stipulated in Environment and CRZ Clearance**

Sr. No.	Specific Conditions	Compliance Status as on 30-09-2020
		Please refer condition no. i, iv & viii of General Conditions of the EC & CRZ Clearance above.
10	The dredge material generated during capital dredging shall be used only for reclamation and that to be generated during maintenance dredging shall be disposed of at the place identified by NIO/CWPRS/WAPCOS through appropriate modeling and it shall be ensured that it does not create any negative impacts.	Complied.  Entire quantity of dredged material is used for reclamation activities only; no disposal is carried out in the sea. No capital dredging activities are carried out during the Oct'19 to Mar'20 period.
11	Necessary measures including the shore protection activities shall be undertaken to ensure that there are no erosion in surrounding area due to the proposed activities.	Complied.  All dredging and reclamation activities are carried out as per EC and CRZ Clearance and no erosion is observed.  For further details regarding the shoreline change study for the Mundra region, please refer specific condition no v of the EC and CRZ clearance.
12	The alignment of the jetties/berths and other structures shall be done after conducting the detailed modeling to ensure that there are no erosion and accretion in the region due to proposed activities.	Complied.  Detailed hydrodynamic modeling was carried out by NIO during preparation of the EIA report. All construction activities are being carried out as per the outcome/recommendations of the modeling report.  However, a detailed shoreline change assessment study is also carried out. Please refer specific condition no v of the EC and CRZ clearance for further details.
13	The MPSEZL shall contribute financially for any common study or project that may be proposed by this department for environment management / conservation / improvement for the Gulf of Kutchh.	Complied.  There are two studies prescribed by MoEF&CC. For further details regarding the same, please refer general condition no xi of the EC and CRZ clearance.
14	The construction debris and /or any other type of waste shall not be disposed of into the sea, creek or in	Complied.  All construction and operation activities as well as

**Status of the conditions stipulated in Environment and CRZ Clearance**

Sr. No.	Specific Conditions	Compliance Status as on 30-09-2020
	the CRZ areas. The construction is over and shall be disposed off in low lying areas in consultation with NIO, NEERI or any such institute of repute.	dredging and reclamation activities are being carried out as per the EIA report prepared by NIO.  The construction debris, if any, is being used for area development outside CRZ area. For details about management of other types of wastes, please refer general condition no. iii of the EC and CRZ clearance.
15	The construction camps shall be located outside the CRZ area and the construction labour shall be provided with the necessary amenities, including sanitation, water supply and fuel and it shall be ensured that the environmental conditions are not deteriorated by the construction labors.	Compiled.  Please refer general condition no ii of the EC and CRZ clearance for further details.
16	The MPSEZL shall regularly update their Local Oil Spill Contingency and Disaster Management Plan in consonance with the National Oil Spill and Disaster Contingency Plan and shall submit the same to this Department after having it vetted through the Indian Coast Guard.	Compiled.  Disaster Management Plan is updated regularly and the updated DMP was submitted as a part of compliance report for the period Apr'16 to Sep'16.  Oil spill contingency plan is in place to handle Tier 1 level oil spills considering different accident scenarios, and the vulnerable areas are identified and mitigation plan is prepared.  Oil spill contingency response plan updated on 01.10.2019 is in place and implemented. Details of the same were submitted along with last half yearly compliance report for the period Oct'19 to Mar'20. And there is no further change.
17	The MPSEZL shall participate and contribute for the Vessel Traffic Management System to be developed for the Gulf of Kutchh being developed.	Complied.  A VTS service for Gulf of Kutch is operated by Directorate General of Lighthouses and Lightships (DGLL), Govt. of India.  APSEZ is practicing well defined traffic control procedure. Marine Control of APSEZ provides traffic update to vessels in Mundra Port Limit on VHF Channel- 77. Arrival and departure information in

	<b>Adani Ports and Special Economic Zone Limited, Mundra.</b>	<b>From : Apr'20 To : Sep'20</b>
<b>Status of the conditions stipulated in Environment and CRZ Clearance</b>		

Sr. No.	Specific Conditions	Compliance Status as on 30-09-2020
		Gulf of Kutch is provided to VTS information cell through an agent or directly by sending an e-mail to <a href="mailto:vtsmanagergulfofkutch@yahoo.com">vtsmanagergulfofkutch@yahoo.com</a> and <a href="mailto:vtsgok@yahoo.com">vtsgok@yahoo.com</a> .
18	The MPSEZL shall bear the cost of external agency that may be appointed by this Department for supervision/monitoring of proposed activities and the environmental impacts of the proposed activities.	Complied.  There are two studies prescribed by MoEF&CC. For further details regarding the same, please refer general condition no xi of the EC and CRZ clearance.

 Ports and Logistics	<b>Adani Ports and Special Economic Zone Limited, Mundra.</b>	<b>From : Apr'20 To : Sep'20</b>
<b>Status of the conditions stipulated in Environment and CRZ Clearance</b>		

# **Annexure – B**

## **Compliance Status of MoEF & CC Order dated 18.09.2015**

Based on the report submitted by Sunita Narain committee, MoEF&CC issued a Show Cause Notice (SCN) to APSEZ vide their letter dated 30.09.2013. APSEZ replied to the SCN vide letter dated 14.10.2013. Further, an order (containing 10 directions) was issued by MoEF&CC vide their letter dated 18.09.2015. Compliance to these 10 directions is mentioned below.



**Status of the conditions stipulated in Environment and CRZ Clearance**

Sr. No.	Condition	Compliance Status
i	The proposal of extension of the validity of environmental clearance granted to the North Port vide letter dated 12.01.2009 will be considered separately at later stage.	<p>Complied</p> <p>After receipt of this order, so far APSEZ has not done any application to MoEF&amp;CC for the proposed North port.</p>
ii	Bocha island, ecologically sensitive geomorphological features and areas in the island and creeks around the island will be declared as conservation zone action plan for its conservation must be prepared. M/s. APSEZ should provide necessary financial assistance for this purpose.	<p>Complied</p> <p>This reply covers condition no ii, iv and v.</p> <p>Based on the MoEF&amp;CC directions,</p> <ol style="list-style-type: none"> <li>1. APSEZ, vide letter dtd. 19<sup>th</sup> October 2015 had requested GCZMA, for consideration of project for finalization of ToR for NCSCM.</li> <li>2. Project was considered on 28<sup>th</sup> GCZMA meeting, scheduled on 22<sup>nd</sup> April 2016, where ToR was discussed and agreed, upon.</li> <li>3. APSEZ, vide its letter dtd. 25<sup>th</sup> April 2016, submitted the proposal to GCZMA along with Scope of work, as submitted by NCSCM.</li> </ol>
iv	A comprehensive and integrated study and protection of creeks/ mangrove area including buffer zone, mapping of co-ordinates, running length, HTL, CRZ boundary, will be put in place. The plan will take note of all the conditions of approvals granted to all the project proponents in this area e.g. the reported case of	<ol style="list-style-type: none"> <li>4. Service Order was issued to NCSCM vide SO dtd. 29<sup>th</sup> Aug 2016. Cost of the study as per the NCSCM proposal was 315.5 Lakh and 90% of payment has already paid to NCSCM.</li> <li>5. NCSCM has carried out number of site surveys during the period, February 2017 – April 2018 as per the defined scope</li> <li>6. The study report was submitted to GCZMA (with a copy to MoEF&amp;CC vide letter dated 04.06.2018) for their consideration and recommendation if any.</li> <li>7. A reminder letter was submitted to GCZMA vide letter dated 4<sup>th</sup> Jan 2019.</li> </ol> <p>Details of above chronology were submitted along with last half yearly compliance report for the period Apr'19 to Sep'19. The site survey carried out by NCSCM includes:</p>

**Status of the conditions stipulated in Environment and CRZ Clearance**

Sr. No.	Condition	Compliance Status
	<p>disappearance of mangroves near navinal creek. The preservation of entire area to maintain the fragile ecological condition will be a part of the plan in relation to the creeks, mangrove conservation and conservation of bocha island up to baradimata and others.</p>	<ol style="list-style-type: none"> <li>1. Bathymetry survey of creeks</li> <li>2. Topography survey of intertidal areas</li> <li>3. Mangrove survey (health and area demarcation)</li> <li>4. Sampling of soil and water for analysis of physico-chemical and biological parameters</li> <li>5. Tide and currents data collection (including residence time of tidal water)</li> <li>6. Focus Group Discussions with the community in the close vicinity of the project area</li> </ol> <p>In addition to the site surveys, NCSCM has procured satellite images for analysis of mangrove cover.</p>
v	<p>NCSCM will prepare the plan in consultation with NIOT, PP and GCZMA. In recognition of the fact that the existing legal provisions under the E(P) Act 1986 do not provide for any authority to impose ERF by the government, the plan will be financed by the PP. the implementation will be carried out by GCZMA. The monitoring of the implementation will be carried by NCSCM.</p>	<p>The data collected (through site surveys and analysis of satellite maps) was used as input for mathematical modelling. The modelling studies were carried out to understand the impacts of the development activities. Based on the outcome of the modelling studies the necessary conservation plan for protection of creeks and mangrove areas is prepared.</p> <p>Based on the final study report, outcome is summarized in to following points :</p> <ol style="list-style-type: none"> <li>1. There is no obstruction to any water stream (creeks / branches of creeks / rivers)</li> <li>2. Presently, mangrove cover in and around APSEZ is over 2340 ha. There is substantial growth in mangrove cover to the tune of 246 ha (comparison between 2011 and 2016-17)</li> <li>3. Mundra has undergone substantial development during this tenure. Hence it can be interpreted that the infrastructure development has not left any adverse impacts on ecology.</li> </ol> <p>NCSCM study same was submitted to the GCZMA on 04.06.2018. Details of the same were submitted along with half yearly EC Compliance report for the period Apr'19 to Sep'19.</p> <p>The action plan for conservation of creeks and mangrove was submitted to GCZMA and MoEF&amp;CC for their final examination and recommendation. Presentation on the findings of the report was made to GCZMA committee on</p>

**Status of the conditions stipulated in Environment and CRZ Clearance**

Sr. No.	Condition	Compliance Status
		<p>4<sup>th</sup> October 2019 and the recommendation for the same has been received vide email dtd 22nd Sept 2020 from GCZMA with following conditions:</p> <ul style="list-style-type: none"> <li>✓ The APSEZL shall carry out annual compliance monitoring of the mangrove conservation area.</li> <li>✓ The APSEZL shall explore the possibility for taking necessary adequate measures to reduce the erosion near Bocha Island.</li> <li>✓ The approval of mangrove conservation plan shall not be considered as any permission under CRZ Notification for dredging activity.</li> <li>✓ There should not be blockage of any drainage line and free flow of water is to be maintained, as flushing of mangrove areas is very essential.</li> <li>✓ The APSEZL shall carry out mangrove monitoring every two years and submit the data to Forest Department/GCZMA and MOEF&amp;CC, GOI.</li> </ul> <p>APSEZ is under the process of complying above recommendations -            Inline to the compliance of the action plan "Monitoring of mangrove cover in Jan/Mar, 2020 using latest satellite images and validation with field observations", Work has already been assigned to NCSCM, for amount of INR. 23,56,000/- vide PO no 4800050718, dtd. 31<sup>st</sup> December 2019 and same is under progress.</p> <p>For demarcation of HTL and CRZ areas, NCSCM is under process of finalizing CZMP for this area. Once the maps are finalized, NCSCM will issue the final maps for the project area of APSEZ. The said maps will then be submitted to GCZMA and MoEF&amp;CC by APSEZ.</p>
iii	<p>The violations of specific condition of all the ECs and CRZ clearances, if any, will be examined and proceeded with the provisions of EP Act, 1986 independently.</p>	<p>Complied</p> <p>Regional Officer, MoEF&amp;CC, Bhopal visited APSEZ on 21-22 December'16 for monitoring the implementation of environmental safeguards.</p> <p>APSEZ was also visited by RO, MoEF&amp;CC Bhopal on 3<sup>rd</sup> May, 2018 for compliance verification. APSEZ provided all requisite information and documents required by the Regional Officer. During the said compliance verification visit, and as per the</p>

**Status of the conditions stipulated in Environment and CRZ Clearance**

Sr. No.	Condition	Compliance Status
		<p>compliance certificate by Ro-MOEF&amp;CC vide dated, 07<sup>th</sup> June 2018, there was no major non-compliance observed.</p> <p>Regional Office MoEF&amp;CC, Bhopal , officer had visited the site on 3<sup>rd</sup> &amp; 4<sup>th</sup> Sep, 2019 in compliance of the order of the Hon'ble HIGH COURT of Gujarat vide letter dated 22<sup>nd</sup> Aug. 2019 w.r.t. compliance verification of MoEF&amp;CC order dated 18<sup>th</sup> Sep, 2015. APSEZ had provided all requisite information and documents required by the Officer.</p> <p>Inline to the compliance certification process of Environment Clearance condition of Waterfront Development Plan, RO, MoEF&amp;CC Bhopal had visited the site on 27<sup>th</sup> &amp; 28<sup>th</sup> January, 2020 for compliance verification. APSEZ provided all requisite information and documents required by the Regional Officer (MoEF&amp;CC). During the said compliance verification visit and as per the compliance certification received, there was no major non-compliance observed.</p> <p>It may also be noted that GPCB, Regional Office does regular site visit for various components. Last visit of Regional Office, GPCB was done on 25.09.2020 for Main port and West Port. APSEZL has submitted the reply to the site visit report vide letter dated 26.09.2020 incorporating details of action taken in respect of the observations of the GPCB representative. Details of the same are attached as <b>Annexure – 8</b>.</p>
vi	<p>There will be no development in the area restricted by the High court of Gujarat. APSEZ shall abide by the outcome of the PIL 12 of 2011 and other relevant cases.</p>	<p>Complied</p> <p>The order passed by Hon' ble high court in context of PIL 12 of 2011 vide dated 10<sup>th</sup> Nov 2011. Subject PIL has been disposed off by Hon'ble High Court vide their order dated 17.04.2015 and now there is no restriction on development in the subject area. The order reads as <i>"In view of the aforesaid discussion, we do not find any merit in this writ petition. This writ petition fails and is accordingly dismissed. No order as to cost."</i> Copy of the order was submitted along with EC Compliance report for the period Apr'18 to Sep'18.</p> <p>Considering the above status and in line to submission of compliance of all the directions under this order, this condition is closed.</p>

**Status of the conditions stipulated in Environment and CRZ Clearance**

Sr. No.	Condition	Compliance Status
vii	APSEZ will submit specific action plan to protect the livelihood of fishermen along with budget.	<p>Complied.</p> <p>Adani Foundation (AF) is the CSR arm of the Adani Group actively working for upliftment of the communities in the surroundings of various project sites of Adani Group. AF has prepared a specific action plan to protect livelihood of fishermen at Mundra.</p> <p>Various initiatives, as stated below are discussed in detail in the report namely "Silent Transformation of Fisher folk at Mundra". Said report also includes the information related to the planned expenses to the tune of approx. 13.5 Cr. INR for various initiatives for the next five years (2016 – 2021) (Budget details provided in Page No. 68 of report). Copy of the same is already submitted to MoEF&amp;CC vide our letter dated 10.09.2016.</p> <p>Till, Sep 2020 approx. 8.62 Cr. INR, has already been invested. Further, details regarding the expenditure incurred against the commitment are attached as <b>Annexure – 11</b>.</p> <p>APSEZ is carrying out various initiatives specific to the Fisherfolk community which includes:</p> <ul style="list-style-type: none"> <li>• <b>Vidya Deep Yojana</b> Developing school preparedness programme and empowering balwadis at fisherfolk settlement Under this scheme, 4 balwadis at different settlement has been constructed This programme include nutrition food, hygiene, awareness of health, cleanliness, discipline, regularity and development of basic age appropriate conception</li> <li>• <b>Vidya Sahay Yojana – Scholarship Support</b> All basic education supportive facilities have been created to promote education in fisher folk community.</li> <li>• <b>Adani Vidya Mandir</b> Childred of the family with the income of salary less than 1.5 lac/annum are admitted School focusses on nutrition food, uniform and other services to the children for free.</li> <li>• <b>Fisherman Approach in SEZ</b> After due consultative process, APSEZ has provided 7 fishermen access roads for to approach to the sea for fishing activity.</li> <li>• <b>Machhimar Arogya Yojana</b> The Fisher folk communities are disposed to several water and air abided diseased due to exposure to unhygienic working conditions. Frequently</li> </ul>

**Status of the conditions stipulated in Environment and CRZ Clearance**

Sr. No.	Condition	Compliance Status
		<p>Special Health care Camps are organized at Vasahat. Our Mobile health care unit van regularly visit fisher folk settlements</p> <ul style="list-style-type: none"> <li>• <b>Machhimar Kaushalya Vardhan Yojana</b> Based on need assessment a number of trades were introduced through the Adani Skill Development Centre in Mundra, where in fisher folk youth could join and get a number of technical and non-technical training</li> <li>• <b>Machhimar Sadhan Sahay Yojana</b> Fishing material support was provided by AF at Mundra as per the requests of Pagadiya fishermen. According to their needs, fishing nets, ropes, buoys, ice boxes, crates, weighing scales, anchors, solar lights etc., were provided</li> <li>• <b>Machhimar Awas Yojana</b> Shelters, equipped with basic facilities of a toilet and pure drinking water have been constructed for living while fishing and to provide a healthy and hygienic residence.</li> <li>• <b>Machhimar Shudhh Jal Yojana</b> This scheme of providing potable water has helped in reducing the drudgery of women and contributed largely towards general wellbeing</li> <li>• <b>Sughad Yojana</b> Toilets for men and women are constructed at all three Vasahats. Infrastructure was accompanied with continuous awareness campaign on hygiene sanitation and use of toilets in particular.</li> <li>• <b>Machhimar Akshay Kiran Yojana</b> Solar street lights at each settlement have been installed. For fish landing shed and school extension room have been fitted with solar inverter allowing late evening video shows for awareness and fish sorting work at ease.</li> <li>• <b>Machhimar Suraksha Yojana</b> Distance Alarm Transmission System – DATS' project was introduced in order to promote safety of the fishermen. Forced to be at sea to earn their livelihood puts the lives of many fishermen at risk</li> <li>• <b>Machhimar Ajivika Uparjan Yojana</b> Mangrove plantation in the area as means of alternate income generating activity for the fisher folk community during the non-fishing months. During the non-fishing months, the fishermen under usual circumstances were benefited by other alternate economic activity to sustain them.</li> <li>• <b>Bandar Svachhata Yojana</b> Waste bins have been provided for proper collection and segregation of waste.</li> </ul> <p>Further, APSEZ is actively working with local community (including fishermen community) around the project area and provides required support for their livelihood and other concerns through the CSR arm – Adani Foundation. Brief information about activities in the main five persuasions is mentioned below. Adani Foundation has also worked for fight against COVID – 19 pandemic situation during this compliance</p>

**Status of the conditions stipulated in Environment and CRZ Clearance**

Sr. No.	Condition	Compliance Status								
		<p>period Activities carried out for the same are summarized as below.</p> <table border="1"> <thead> <tr> <th>Area</th> <th>Activity</th> </tr> </thead> <tbody> <tr> <td>Fight Against COVID-19</td> <td> <ul style="list-style-type: none"> <li>• <b>24 villages</b> of Mundra block Sanitized.</li> <li>• <b>45000+</b> Mask prepared by SHG group.</li> <li>• <b>1800+</b> food packet per day two time for the workers, drivers and labours of APSEZ and AWL Cost free Fresh Food Support (Breakfast, Lunch and Dinner)</li> <li>• <b>9000+</b> ration kit support Ration Kit support to Daily Wedge Labours and Needy people</li> <li>• Mobile health care unit is providing primary treatment to community at door step and also creating awareness to fight against Corona virus - <b>150+ beneficiaries</b> covered</li> <li>• <b>12500 people</b> connected By Awaz De software creating awareness in people in local kutchhi language.</li> <li>• <b>1400+</b> patient covered - AHMPL is providing all services IPD and OPD during lockdown period.</li> <li>• Important of handwashing &amp; hygiene by Sangini</li> <li>• <b>57 senior citizens</b> of old age home - During lockdown period our team providing medical facility to senior citizens at old age home in Mandvi and Gundala</li> </ul> </td> </tr> <tr> <td>Community Health</td> <td> <p><b>Community Health – Mundra</b></p> <ul style="list-style-type: none"> <li>• 11 Rural Clinic – 8 from Mundra &amp; 3 from Anjar block treated; <b>8196 patients.</b></li> <li>• <b>31 villages</b> covered, with <b>109 types</b> of general and lifesaving medicines through Mobile healthcare unit <b>6879 patients</b> benefited during six month.</li> <li>• Provided dialysis treatment to <b>6 patients</b> of kidney failure <b>236 times.</b></li> <li>• <b>Citizen project - 8672 Card holders</b> of <b>68 villages</b> get benefit under this project.</li> <li>• <b>2921 sr. citizen patients</b> benefited during six month - <b>8000 limit</b> for three year per patients</li> <li>• <b>470</b> Needy patients had been facilitated with Medical Support OPD &amp; IPD treatment with token charges during this six month.</li> <li>• <b>1150</b> health calendar were distributed to various PHC, CHC and ICDS department of Mundra, Mandvi, Nakhtrana, Lakhat, Abadasa, Anjar &amp; Gandidham block.</li> <li>• <b>594 Protein Powder packet</b> distributed to ANC woman of Utthan villages and TB patient of Mundra block.</li> <li>• Total <b>18698 &amp; 10380</b> IPD / OPD facilities provided project wise and AHMPL subsequently during six months.</li> </ul> </td> </tr> <tr> <td>Sustainable Livelihood – Fisher folk</td> <td> <ul style="list-style-type: none"> <li>• Average <b>70 KL</b> of water was supplied to <b>717</b> households at 4 fisherman vasahat on a daily basis under Machhimar Shudhh Jal Yojana.</li> <li>• <b>55 Higher secondary Fishermen students</b> of Sekhadiya, Navinal, Zarpara &amp; Junabandar benefitted with book support. 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Area	Activity									
Fight Against COVID-19	<ul style="list-style-type: none"> <li>• <b>24 villages</b> of Mundra block Sanitized.</li> <li>• <b>45000+</b> Mask prepared by SHG group.</li> <li>• <b>1800+</b> food packet per day two time for the workers, drivers and labours of APSEZ and AWL Cost free Fresh Food Support (Breakfast, Lunch and Dinner)</li> <li>• <b>9000+</b> ration kit support Ration Kit support to Daily Wedge Labours and Needy people</li> <li>• Mobile health care unit is providing primary treatment to community at door step and also creating awareness to fight against Corona virus - <b>150+ beneficiaries</b> covered</li> <li>• <b>12500 people</b> connected By Awaz De software creating awareness in people in local kutchhi language.</li> <li>• <b>1400+</b> patient covered - AHMPL is providing all services IPD and OPD during lockdown period.</li> <li>• Important of handwashing &amp; hygiene by Sangini</li> <li>• <b>57 senior citizens</b> of old age home - During lockdown period our team providing medical facility to senior citizens at old age home in Mandvi and Gundala</li> </ul>									
Community Health	<p><b>Community Health – Mundra</b></p> <ul style="list-style-type: none"> <li>• 11 Rural Clinic – 8 from Mundra &amp; 3 from Anjar block treated; <b>8196 patients.</b></li> <li>• <b>31 villages</b> covered, with <b>109 types</b> of general and lifesaving medicines through Mobile healthcare unit <b>6879 patients</b> benefited during six month.</li> <li>• Provided dialysis treatment to <b>6 patients</b> of kidney failure <b>236 times.</b></li> <li>• <b>Citizen project - 8672 Card holders</b> of <b>68 villages</b> get benefit under this project.</li> <li>• <b>2921 sr. citizen patients</b> benefited during six month - <b>8000 limit</b> for three year per patients</li> <li>• <b>470</b> Needy patients had been facilitated with Medical Support OPD &amp; IPD treatment with token charges during this six month.</li> <li>• <b>1150</b> health calendar were distributed to various PHC, CHC and ICDS department of Mundra, Mandvi, Nakhtrana, Lakhat, Abadasa, Anjar &amp; Gandidham block.</li> <li>• <b>594 Protein Powder packet</b> distributed to ANC woman of Utthan villages and TB patient of Mundra block.</li> <li>• Total <b>18698 &amp; 10380</b> IPD / OPD facilities provided project wise and AHMPL subsequently during six months.</li> </ul>									
Sustainable Livelihood – Fisher folk	<ul style="list-style-type: none"> <li>• Average <b>70 KL</b> of water was supplied to <b>717</b> households at 4 fisherman vasahat on a daily basis under Machhimar Shudhh Jal Yojana.</li> <li>• <b>55 Higher secondary Fishermen students</b> of Sekhadiya, Navinal, Zarpara &amp; Junabandar benefitted with book support. Mother meeting and telephone Discussion for their wards discussion.</li> <li>• <b>4830 Man-days</b> work was provided over <b>236 Fishermen family</b> during this six months.</li> </ul>									



**Status of the conditions stipulated in Environment and CRZ Clearance**

Sr. No.	Condition	Compliance Status
		<ul style="list-style-type: none"> <li>● To avail Fishermen Government scheme (Fishermen Credit card) one day program was arranged with social distancing and all precaution. <b>30 KCC</b> form fill-up at Navinal. Created awareness with Telephonic about same.</li> <li>● To create option livelihood over fishermen with co-ordination of VRTI. Pilot phase – <b>3500 Kg sea weed</b> was harvested</li> <li>● Total <b>85 Acre Gauchar Land</b> was approved by GP for Development by decision taken in Gram Sabha. Among them <b>72 Acre</b> land Has been Sowed and Remaining land would be Grow with Wild Grass.</li> <li>● Government Scheme Facilitation - Facilitate widows, senior Citizens and Divyang to various schemes of government like widow pension, free bus pass, Senior citizen pension scheme sankat mocha sahay etc. support for process and documentation – Total <b>66 Nos.</b> of beneficiaries.</li> <li>● <b>60,000+</b> three layer mask has been prepared and sold by Umang SHG group @ <b>Rs.10.00</b> per mask.</li> <li>● <b>5-SHG</b> had been facilitated for <b>Rs 1.0 lac</b> bank loan through DRDA to start-up new business for women empowerment.</li> <li>● Fodder support in <b>20 villages</b> of Mundra and Anjar block. Dry fodder <b>6.70 lacs kg</b> &amp; Green fodder <b>11.60 lacs kg</b>.</li> <li>● To Doubling the farmer income by aviling “Barahi Varities Tissue plant” has good productivity <b>850 plants</b> have been distributed to <b>34 farmers 25 plants / Farmers</b> cost of a plants is <b>Rs. 3500</b>.</li> <li>● Installation of <b>53 Home Bio-gas</b> with SOP Awareness and trouble shoot of problem as well.</li> <li>● <b>10,000 dragon food sapling</b>, Pole and wire have been supported to 5 farmers.</li> </ul>
	Education	<ul style="list-style-type: none"> <li>● Apart from CPD Utthan Sahayks attended <b>30+ educational webinar</b> during lockdown.</li> <li>● Arrange various competition and celebration for Priya VidyarthiSchool Visit and Home Visit by Utthan Sahayak.</li> <li>● Conduct meeting with Principal / Teacher of Utthan schools, TPEO, BRC, CSR Head, Education Coordinator, Project Officer and Utthan Sahayaks through Microsoft Team.</li> <li>● Adani Vidya Mandir Bhadreshwar provide “cost-free” education to meritorious students coming from challenging economic background, who have priceless treasures but have been under achievers due to situation. In year 2020-21 <b>490 students</b> are studying. <b>82.60%</b> - Result SSC Board Exam</li> <li>● Tablet provide to students of std. 10<sup>th</sup> for online study through Employee Volunteering Programme</li> <li>● Admission process of std 1 students through draw system. <b>80</b> students selected out of <b>91</b>. remain <b>11</b> students in waiting list</li> <li>● Online Class through WhatsApp and you tube video</li> </ul>
	Rural Infrastructure	<p><b><u>WORK COMPLETED</u></b></p> <ul style="list-style-type: none"> <li>● Development of Prisha Park at Mundra.</li> <li>● Pond Bund strengthening at Zarpara Village</li> </ul> <p><b><u>WORK IN PROGRESS</u></b></p> <ul style="list-style-type: none"> <li>● Drainage Line and Chamber work at Bhopavandh.</li> </ul>

**Status of the conditions stipulated in Environment and CRZ Clearance**

Sr. No.	Condition	Compliance Status
		<ul style="list-style-type: none"> <li>• Drainage Maintenance &amp; JCB Hiring &amp; Other Mis. Work.</li> <li>• Road Repairing at Kutdi Bandar.</li> <li>• Road Repairing at Zarapra Fisherman Vashat.</li> <li>• Road Repairing at Luni Pagadiya Fisherman</li> </ul> <p><b><u>WATER CONSERVATION PROJECTS</u></b></p> <ul style="list-style-type: none"> <li>• A large number of water harvesting structure (<b>18 Nos. of check dams</b> in coordination with salinity department)</li> <li>• Ground recharge activities (<b>pond deepening work for more than 52 ponds</b>) individually and 26 ponds under Sujlam Suflam Jal Abhiyan leading to a significant increase in water table and higher returns to the farmers</li> <li>• <b>Roof Top Rain Water Harvesting 54 Nos.</b> which is having <b>10,000 litre</b> storage which is sufficient for one year drinking water purpose for 5 people family.</li> <li>• Recharge Bore well <b>75 Nos</b> which is best ever option to conserve ground water Drip Irrigation 823 Farmers benefitted in coordination with Gujrat Green Revolution Company</li> <li>• Participatory Ground Water Management in ten villages with holistic approach for Kankavati Sandstone Aquifer Programme</li> <li>• As per Average Calculation more than <b>450 hac. area</b> benefitted with increased in <b>109 MCFT</b> water Quantity.</li> </ul> <p><b><u>Bio Diversity Park – Mundra</u></b></p> <ul style="list-style-type: none"> <li>• Adani Foundation, Mundra-Kutchh proposed a biodiversity park at 5 acres Nandi Sarovar area and approached to Sahjeevan, Bhuj for technical support for same.</li> <li>• Sahjeevan team visited this proposed site for development of greenbelt to support biodiversity and enhancement of overall ecological food web existing in and around the landscape in first phase.</li> </ul> <p>Skill Development</p> <ul style="list-style-type: none"> <li>• Adani Skill Development Centre (ASDC) is playing a pivotal role in implementing sustainable development in the state. The objective of this Centre is to impart different kinds of training to the students of 10<sup>th</sup>, 12<sup>th</sup>, college or ITI from surrounding areas.</li> <li>• During this year Total 440 people trained in various trainings to enhance socio economic development.</li> <li>• 324 students Enrolled in Online Training.</li> <li>• The students of DDU-GKY (GDA) creating awareness regarding COVID-19 in their own village through various activity. 27students get placement in GAIMS (sodexo), Alilance Hospital, Shreeji Hospital, Bhuj Fire Academy, Divine Hospital etc. 3 students are working in COVID-19 Hospital.</li> </ul> <p>Please refer <b>Annexure – 2</b> for full details of CSR activities carried out by Adani Foundation in the Mundra region. Budget for CSR Activity for the FY 2020-21 is to the tune of INR 1429.3 lakh. Out of which, Approx. INR 416.7 lakh are spent during the year FY 2020-21 (Till Sep'20).</p>

**Status of the conditions stipulated in Environment and CRZ Clearance**

Sr. No.	Condition	Compliance Status
viii	APSEZ will voluntarily return the grazing land, if any, in their possession.	<p>Point noted.</p> <p>All lands are acquired through proper procedure prescribed by State Government. However APSEZ has agreed for voluntarily giving 400 acres of land back to Zarpara village for the purpose of Gauchar. 400 acres of land has been identified in the presence and confirmation of Gram Panchayat. Necessary procedure has been initiated by APSEZ vide its letter dated 09<sup>th</sup> Aug 2012 with concerned revenue authority with respect to surrender of 400 acre gauchar land at village Zarpara. Same has been taken up by revenue department for necessary procedure of transfer and is under process. Details of the same were submitted along with last half yearly compliance report for the period Apr'19 to Sep'19.</p>
ix  x.	<p>A regional strategic impact assessment report with a special focus on Mundra region will also be prepared. The cost towards these studies will also be borne by PP.</p> <p>In the subject matter of thermal power plant, the proposed regional strategic Impact assessment analysis will take In to account salinity aspect along with Its potential environmental Impact to suggest future corrective actions as well as the guiding tool on extension and addition of the capacities.</p>	<p>Complied</p> <p>This reply covers direction no ix and x.</p> <ol style="list-style-type: none"> <li>1. APSEZ vide its letter dtd. 24<sup>th</sup> Feb 2014 has submitted draft ToR for preparation of CIA report to GCZMA for their approval.</li> <li>2. GCZMA vide its letter dtd. 19<sup>th</sup> Dec 2014, has approved ToR for CIA.</li> <li>3. Based on the ToR finalized by GCZMA (as per the instructions of MoEF&amp;CC) for carrying out regional impact assessment study, APSEZ awarded the work to NABET accredited consultant M/s. Cholamandalam MS Risk Services Ltd. to carry out the studies, vide SO dtd 10<sup>th</sup> Feb 2016 as stated in these directions.</li> <li>4. Primary baseline environmental monitoring data collection during March – June 2016 and published secondary data on various environmental attributes have been considered for the study.</li> <li>5. The study has been concluded and the final report was submitted to GCZMA and MoEF&amp;CC for their consideration vide our letter dated 30.04.2018.</li> <li>6. Reminder letter has been submitted to GCZMA for their comments and consideration vide letter dated 4<sup>th</sup> Jan 2019.</li> </ol> <p>Details of above chronology were submitted along with last half yearly compliance report for the period Apr'19 to Sep'19.</p>

**Status of the conditions stipulated in Environment and CRZ Clearance**

Sr. No.	Condition	Compliance Status
		<p>Total cost of the study is approx. INR 1.3 cr. which is financed by APSEZ. 90% of the payment has already been made.</p> <p>The stated study was carried out in following 3 phases</p> <ul style="list-style-type: none"> <li>• Baseline data collection and review of the past EIA reports and clearances issued to APSEZ.</li> <li>• Mathematical modelling and other technical studies for identification of potential impacts (for the year 2030) of the approved and existing project activities.</li> <li>• Development of macro level EMP for the phase wise implementation of actionable points.</li> </ul> <p>As part of the study, following modelling exercises / technical studies have been carried out to study the impacts on all environmental attributes:</p> <ul style="list-style-type: none"> <li>• Ambient air quality</li> <li>• Marine (Hydrodynamic, Thermal &amp; Salinity dispersion, Sediment transport)</li> <li>• Noise level</li> <li>• Traffic assessment</li> <li>• Oil spill contingency plan</li> <li>• Water resource and salinity ingress</li> <li>• Land Use / Land Cover</li> <li>• Socioeconomic, Regional infrastructure</li> <li>• Waste management</li> <li>• Ecology, Bio diversity and Fisheries</li> <li>• Shoreline change assessment</li> </ul> <p>Preparation of these reports require extensive use of modelling software and study of the available information / research reports to assess the impacts on individual attribute of environment. Based on the modelling outcomes and findings of the technical studies, a macro level environment management plan is prepared.</p> <p>Inline to the present stage of the project, APSEZ is already complying, as per Environment Management Plan and further recommendations, applicable to APSEZ as mentioned in the EMP, wrt Traffic Management Plan, Ground water quality management, Salinity ingress programme, Air and Noise quality Management, Surface and Marine water quality management, Ecology and Biodiversity Management, Solid &amp; Hazardous</p>

**Status of the conditions stipulated in Environment and CRZ Clearance**

Sr. No.	Condition	Compliance Status
		<p>waste management, Socio-economic Management and Shoreline Management, will be implemented in phase wise manner as per the progress of development within the boundary limits of APSEZ.</p> <p>The final CIA Report was prepared inline to the ToR by Chola MS and the same was submitted to the GCZMA on 30.04.2018. Details of the same were submitted along with half yearly EC Compliance report for the period Apr'18 to Sep'18. Presentation on the findings of the report was made to GCZMA committee on 4<sup>th</sup> October 2019 and after detailed discussion, authority has decided to constitute committee to discuss the details of the report further.</p> <p>However, APSEZ is already complying with the Environment Management Plan (applicable to APSEZ) suggested in Cumulative Impact Assessment report. The detailed compliance, applicable to APSEZ is attached as <b>Annexure – 12</b>.</p>

# **Annexure – 1**

## Details of Greenbelt Development at APSEZ, Mundra

LOCATION	Total Green Zone Detail Till Up to Sep - 2020				
	Area (In Ha.)	Trees (Nos.)	Palm (Nos.)	Shrubs (SQM)	Lawn (SQM)
SV COLONY	70.81	33920.00	7962.00	69426.00	92791.00
PORT & NON SEZ	81.51	149192.00	19220.00	75061.78	61982.38
SEZ	116.60	227120.00	20489.00	220583.60	28162.03
MITAP	2.48	8168.00	33.00	3340.00	4036.00
WEST PORT	94.47	210022.00	63331.00	24112.00	22854.15
AGRI PARK	8.94	17244.00	1332.00	5400.00	2121.44
SOUTH PORT	14.45	27530.00	3470.00	3882.00	3327.26
Samudra Township	56.03	53922.00	11834.00	20908.89	47520.07
Productive Farming (Vadala Farm)	23.79	27976.00	--	--	--
<b>TOTAL (APSEZL)</b>	<b>469.05</b>	<b>755094.00</b>	<b>127671.00</b>	<b>422714.27</b>	<b>262794.33</b>
		<i>882765.00</i>			



## Details of Mangrove Afforestation done by APSEZ

Sl. no.	Location	Area (ha)	Duration	Species	Implementation agency
1	Mundra Port	24.0	-	Avicennia marina	Dr. Maity, Mangrove consultant of India
2	Mundra Port	25.0	-	Avicennia marina	Dr. Maity, Mangrove consultant of India
3	Luni/Hamirmora (Mundra, Kutch)	160.8	2007 - 2015	Avicennia marina, Rhizophora mucronata, Ceriops tagal	GUIDE, Bhuj
4	Kukadsar (Mundra, Kutch)	66.5	2012 - 2014	Avicennia marina	GUIDE, Bhuj
5	Forest Area (Mundra)	298.0	2011 - 2013	Avicennia marina	-
6	Jangi Village (Bhachau, Kutch)	50.0	2012 - 2014	Avicennia marina	GUIDE, Bhuj
7	Jakhau Village (Abdasa, Kutch)	310.6	2007-08 & 2011-13	Avicennia marina, Rhizophora mucronata, Ceriops tagal	GUIDE, Bhuj
8	Sat Saida Bet (Kutch)	255.0	2014-15 & 2016-17	Avicennia marina & Bio diversity	GUIDE, Bhuj
9	Dandi Village (Navsari)	800.0	2006 - 2011	Avicennia marina, Rhizophora mucronata, Ceriops tagal	SAVE, Ahmedabad
10	Talaza Village (Bhavnagar)	50.0	2011-12	Avicennia marina	SAVE, Ahmedabad
11	Narmada Village (Bhavnagar)	250.0	2014 - 2015	Avicennia marina	SAVE, Ahmedabad
12	Malpur Village (Bharuch)	200.0	2012-14	Avicennia marina	SAVE, Ahmedabad
13	Kantiyajal Village (Bharuch)	50.0	2014-15	Avicennia marina	SAVE, Ahmedabad
14	Devla Village (Bharuch)	150.0	210-16	Avicennia marina	SAVE, Ahmedabad
15	Village Tala Talav (Khambhat, Anand)	100.0	2015 - 2016	Avicennia marina	SAVE, Ahmedabad
16	Village Tala Talav (Khambhat, Anand)	38.0	2015 - 2016	Avicennia marina	GEC, Gandhinagar
17	Aliya Bet, Village Katpor (Hansot, Bharuch)	62.0	2017-18	Avicennia marina & Rhizophora spp.	GEC, Gandhinagar
<b>Total Mangrove Plantation:</b>		<b>2889.90 Ha</b>			

# **Annexure – 2**



# C S R K U T C H

## ► Six Monthly Report 2020-21

### **Adani Foundation**

Adani House, Port Road, Mundra – Kutch 370 421  
[info@adanifoundation.com] [www.adanifoundation.com]



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# Fight Against COVID-19

While most of the nation is locked in the safe confines of home, Adani foundation is doing various activity in villages during lock-down period to fight against COVID-19.

24

villages of Mundra block Sanitized



Adani Foundation had done sanitization work with coordination of Fire Department APSEZ in 22 Villages in Mundra.

45000+

Mask prepared by SHG group



Adani Foundation has supported SHG Groups of Mundra, Mota Kapaya, Navinal, Nakhtrana and Lakhpat for mask preparation.

1800+

food packet per day two time



For The workers, drivers and labors of APSEZ and AWL Cost free Fresh Food Support (Breakfast, Lunch and Dinner) in AWL premises , Port premises and SEZ Premises.

9000+ ration kit support



Ration Kit support to Daily Wage Labors and Needy people

150+ beneficiaries covered



Mobile health care unit is providing primary treatment to community at door step and also creating awareness to fight against Corona virus.

12500 people connected



By Awaz De software creating awareness in people in local kutchi language.

1400+ patient covered



AHMPL is providing all services IPD and OPD during lockdown period. social distance maintained during Pharmacy and queue for consultancy.

Important of handwashing & hygiene



Creating awareness of handwashing and hygiene by Sangini

57 senior citizens of old age home



During lockdown period our team providing medical facility to senior citizens at old age home in Mandvi and Gundala



# Environmental Sustainability

Sustainable development has many important facets/components like social, economic, environmental, etc. these components are closely interrelated and mutually re-enforcing. Under Corporate Environmental responsibility 10 km radius villages from SEZ Boundaries.

To make connections between human actions and the level of biological diversity found within a habitat and/or ecosystem, this year we launch project "Sanrakshan" in coordination with GUIDE and Sahjeevan.





# Environmental Sustainability

## Water Conservation Projects

Since 10 years considerable Water Conservation Work carried out in Mundra Taluka. Due to satisfactory rain in current year 1.11 mtr ground water table increased as per Government Figures. Our water conservation work is as Below.

- A large number of water harvesting structure ( 18 Nos. of check dams in coordination with salinity department)
- Ground recharge activities (pond deepening work for more than 52 ponds) individually and 26 ponds under Sujlam Suflam Jal Abhiyan were built leading to a significant increase in water table and higher returns to the farmers
- Roof Top Rain Water Harvesting 54 Nos. which is having 10,000 litre storage which is sufficient for one year drinking water purpose for 5 people family.
- Recharge Bore well 75 Nos which is best ever option to conserve ground water



# Environmental Sustainability

## Water Conservation Projects

- Drip Irrigation 823 Farmers benefitted in coordination with Gujrat Green Revolution Company
- Participatory Ground Water Management in ten villages with holistic approach for Kankavati Sandstone Aquifer Programme
- **As per Average Calculation more than 450 hac. area benefitted with increased in 109 MCFT water Quantity.**





# Environmental Sustainability

## Bio Diversity Park – Mundra

Ecological greenbelt development plan expects to attract and provide habitats for many species of major faunal groups such as amphibians, reptiles, birds (terrestrial and aquatic), butterflies and mammals. Further this developed area can act as recreational, educational and interpretation center for the community of the corporate sector to understand and enhance their knowledge base on local environmental and ecological scenario.

Adani Foundation, Mundra-Kutchh proposed a biodiversity park at 5 acres Nandi Sarovar area and approached to Sahjeevan, Bhuj for technical support for same. Sahjeevan team visited this proposed site for development of greenbelt to support biodiversity and enhancement of overall ecological food web existing in and around the landscape in first phase.

In addition, senior team of Adani Foundation and Sahjeevan also discussed in details for this program and suggested to initiate an interpretation center for awareness to various stakeholders on very unique biodiversity of Kutchh region in second phase.





# Environmental Sustainability

## Bio Diversity Park – Mundra

Zone wise different habitats identified by technical team, i.e. Outside Plot Area, Along Waterlogged Area, Climber/ Twiner Area, New Plantation Area, Entry Gap Filing Area, Gate Area, and Wetland Area within the proposed project area, technical team will develop a list of species that are representative of mature, undisturbed local forests, grasslands and wetlands. The chosen species will be typical of the species composition of local habitats. Main objectives are :-

Develop a list of plant species that can be chosen on the basis of aesthetic characteristics, in particular for the beauty/abundance of their flowers, eventually of their fruits/foilage.

Define information on different types activities involved under this ecological greenbelt development project (i.e. butterflies areas, medicinal plants areas, birds areas etc.).

Develop a manual that will give guidelines for habitats based on local practices, for short term and long-term management.

Till date more than 2500 medicinal plants and 1000 native plants are planted, due to good rain growth is considerable





# Environmental Sustainability





# Environmental Sustainability

## Coastal Bio Diversity Park – Luni

Bio diversity Project has been Continue with three species Rhizophora Mucronata ,Ceripos Tagal, Ceriops Decandra with good growth at Luni Bandar.

The mangrove biodiversity enrichment project in and around Adani ports special economic zone limited (APSEZL) aims to introduce select true mangrove species on a pilot scale in suitable coastal belts and assess their survival. Because this project is the first of its kind, the expected survival rate is between 20-30.

The project is currently in its initial stages of establishing nurseries and sowing seeds of several different species brought in from multiple locations in and outside of Gujarat state. These nurseries have been developed in tidal flats near the village of Luni, Kutchh, Gujarat.

The mangrove seeds/propagules) for the establishment of the nursery were brought in from various locations in India, namely, Machilipatnam (Andhra Pradesh), Pondicherry (Tamil Nadu), Parangipettai (Pichavaram Mangroves, Tamil Nadu), Kandla (Gujarat) and Jamnagar (Gujarat).



# Environmental Sustainability

## Coastal Bio Diversity Park – Luni

In most of these locations, there is adequate fresh water supply available due to high/substantial rainfall and/or presence of major rivers (also important river confluences and deltas that give rise to a thriving estuarine environment). Consequently, the mangrove species that successfully grow in those regions are adapted to a low-salinity environment (where salinity is approximately 20 ppt) against that of 37-44 ppt prevailing in Kutchh coastal waters. Furthermore, the species selected to establish the biodiversity enrichment project also belong to this group of mangrove species. This subsequently creates a challenge for the team heading this project because the Kachchh region does not provide adequate salinity ranges for survival of most of these species. In fact, it provides an extremely harsh saline environment (salinity can range up to as high as 44 ppt during summer).

Considering the above-mentioned scenario, the site selection criteria, need for species of high salinity tolerance and studying their natural occurrence in Kutchh becomes critical in ensuring a substantial survival rate of the mangrove species selected to potentially successfully establish a diverse and resilient mangrove community in the Kutchh region. Furthermore, a highly diverse set of mangrove species will ensure resilience in the face of changing climate and could probably provide as a thriving gene pool and seed bank in the future for the Kutchh region.





# Environmental Sustainability

## Tree Plantation

4110 Tree have been planted at various Public places , Schools, GP and crematorium with their responsibility to nurture and maintain regularly.



# Environmental Sustainability

## Drip Irrigation Projects

- **Basis of Requirements of Drip Irrigation**

The main source of livelihood being agriculture, the cultivators tend to use more and more underground water for irrigation. Underground waters have gone very highly saline. The use of such water for irrigation has made the soil also saline and the crop yields have dwindled.

- **Process of Drip Support**

Farmer have to applied in the prescribed form of Adani foundation with photograph.

Inspection and verification will be by AF representative.

Ration card, work order of G.G.R.C, 7/12 certificate and all bills must be attached.

Farmer will be informed by telephonic to have form query.

Primary information about farmer land will be received by telephone.

Farm visit within 10 days of after received of application and verified the installation of system as per map and material as per bill will be checked and get farmer feed back.

Verification report submitted to account office.

Payment within 20 days if all document is complete through net banking.

Farmer economic study after our support. – Follow up

- **We have covered 295 farmers and 1422 acre drip irrigation area in last two years which is remarkable for water conservation – in this six months we have covered 51 farmers and 310 Acre land for the same.**





# Environmental Sustainability

## Sea Weed Projects

The cultivation of seaweed have significant potential for the sequestration of carbon dioxide (CO<sub>2</sub>) and will very fulfill in mitigating the climate change. Seaweeds are macrophysics algae, a primitive type of plants lacking true roots, stems and leaves. They provides valuable source of raw material for industries like health food, medicines, pharmaceuticals, textiles, fertilizers, animal feed etc.

As per study of government of Gujarat, Seaweed culture can be best developed along the coast lines of Amreli and Kutchh districts in Gujarat. Juna bandar has good potential for seaweed farming as it has Calm and less wind action. We started this project as Pilot base at Junabadar with 50Kg Quantity. though there was good growth but due to cyclone it was damaged at present it 600Kg.

**In July 2020, We have done MOU with VRTI who is expert in Sea weed cultivation for supporting 20 fisherman in first phase for tank based sea weed farming. Dr. CVR Reddy (Ex- Director CSMSRI) is our Guide for the Project.**



# Environmental Sustainability

## Homebiogas Project

Home biogas is the Israel based company was founded in 2012 manufactures dynamic biogas unit not only for farm waste but for kitchen waste too.

Under Gram Utthan Project, Adani Foundation is supporting home biogas to farmers to Uthhan Villages phase wise. Current year supported 95 home biogas in Dhruh, Zarpara and Navinal Villages.

- Reducing organic waste,
- Transitioning to renewable energy
- Motivation for reduction in use for fertilizer

And Improving the health and living conditions for the millions of families that are still cooking on charcoal and wood. Adani Foundation is not only supporting but creating awareness to save environment and health of the community who regularly cooking on Chula. It is proven that one hour cooking on Chula is as dangerous as smoking 40 cigrates.

As a Main Process, Bacteria break down organic waste in a naturally occurring process, and Home Biogas stores and harnesses the energy created so that it can be used for gas.

Earlier we had proceeded for capacity 2 cum but after visit and series of meetings with farmer group – we need to take up plant capacity 6 cum.

Till date 54 farmers are utilizing it with satisfaction and considerable outcome by saving Average Rs. 1250 for gas and fertilizer as well.





# Utthan

## Academic

- ✓ Utthan Sahayaks connected through WhatsApp and phone calls with the progressive learners from April – July
- ✓ July onwards structured 'Online classes' were started for Utthan Schools focusing Progressive learner on Google meet platform
- ✓ Utthan Shayaks made Annual syllabus, customized worksheets and TLM
- ✓ Weekly IT and Sports material were circulated in all Utthan Schools

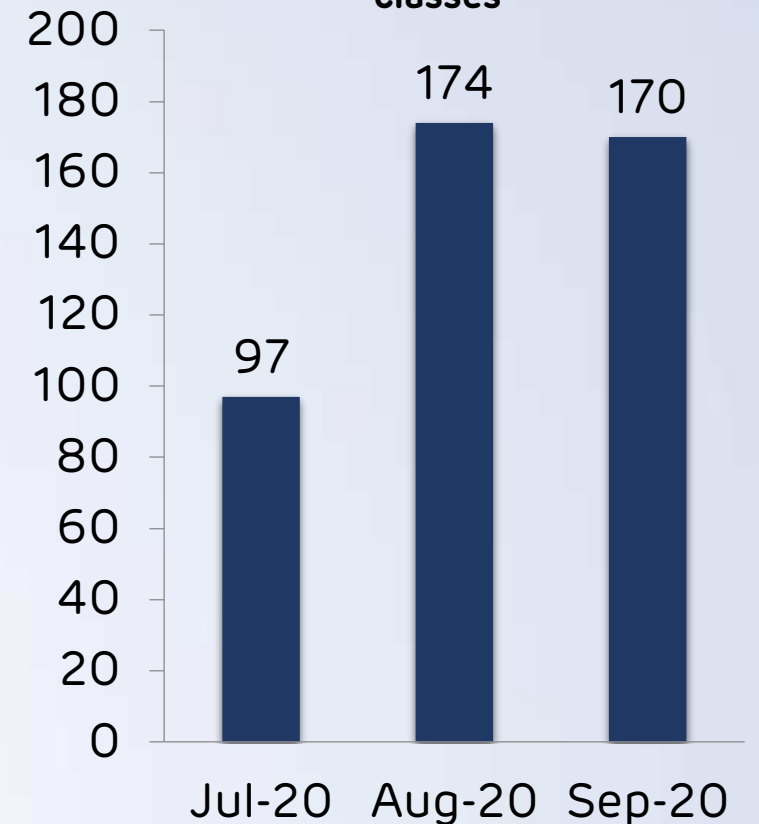
**Mother's meet** 3 Mothers' meet conducted 148 Mothers' were addressed



### Topic covered -

- Precaution during heavy rainfall and covid
- Active participation in online classes
- Spend quality time with your child
- Focus to develop creative skills amongst your kids

**Priya Vidyarthi in 17 Government Primary School : 259 (2020-21)**  
No. of Priya Vidyarthi attending online classes



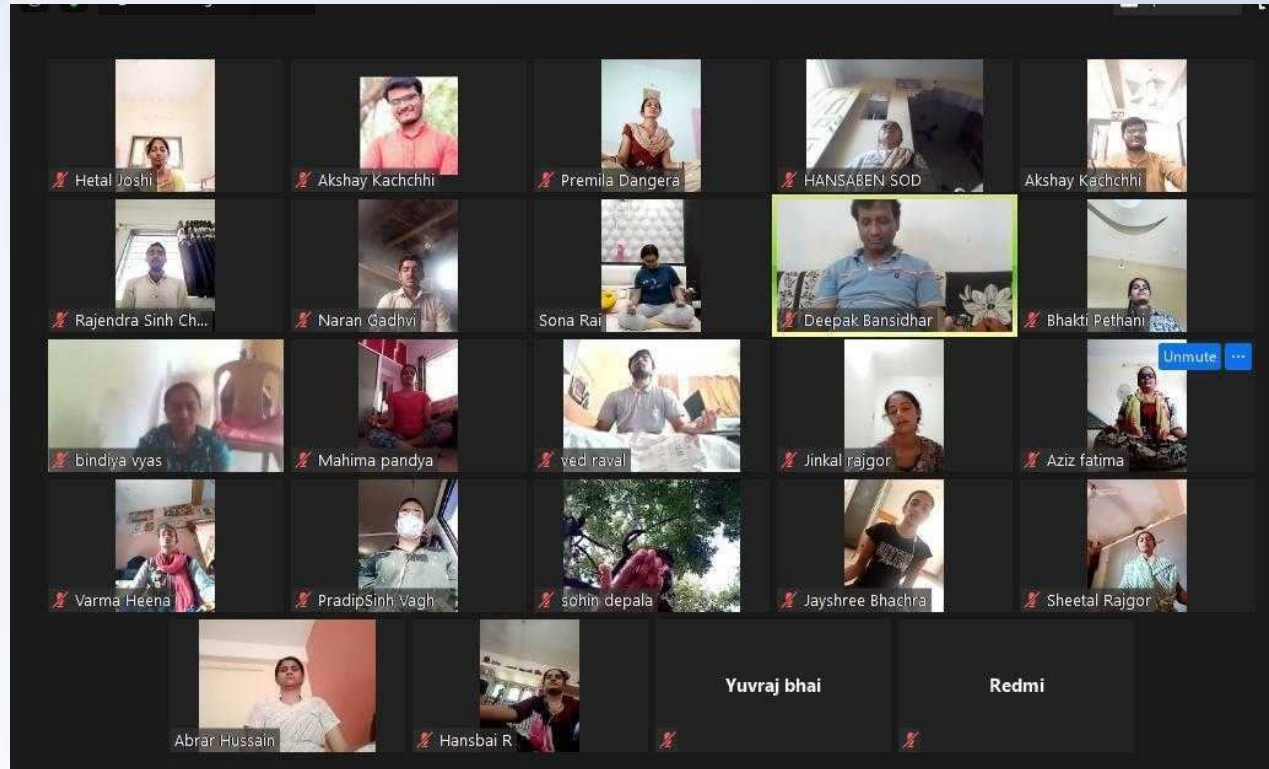
# Utthan

## 06 Virtual Capacity Building Program on various topic through Microsoft team

Apart from CPD Utthan Sahayks attended **30+** educational webinar during lockdown.

Topics covers -

- We're all at home-but you're not alone,
- Think big! Boost your learning
- Project for teen
- Teaching CLIL
- Building up confidence in writing skills
- An introduction to positive psychology well being for your classroom



# Utthan



Arrange various competition and celebration for Priya Vidyarthi



School Visit and Home Visit by Utthan Sahayak



## Meeting with School principals and Utthan Sahayaks

Conduct meeting with Principal / Teacher of Utthan schools, TPEO, BRC, CSR Head, Education Coordinator, Project Officer and Utthan Sahayaks through Microsoft Team

### Agenda:

- Utthan Sahayaks strengthen themselves by attending 30 + webinar
- Online courses conducted by Cambridge University
- Prepare worksheets especially for *Priya Vidyarthi* Annual curriculum for Reading, Writing, Maths, English, Library, IT, Sports
- Prepared Teaching Learning material Connect with *Priya Vidyarthi* by Online class + WhatsApp + Text messages + Home Visit
- Meeting with government officials





# Adani Vidya Mandir Bhadreshwar

Adani Vidya Mandir Bhadreswar **provide "cost-free"** education to meritorious students coming from challenging economic background, who have priceless treasures but have been under achievers due to situation. In year **2020-21 490 students are studying.**

**82.60%** - Result SSC Board Exam



## Tab Distribution

Tablet provide to students of std 10<sup>th</sup> for online study through Employee Volunteering Programme and we distributed the tablets to students of Std 10. HOD's and HOS's of Adani Ports, Adani Power, Solar and Adani Wilmar and Adani Tuna had supported for online studies of Standard 10<sup>th</sup> Students of AVMB for smooth studies.

# Adani Vidya Mandir Bhadreshwar

## Activities Covered

- Admission process of std 1 students through draw system. 80 students selected out of 91. remain 11 students in waiting list
- Online Class through WhatsApp and you tube video
- Teachers are regularly visiting students house for checking homework and lessons with PPE's.
- supported Text-books to the students of all classes.
- Tab distribution to Std 10<sup>th</sup> students
- House Visit by Principal Madam & Vice Principal to irregular students.
- Hindi Day celebration
- Unit test conducted as per GSEB circular for the students. Paper received from CRC & Board for std 9<sup>th</sup> and 10<sup>th</sup>.





# Health

During this panic situation health is the basic need for development of community. Adani Foundation focuses on ensuring good health for better contribution to growth and progress.

**11** Rural Clinic

8 from Mundra 3 from Anjar block treated ;

**8196** patients.

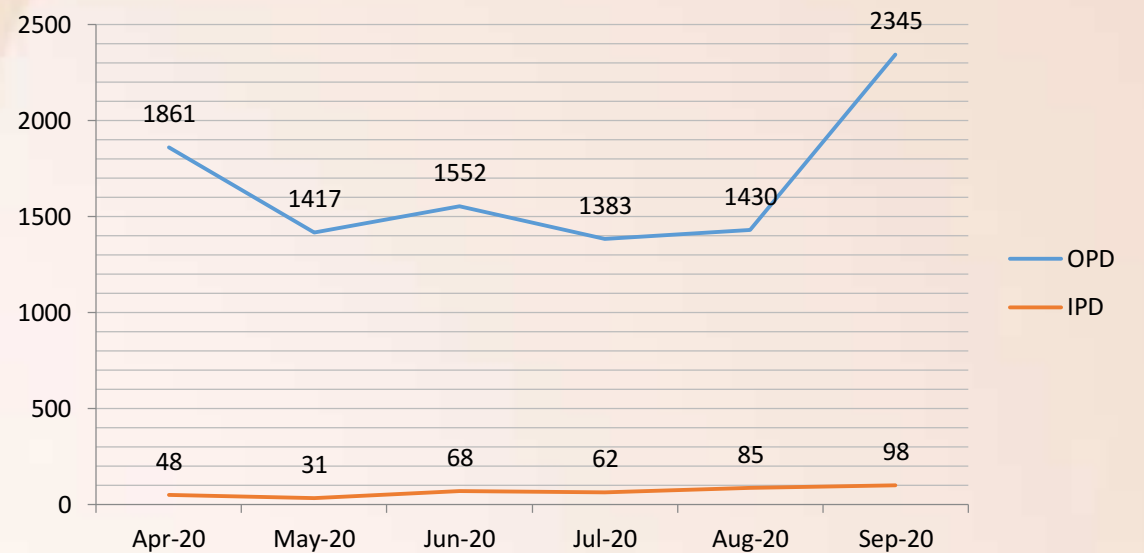
**31** villages covered, with 109 types of general and life saving medicines through Mobile healthcare unit

**6879** patients benefited during six month



# Health

## AHMPL OPD & IPD detail



## Project wise detail

Project`	OPD/IPD						Total
	20-Apr	20-May	20-Jun	20-Jul	20-Aug	20-Sep	
Senior citizen	471	537	694	504	313	402	2921
Medical Supports	106	89	70	41	60	100	466
Dialysis Supports	43	51	41	36	35	30	236
Medical Mobile van	50	1470	1107	1234	1445	1573	6879
Rural Clinic	0	1653	1557	1705	1591	1690	8196
Total	670	3800	3469	3520	3444	3795	18698

AHMPL	Month						Total
	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	
OPD	1861	1417	1552	1383	1430	2345	9988
IPD	48	31	68	62	85	98	392
Total	1909	1448	1620	1445	1515	2443	10380

# Health

## Dialysis Support



Due to high salinity, in Kutch cases of kidney failures are comparatively more. At Adani Hospital we are providing dialysis treatment with token charges. We have provided treatment to 6 patients of kidney failure 236 times.



### Sr. Citizen project

8672 Card holders of 68 villages get benefit under this project .

2921 sr. citizen patients benefited during six month 8000 limit for three year per patients



## Medical Support

470 Needy patients had been facilitated with Medical Support OPD & IPD treatment with token charges during this six month



# Health

## Abhimanyu Project

Having pregnancy is the precious for women as well as her family. But sometimes some complication may arise which can be fatal for mother and child due to incomplete knowledge and irregular health check-up.

To resolve its at some extent we design Abhimanyu health calendar with all details about diet, vaccination, symptoms and precautionary measures in Gujarati language with pictures so the pregnant women can be align with it's regularly.



1150 health calendar were distributed to various PHC,CHC and ICDS department of Mundra, Mandvi, Nakhtrana, Lakhpat, Abadasa, Anjar & Gandidham block.

594 Protein Powder packet distributed to ANC woman of Utthan villages and TB patient of Mundra block.



# Sustainable Livelihood Development

## Education:-

Education play significant role for any individual as well as community transformation. Covid pandemic has severely impacted on education system. Hence to keep them connected and motivated various intervention have been made.



**55** Higher secondary Fishermen students of Sekhadiya, Navinal, Zarpara & Junabandar benefitted with book support. Mother meeting and telephone Discussion for their wards discussion.

## Alternative livelihood

Fisher folk



Providing Option livelihood to Fishermen during Fishing Off season by Mangroves plantation and Maintenance. It also creating environment sustenance.

**4830** Man-days work was provided over **236** Fishermen family during this six months



# Sustainable Livelihood Development

## Government Scheme Facilitation.



To avail Fishermen Government scheme (**Fishermen Credit card**) one day program was arranged with social distancing and all precaution.

**30 KCC form fill-up at Navinal.**

Created awareness with Telephonic about same.

## Sea Weed Culture

To create option livelihood over fishermen with co-ordination of VRTI.

Pilot phase -3500Kg seaweed was harvested Based on that MOU with **ICCSIR** (Brach of VRTI) to expand sea weed Culture by Offshore and inshore Method We have to support for Community Mobilization and land for inshore Seaweed Culture.



## Potable Water at Fishermen Vasahat

Potable Water to Fisher Folk at vasahat-2020-21			
Sr.	Vasahat	family	Requirement Per day
1	Luni Bandar	110	15000
2	Bavdi Bandar	117	15000
3	Kutdi Bandar	140	15000
4	Randh Bandar	350	25000
	Total	717	70000

Availing pure drinking water to fishermen vasahat.

To mitigate born disease and women drudgery to get water

**1113 fishermen** are getting benefit of its

Juna Bandar Fishermen vasahat been water sustain with linking to Mundra Gram Panchayat

# Sustainable Livelihood Development

The purpose of this project is to initiate village wise integrated agricultural & allied development for sustaining agriculture and socio economic situation of farming community of Mundra block.

Adani Foundation had coordinated with Village Development Committee, Gram Panchayat and Gau Seva Samiti of Siracha Village Gauchar Development.

Total 85 Acre Gauchar Land was approved by GP for Development by decision taken in Gram Sabha . Among them 72 Acre land Has been Sowed and Remaining land would be Grow with Wild Grass.

## Fodder cultivation

- To Increase production and availability of green and dry Fodder.
- Village driven fodder sustainability through cultivation in village Gauchar land..
- Zarpara -25 Acre & Siracha- 85 Acre Gauchar land development is in progress – We got very good support from Village Development Committee in post care.





# Sustainable Livelihood Development

## Government Scheme Facilitation

Facilitate widows, senior Citizens and Divyang to various schemes of government like widow pension, free bus pass, Senior citizen pension scheme sankat mocha sahay etc. support for process and documentation

Sr.	Name of Scheme	Nos of beneficiaries	Supports amount
1	Widow pension	51	Rs.1250 per month
2	Divyang Buss	8	Free of cost traveling
3	Senior Citizen pension scheme	3	Rs.750 per month
4	Sankatmochan sahay	2	Rs.20,000 once in life for BPL
5	Cabin support to widow	2	by foundation

66 people are getting benefits of various government scheme



# Sustainable Livelihood Development

## Women Empowerment

An initiative under the Sustainable Livelihoods Development Program to encourage women, take control of their own lives and increase their confidence whether they are single, married or widowed.

5-SHG had been Facilitated for Rs1.0 lac bank loan through DRDA to start-up new business for women empowerment.

facilitated artisan for artisan support by District collector Kutch Rs.1000/- per month for four month

11 members Shradha saheli SHG of Motakapaya village is prepared snacks and meals for catering.

The group's catering tender has been sanction to providing snacks and meals service for Government program in mundra block.



₹ 6,00,000+  
income has been earned



60,000+ three layer mask has been prepared and sold by Umang SHG group @ Rs.10.00 per mask



# Sustainable Livelihood Development



Registration of "Kutchh Kalptaru Farmer's Producer Company and meeting with Director, DRDA for Equipment and Agri mall Grant is done.

## Fodder support

Fodder support in 20 villages of Mundra and Anjar block.

Dry fodder 6.70 lacs kg  
Green fodder 11.60 lacs kg



## Tissue Culture

Our periphery villages are famous for the dates farming as having appropriate weather and soil condition.

To Doubling the farmer income by availing "Barahi Varieties Tissue plant" has good productivity 850 plants have been distributed to 34 farmers 25 plants / Farmers cost of a plants is Rs.3500. 50% Contribution have been collected from Farmers which will further utilized to purchase more tissue plants to availed more farmers.



# Sustainable Livelihood Development



## Dragon Fruit Farming

To promote dragon food farming to doubling farmer income as having good economic value. 10,000 dragon food sapling , Pole and wire have been supported to 5 farmers.



## Home Bio Gas

Installation of 53 Home Bio-gas with SOP Awareness and trouble shoot of problem as well.

## Model Farming

To promote cow-based farming two model farm have been developed with 25 type innovative activities. This will be utilized for demonstration and replication at other farms.





# Sustainable Livelihood Development



95 Farmers benefitted with NB -20 Off suite to bring fodder sustainability.



Kitchen garden Kits (Seeds, Fertilizer and Pesticides) were facilitated to 48 SC family with the help of horticulture department and aware about its importance in diet.

**ORGANIC FARMER'S HAAT**  
by  
श्रीविठ्ठल बाजार  
Healthy Food for Healthy Life  
Date: 23rd August, 2020  
Time: 8AM to 11AM  
Venue: Shopping Center, Shantivan colony

**We Believe and Deliver**  
Nutritious, Tasty, Chemical Free Naturally Grown Produce at your doorsteps directly from Farm

adani Foundation  
Supported by:  
ADANI FOUNDATION, MUNDRA  
+91 77779 08024  
info@jaivikbazaar.com  
www.jaivikbazaar.com

adani Foundation  
Healthy Food for Healthy Life

**"Food is Medicine: But is your food safe?"**  
Today, Food we eat contains harmful Pesticides, Chemicals, Color.  
So, We Believe and Deliver...  
Nutritious, Tasty, Chemical-free, Healthy, Naturally Grown Produces at your doorsteps fresh directly from our Farms

We are delivering Fresh Organic Vegetables & Fruits, Cereals, Pulses, Spices, Oils, A2 Cow Milk, Ghee, Fruit Juices, Clay utensils, etc.

FREE DELIVERY

Page 78 of 343

Organic farmer hat at shantivan colony  
To avail pure organic vegetables ,Milk, ghee, buttermilk as well as webinar was also organized to aware about the importance of healthy food for healthy life.



# Community Infrastructure Development

Adani foundation has designed, planned and built a infrastructure community health, agriculture and living standards, all initiatives were fulfilled according to the needs of people of community.

## Development of Prisha Park at Mundra.



## Pond Bund strengthening at Zarpara Village





# Community Infrastructure Development

## Work In Progress:-

1. Drainage Line and Chamber work at Bhopavandh.
2. Drainage Maintenance & JCB Hiring & Other Mis. Work.
3. Road Repairing at Kutdi Bandar.
4. Road Repairing at Zarapra Fisherman Vashat.
5. Road Repairing at Luni Pagadiya Fisherman

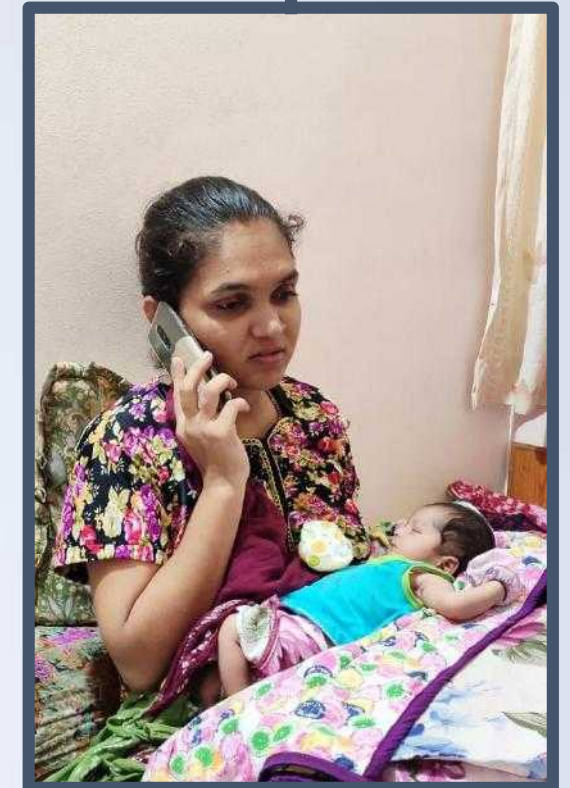


# SuPoshan

The purpose of the Project is to reduce occurrence of malnutrition and anemia.

create awareness about malnutrition and anemia and related factors amongst all stakeholders and role they may play in curbing the issue.

To successful implementation of the project, "Sangini – Village Health Volunteer" plays major role in the Project.





# SuPoshan

Covid-19 awareness in village & Slum Area

100 beneficiaries covered in Menstrual Hygiene Day - with slogan called "RED-ACHHA HAI"

204 beneficiaries covered in Breastfeeding Week

320 beneficiaries covered in National Deworming Day

20 villages covered in celebration of NATIONAL NUTRITION MONTH

42 FAMILY COUNSELLING

Participate in Umbre Anganwadi episode



# SuPoshan

## THANKS GIVING PROGRAMME” MUNDRA & BITTA Site

Community Engagement and other Activities		
Sr.No	Activity	Total
1	No of Sangini	24
2	Total Village Cover	41
3	Total Anganwadi Cover	70
4	SAM to MAM Monitoring Progress	03
5	MAM to Normal Monitoring Progress	15
6	Focus Group Discussion	85
7	Family Based Counselling	42
8	Village level Events	05
9	No of SAM children referred to CMTC	06
10	Total Anthropometric screening	140
11	Total Family Cover through video & Audio Calling	20
12	Total House Hold Family Visit	130
13	No. of Severe Acute Malnourished children (SAM) Telephonic Counselling	08
14	No. of Severe Underweight children (SUW) Telephonic Counselling	03
15	No. of adolescent girls-Telephonic Counselling	190
16	No. of pregnant women-Telephonic Counselling	100
17	No. of lactating mothers-Telephonic Counselling	230
18	No IFA Tablet Distribution to adolescent girls	200
19	Total Family Cover	9178
20	No of Sangini completed online POSHAN Abhiyan E- Learning module	3435



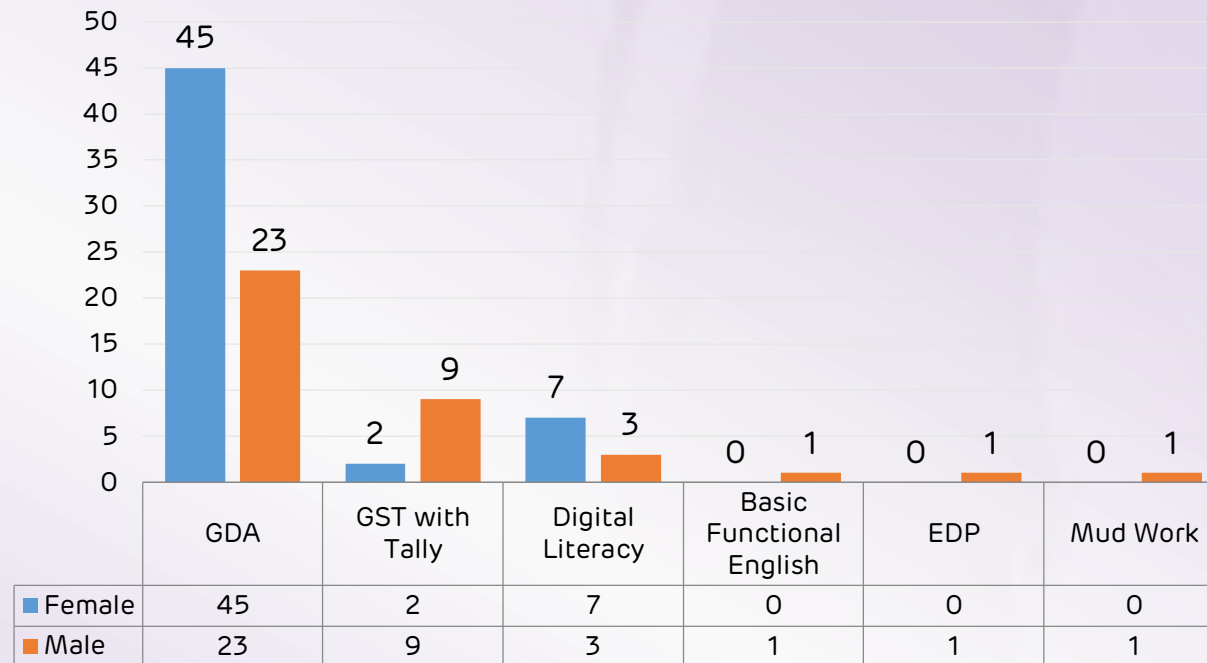
SuPoshan Thanksgiving program was organized. In this webinar DDO, CDPO Mundra and other dignitaries remained present and appreciated the efforts to overcome malnourishment in Mundra and Bitta.



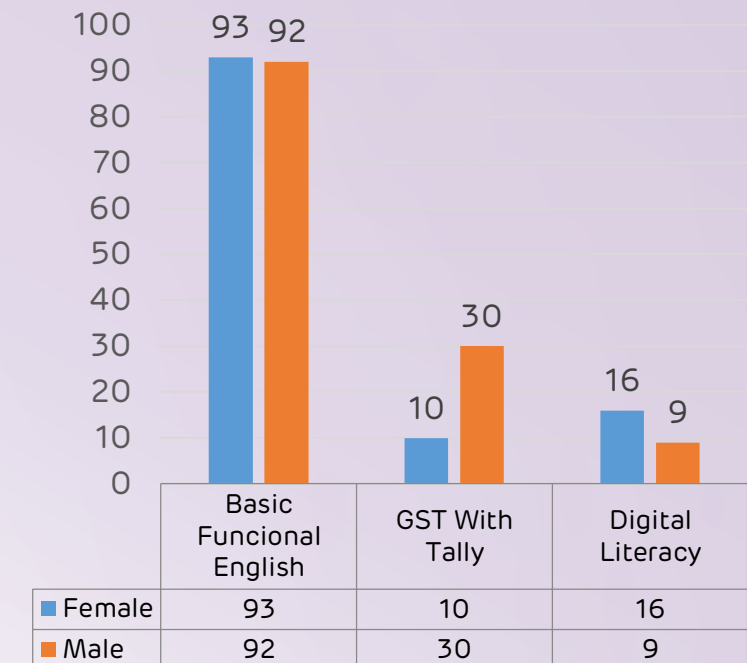
# Adani Skill Development Centre

Admissions From April to September, 2020

OHO Model (Subsidized)



Free Training Model



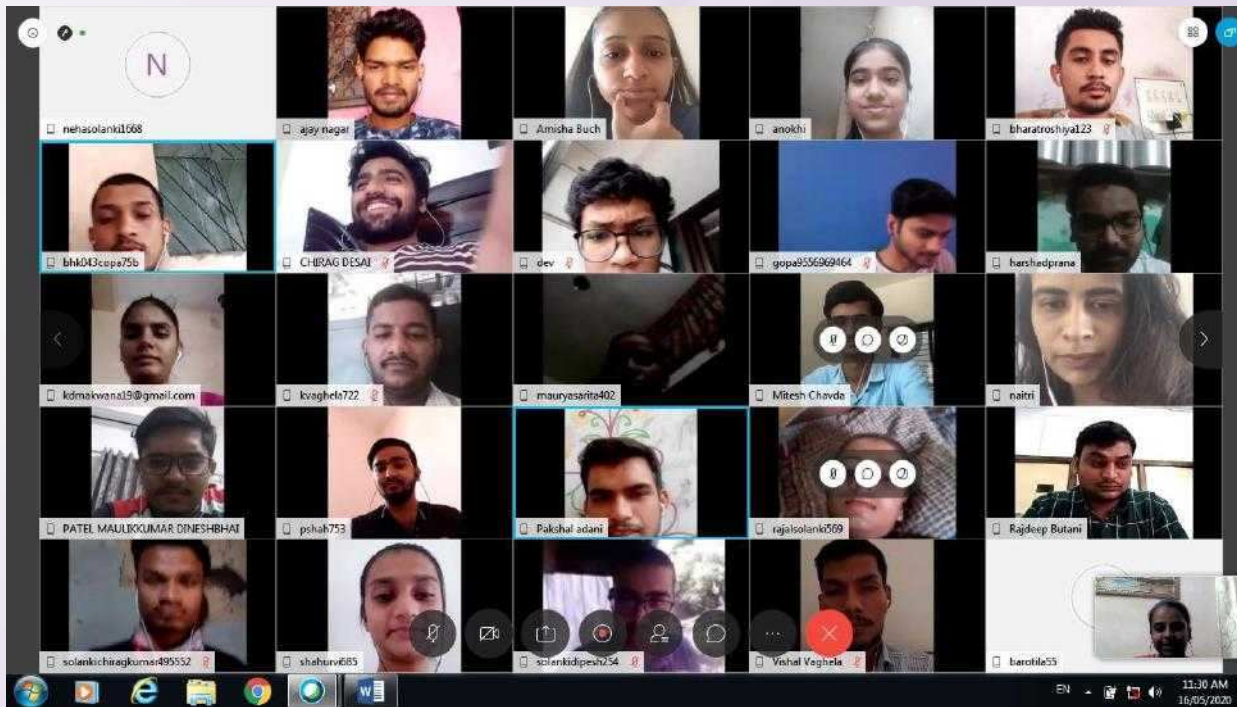
# Adani Skill Development Centre

E-Learning

324 students Enrolled in Online Training

## Various Activity

The students of DDU-GKY (GDA) creating awareness regarding Covid-19 in their own village through various activity



# Adani Skill Development Centre

## Interview and Placement

Arranged interview of DDU-GKY GDA students at Sterling Hospital – Gandhidham, GAIMS (Sodexo), Chanakya College, Accord Hospital, Fire Academy.

**27** students get placement in GAIMS (sodexo), Alilance Hospital, Shreeji Hospital, Bhuj Fire Academy, Divine Hospital etc.  
**3** students are working in COVID-19 Hospital





# Adani Skill Development Centre

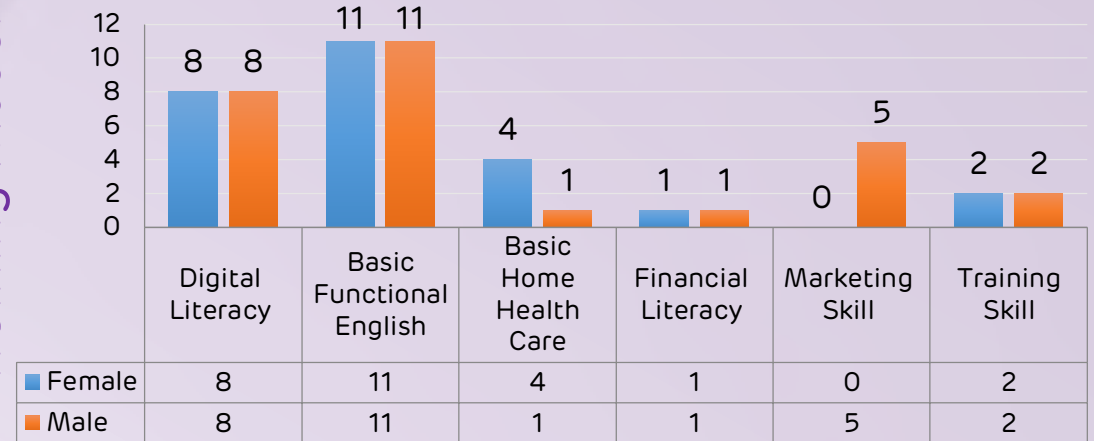
## Admissions From April to September, 2020

### E-Learning & Activity

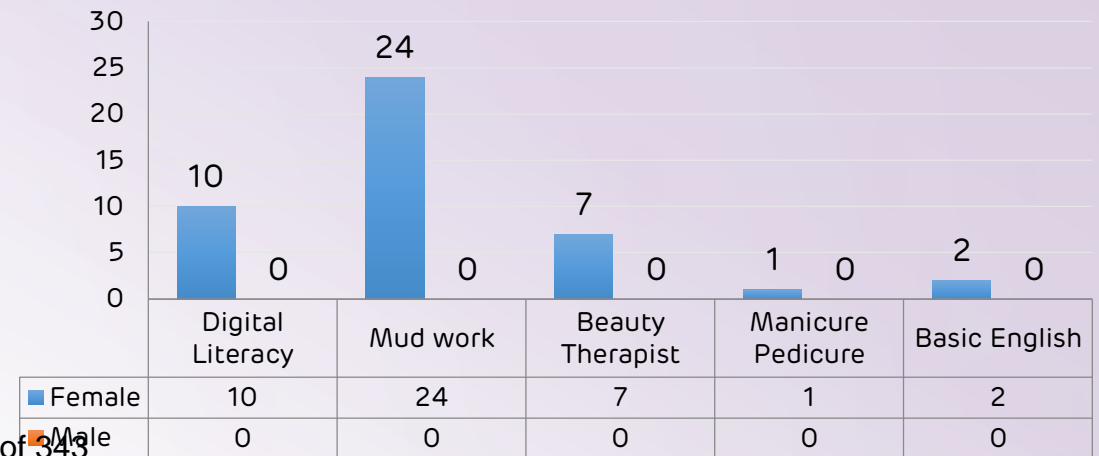
- Online E- Learning training of Interview skill course
- Online training of Mud work – Theory and practical



### Free Training Model



### Subsidized Training Model





# CSR - Nakhatrana

## Recharge Bore well

Adani Foundation, Nakhatrana had revived ground water table by recharging the bore wells and wells in Amara and Jinjay village. Total 15 Bore well recharge work will be beneficial to more than 70 beneficiaries in irrigation.



## Benches and Otta Work

In Jinjay Village 5 cement benches were grouted and 2 sitting places – otta were repaired at public places. Also in Amara village 6 cement benches was grouted near Village Pond which brought visibility of our entry point activity work for Green Energy Projects.

## Tree Guard Support

Adani Foundation always believes in Nature conservation. For purpose of planting and protection of trees, Adani Foundation provided 50 cages in Ugedi village of Nakhatrana taluka and 100 cages in Ratadia village..



# CSR - Nakhatrana



## Swavlamban Divyang Support

The Adani Foundation, Nakhatrana provides a variety of tools to help people with disabilities become financially self-sufficient. Disabled people are given various support for livelihood such as cabin shop, sewing machine, Atta chakki in which they earn income by selling various things.

## SETU Agriculture Projects

Adani Foundation supported agriculture projects by linkages of Government Scheme. Facilitated 23 SC Farmers of Ugedi, Amara, Ratadiya and Desalpar village by Kitchen Garden kits worth Rs 2000 by coordination with Department of Horticulture GOG.



## SETU Widow/Divyang Support

We act as a bridge between Government schemes for Widows and Divyang people. 104 Widow women were supported to fulfill formalities of filling pension scheme forms and started getting aid of Rs. 1250 per month. Tricycle, Bus pass and sewing machine support was also coordinated with social welfare department



# CSR - Nakhatrana

## Biodiversity - Ugedi

Adani Foundation also works for the conservation of biodiversity. To do such work, Adani Foundation works with the advice of experts and the guidance of an expert organization to protect the environment and also to protect and preserve the wild biodiversity. It works to protect biodiversity.

This work has been entrusted to Sahajivan, an expert organization for the protection and conservation of biodiversity, as part of which a Biodiversity Conservation Committee has been formed in Ugedi village (BMC). As well as in the garden of Ugedi village and in the place of Angalwadi, trees have been planted. Also, in the seam area of Ugedi village, more than 300 native trees have been planted, In which trees like Pilu, Desi Bawal, Khejari, Liar have been planted. As well as the seeds of the native trees have been sprinkled, babool has been removed from the roots in the village pastures by JCB and the pastures have been cleared so that the native trees can grow more and the sprinkled seeds grow there and It has been tried to grow back the native trees of Kutch. Also, a small pond has been constructed in Shim of Ugedi village, in which wild animals can get water as well as survive



# CSR - Lakhpatt

## Tree Guard Support

Adani Foundation always believes in Nature conservation. For purpose of planting and protection of trees, Adani Foundation provided 100 cages in Kapurashi village of Lakhpatt taluka and 100 cages in Koriyani village..



## Fodder Cultivation

Animal Husbandry is the main livelihood of Lakhpatt. Due to good rain we motivated more than 61 farmers to grow fodder in at least one acre of land to become self sustainable.





# CSR-Tuna



## Rations Kits Support

We believe in growth with Goodness and giving back to society.

We are Always ready to support during any Nature calamities and pandemic.

During the Covid -19 pandemic we had started Ration kit Distributed campaign with spreading precautionary awareness to needy and poor people.

Total 1100 Ration Kits Distributed to Tuna Rampar and Vandi Villages

## SETU – Widow/Divyang Support

We act as a bridge between Government schemes for Widows and Divyang people. social welfare department.

We arranged Awareness program with Anarde Foundation , setu and Government Officers.





# CSR-Tuna



## Potable water Distribution

at Vira and Ghavarvado Fishermen Vasahat

## Water Project

Water Pipe Line installation & Storage tank construction with Collaboration with WASMO , GP and AKBTL at Tuna



Adani Foundation always believes in Nature conservation. For purpose of planting and protection of trees, Adani Foundation have Done Tree planation at Tuna , Rampar , Vandi Government Schools and Police station.



## Fodder Support

Fodder distribution to Rampar and Tuna Villages.  
**Rampar**

**15520** Kg dry Fodder Rs.1.1 Lacs

**122930** Kg Green Fodder Rs.3.50 Lacs

**Tuna**

**32430** Kg Dry Fodder Rs.2.65 Lacs

**212800** Kg Green Fodder Rs.6.06Lacs.

## Tree Plantation



# EVP-Employee Volunteering program



802 students of Vallabh Vidhalaya schools has been adopted by Adani employee

35 tablet for students of AVMB

Amid covid-19 its difficult to continue 10<sup>th</sup> standard study for the financial weaker students who don't have any digital gadget for online learning . Hence to enable them for online learning our APSEZ Employee volunteering support to provide Lenovo tablet to AVMB Students . .



All the 802 students are in the school are from migrants labour families who are working in various industries in and around of Mundra. Laborer children are in addition to resource constrain at home and also bear the dis-advantages of unfamiliarity of local language and culture, which inhabiting them to participation in school. Vallabh vidhalaya by passes the language barrier as the medium of instruction is Hindi.

Total Rs.16.04Lacs cheque had been handed over to Mr. Dharmendra who is the director of Vallabh vaiadhalaya On 1<sup>st</sup> may as the world labour day.



# Events

## World Environment Day

World Environment Day was celebrated in Four Talukas by different activities related to conservation of Environment.

- Mangrove Plantation at Luni sea coast with fisher folk community
- Tree Plantation at Mundra, Nakhtrana, Lakhpat & Tuna block.
- Inauguration of Gauchar land development work in 22 acres at Siracha village
- Tissue culture plant distribution to farmer
- 1500 herbal plants like meshvak, amla, galo, gugal, ardusi, pilu, etc planted at Nandi Sarovar biodiversity park





# Events

## Vanmhotsav

4100+ tree plantation

Vanmhotsav tree plantation :

**Tunda, Siracha, Navinal , Zarpara, Dharb, Baroi, Luni, Samgoga, Nani bhujapar, Moti bhujapar, Mota bhadiya, Gundiyali , Anjar, Tuna, Rampar and Wandi Village.**

For Mota bhdiya, Ravalpirdada temple and Zarpara with Government 1000 plants received from Forest Department.





# Events

## World Mangrove day

Web talk show was organized on the occasion of "World Mangrove days On Multi species Mangrove bio diversity with Joint effort of Guide and Adani Foundation, mundra.

Dr.V.Vijayan Kumara (Director of Gujarat institute of Desert ecology) , Mr. C.R.K Reddy (Former chief scientist ,CSIR-CSMCRI CEO) and Respected PNR sir and Gadhvi sir had delivered occasionally speech. As well as Paper presentation by GUIDE and with KSKV Scientist . Total 70 participated had joint this webinar.





# Events

## World ocean day

### World ocean day

World ocean day celebration on 8<sup>th</sup> June at Luni bandar with spreading cleanliness message through coastal cleaning program and aware about government scheme with maintaining of social distancing



## My Mother's dream became true

**Name:** Mura Keshabhai Dhuva

**Place:** Khavda, Bhuj, Kutch, Gujarat

**Employer:** Alliance Hospital (Covid 19 hospital), Mundra, Kutch, Gujarat.

**Job:** Joined as Nursing Assistant.

**Salary:** Rs. Up to 9000/- per month with lodging and boarding facilities.

### **Candidate Brief:**

He belongs to rural family. Father is Carpenter and mother is Home maker. Parental household's monthly income prior to his placement was Rs.8, 000. His prior educational qualifications is 12th pass.

### **In his own words:**

My mother's dream is that one of the sons should be in medical field. But due to financial constraint, I couldn't study further. I thought I will never be able to fulfill my mother's dream but fortunately, I got opportunity to get trained under GDA course and soon after its completion, I got placement in hospital. I feel proud to serve Covid19 patients and will continue doing fearlessly.

Thanks to Adani Skill Development Centre to give me opportunity to take training under DDU-GKY scheme and make me capable to take care of my family.





## It helped me to become good team member and work efficiently

**Name:** Nipul Punjabhai Sanjot

**Place:** Bidada-Mandvi, Kutch, Gujarat

**Employer:** Alliance Hospital (Covid 19 hospital), Mundra, Kutch, Gujarat.

**Job:** Joined as Nursing Assistant.

**Salary:** Rs. Up to 9000/- per month with lodging and boarding facilities.

### **Candidate Brief:**

His father and mother works as helping staff (housekeepers) in another hospital. Monthly income of family prior to his placement was 10,000/-. His prior educational qualifications is 12th pass.

### **In his own words:**

I am youngest in Covid19 hospital here but I know this is the time to act wise. When my friends ask me do you fear working as PCA? I simply laugh and say I am trained in GDA course and fully prepared for this work. My duty is to check patient's temperature, blood pressure and oxygen level and maintain record. We get residential facility nearby hospital. To Treat Covid19 patients, needs a courage and team work and I am blessed I got this wonderful chance. Thanks to Adani Skill Development Centre to give me opportunity to take training under DDU-GKY scheme and make me capable to take care of my family.

*When asked how confident he is at his new and challenging work, he replies "Along with GDA training we were also trained with soft skills training as it helped me to become good team member and work efficiently."*



## Stick at old ages

Dhanuba a self-esteem lady from Zarpara Village. While I peeped in her life it seems like that her existence is only to bear grief and sadness. Her husband was passed away before 20 Years since that she has been enduring social and economic responsibility of her family by drudgery daily wages. She have two daughter who are married and two sons who are supporting her for daily end meet, day was passed little more good combatively .....Who knows it was for short times .....

Unfortunately one more shock in her life that her elder son get Heart attack and passed away & younger son got mentally ill again she have to drudgery to get them daily bread and butter.. Though her daughters called her to lives with them but she denied strongly believed to don't be burden & belongs to daughter. Now she is 70 years old and physically weak and also get ill often.

One day she came to our Rural clinic for medical check-up and was talking with deep sigh & despair about her problem. Fortunately our Employee Mr. Karsanbhai was present at their and promptly talked with her and comprehend the reality. She could not availed benefit of widow pension scheme because of the certain government limitation even after numbers of time applied and Follow-up for the same. He went along with her and Collected the essential document and submitted to the respective department later within two month she received sanction order for the same and further Rs.1250 /- Widow pension has been started which been the great support for daily meet.

She and her daughters expressed great gratitude and said that Adani Foundation is hope For the Poor and needy persons.



## “Vidyadan Mahadan”

**Name:** Sohil Gafur Manjaliya

**Place:** Luni ,Mundra

**AF intervention:-** Education Scholarship Support

**Progress & Achievement:-** Studied intently and perused Graduation Degree and process for LLB admission

**Salary:** Working with Lawyer as a practicenor and earn Rs. 8000/Month

**Back Ground :** He belongs to Poor Fishermen family and sincere to study since child hood. He belongs to Poor Fishermen family and sincere to study since child hood. His father is used to Pagadiya fishing practice to get the daily end meet.

**In his own words:**

In our community most of the youth left study after 8<sup>th</sup> standard and engaged in Fishing practice but when I had interacted with AF staff and persuaded for further study and Scholarship support. I realized that the only education can be the game changer to strengthen my Financial condition. Later I focused to study Intentionally and dreamed to be Lawyer.

Now am working with Advocate as Assistance and do Financially support to my family.

Indeed AF sensitized me and act as catalyst to transform my life than others really I am honored by friends and Society



*Really AF Scholarship support intervention could be the Community transformation rather than Individual.*



*The sewing machine  
act as legs to made me  
earned and confident  
for my family*

## Real Support

Name: Harkhumben hirabhai Rabari

Place: Jinjauu, Nakhtrana

AF intervention:- Sewing Machine Support.

Progress & Achievement:- Started Embroidery and sewing work

Income : Rs.2500 to 3000/Month

Back Ground : She is 40 year old lady and disable by polio in childhood. They are five members three Children and Husband wife. Her husband is driver and the only person to earn hence financial problem is always remain host. However She is illiterate & handicapped but symbol of etiquette and dedication. She always thought to be financial Supporter to her life partner . As belongs to Rabari community stitching & hand work is imbibed in her and she want to purchase Sewing machine for the same but Financial constrain did not allow them for same.

During community interaction she express her willing sewing machine support. we met her and after verification Support accordingly.

In his own words:

It was difficult to me as house wife to maintain budget but since I have started sewing work which added some extra money which can we expence for our children nurturing and education for their bright future.

Thanks to Adani foundation to be supporter to such disable persons



## Sea of Change – I got a job ....

Manjaliya Jakum Osman is 36 years old Fishermen Youth though he was little dull in study but has insight sense and dedication to work. After completion of primary education he had been engaged in fishing practice with his father. Though he was earning but not enough to sustain his big family with Five Daughters .

He was always thinking to get hike and asking to provide work according to his skill like driving ,electrician and painting work.

One day we offer him contract work in our dry cargo department for loading Unloading work. He started enthusiastically with 30 Labors teams and paid 100% Efforts to fetch the targets but.....Unfortunately he had to left contract due to some constrain.

Again he engaged in fishing as routine but destiny define another for him. we had called From APSEZ to need Casual labors and referenced for Jakum as having Good feedback for dedication toward work.

he accepted opportunity even did not know the process. Initially We supported for gate pass and other mandatory formalities. Currently 22 Fishermen youth are working under him.

He is saying that I am earning Approx Rs.40000/Month. And message to Fishermen youth that I am grateful to AF to provide chance to proof my self and sustaining well. now I can Fulfill all basic amenities and invest to my daughter education.

He message to Fishermen Youth that we have great Opportunity as having ADANI port and companies to get employed.





# Media coverage



ખારેક, દાડમ અને કેરીના ગ્રોડિંગ, ક્લીનિંગ અને પેકિંગ માટે ખાસ વ્યવસ્થા ઉભી કરાશે

## મુંદ્રાના ૧૧ ગામોના ખેડૂતોના ઉત્થાન માટે 'કચ્છ કલ્પતરૂ પ્રોડ્યુસર કંપની લિ.' એગ્રોમોલ બનાવશે !



માસિક એ શારીરિક પ્રક્રિયા હોવાથી અપવિત્રતા સાથે ન જોડો અદાણી ફાઉન્ડેશન દ્વારા રાષ્ટ્રીય માસિક સ્ત્રાવ સ્વચ્છતા દિવસની ઉજવણી કરાઈ

મુંદ્રા | ફાઉન્ડેશન દ્વારા કાર્યરત આશા સહેલી સૂપે સેનેટરી પેડનું વિતરણ કરતાં નિકાલ



## જીવન સાથે જીવનનિર્વાહની સામર્થવાન કામગીરી કરતું: અદાણી ફાઉન્ડેશન

(પ્રેસ રીલીઝ) મુંદરા તા. ૧૨ આજે અદાણી ફાઉન્ડેશન ૧૮ રાજ્યમાં ૨૨૫૦ ગામડાઓ સુધી લોક કલ્યાણ અર્થે કામ કરી રહ્યું છે. અદાણી ફાઉન્ડેશન કચ્છ જિલ્લામાં પણ સુસંગત, વ્યવસ્થિત રીતે, સમાજ ઉપયોગી કામગીરી કરવા હંમેશા તત્પર રહ્યું છે. તેની કામગીરી સહીયારા મૂલ્યની વિભાવનાથી પ્રેરિત છે. જેમાં અદાણી ફાઉન્ડેશન સમાજ માટે સર્વસમાવેશક વાતાવરણ ઉભું કરવા ઉત્સુક છે, તેના આ કાર્યની સાબિતી મુંદ્રાના લાભાર્થી પરિવારો પૂરી પાડે છે.

**અદાણી ફાઉન્ડેશન દ્વારા દેશના ૧૮ રાજ્યમાં ૨,૨૫૦ ગામડાઓમાં કરવામાં આવેલ લોક કલ્યાણના વિવિધ કાર્યો : મુંદ્રા તાલુકાના ૨૨ ગામોને સેનીટાઈઝ કરવામાં આવ્ય અસરગ્રસ્ત પરિવારોને ૧૦,૦૦૦ જેટલી રાશન કીટનું વિતરણ**

જેટલી રાશન કીટનું વિતરણ કરવામાં આવ્યું છે તથા આ કામગીરી હમણાં પણ ચાલી રહી છે. આવશ્યક સેવાના ભાગરૂપે અદાણી પોર્ટ અને વિભારના સહયોગથી ત્યાં કામ કરતા કામદારો અને ડ્રાઈવરોને દૈનિક બે ટાઈમ અંદાજિત ૫,૨૦૦ આપતાં સુપોષણ પ્રોજેક્ટની "સંગીની બહેનો" કોવિડ ૧૯થી બચવા હેલ્થ હાઈજિનની સચોટ માહિતી દરેકને અને ખાસ કરીને પ્રસૂતા બહેનોને આપવામાં આવે છે. છેલ્લા સાત વર્ષથી સકળ રીતે કાર્યરત "આવાજ દે" સોફ્ટવેર પ્રતિકારક શક્તિ વધારવા માટેના જરૂરી ખોરાકની માહિતી પણ વર્ચ્યુઅલ પ્લેટફોર્મ દ્વારા આપવામાં આવે છે. આ સાથે અન્ય રોગથી પીડાતા દર્દીઓને ઘરે ફોન કરીને નિયમિત દવા લેવા અને ઘરની બહાર ન નીકળવા માટે અનુરોધ



**અદાણી ફાઉન્ડેશને મુંદરાના વલ્લભ વિદ્યાલયનાં ૮૦૦ બાળકને દત્તક લીધાં**



મુંદરા, તા. ૨ : અદાણી ફાઉન્ડેશન દ્વારા અભ્યાસ કરતાં બાળકોને દત્તક લેવાનું કાર્ય છેલ્લા બે વર્ષથી અદાણી ફાઉન્ડેશને મુંદરાના વલ્લભ વિદ્યાલયનાં ૮૦૦ બાળકને દત્તક લીધાં. આ કાર્યમાં અદાણી ફાઉન્ડેશનના સંયુક્ત પ્રયાસથી ખારેક વાવતા ખેડૂતોને જરૂરી વળતર મળે એ હેતુસર ખારેકના ૮૫૦ ટીસ્યુ કલ્ચર રોપાઓનું ૩૪ ખેડૂતોને વિતરણ કરવામાં આવ્યું હતું, તો બીજી તરફ ખેડૂતોના આ ઉત્પાદનની બજાર વ્યવસ્થા માટે કચ્છ - કલ્પતરૂ પ્રોડ્યુસર કંપની બનાવવાની કાર્યવાહી શરૂ

● અદાણી ફાઉન્ડેશનનો સહયોગ અને ડાયરેક્ટરો સમન્વય થકી ધરતીપુત્રોને કૃષિ ક્ષેત્રે મળશે સારા

● ઓક્ટોબરના અંત સુધીમાં ૨૦૦ સભાસદોને મુંદ્રા તાલુકાના ૮ ગામોના ૩૪ ખેડૂતોને બારેકી ખારેકના ટીસ્યુકલ્ચર રોપાઓનું વિતરણ કરાયું

● ભુજપુર આસપાસ ૨૩ લાખના ખર્ચે વિવિધ વિકાસકામો સંપન્ન : ખાનગી કંપનીનો સહયોગ

## નર્સિંગ કોર્સના ૨૦ તાલીમાર્થીઓને પ્રમાણપત્ર પહેલા જ નોકરી મળી

ભુજમાં અદાણી સ્કિલ ડેવલોપમેન્ટ દ્વારા અપાઈ હતી તાલીમ કચ્છમાં જરૂરિયાત મુજબ નિમણુક અપાવવામાં પ્લેસમેન્ટ ઓફિસર નિરવ લેઉવા, કિન્નરી ઉમરાણીયા તથા રોહન સોની મદદરૂપ થયા હતા. તાલીમ માટે અસ્મિતાબેન જેઠી અને પૂર્વી ગોસ્વામી સહાયરૂપ થયા હતા. હજુ પણ જરૂરિયાત મુજબ પ્રયત્નો કરવામાં આવી રહ્યા છે. અત્રે ઉલ્લેખનીય છે કે, ગયા ઓક્ટોબર-૧૯માં બેચ શરૂ થઈ હતી. પરંતુ, લોકડાઉન આવી જતા પરીણા લઈ શકાઈ નહોતી હતી કળ મળ્યું છે.

## ભુજીમાં સમુદ્ર સફાઈ અભિયાન હાથ ધરાયું

ભુજીના દરિયામાં પાણીમાંથી સાથે રાખીને હાથ ધરાયેલી બહારથી ગુલામની તસવીર. ભુજ, તા. ૨ : ભુજમાં સમુદ્ર સફાઈ અભિયાન હાથ ધરાયું. આ કાર્યમાં અદાણી ફાઉન્ડેશનના સંયુક્ત પ્રયાસથી ખારેક વાવતા ખેડૂતોને જરૂરી વળતર મળે એ હેતુસર ખારેકના ૮૫૦ ટીસ્યુ કલ્ચર રોપાઓનું ૩૪ ખેડૂતોને વિતરણ કરવામાં આવ્યું હતું, તો બીજી તરફ ખેડૂતોના આ ઉત્પાદનની બજાર વ્યવસ્થા માટે કચ્છ - કલ્પતરૂ પ્રોડ્યુસર કંપની બનાવવાની કાર્યવાહી શરૂ

**ખારેક બજાર વ્યવસ્થા માટે કચ્છ-કલ્પ તરુ પ્રોડ્યુસર કંપની બનાવશે : અદાણી ફાઉ. દ્વારા આયોજન**

ગઢવી, દત્તાત્રેય ગોખલે તેમજ અદાણી સેજ પોર્ટના એક્ઝીક્યુટીવ પ્રપ્રેક્ટર રશિતભાઈ શાહે

ભુજપુર (તા. મુંદરા), તા. ૨૧ : મુંદરા તાલુકાના કી વિસ્તારમાં મહાનગર ભુજપુર નામની આમપત્તી ખાતુ વાડામાં વાઠી વિભારમાં અનાઉ ચાલત કમળના તથાવ મનેપું હતું. પરંતુ એ તથાવમાં પાવતો સંબંધ ઓછો પતો હતો. જો પાવતો સંબંધ વધુ થાય તો જ આ વિભારમાં આપત્તી પાડીને પાવતોના પ્રક્રે ચાલત મળી સ તેવી યાચત હતી. જે આજે ભેટુન પુરી કરી અપાઈ છે. અહીંના નામપત્તી નામો આવતું વરસાદી પાવતી મ તથાવમાં જઈ જવાય એ મા ભેટુન આમપત્તી નારાણપુ ભુજાર કામચા અને સરપં નિયુક્તકરના અન્વેષણે

**અદાણી સ્કિલ ડેવ. દ્વારા નિ:શુલ્ક ઓનલાઈન વ્યવસાયલક્ષી અભ્યાસક્રમ**





We Salute to Corona Warrior Staff of Adani GKGH, Adani Hospital Mundra, Community Health Staff and team....

Our fight against Corona is still continue with new hope and dreams.....



**Adani Foundation-Mundra : Budget F.Y. 2020-21****Executive Summary : Budget Utilization Statement-April to September.2020**

F.Y. 2020-21 (Rs. In Lacs)

Sr. No.	Budget Line Item	Budget 2020-21	Budget Utilization	% of utilization	Remarks
A.	Admin Expense	61.10	24.07	39.39%	
B.	Education	94.56	25.11	26.55%	
B1	Utthan-Education -Mundra	64.11	24.16	37.68%	
B2	Education -Fisherfolk - Balwadi	30.45	0.95	3.12%	
C.	Community Health	420.70	95.29	22.65%	
D.	Sustainable Livelihood Development	365.00	171.83	47.08%	
E.	Community Infrastructure Development	58.30	7.81	13.40%	
F.	EDM Recommended Projects	60.00	1.38	2.30%	
G.	COVID 19 Support	100.00	23.05	23.05%	
Total AF CSR Budget :		1,159.66	348.54	30.06%	
H.	Adani Vidya Mandir-Bhadreshwar	219.67	42.24	19.23%	
I.	Project Udaan-Mundra	50.00	25.92	51.84%	
GRAND TOTAL BUDGET F.Y. 2020-21 :		1,429.33	416.70	29.15%	

# Development of Biodiversity Park

at

## Nandi Sarovar

Mundra- Kachchh







# Collection of Baseline Data

## PRE MONSOON SURVEY

- 78 Species (under 34 Families and 71 Genera)
- 384 TREES
- 50% plant species are herbs, followed by trees (31%) and grasses (11%).

## POST MONSOON SURVEY

- 25 New NATIVE Species added in List
- 48 SPECIES are planted including 6-7 Saline Mixed Grasses



# Site Clearing and Leveling



- *Before and after Lockdown*
- *Through Labors*
- *Through Machineries*
- *Prosopis juliflora, debris and other waste*





# Nursery Beds and Purchasing Native Saplings (45+ Species)



Sr. No	Species Name	Social Forest Nursery, Dhunai	Normal Forest Nursery, Dhunai	Hightech Nursery, FD, Bhuj	Salvadora Green Nursery, Nakhtrana	Gov. Ayurveda Farm, Reldi	Pvt. Nursery, Adipur	Gulfarm Nursery, Bhuj	TOTAL
1	Manilkara hexandra (Rayan)				12				12
2	Azadirachta indica (Limdo)			10					10
3	Cordia gharf (Liyar)				63				63
4	Acacia nilotica (Deshi Bavara)			50	50				100
5	Pomegranatum (Dadam)			20					20
6	Psidium (Jamphal)	10							10
39	Withania somnifera (Ashwagandha)					14			14
40	Abrus precatorius (Chanothi)					10			10
41	Canna indica (Canna)						50	50	100
<b>Total from Each Nursery</b>		100	240	150	358	56	60	160	1124





# Collection and Purchased SEEDs (10+ Species)



- ❖ Vegetative cuttings of stem of drought resistant plant species like *Euphorbia caducifolia* (Tuar, Thor)



- ❖ Seeds of *Cassia auriculata* (Awar), *Acacia nilotica* (Desi Baval) and *Pongamia pinnata* (Karanj), from surrounding landscape.

- ❖ Seeds of *Grewia villosa* (Luska), *Premna sp.* (Kundher), *Gymnosporia montana* (Vikado), *Moringa oleifera* (Mitho Saragavo) are collected from wild area of Bhuj Taluka and

- ❖ Seeds of *Ziziphus mauritiana* (Bor) and *Salvadora oleoides* (Mithi Jar) are purchased from Koli communities of





# Development of Grassland Habitat

More than 10 species planted: Mixed Saline, High Nutritive, Sedges etc.

More than 5 species are planted through roots-saplings from our site





# Development of Wetland Habitat



Site composition	Species planted	Strategies
Waterlogged area	<i>Vitex negundo</i> (Nagod), <i>Salvadora persica</i> (Khari Jar), <i>Suaeda nudiflora</i> (Lano, Unt Morad)	Water preferable species, fast growing and saline tolerant; medicinal plant; attract many insects, butterflies during flowering.
Seepages with sewage water	<i>Canna indica</i> (Cana Plant)	Evergreen tuberous herb and helpful in water purification with control on sewage smell.
Dominant by sedges	<i>Cyperus scariosus</i> , <i>C. rotundens</i> and others	Soil binder and saline tolerant species and also preferable by many insects and butterflies.
Dominant by <i>Phragmites</i> sp. and other vegetation	Seed sowing of mix grasses collected from Banni grassland as part of gap filling along the boundary	Soil binder and saline tolerant-high nutritive species and also preferable by many insects and butterflies.
Dominant by <i>Sesbania bisponosa</i> and <i>Cyperus scariosus</i>	Seed sowing of mix grasses collected from Banni grassland as part of gap filling along the boundary; and also planted seeds of native thorny species available at sites for providing more shelter trees for birds	Soil binder and saline tolerant-high nutritive species and also preferable by many insects and butterflies.  Native seed sowing of <i>Zizyphus mauritiana</i> (Bor), <i>Cassia auriculate</i> (Aavar), <i>Pongamia pinnata</i> (Karanj), <i>Acacia nilotica</i> (Deshi Bavar), <i>Salvadora oleiode</i> (Mithi Jar) etc.
Complete Dry area	<i>Caesalpinia crista</i> (Kachka)	Spiny straggling shrub, provide green and wild protection/live fencing; medicinal species



# Development of Thorn Forest Habitat

Species Name	Local Name
<i>Cordia gharaf</i>	Liyar
<i>Acacia nilotica</i>	Desi Bavar
<i>Grewia tanax</i>	Gangani
<i>Commiphora wightii</i>	Gugal
<i>Prosopis cineraria</i>	Khijdo, Kandhi
<i>Pithecellobium dulce</i>	Goras Ambli
<i>Zizyphus mauritiana</i>	Bor
<i>Azadiractha indica</i>	Limdo
<i>Salvadora persica</i>	Khari Jar, Pilu

- Drought resistant, thorny and deep-rooted plants.

- Less requirement of water during summer season compared to other evergreen plant species.





# Development of Medicinal Plants PLOTS

- **Increased density:** *Salvadora persica* (Khari Jar), *Moringa concensis* (Kadvo Sargavo), *Pithecellobium dulce* (Goras Amali), *Prosopis cineraria* (Kandhi), *Tecomella undulata* (Ragat Rohido), *Zizyphus mauritiana* (Bor), *Cordia dichotoma* (Gunda), *Salvadora oleoides* (Mithi Jar), *Holoptelea integrifolia* (Kanaji), *Punica granatum* (Dadam), *Acacia nilotica* (Deshi Bavar), *Cordia gharaf* (Liyar).

- Between two small plots, we planted almost **12 medicinal plant species in block**





# Development of Climbers and Live Hedges



- Wild climber species are planted i.e. *Tinospora cordifolia* (Garo), *Abrus precatorius* (Chanothi), *Argyreia nervosa* (Samudra Sosh) and *Asparagus racemosus* (Satavari).

- Mainly FOUR species, i.e. *Acacia nilotica* (Desi Bavar), *Pithecellobium dulce* (Goras Amali), *Grewia tenax* (Gangani) and *Euphorbia cuducifoilia* (Tuar) for plantation are planted as LIVE FENCED





# Diversity of Butterflies



Painted Lady



Plain Tiger



Pioneer



The plains Cupid



The lesser grass blue



Pioneer

# Common Faunal Species



Dragon Fly



Red-wattled Lapwing



Garden lizard



Blue Bull- *Nilgai*



Beetle



Spider



Fan Throated Lizard



# Celebration of Special Days...

Environment Day on 5<sup>th</sup> June 2020 and Van-Mahotsav on 6<sup>th</sup> July 2020

## નંદી સરોવરમાં પાર્ક બનાવવાનું આયોજન પ્રાગપર ગામે પાંચ એકરમાં બાયોડાયવર્સિટી પાર્ક બનશે અહિંસાધામ અને અદાણી ફાઉન્ડેશન દ્વારા આયોજન



। ભુજ । (સંદેશ પ્રતિનિધિ)

મુન્દ્રા તાલુકાનાં પ્રાગપર ખાતે અદાણી ફાઉન્ડેશન દ્વારા એન્કરવાલા અહિંસાધામ સંચાલિત નંદી સરોવર ખાતે આવેલા પાંચ એકર પ્લોટને બાયોડાયવર્સિટી (જૈવ વિવિધતા) પાર્ક તરીકે વિકસાવવામાં આવશે.

૧લી જુલાઈથી ૭ જુલાઈ સુધી યોજાયેલા વન મહોત્સવ અઠવાડિયા દરમિયાન પાંચ એકર પ્લોટમાં ૧૨૫૦ જેટલા ઔષધિ વનસ્પતિના રોપાંઓનું વાવેતર કરવામાં આવ્યું હતું. આ કાર્ય માટે ટ્રીપ પદ્ધતિ અપનાવવામાં આવી છે. આ વન મહોત્સવમાં અહિંસા ધામના સી.ઈ.ઓ. ગિરીશભાઈ નાગડા, અદાણી ફાઉન્ડેશનનાં હેડ પંકિતબેન

શાહ તથા માવજીભાઈ બારૈયા, કરસનભાઈ ગઢવી, સહજીવન સંસ્થાના ડાયરેક્ટર ડો.પંકજભાઈ જોશીનાં હસ્તે વાવેતર કરવામાં આવ્યું હતું. મુન્દ્રા તાલુકાના જરપરા ગામની સરકારી હાઈસ્કૂલ અને સ્મશાનભૂમિ ખાતે પણ વૃક્ષારોપણ કરવામાં આવ્યું હતું. આ ઉપરાંત નખત્રાણા તાલુકાના ઉગેરી ગામે વન મહોત્સવ દરમિયાન વિવિધ રોપાંનું સરપંચ મીઠુભાઈનાં સહકારથી અદાણી ફાઉન્ડેશન દ્વારા કરવામાં આવ્યું હતું. સમગ્ર કાર્યક્રમનું આયોજન અને અમલીકરણ પ્રોજેક્ટ ઓફિસર કરસનભાઈ ગઢવી તથા તેમની ટીમ દ્વારા કરવામાં આવ્યું હતું.



SHOT ON OPPO



2020/7/6 16:47





# Future Planning...

## *for discussion*

- Landscaping, designing and seating arrangement at 2-3 Locations;
- Preparation of Signboards for Medicinal plants and selected Faunal Species;
- GAP Plantation of medicinal plants- MAKING DENSE PLOTS; and
- Compilation of Biodiversity Data: FLORA & FAUNA

# Budget For Next Six Months

<b>ACTIVITY</b>	<b>Proposed Budget Rs.</b>	<b>Accumulated Expenses</b>	<b>Available Balance Rs.</b>
<b>Layout and Designing of BD Park</b>	<b>40,000</b>	<b>0</b>	<b>40,000</b>
<b>Saplings , Seeds Purchasing</b>	<b>1,06,230</b>	<b>65,578</b>	<b>40,652</b>
<b>Travel Cost Including TEDE</b>	<b>1,25,200</b>	<b>54,097</b>	<b>71,103</b>
<b>H.R.Cost Including Support Team</b>	<b>2,76,000</b>	<b>1,38,000</b>	<b>1,38,000</b>
<b>Overhead Cost</b>	<b>46,600</b>	<b>23,296</b>	<b>23,304</b>
<b>Total</b>	<b>5,94,030</b>	<b>2,80,971</b>	<b>3,13,059</b>





THANK YOU...



# **Annexure – 3**



**POLLUCON** LABORATORIES PVT. LTD.

Environmental Auditors, Consultants & Analysts.  
Cleaner Production / Waste Minimization Facilitator

Recognised by MoEF New Delhi Under Sec. 12 of Environmental (Protection) Act-1986

# "HALF YEARLY ENVIRONMENTAL MONITORING REPORT"

FOR

**adani**<sup>TM</sup>

**ADANI PORTS AND SPECIAL ECONOMIC ZONE LIMITED  
TAL: MUNDRA, KUTCH, MUNDRA – 370 421**

**MONITORING PERIOD: APRIL 2020 TO SEPTEMBER 2020**

**PREPARED BY:**

**Pollucon**

**POLLUCON LABORATORIES PVT.LTD.**

**PLOT NO.5/6 "POLLUCON HOUSE", OPP. BALAJI INDUSTRIAL SOCIETY,  
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**TC - 5945**

**ISO 9001:2015**

**ISO 14001:2015**

**OHSAS 18001:2007**

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## MARINE WATER MONITORING SUMMARY REPORT

### RESULTS OF MARINE WATER [M1 LEFT SIDE OF BOCHA CREEK - N 22°45'183" E 069°43'241"]

SR. NO.	TEST PARAMETERS	UNIT	MAY 2020		JUNE 2020		JULY 2020		AUGUST 2020		SEPTEMBER 2020		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
1	pH	--	8.25	8.20	8.27	8.21	8.26	8.19	8.27	8.21	8.25	8.19	IS3025(P11)83Re.02
2	Temperature	oC	30.9	30.8	31.1	30.8	31.5	31.1	30.6	30.4	30.7	30.4	IS3025(P9)84Re.02
3	Total Suspended Solids	mg/L	156	174	174	190	186	210	208	225	220	241	IS3025(P17)84Re.02
4	BOD (3 Days @ 27 °C)	mg/L	3.3	Not Detected	3.6	Not Detected	3.4	Not Detected	3.1	Not Detected	3.0	Not Detected	IS 3025 (P44)1993Re.03Edition 2.1
5	Dissolved Oxygen	mg/L	6.1	5.9	5.9	5.7	5.9	5.8	5.9	5.7	5.9	5.6	IS3025(P38)89Re.99
6	Salinity	ppt	34.7	35	35.6	35.2	36	36.3	36.2	36.5	36.5	36.7	APHA (22 <sup>nd</sup> Edi) 2550 B
7	Oil & Grease	mg/L	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	APHA(22 <sup>nd</sup> Edi)5520D
8	Nitrate as NO <sub>3</sub>	µmol/L	8.1	6.12	4.37	5.28	4.18	4.32	3.76	3.53	3.17	2.94	IS3025(P34)88
9	Nitrite as NO <sub>2</sub>	µmol/L	0.74	0.58	0.49	0.31	0.64	0.52	0.94	0.78	0.68	0.52	IS3025(P34)88 NEDA
10	Ammonical Nitrogen as NH <sub>3</sub>	µmol/L	3.16	3.20	2.68	2.44	3.16	3.1	2.63	2.51	2.53	2.31	IS3025(P34)88Cla.2.3
11	Phosphates as PO <sub>4</sub>	µmol/L	1.36	1.17	1.94	1.73	2.44	2.28	1.87	1.63	1.6	1.39	APHA(22 <sup>nd</sup> Edi) 4500 C
12	Total Nitrogen	µmol/L	12.00	9.90	7.54	8.03	7.98	7.94	7.33	6.82	6.38	1.39	IS3025(P34)88
13	Petroleum Hydrocarbon	µg/L	Not Detected	Not Detected	5.3	Not Detected	9.5	Not Detected	12	Not Detected	10	Not Detected	PLPL-TPH
14	Total Dissolved Solids	mg/L	35790	36170	36649	36274	36948	37204	37294	37450	37446	37638	IS3025(P16)84Re.02
15	COD	mg/L	19	Not Detected	21	Not Detected	25	19.0	23.4	18	26	19.0	APHA(22 <sup>nd</sup> Edi) 5520-D Open Reflux
<b>B</b>	<b>Phytoplankton</b>												
16.1	Chlorophyll	mg/m <sub>3</sub>	3.68	2.61	3.41	2.5	3.04	2.45	2.83	2.61	2.72	2.5	APHA (22 <sup>nd</sup> Edi) 10200-H
16.2	Phaeophytin	mg/m	0.7	2.1	1.2	2.2	1.82	2.29	2.18	2.02	1.87	2.27	APHA (22 <sup>nd</sup> Edi) 10200-



**H. T. Shah**  
Lab Manager




**Dr. Arun Bajpai**  
Lab Manager (Q)



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		3											H
16.3	Cell Count	No. x 10 <sup>3</sup> /L	172	96	150	78	142	80	136	92	138	106	APHA (22 <sup>nd</sup> Edi) 10200-H
16.4	Name of Group Number and name of group species of each group	--	<i>Synedra</i> <i>sp.</i> <i>Thalassiothrix</i> <i>sp.</i> <i>Nitzschia</i> <i>sp.</i> <i>Biddulphia</i> <i>sp.</i> --	<i>Cheatoce</i> <i>rus sp.</i> <i>Skeletonem</i> <i>a sp.</i> <i>Rhizosoleni</i> <i>a sp.</i> -- --	<i>Navicula sp.</i> <i>Thallassione</i> <i>ma sp.</i> <i>Rhizosolenia</i> <i>sp.</i> <i>Biddulphia</i> <i>sp.</i>	<i>Thallassiothri</i> <i>x sp.</i> <i>Coscinodisc</i> <i>us sp.</i> <i>Ceratilem</i>	<i>Nitzschia sp.</i> <i>Thallassione</i> <i>ma sp.</i> <i>Biddulphia</i> <i>sp.</i> <i>Rhizosolenia</i> <i>sp.</i> --	<i>Navicula sp.</i> <i>Pleurosigma</i> <i>sp.</i> <i>Coscinodisc</i> <i>us sp.</i> --	<i>Rhizosoleni</i> <i>a sp.</i> <i>Coscinodisc</i> <i>us sp.</i> <i>Pleurosigma</i> <i>sp.</i> <i>Nitzschia</i> <i>sp.</i>	<i>Navicula</i> <i>sp.</i> <i>Thallassiosi</i> <i>ra sp.</i> <i>Synedra</i> <i>sp.</i>	<i>Nitzschia sp.</i> <i>Thallassione</i> <i>ma sp.</i> <i>Ceratium</i> <i>Biddulphia</i> <i>sp.</i> <i>Cyclotella</i> <i>sp.</i>	<i>Fragillaria</i> <i>sp.</i> <i>Rhizosoleni</i> <i>a sp.</i> <i>Coscinodisc</i> <i>us sp.</i>	APHA (22 <sup>nd</sup> Edi) 10200-H
<b>C Zooplanktons</b>													
17.1	Abundance (Population)	noX10 <sup>3</sup> / 100 m <sup>3</sup>	40	32		27		22		23		APHA (22 <sup>nd</sup> Edi) 10200-G	
17.2	Name of Group Number and name of group species of each group	--	Ostracods Gastropods Copepods --	Hydroloans Polychaetes Amphipods Molluscans		Polychaetes Gastropods -- --		Hydrodictyons Polychaetes Bivalves Mysids		Polychaetes Chaetognathes Foraminiferans Decapods		APHA (22 <sup>nd</sup> Edi) 10200-G	
17.3	Total Biomass	ml/10 0 m <sup>3</sup>	3.45	3.1		3.15		3.10		3.1		APHA (22 <sup>nd</sup> Edi) 10200-G	
<b>D Microbiological Parameters</b>													
18.1	Total Bacterial Count	CFU/m l	1980	2120		2180		2450		2320		IS 5402:2002	
18.2	Total Coliform	/ml	Absent	Absent		Absent		Absent		Absent		APHA(22 <sup>nd</sup> Edi)9221-D	
18.3	Ecoli	/ml	Absent	Absent		Absent		Absent		Absent		IS:1622:1981Edi.2.4(2003-05)	
18.4	Enterococcus	/ml	Absent	Absent		Absent		Absent		Absent		IS : 15186 :2002	
18.5	Salmonella	/ml	Absent	Absent		Absent		Absent		Absent		IS : 5887 (P-3)	
18.6	Shigella	/ml	Absent	Absent		Absent		Absent		Absent		IS : 1887 (P-7)	
18.7	Vibrio	/ml	Absent	Absent		Absent		Absent		Absent		IS : 5887 (P-5)	



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**RESULTS OF SEDIMENT ANALYSIS [M1 LEFT SIDE OF BOCHA CREEK - N 22°45'183" E 069°43'241"]**

SR. NO.	TEST PARAMETERS	UNIT	MAY 2020	JUNE 2020	JULY 2020	AUGUST 2020	SEPTEMBER 2020	TEST METHOD
			SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	
1	Organic Matter	%	0.63	0.56	0.62	0.49	0.37	FCO:2007
2	Phosphorus as P	µg/g	268	314	379	305	408	APHA(22 <sup>nd</sup> Edi) 4500 C
3	Texture	--	Sandy	Sandy	Sandy	Sandy	Sandy	--
4	Petroleum Hydrocarbon	µg/g	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	PLPL-TPH
5	<b>Heavy Metals</b>							
5.1	Aluminum as Al	%	5.1	5.84	5.26	4.86	4.56	AAS APHA 3111 B
5.2	Total Chromium as Cr <sup>+3</sup>	µg/g	148	203	218	193	213	AAS 3111B
5.3	Manganese as Mn	µg/g	1240	1048	946	924	870	AAS APHA 3111 B
5.4	Iron as Fe	%	5.18	5.3	5.1	4.9	4.83	AAS APHA(22 <sup>nd</sup> Edi)3111 B
5.5	Nickel as Ni	µg/g	53	41	59	50	61	AAS APHA(22 <sup>nd</sup> Edi)3111 B
5.6	Copper as Cu	µg/g	32	39	42	35	42	AAS APHA(22 <sup>nd</sup> Edi)3111 B
5.7	Zinc as Zn	µg/g	170	208	196	184	158	AAS APHA(22 <sup>nd</sup> Edi)3111 B
5.8	Lead as Pb	µg/g	2.78	2.19	2.3	1.96	2.3	AAS APHA(22 <sup>nd</sup> Edi)3111 B
5.9	Mercury as Hg	µg/g	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	AAS APHA- 3112 B
6	<b>Benthic Organisms</b>							
6.1	Macrobenthos	--	Polychaetes Crustaceans --	Polychaetes Crustaceans	Polychaetes Crustaceans ---	Polychaetes Gastropods Crustaceans	Crustaceans Gastropods	APHA (22 <sup>nd</sup> Edi) 10500-C
6.2	MeioBenthos	--	Nematodes	Foraminiferans	Nematodes	--	Foraminiferans	APHA (22 <sup>nd</sup> Edi) 10500-C
6.3	Population	no/m2	529	471	382	324	352	APHA (22 <sup>nd</sup> Edi) 10500-C


**H. T. Shah**  
 Lab Manager


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**RESULTS OF MARINE WATER [M2 MOUTH OF BOCHA & NAVINAL CREEK - N 22°44'239" E 069°43'757"]**

SR. NO.	TEST PARAMETERS	UNIT	MAY 2020		JUNE 2020		JULY 2020		AUGUST 2020		SEPTEMBER 2020		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
1	pH	--	8.21	8.17	8.28	8.19	8.24	8.18	8.21	8.17	8.24	8.19	IS3025(P11)83Re.02
2	Temperature	oC	30.5	30.3	31.4	31.3	31.6	31.3	30.4	30.2	30.8	30.4	IS3025(P9)84Re.02
3	Total Suspended Solids	mg/L	216	238	198	170	209	184	192	174	207	219	IS3025(P17)84Re.02
4	BOD (3 Days @ 27 °C)	mg/L	3.4	Not Detected	3.5	Not Detected	3.8	Not Detected	3.2	Not Detected	2.9	Not Detected	IS 3025 (P44)1993Re.03Edition 2.1
5	Dissolved Oxygen	mg/L	6.1	5.9	5.9	5.7	5.6	5.8	5.8	5.7	5.9	5.7	IS3025(P38)89Re.99
6	Salinity	ppt	34.9	35.3	35.3	35.2	36.1	36.4	36.3	36.5	36.6	36.8	APHA (22 <sup>nd</sup> Edi) 2550 B
7	Oil & Grease	mg/L	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	APHA(22 <sup>nd</sup> Edi)5520D
8	Nitrate as NO <sub>3</sub>	µmol/L	8.3	6.13	5.0	4.63	4.86	4.7	3.84	3.61	3.27	3.1	IS3025(P34)88
9	Nitrite as NO <sub>2</sub>	µmol/L	0.72	0.64	0.83	0.59	0.77	0.68	0.96	0.72	0.8	0.67	IS3025(P34)88 NEDA
10	Ammonical Nitrogen as NH <sub>3</sub>	µmol/L	3.56	3.12	2.76	2.17	3.16	3.24	2.74	2.53	2.6	2.3	IS3025(P34)88Cla.2.3
11	Phosphates as PO <sub>4</sub>	µmol/L	1.27	1.1	2.19	1.93	2.7	2.56	2.36	2.2	2.21	2.16	APHA(22 <sup>nd</sup> Edi) 4500 C
12	Total Nitrogen	µmol/L	12.54	9.89	8.54	7.39	8.79	8.62	7.54	6.86	6.63	5.95	IS3025(P34)88
13	Petroleum Hydrocarbon	µg/L	Not Detected	Not Detected	9.2	Not Detected	8.4	Not Detected	11.4	Not Detected	9.6	Not Detected	PLPL-TPH
14	Total Dissolved Solids	mg/L	37878	36314	36398	36134	37108	3710	37266	37463	37550	37756	IS3025(P16)84Re.02
15	COD	mg/L	24.0	Not Detected	21.0	Not Detected	26.0	20.0	22.6	17.5	25.0	18.6	APHA(22 <sup>nd</sup> Edi) 5520-D Open Reflux
<b>B Phytoplankton</b>													
16.1	Chlorophyll	mg/m <sup>3</sup>	3.47	2.83	3.2	3.04	2.88	2.45	2.93	2.67	2.83	2.61	APHA (22 <sup>nd</sup> Edi) 10200-H
16.2	Phaeophytin	mg/m <sup>3</sup>	1.0	1.4	1.1	1.1	1.6	2.14	1.51	2.41	1.7	2.5	APHA (22 <sup>nd</sup> Edi) 10200-H
16.3	Cell Count	No. x 10 <sup>3</sup> /L	158	90	144	86	138	108	124	98	134	102	APHA (22 <sup>nd</sup> Edi) 10200-H


**H. T. Shah**  
 Lab Manager


**Dr. Arun Bajpai**  
 Lab Manager (Q)



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16.4	Name of Group Number and name of group species of each group	--	<i>Rhizosolenia</i> sp. <i>Cheatoceus</i> sp. <i>Pleurosigma</i> sp. <i>Biddulphia</i> sp.	<i>Synedra</i> sp. <i>Nitzschia</i> sp. <i>Fragillaria</i> sp. --	<i>Rhizosolenia</i> sp. <i>Coscinodiscus</i> sp. <i>Chaetognathes</i> <i>Nitzschia</i> sp.	<i>Navicula</i> sp. <i>Synedra</i> sp. <i>Amphiprotra</i> sp.	<i>Nitzschia</i> sp. <i>Coscinodiscus</i> sp. <i>Rhizosolenia</i> sp. <i>Biddulphia</i> sp.	<i>Navicula</i> sp. <i>Rhizosolenia</i> sp. <i>Synedra</i> sp. --	<i>Rhizosolenia</i> sp. <i>Coscinodiscus</i> sp. <i>Pleurosigma</i> sp. <i>Nitzschia</i> sp.	<i>Navicula</i> sp. <i>Thalassiosira</i> sp. <i>Synedra</i> sp. --	<i>Rhizosolenia</i> sp. <i>Biddulphia</i> sp. <i>Skeletonema</i> sp. <i>Nitzschia</i> sp.	<i>Fragillaria</i> sp. <i>Thalassiosira</i> sp. <i>Navicula</i> sp. --	APHA (22 <sup>nd</sup> Edi) 10200-H
<b>C Zooplanktons</b>													
17.1	Abundance (Population)	noX10 <sup>3</sup> / 100 m <sup>3</sup>	42		39		33		27		24		APHA (22 <sup>nd</sup> Edi) 10200-G
17.2	Name of Group Number and name of group species of each group	--	Polychaetes Ostracods Decapods Foraminiferans		Molluscs Bivalves Foraminiferans		Polychaetes Decapods Bivalves --		Hydrodictyons Polychaetes Bivalves Mysids		Crustaceans Polychaetes Mysids		APHA (22 <sup>nd</sup> Edi) 10200-G
17.3	Total Biomass	ml/100 m <sup>3</sup>	3.95		3.5		3.4		2.90		3		APHA (22 <sup>nd</sup> Edi) 10200-G
<b>D Microbiological Parameters</b>													
18.1	Total Bacterial Count	CFU/ml	2120		1950		2210		2210		2160		IS 5402:2002
18.2	Total Coliform	/ml	Absent		Absent		Absent		Absent		Absent		APHA(22 <sup>nd</sup> Edi)9221-D
18.3	Ecoli	/ml	Absent		Absent		Absent		Absent		Absent		IS:1622:1981Edi.2.4(2003-05)
18.4	Enterococcus	/ml	Absent		Absent		Absent		Absent		Absent		IS : 15186 :2002
18.5	Salmonella	/ml	Absent		Absent		Absent		Absent		Absent		IS : 5887 (P-3)
18.6	Shigella	/ml	Absent		Absent		Absent		Absent		Absent		IS : 1887 (P-7)
18.7	Vibrio	/ml	Absent		Absent		Absent		Absent		Absent		IS : 5887 (P-5)



**H. T. Shah**  
Lab Manager




**Dr. Arun Bajpai**  
Lab Manager (Q)

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**RESULTS OF SEDIMENT ANALYSIS [M2 MOUTH OF BOCHA & NAVINAL CREEK – N 22°44'239" E 069°43'757"]**

SR. NO.	TEST PARAMETERS	UNIT	MAY 2020	JUNE 2020	JULY 2020	AUGUST 2020	SEPTEMBER 2020	TEST METHOD
			SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	
1	Organic Matter	%	0.64	0.53	0.62	0.49	0.43	FCO:2007
2	Phosphorus as P	µg/g	276	304	319	293	318	APHA(22 <sup>nd</sup> Edi) 4500 C
3	Texture	--	Sandy	Sandy	Sandy	Sandy	Sandy	--
4	Petroleum Hydrocarbon	µg/g	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	PLPL-TPH
5	<b>Heavy Metals</b>							
5.1	Aluminum as Al	%	5.14	4.76	4.92	4.76	4.56	AAS APHA 3111 B
5.2	Total Chromium as Cr <sup>+3</sup>	µg/g	168	203	234	216	270	AAS 3111B
5.3	Manganese as Mn	µg/g	1130	1076	968	934	839	AAS APHA 3111 B
5.4	Iron as Fe	%	5.24	4.98	4.81	4.96	4.35	AAS APHA(22 <sup>nd</sup> Edi)3111 B
5.5	Nickel as Ni	µg/g	38	41	56	43	60	AAS APHA(22 <sup>nd</sup> Edi)3111 B
5.6	Copper as Cu	µg/g	46	38	47	35	42	AAS APHA(22 <sup>nd</sup> Edi)3111 B
5.7	Zinc as Zn	µg/g	208	201	213	190	239	AAS APHA(22 <sup>nd</sup> Edi)3111 B
5.8	Lead as Pb	µg/g	2.7	1.98	2.96	1.79	2.5	AAS APHA(22 <sup>nd</sup> Edi)3111 B
5.9	Mercury as Hg	µg/g	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	AAS APHA- 3112 B
6	<b>Benthic Organisms</b>							
6.1	Macrobenthos	--	Copepods Molluscs Crustaceans	Polychaetes Crustaceans Bivalves	Polychaetes Crustaceans --	Polychaetes Gastropods	Copepods Crustaceans Bivalves	APHA (22 <sup>nd</sup> Edi) 10500-C
6.2	MeioBenthos	--	--	Foraminiferans	Foraminiferans	Nematodes	--	APHA (22 <sup>nd</sup> Edi) 10500-C
6.3	Population	no/m2	441	469	440	352	381	APHA (22 <sup>nd</sup> Edi) 10500-C


**H. T. Shah**  
 Lab Manager


**Dr. Arun Bajpai**  
 Lab Manager (Q)

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**RESULTS OF MARINE WATER [M3 EAST OF BOCHAISLAND - N 22°46'530" E 069°41'690"]**

SR. NO.	TEST PARAMETERS	UNIT	MAY 2020		JUNE 2020		JULY 2020		AUGUST 2020		SEPTEMBER 2020		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
1	pH	--	8.25	8.19	8.29	8.23	8.2	8.15	8.23	8.19	8.19	8.14	IS3025(P11)83Re.02
2	Temperature	oC	30.6	30.5	31.6	31.3	31.7	31.5	31	30.3	30.7	30.5	IS3025(P9)84Re.02
3	Total Suspended Solids	mg/L	216	227	234	259	216	204	201	218	216	241	IS3025(P17)84Re.02
4	BOD (3 Days @ 27 °C)	mg/L	3.5	Not Detected	3.1	Not Detected	4.0	Not Detected	3.3	Not Detected	3.0	Not Detected	IS 3025 (P44)1993Re.03Edition2.1
5	Dissolved Oxygen	mg/L	6.0	5.9	5.8	5.6	5.9	5.7	5.9	5.7	5.9	5.6	IS3025(P38)89Re.99
6	Salinity	ppt	34.9	35.2	35.9	35.3	36	36.4	36.3	36.5	36.5	36.8	APHA (22 <sup>nd</sup> Edi) 2550 B
7	Oil & Grease	mg/L	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	APHA(22 <sup>nd</sup> Edi)5520D
8	Nitrate as NO <sub>3</sub>	µmol/L	7.94	7.16	4.18	3.96	4.98	4.76	3.57	3.3	2.6	2.2	IS3025(P34)88
9	Nitrite as NO <sub>2</sub>	µmol/L	0.63	0.57	0.83	0.49	0.72	0.58	0.83	0.64	0.49	0.32	IS3025(P34)88 NEDA
10	Ammonical Nitrogen as NH <sub>3</sub>	µmol/L	3.46	3.00	2.99	2.75	3.18	2.91	2.76	2.56	2.4	2.1	IS3025(P34)88Cla.2.3
11	Phosphates as PO <sub>4</sub>	µmol/L	1.33	1.14	2.1	1.93	2.3	2.13	1.94	1.7	1.5	1.39	APHA(22 <sup>nd</sup> Edi) 4500 C
12	Total Nitrogen	µmol/L	12.03	10.7	8.00	7.2	8.88	8.25	7.16	6.46	5.44	4.7	IS3025(P34)88
13	Petroleum Hydrocarbon	µg/L	Not Detected	Not Detected	9.8	Not Detected	11.6	Not Detected	15	Not Detected	10.2	Not Detected	PLPL-TPH
14	Total Dissolved Solids	mg/L	35824	36418	36910	36298	36918	37316	37298	37494	37450	37746	IS3025(P16)84Re.02
15	COD	mg/L	22.0	Not Detected	23.0	Not Detected	27.0	Not Detected	25	20	23	18.0	APHA(22 <sup>nd</sup> Edi) 5520-D Open Reflux
<b>B</b>	<b>Phytoplankton</b>												
16.1	Chlorophyll	mg/m <sub>3</sub>	3.15	2.93	3.25	2.77	2.83	2.67	2.93	2.45	2.88	2.56	APHA (22 <sup>nd</sup> Edi) 10200-H
16.2	Phaeophytin	mg/m <sub>3</sub>	1.5	1.5	1.3	1.8	1.99	2.0	2.56	2.33	2.05	2.4	APHA (22 <sup>nd</sup> Edi) 10200-H
16.3	Cell Count	No. x 10 <sup>3</sup> /L	150	78	140	82	132	78	120	96	148	104	APHA (22 <sup>nd</sup> Edi) 10200-H


**H. T. Shah**  
 Lab Manager


**Dr. Arun Bajpai**  
 Lab Manager (Q)



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16.4	Name of Group Number and name of group species of each group	--	<i>Skeletonema sp.</i> <i>Biddulphia sp.</i> <i>Coscinodiscus sp.</i> <i>Thalassionem a sp.</i> --	<i>Nitzschia sp.</i> <i>Pleurosigm a sp.</i> <i>Synedra sp.</i> --	<i>Nitzschia sp. Biddulphia sp.</i> <i>Thalassionem a sp.</i> <i>Chaetognathes</i> <i>Coscinodiscus sp.</i>	<i>Navicula sp.</i> <i>Nitzschia sp.</i> <i>Biddulphi a sp.</i> <i>Synedra</i>	<i>Nitzschia sp. Coscinodiscus sp.</i> <i>Rhizosolenia sp.</i> <i>Thalassiosira sp.</i> --	<i>Pleurosigm a sp.</i> <i>Navicula sp.</i> <i>Synedra sp.</i> --	<i>Nitzschia sp. Thalassiosira sp.</i> <i>Coscinodiscus sp.</i> <i>Rhizosolenia sp.</i>	<i>Synedra sp.</i> <i>Navicula sp.</i> <i>Pleurosigm a sp.</i> --	<i>Nitzschia sp. Thalassiosira sp.</i> <i>Coscinodiscus sp.</i> <i>Rhizosolenia sp.</i> --	<i>Synedra sp.</i> <i>Navicula sp.</i> <i>Pleurosigm a sp.</i> --	APHA (22 <sup>nd</sup> Edi) 10200-H
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**C Zooplanktons**

17.1	Abundance (Population)	noX10 <sup>3</sup> / 100 m <sup>3</sup>	41	34	28	23	25	APHA (22 <sup>nd</sup> Edi) 10200-G
17.2	Name of Group Number and name of group species of each group	--	Decapods Polychaetes amphipods Gastropods	Gastropods Bivalves Foraminiferans Polychaetes	Gastropods Decapods Isopods --	Polychaetes Crustaceans Mysids	Polychaetes Molluscans Chaetognathes	APHA (22 <sup>nd</sup> Edi) 10200-G
17.3	Total Biomass	ml/100 m <sup>3</sup>	3.4	3.5	33	3.05	2.95	APHA (22 <sup>nd</sup> Edi) 10200-G

**D Microbiological Parameters**

18.1	Total Bacterial Count	CFU/ml	2140	1920	2280	2240	2160	IS 5402:2002
18.2	Total Coliform	/ml	Absent	Absent	Absent	Absent	Absent	APHA(22 <sup>nd</sup> Edi)9221-D
18.3	Ecoli	/ml	Absent	Absent	Absent	Absent	Absent	IS:1622:1981Edi.2.4(2003-05)
18.4	Enterococcus	/ml	Absent	Absent	Absent	Absent	Absent	IS : 15186 :2002
18.5	Salmonella	/ml	Absent	Absent	Absent	Absent	Absent	IS : 5887 (P-3)
18.6	Shigella	/ml	Absent	Absent	Absent	Absent	Absent	IS : 1887 (P-7)
18.7	Vibrio	/ml	Absent	Absent	Absent	Absent	Absent	IS : 5887 (P-5)


**H. T. Shah**  
**Lab Manager**


**Dr. Arun Bajpai**  
**Lab Manager (Q)**

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**RESULTS OF SEDIMENT ANALYSIS [M3 RIGHT SIDE OF BOCHA CREEK - N 22°46'530" E 069°41'690"]**

SR. NO.	TEST PARAMETERS	UNIT	MAY 2020	JUNE 2020	JULY 2020	AUGUST 2020	SEPTEMBER 2020	TEST METHOD
			SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	
1	Organic Matter	%	0.68	0.56	0.62	0.49	0.45	FCO:2007
2	Phosphorus as P	µg/g	214	270	256	236	293	APHA(22 <sup>nd</sup> Edi) 4500 C
3	Texture	--	Sandy	Sandy	Sandy	Sandy	Sandy	--
4	Petroleum Hydrocarbon	µg/g	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	PLPL-TPH
5	<b>Heavy Metals</b>							
5.1	Aluminum as Al	%	5.06	4.98	4.83	4.7	4.68	AAS APHA 3111 B
5.2	Total Chromium as Cr <sup>+3</sup>	µg/g	139	205	228	203	270	AAS 3111B
5.3	Manganese as Mn	µg/g	1180	1074	970	958	816	AAS APHA 3111 B
5.4	Iron as Fe	%	5.16	4.8	5.16	4.63	4.53	AAS APHA(22 <sup>nd</sup> Edi)3111 B
5.5	Nickel as Ni	µg/g	38	53	42	35	50	AAS APHA(22 <sup>nd</sup> Edi)3111 B
5.6	Copper as Cu	µg/g	48	49	39	27	41	AAS APHA(22 <sup>nd</sup> Edi)3111 B
5.7	Zinc as Zn	µg/g	203	170	204	178	236	AAS APHA(22 <sup>nd</sup> Edi)3111 B
5.8	Lead as Pb	µg/g	2.7	2.19	3.16	2.9	1.94	AAS APHA(22 <sup>nd</sup> Edi)3111 B
5.9	Mercury as Hg	µg/g	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	AAS APHA- 3112 B
6	<b>Benthic Organisms</b>							
6.1	Macrobenthos	--	Amphipods Polychaetes Copepods	Polychaetes Crustaceans Copepods	Crustaceans Bivalyes Decapods	Polychaetes Crustaeans Isopods	Crustaceans Gastropods Decapods	APHA (22 <sup>nd</sup> Edi) 10500-C
6.2	MeioBenthos	--	--	--	Nematodes	--	--	APHA (22 <sup>nd</sup> Edi) 10500-C
6.3	Population	no/m2	412	559	441	353	382	APHA (22 <sup>nd</sup> Edi) 10500-C


**H. T. Shah**  
**Lab Manager**


**Dr. Arun Bajpai**  
**Lab Manager (Q)**

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**RESULTS OF MARINE WATER [M4 JUNA BANDAR N 22°47'57" E 069°43'620"]**

SR. NO.	TEST PARAMETERS	UNIT	MAY 2020		JUNE 2020		JULY 2020		AUGUST 2020		SEPTEMBER 2020		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
1	pH	--	8.26	8.19	8.27	8.19	8.29	8.25	8.28	8.2	8.21	8.17	IS3025(P11)83Re.02
2	Temperature	oC	30.7	30.5	31.8	31.6	31.6	31.4	30.5	30.2	30.7	30.5	IS3025(P9)84Re.02
3	Total Suspended Solids	mg/L	230	216	219	247	236	220	212	236	239	256	IS3025(P17)84Re.02
4	BOD (3 Days @ 27 °C)	mg/L	2.9	Not Detected	3.2	Not Detected	4.1	Not Detected	3.6	Not Detected	3.1	Not Detected	IS 3025 (P44)1993Re.03Edition2.1
5	Dissolved Oxygen	mg/L	5.9	5.8	5.9	5.7	4.8	4.6	5.8	5.6	5.9	5.7	IS3025(P38)89Re.99
6	Salinity	ppt	34.7	35.2	35.8	35.5	36.1	36.4	36.4	36.7	36.8	37.1	APHA (22 <sup>nd</sup> Edi) 2550 B
7	Oil & Grease	mg/L	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	APHA(22 <sup>nd</sup> Edi)5520D
8	Nitrate as NO <sub>3</sub>	µmol/L	6.54	6.13	4.27	4.1	4.68	4.32	3.68	3.47	2.71	2.39	IS3025(P34)88
9	Nitrite as NO <sub>2</sub>	µmol/L	1.12	0.69	0.98	0.74	0.82	0.76	0.76	0.49	0.63	0.42	IS3025(P34)88 NEDA
10	Ammonical Nitrogen as NH <sub>3</sub>	µmol/L	3.27	3.10	2.56	2.33	2.74	2.39	2.53	2.38	2.3	2.1	IS3025(P34)88Cla.2.3
11	Phosphates as PO <sub>4</sub>	µmol/L	1.39	1.16	2.21	2.14	2.14	2	1.81	1.67	1.68	1.46	APHA(22 <sup>nd</sup> Edi) 4500 C
12	Total Nitrogen	µmol/L	10.93	9.92	7.81	7.17	8.24	7.47	6.97	6.34	5.65	4.91	IS3025(P34)88
13	Petroleum Hydrocarbon	µg/L	Not Detected	Not Detected	6	Not Detected	9.8	Not Detected	11.8	Not Detected	9.2	Not Detected	PLPL-TPH
14	Total Dissolved Solids	mg/L	35698	36298	36829	36544	37102	37402	37390	37645	38280	38554	IS3025(P16)84Re.02
15	COD	mg/L	20	Not Detected	25	Not Detected	24.6	Not Detected	21.2	Not Detected	23.9	19.0	APHA(22 <sup>nd</sup> Edi) 5520-D Open Reflux
<b>B</b>	<b>Phytoplankton</b>												
16.1	Chlorophyll	mg/m <sub>3</sub>	3.36	2.67	3.57	2.72	3.09	2.67	2.93	2.61	3.09	2.83	APHA (22 <sup>nd</sup> Edi) 10200-H
16.2	Phaeophytin	mg/m <sub>3</sub>	1.2	2.4	0.9	2.3	1.69	2.41	1.96	2.32	1.69	1.95	APHA (22 <sup>nd</sup> Edi) 10200-H
16.3	Cell Count	No. x 10 <sup>3</sup> /L	186	76	162	84	144	76	136	92	144	106	APHA (22 <sup>nd</sup> Edi) 10200-H


**H. T. Shah**  
 Lab Manager


**Dr. Arun Bajpai**  
 Lab Manager (Q)



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16.4	Name of Group Number and name of group species of each group	--	<i>Melosira sp.</i> <i>Rhizosolenia sp.</i> <i>Coscinodiscus sp.</i> <i>Thalassionem a sp.</i> --	<i>Nitzschia sp.</i> <i>peridiniu m sp</i> <i>Cyclotella sp.</i> --	<i>Navicula sp.</i> <i>Synedra Coscinodiscu s sp.</i> <i>Thalassionem a sp.</i> <i>Pleurosigma sp.</i>	<i>Navicula sp.</i> <i>Nitzschia sp.</i> <i>Cheatocero us sp.</i> <i>Cyclotella sp.</i> --	<i>Nitzschia sp.</i> <i>Thallassiosir a sp.</i> <i>Rhizosoleni a sp.</i> <i>Biddulphia sp.</i> --	<i>Navicula sp.</i> <i>Thallassionem a sp.</i> <i>Rhizosolenia sp.</i> <i>Pleurosigma sp.</i>	<i>Navicula sp.</i> <i>Synedra sp.</i> <i>Biddulphi a sp.</i>	<i>Navicula sp.</i> <i>Biddulphia sp.</i> <i>Rhizosoleni a sp.</i> <i>Skeletonem a sp.</i>	<i>Nitzschia sp.</i> <i>Thallassionem a sp.</i> <i>Amphora sp.</i>	APHA (22 <sup>nd</sup> Edi) 10200-H
<b>C Zooplanktons</b>												
17.1	Abundance (Population)	noX10 <sup>3</sup> / 100 m <sup>3</sup>	42		35		32		27		31	APHA (22 <sup>nd</sup> Edi) 10200-G
17.2	Name of Group Number and name of group species of each group	--	Foraminiferans Ostracods Decapods Gastropods		Gastropods Polychaetes Foraminiferans Decapods		Polychaetes Decapods Nematodes Isopods		Polychaetes Decapods Crustaceans		Polychaetes Crustaceans Chaetognathes	APHA (22 <sup>nd</sup> Edi) 10200-G
17.3	Total Biomass	ml/100 m <sup>3</sup>	3.65		3.9		3.10		2.90		3.35	APHA (22 <sup>nd</sup> Edi) 10200-G
<b>D Microbiological Parameters</b>												
18.1	Total Bacterial Count	CFU/ml	1960		2180		2150		2180		2260	IS 5402:2002
18.2	Total Coliform	/ml	Absent		Absent		Absent		Absent		Absent	APHA(22 <sup>nd</sup> Edi)9221-D
18.3	Ecoli	/ml	Absent		Absent		Absent		Absent		Absent	IS:1622:1981Edi.2.4(2003-05)
18.4	Enterococcus	/ml	Absent		Absent		Absent		Absent		Absent	IS : 15186 :2002
18.5	Salmonella	/ml	Absent		Absent		Absent		Absent		Absent	IS : 5887 (P-3)
18.6	Shigella	/ml	Absent		Absent		Absent		Absent		Absent	IS : 1887 (P-7)
18.7	Vibrio	/ml	Absent		Absent		Absent		Absent		Absent	IS : 5887 (P-5)



**H. T. Shah**  
Lab Manager




**Dr. Arun Bajpai**  
Lab Manager (Q)

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**RESULTS OF SEDIMENT ANALYSIS [M4 JUNA BANDAR N 22°47'57" E 069°43'620"]**

SR. NO.	TEST PARAMETERS	UNIT	MAY 2020	JUNE 2020	JULY 2020	AUGUST 2020	SEPTEMBER 2020	TEST METHOD
			SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	
1	Organic Matter	%	0.72	0.56	0.68	0.52	0.48	FCO:2007
2	Phosphorus as P	µg/g	216	298	340	316	370	APHA(22 <sup>nd</sup> Edi) 4500 C
3	Texture	--	Sandy	Sandy	Sandy	Sandy	Sandy	--
4	Petroleum Hydrocarbon	µg/g	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	PLPL-TPH
5	<b>Heavy Metals</b>							
5.1	Aluminum as Al	%	4.98	5.12	4.98	4.86	4.7	AAS APHA 3111 B
5.2	Total Chromium as Cr <sup>+3</sup>	µg/g	180	201	240	213	239	AAS 3111B
5.3	Manganese as Mn	µg/g	1073	958	976	958	864	AAS APHA 3111 B
5.4	Iron as Fe	%	5.11	4.9	5.18	4.7	4.9	AAS APHA(22 <sup>nd</sup> Edi)3111 B
5.5	Nickel as Ni	µg/g	43	58	62	52	63	AAS APHA(22 <sup>nd</sup> Edi)3111 B
5.6	Copper as Cu	µg/g	36	49	54	35	42	AAS APHA(22 <sup>nd</sup> Edi)3111 B
5.7	Zinc as Zn	µg/g	183	203	216	193	148	AAS APHA(22 <sup>nd</sup> Edi)3111 B
5.8	Lead as Pb	µg/g	2.48	2.79	2.58	2.36	1.79	AAS APHA(22 <sup>nd</sup> Edi)3111 B
5.9	Mercury as Hg	µg/g	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	AAS APHA- 3112 B
6	<b>Benthic Organisms</b>							
6.1	Macrobenthos	--	Polychaetes Crustaceans --	Polychaetes Bivalves Crustaceans	Polychaetes Molluscs --	Polychaetes Crustaceans Isopods	Polychaetes Gastropods Amphipods	APHA (22 <sup>nd</sup> Edi) 10500-C
6.2	MeioBenthos	--	Nematodes	Foraminiferans	Nematodes	--	--	APHA (22 <sup>nd</sup> Edi) 10500-C
6.3	Population	no/m2	468	497	409	382	350	APHA (22 <sup>nd</sup> Edi) 10500-C


**H. T. Shah**  
 Lab Manager


**Dr. Arun Bajpai**  
 Lab Manager (Q)

Recognised by MoEF, New Delhi Under Sec. 12 of Environmental (Protection) Act-1986

**RESULTS OF MARINE WATER [M5 TOWARDS WESTERN SIDE OF EAST PORT – N 22°46'041" E 069°47'296"]**

SR. NO.	TEST PARAMETERS	UNIT	MAY 2020		JUNE 2020		JULY 2020		AUGUST 2020		SEPTEMBER 2020		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
1	pH	--	8.25	8.21	8.28	8.18	8.26	8.21	8.29	8.24	8.21	8.24	IS3025(P11)83Re.02
2	Temperature	oC	30.8	30.7	31.5	31.3	31.4	31.2	30.4	30.3	30.7	30.5	IS3025(P9)84Re.02
3	Total Suspended Solids	mg/L	193	181	218	234	245	270	216	238	241	263	IS3025(P17)84Re.02
4	BOD (3 Days @ 27 °C)	mg/L	3.1	Not Detected	3.5	Not Detected	4.0	Not Detected	3.1	Not Detected	3.5	Not Detected	IS 3025 (P44)1993Re.03Edition2.1
5	Dissolved Oxygen	mg/L	6.0	5.8	5.9	5.7	5.9	5.6	5.9	5.5	5.9	5.7	IS3025(P38)89Re.99
6	Salinity	ppt	34.8	35.3	35.9	35.5	36.1	36.4	36.4	36.6	36.7	36.9	APHA (22 <sup>nd</sup> Edi) 2550 B
7	Oil & Grease	mg/L	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	APHA(22 <sup>nd</sup> Edi)5520D
8	Nitrate as NO <sub>3</sub>	µmol/L	5.1	4.92	4.76	4.13	4.58	4.31	3.61	3.38	2.61	2.34	IS3025(P34)88
9	Nitrite as NO <sub>2</sub>	µmol/L	1.58	1.43	0.99	0.75	0.76	0.68	0.98	0.70	0.73	0.49	IS3025(P34)88 NEDA
10	Ammonical Nitrogen as NH <sub>3</sub>	µmol/L	3.39	3.14	2.59	2.34	2.98	2.71	2.49	2.30	2.32	2.11	IS3025(P34)88Cla.2.3
11	Phosphates as PO <sub>4</sub>	µmol/L	1.47	1.28	1.96	1.58	2.16	1.92	1.86	1.74	1.69	1.43	APHA(22 <sup>nd</sup> Edi) 4500 C
12	Total Nitrogen	µmol/L	10.07	9.49	8.34	7.22	8.32	7.70	7.08	6.38	5.66	4.94	IS3025(P34)88
13	Petroleum Hydrocarbon	µg/L	Not Detected	Not Detected	6.8	Not Detected	10.1	Not Detected	9.6	Not Detected	11.8	Not Detected	PLPL-TPH
14	Total Dissolved Solids	mg/L	35710	36312	36918	36540	37120	37310	37362	37568	37642	37834	IS3025(P16)84Re.02
15	COD	mg/L	19.3	Not Detected	27.0	Not Detected	25.8	Not Detected	21.9	Not Detected	25.4	20.0	APHA(22 <sup>nd</sup> Edi) 5520-D Open Reflux
<b>B</b>	<b>Phytoplankton</b>												
16.1	Chlorophyll	mg/m <sub>3</sub>	3.25	3.04	3.52	3.09	3.20	3.04	2.93	2.72	3.15	2.93	APHA (22 <sup>nd</sup> Edi) 10200-H
16.2	Phaeophytin	mg/m <sub>3</sub>	2.1	1.8	1.6	1.6	2.14	1.67	2.6	2.21	1.63	1.47	APHA (22 <sup>nd</sup> Edi) 10200-H
16.3	Cell Count	No. x 10 <sup>3</sup> /L	162	84	146	78	134	84	126	98	140	108	APHA (22 <sup>nd</sup> Edi) 10200-H


**H. T. Shah**  
 Lab Manager


**Dr. Arun Bajpai**  
 Lab Manager (Q)



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16.4	Name of Group Number and name of group species of each group	--	<i>Biddulphia sp. peridinium sp. Coscinodiscus sp. Rhizosolenia sp.</i>	<i>Fragillaria sp. Melosira sp. Pleurosigma sp.</i>	<i>Nitzschia sp. Rhizosolenia sp. Coscinodiscus sp. Biddulphia sp. Cyclotella sp.</i>	<i>Navicula sp. Nitzschia sp. Thallasione ma sp. Fragillaria sp.</i>	<i>Nitzschia sp. Thallasiosira sp. Rhizosolenia sp. Coscinodiscus sp.</i>	<i>Navicula sp. Synedra sp. Biddulphia sp.</i>	<i>Coscinodiscus sp. Synedra sp. Thallasiosira sp. Melosira sp. Pleurosigma sp.</i>	<i>Navicula sp. Rhizosolenia sp. Cheatoceros sp.</i>	<i>Rhizosolenia sp. Synedra sp. Skeletonema sp. Biddulphia sp. Navicula sp.</i>	<i>Fragillaria sp. Coscinodiscus sp. Melosira sp. Nitzschia sp.</i>	APHA (22 <sup>nd</sup> Edi) 10200-H
<b>C</b>	<b>Zooplanktons</b>												
17.1	Abundance (Population)	noX10 <sup>3</sup> / 100 m <sup>3</sup>	48		42		26		23		29		APHA (22 <sup>nd</sup> Edi) 10200-G
17.2	Name of Group Number and name of group species of each group	--	Polychaetes Gastropods Decapods amphipods		Polychaetes Foraminiferans Cheatoceros sp. Mysids		Polychaetes Gastropods -- --		Polychaetes Molluscans Decapods Mysids		Gastropods Polychaetes Ostracods		APHA (22 <sup>nd</sup> Edi) 10200-G
17.3	Total Biomass	ml/100 m <sup>3</sup>	3.7		3.95		3.00		2.9		3.2		APHA (22 <sup>nd</sup> Edi) 10200-G
<b>D</b>	<b>Microbiological Parameters</b>												
18.1	Total Bacterial Count	CFU/ml	2150		1950		2290		2250		2250		IS 5402:2002
18.2	Total Coliform	/ml	Absent		Absent		Absent		Absent		Absent		APHA(22 <sup>nd</sup> Edi)9221-D
18.3	Ecoli	/ml	Absent		Absent		Absent		Absent		Absent		IS:1622:1981Edi.2.4(2003-05)
18.4	Enterococcus	/ml	Absent		Absent		Absent		Absent		Absent		IS : 15186 :2002
18.5	Salmonella	/ml	Absent		Absent		Absent		Absent		Absent		IS : 5887 (P-3)
18.6	Shigella	/ml	Absent		Absent		Absent		Absent		Absent		IS : 1887 (P-7)
18.7	Vibrio	/ml	Absent		Absent		Absent		Absent		Absent		IS : 5887 (P-5)



**H. T. Shah**  
Lab Manager




**Dr. Arun Bajpai**  
Lab Manager (Q)

Recognised by MoEF, New Delhi Under Sec. 12 of Environmental (Protection) Act-1986

**RESULTS OF SEDIMENT ANALYSIS [M5 TOWARDS WESTERN SIDE OF EAST PORT – N 22°46'041" E 069°47'296"]**

SR. NO.	TEST PARAMETERS	UNIT	MAY 2020	JUNE 2020	JULY 2020	AUGUST 2020	SEPTEMBER 2020	TEST METHOD
			SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	
1	Organic Matter	%	0.73	0.59	0.63	0.51	0.42	FCO:2007
2	Phosphorus as P	µg/g	310	294	339	304	374	APHA(22 <sup>nd</sup> E di) 4500 C
3	Texture	--	Sandy	Sandy	339	Sandy	Sandy	--
4	Petroleum Hydrocarbon	µg/g	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	PLPL-TPH
5	<b>Heavy Metals</b>							
5.1	Aluminum as Al	%	5.04	4.9	5.12	4.82	4.7	AAS APHA 3111 B
5.2	Total Chromium as Cr <sup>+3</sup>	µg/g	208	183	218	203	238	AAS 3111B
5.3	Manganese as Mn	µg/g	1084	918	956	940	813	AAS APHA 3111 B
5.4	Iron as Fe	%	5.14	4.9	5.18	4.98	4.56	AAS APHA(22 <sup>nd</sup> E di)3111 B
5.5	Nickel as Ni	µg/g	38	54	61	52	69	AAS APHA(22 <sup>nd</sup> E di)3111 B
5.6	Copper as Cu	µg/g	45	58	43	37	42	AAS APHA(22 <sup>nd</sup> E di)3111 B
5.7	Zinc as Zn	µg/g	193	203	236	210	258	AAS APHA(22 <sup>nd</sup> E di)3111 B
5.8	Lead as Pb	µg/g	2.694	2.16	3.1	2.68	2.1	AAS APHA(22 <sup>nd</sup> E di)3111 B
5.9	Mercury as Hg	µg/g	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	AAS APHA- 3112 B
6	<b>Benthic Organisms</b>							
6.1	Macrobenthos	--	Polychaetes Molluscans Amphipods	Copepods astropods Polychaetes	Polychaetes Molluscans Bivalyes	Polychaetes Crustaeans Bivalves	Polychaetes Bivalves Crustaceans	APHA (22 <sup>nd</sup> E di) 10500-C
6.2	MeioBenthos	--	Nematodes	--	--	Nematodes	--	APHA (22 <sup>nd</sup> E di) 10500-C
6.3	Population	no/m2	499	466	379	324	412	APHA (22 <sup>nd</sup> E di) 10500-C


**H. T. Shah**  
 Lab Manager


**Dr. Arun Bajpai**  
 Lab Manager (Q)

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**RESULTS OF MARINE WATER [M7 EAST PORT N 22°47'120" E 069°47'110"]**

SR. NO.	TEST PARAMETERS	UNIT	MAY 2020		JUNE 2020		JULY 2020		AUGUST 2020		SEPTEMBER 2020		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
1	pH	--	8.17	8.13	8.24	8.17	8.27	8.22	8.28	8.21	8.2	8.16	IS3025(P11)83Re.02
2	Temperature	oC	30.8	30.6	31.5	31.2	31.5	31.1	30	30.1	30.7	30.5	IS3025(P9)84Re.02
3	Total Suspended Solids	mg/L	172	143	219	236	237	256	216	237	224	246	IS3025(P17)84Re.02
4	BOD (3 Days @ 27 °C)	mg/L	3.9	Not Detected	3.5	Not Detected	3.8	Not Detected	3.2	Not Detected	3.5	Not Detected	IS 3025 (P44)1993Re.03Edition2.1
5	Dissolved Oxygen	mg/L	6.0	5.8	5.9	5.7	5.9	5.6	5.9	5.7	5.9	5.6	IS3025(P38)89Re.99
6	Salinity	ppt	34.9	35.4	35.9	35.6	36.2	36.5	36.4	36.6	36.7	36.9	APHA (22 <sup>nd</sup> Edi) 2550 B
7	Oil & Grease	mg/L	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	APHA(22 <sup>nd</sup> Edi)5520D
8	Nitrate as NO <sub>3</sub>	μmol/L	5.94	5.56	4.74	4.19	4.91	4.72	3.61	3.37	2.73	2.56	IS3025(P34)88
9	Nitrite as NO <sub>2</sub>	μmol/L	1.38	1.17	0.92	0.75	0.78	0.61	0.58	0.41	0.61	0.43	IS3025(P34)88 NEDA
10	Ammonical Nitrogen as NH <sub>3</sub>	μmol/L	3.49	3.12	2.76	2.37	2.81	2.56	2.60	2.35	2.39	2.17	IS3025(P34)88Cla.2.3
11	Phosphates as PO <sub>4</sub>	μmol/L	1.3	1.18	2.19	1.93	2.32	2.15	1.61	1.83	1.41	1.26	APHA(22 <sup>nd</sup> Edi) 4500 C
12	Total Nitrogen	μmol/L	10.81	9.85	8.42	7.31	8.50	7.89	6.79	6.13	5.73	5.16	IS3025(P34)88
13	Petroleum Hydrocarbon	μg/L	Not Detected	Not Detected	6.4	Not Detected	10	Not Detected	13.0	Not Detected	8.4	Not Detected	PLPL-TPH
14	Total Dissolved Solids	mg/L	35716	36410	36918	36630	36994	37418	37394	37594	37626	37836	IS3025(P16)84Re.02
15	COD	mg/L	Not Detected	Not Detected	27	Not Detected	26	Not Detected	23.6	Not Detected	25.3	21.4	APHA(22 <sup>nd</sup> Edi) 5520-D Open Reflux
<b>B</b>	<b>Phytoplankton</b>												
16.1	Chlorophyll	mg <sub>3</sub> /m	3.25	2.5	3.31	2.56	3.09	2.6	2.93	2.7	3.04	2.72	APHA (22 <sup>nd</sup> Edi) 10200-H
16.2	Phaeophytin	mg <sub>3</sub> /m	1.3	2.4	1.3	2.3	1.65	2.24	2.33	2.15	2.15	2.06	APHA (22 <sup>nd</sup> Edi) 10200-H
16.3	Cell Count	No. x 10 <sup>3</sup> /L	148	20	140	76	134	86	150	102	168	116	APHA (22 <sup>nd</sup> Edi) 10200-H


**H. T. Shah**  
 Lab Manager


**Dr. Arun Bajpai**  
 Lab Manager (Q)



**Recognised by MoEF, New Delhi Under Sec. 12 of Environmental (Protection) Act-1986**

16.4	Name of Group Number and name of group species of each group	--	<i>Surirella sp.</i> <i>Melosira sp.</i> <i>Thalassionem a sp.</i> <i>Biddulphia sp.</i> --	<i>Nitzschia sp.</i> <i>Pleurosigm a sp.</i> <i>Cyclotella sp.</i> --	<i>Nitzschia sp.</i> <i>Thalassionem a sp.</i> <i>Pleurosigma sp.</i> <i>Rhizosolenia sp.</i> <i>Biddulphia sp.</i>	<i>Nitzschia sp.</i> <i>Coscinodiscus sp.</i> <i>Thalassiosira sp.</i> <i>Cyclotella sp.</i>	<i>Pleurosigm a sp.</i> <i>Navicula sp.</i> <i>Thalassiosira sp.</i> <i>Rhizosolenia sp.</i> --	<i>Navicula sp.</i> <i>Biddulphia a sp.</i> <i>Synedra sp.</i> --	<i>Rhizosolenia sp.</i> <i>Biddulphia sp.</i> <i>Skeletonema sp.</i> <i>Thalassionem a sp.</i> <i>Coscinodiscus sp.</i>	<i>Biddulphia a sp.</i> <i>Fragillaria sp.</i> <i>Cyclotella sp.</i>	<i>Skeletonema sp.</i> <i>Biddulphia sp.</i> <i>Rhizosolenia sp.</i> <i>Thalassionem a sp.</i>	<i>Melosira sp.</i> <i>Fragillaria a sp.</i> <i>Navicula sp.</i> <i>Synedra sp.</i>	APHA (22 <sup>nd</sup> Edi) 10200-H
<b>C Zooplanktons</b>													
17.1	Abundance (Population)	noX10 <sup>3</sup> / 100 m <sup>3</sup>	38		37		28		23		26		APHA (22 <sup>nd</sup> Edi) 10200-G
17.2	Name of Group Number and name of group species of each group	--	Decapods Gastropods Polychaetes --		Polychaetes Gastropods Foraminiferans Decapods		Polychaetes Decapods Bivalves --		Polychaetes Decapods Bivalves --		Polychaetes Gastropods Decapods Mysids		APHA (22 <sup>nd</sup> Edi) 10200-G
17.3	Total Biomass	ml/100 m <sup>3</sup>	3.25		3.45		3.5		2.95		3.1		APHA (22 <sup>nd</sup> Edi) 10200-G
<b>D Microbiological Parameters</b>													
18.1	Total Bacterial Count	CFU/ml	2080		2140		2160		2140		2360		IS 5402:2002
18.2	Total Coliform	/ml	Absent		Absent		Absent		Absent		Absent		APHA(22 <sup>nd</sup> Edi)9221-D
18.3	Ecoli	/ml	Absent		Absent		Absent		Absent		Absent		IS:1622:1981Edi.2.4(2003-05)
18.4	Enterococcus	/ml	Absent		Absent		Absent		Absent		Absent		IS : 15186 :2002
18.5	Salmonella	/ml	Absent		Absent		Absent		Absent		Absent		IS : 5887 (P-3)
18.6	Shigella	/ml	Absent		Absent		Absent		Absent		Absent		IS : 1887 (P-7)
18.7	Vibrio	/ml	Absent		Absent		Absent		Absent		Absent		IS : 5887 (P-5)



**H. T. Shah**  
Lab Manager




**Dr. Arun Bajpai**  
Lab Manager (Q)

Recognised by MoEF, New Delhi Under Sec. 12 of Environmental (Protection) Act-1986

**RESULTS OF MARINE WATER [M8 RIGHT SIDE OF BOCHA CREEK N 22°45'987" E 069°43'119"]**

SR. NO.	TEST PARAMETERS	UNIT	MAY 2020		JUNE 2020		JULY 2020		AUGUST 2020		SEPTEMBER 2020		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
1	pH	--	8.20	8.11	8.27	8.20	8.25	8.19	8.27	8.21	8.23	8.19	IS3025(P11)83Re.02
2	Temperature	oC	30.6	30.4	31.7	31.4	31.6	31.3	30.5	30.4	30.6	30.4	IS3025(P9)84Re.02
3	Total Suspended Solids	mg/L	187	169	209	225	228	251	237	256	221	240	IS3025(P17)84Re.02
4	BOD (3 Days @ 27 °C)	mg/L	3.1	Not Detected	3.4	Not Detected	4.0	Not Detected	3.4	Not Detected	3.0	Not Detected	IS 3025 (P44)1993Re.03Edition2.1
5	Dissolved Oxygen	mg/L	6.0	5.8	5.9	5.7	5.9	5.6	5.9	5.7	5.9	5.6	IS3025(P38)89Re.99
6	Salinity	ppt	35.3	35.6	36	35.7	36	36.3	36.3	36.6	36.7	36.9	APHA (22 <sup>nd</sup> Edi) 2550 B
7	Oil & Grease	mg/L	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	APHA(22 <sup>nd</sup> Edi)5520D
8	Nitrate as NO <sub>3</sub>	µmol/L	6.14	5.7	4.39	4.12	4.95	4.82	3.76	3.41	2.49	2.28	IS3025(P34)88
9	Nitrite as NO <sub>2</sub>	µmol/L	1.2	0.93	0.89	0.73	0.79	0.53	0.58	0.34	0.35	0.19	IS3025(P34)88 NEDA
10	Ammonical Nitrogen as NH <sub>3</sub>	µmol/L	3.37	3.16	2.70	2.14	2.84	2.63	2.41	2.16	2.28	1.94	IS3025(P34)88Cla.2.3
11	Phosphates as PO <sub>4</sub>	µmol/L	1.48	1.17	2.18	1.89	2.4	2.16	2.27	1.98	1.9	1.73	APHA(22 <sup>nd</sup> Edi) 4500 C
12	Total Nitrogen	µmol/L	10.71	9.79	7.98	6.99	8.58	7.98	6.75	5.91	5.12	4.41	IS3025(P34)88
13	Petroleum Hydrocarbon	µg/L	Not Detected	Not Detected	7.4	Not Detected	9.8	Not Detected	13.4	Not Detected	8.6	Not Detected	PLPL-TPH
14	Total Dissolved Solids	mg/L	36516	36914	36998	36720	36984	37310	37296	37968	37648	38370	IS3025(P16)84Re.02
15	COD	mg/L	21.0	Not Detected	23.0	Not Detected	27.4	Not Detected	23.8	Not Detected	25.4	20	APHA(22 <sup>nd</sup> Edi) 5520-D Open Reflux
<b>B</b>	<b>Phytoplankton</b>												
16.1	Chlorophyll	mg/m <sub>3</sub>	3.47	3.15	3.31	2.99	2.93	2.77	2.83	2.40	2.99	2.72	APHA (22 <sup>nd</sup> Edi) 10200-H
16.2	Phaeophytin	mg/m <sub>3</sub>	0.6	1.0	0.9	1.3	1.6	1.67	1.73	2.31	1.46	1.76	APHA (22 <sup>nd</sup> Edi) 10200-H
16.3	Cell Count	No. x 10 <sup>3</sup> /L	148	82	136	74	130	78	148	92	174	110	APHA (22 <sup>nd</sup> Edi) 10200-H


**H. T. Shah**  
 Lab Manager


**Dr. Arun Bajpai**  
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16.4	Name of Group Number and name of group species of each group	--	<i>Rhizosolenia sp.</i> <i>Synedra sp.</i> <i>Skeletonema sp.</i> <i>Biddulphia sp.</i> <i>Melosira sp.</i>	<i>Cheatoceerous sp.</i> <i>Coscinodiscus sp.</i> <i>Navicula sp.</i> -- --	<i>Rhizosolenia sp.</i> <i>Coscinodiscus sp.</i> <i>Cheatoceerous sp.</i> <i>Biddulphia sp.</i> <i>Navicula sp.</i>	<i>Nitzschia sp.</i> <i>Navicula sp.</i> <i>Thalassiosira sp.</i> <i>Synedra</i>	<i>Navicula sp.</i> <i>Thalassiosira sp.</i> <i>Rhizosolenia sp.</i> <i>Coscinodiscus sp.</i> <i>Cheatoceerous sp.</i>	<i>Nitzschia sp.</i> <i>Rhizosolenia sp.</i> <i>Pleurosigma sp.</i> -- --	<i>Biddulphia sp.</i> <i>Pleurosigma sp.</i> <i>Thalassiosira sp.</i> <i>Synedra sp.</i>	<i>Nitzschia sp.</i> <i>Gyrodinium sp.</i> <i>Biddulphia sp.</i>	<i>Biddulphia sp.</i> <i>Skeletonema sp.</i> <i>Thalassiosira sp.</i> <i>Rhizosolenia sp.</i>	<i>Synedra sp.</i> <i>Nitzschia sp.</i> <i>Coscinodiscus sp.</i>	APHA (22 <sup>nd</sup> Edi) 10200-H
<b>C Zooplanktons</b>													
17.1	Abundance (Population)	noX10 <sup>3</sup> / 100 m <sup>3</sup>	35	38	32	27	23	APHA (22 <sup>nd</sup> Edi) 10200-G					
17.2	Name of Group Number and name of group species of each group	--	Copepods Decapods Gastropods --	Hydroloans Foraminiferans Polychaetes Ostracods	Polychaetes Bivalves Isopods --	Polychaetes Gastropods Decapods --	Polychaetes Mysids Ostracods Chaetognaths	APHA (22 <sup>nd</sup> Edi) 10200-G					
17.3	Total Biomass	ml/100 m <sup>3</sup>	3.1	3.4	3.5	3.0	3.15	APHA (22 <sup>nd</sup> Edi) 10200-G					
<b>D Microbiological Parameters</b>													
18.1	Total Bacterial Count	CFU/ml	1950	2210	2170	2320	2340	IS 5402:2002					
18.2	Total Coliform	/ml	Absent	Absent	Absent	Absent	Absent	APHA(22 <sup>nd</sup> Edi)9221-D					
18.3	Ecoli	/ml	Absent	Absent	Absent	Absent	Absent	IS:1622:1981Edi.2.4(2003-05)					
18.4	Enterococcus	/ml	Absent	Absent	Absent	Absent	Absent	IS : 15186 :2002					
18.5	Salmonella	/ml	Absent	Absent	Absent	Absent	Absent	IS : 5887 (P-3)					
18.6	Shigella	/ml	Absent	Absent	Absent	Absent	Absent	IS : 1887 (P-7)					
18.7	Vibrio	/ml	Absent	Absent	Absent	Absent	Absent	IS : 5887 (P-5)					



**H. T. Shah**  
Lab Manager




**Dr. Arun Bajpai**  
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**RESULTS OF SEDIMENT ANALYSIS [M8 RIGHT SIDE OF BOCHA CREEK – N 22°45'987" E 069°43'119"]**

SR. NO.	TEST PARAMETERS	UNIT	MAY 2020	JUNE 2020	JULY 2020	AUGUST 2020	SEPTEMBER 2020	TEST METHOD
			SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	
1	Organic Matter	%	0.68	0.53	0.63	0.52	0.43	FCO:2007
2	Phosphorus as P	µg/g	304	270	294	316	298	APHA(22 <sup>nd</sup> Edi) 4500 C
3	Texture	--	Sandy	Sandy	Sandy	Sandy	Sandy	--
4	Petroleum Hydrocarbon	µg/g	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	PLPL-TPH
5	<b>Heavy Metals</b>							
5.1	Aluminum as Al	%	4.98	4.86	5.18	4.7	4.56	AAS APHA 3111 B
5.2	Total Chromium as Cr <sup>+3</sup>	µg/g	206	190	230	209	239	AAS 3111B
5.3	Manganese as Mn	µg/g	1130	978	956	918	870	AAS APHA 3111 B
5.4	Iron as Fe	%	5.12	4.94	5.3	4.86	4.63	AAS APHA(22 <sup>nd</sup> Edi)3111 B
5.5	Nickel as Ni	µg/g	46	59	69	54	60	AAS APHA(22 <sup>nd</sup> Edi)3111 B
5.6	Copper as Cu	µg/g	39	51	40	32	41	AAS APHA(22 <sup>nd</sup> Edi)3111 B
5.7	Zinc as Zn	µg/g	213	170	208	190	176	AAS APHA(22 <sup>nd</sup> Edi)3111 B
5.8	Lead as Pb	µg/g	2.68	2.19	2.39	1.7	2.13	AAS APHA(22 <sup>nd</sup> Edi)3111 B
5.9	Mercury as Hg	µg/g	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	AAS APHA- 3112 B
6	<b>Benthic Organisms</b>							
6.1	Macrobenthos	--	Polychaetes Crustaceans Molluscsans	Polychaetes Gastropods Bivalves	Polychaetes Bivalyes <i>Isopods</i>	Polychaetes Crustaceans	Polychaetes Crustaceans Bivalves	APHA (22 <sup>nd</sup> Edi) 10500-C
6.2	MeioBenthos	--	--	--	--	Foraminiferans	--	APHA (22 <sup>nd</sup> Edi) 10500-C
6.3	Population	no/m2	382	441	353	294	381	APHA (22 <sup>nd</sup> Edi) 10500-C


**H. T. Shah**  
 Lab Manager


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**RESULTS OF MARINE WATER [M11 MPT T1 JETTY N 22°42'278" E 069°43'450"]**

SR. NO.	TEST PARAMETERS	UNIT	MAY 2020		JUNE 2020		JULY 2020		AUGUST 2020		SEPTEMBER 2020		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
1	pH	--	8.26	8.19	8.25	8.17	8.29	8.23	8.28	8.24	8.23	8.17	IS3025(P11)83Re.02
2	Temperature	oC	30.7	30.4	31.6	31.3	31.5	31.2	30.6	30.5	30.8	30.5	IS3025(P9)84Re.02
3	Total Suspended Solids	mg/L	183	169	210	249	218	230	228	246	241	268	IS3025(P17)84Re.02
4	BOD (3 Days @ 27 °C)	mg/L	3.0	Not Detected	3.5	Not Detected	3.9	Not Detected	3.3	Not Detected	3.0	Not Detected	IS 3025 (P44)1993Re.03Edition2.1
5	Dissolved Oxygen	mg/L	6.0	5.8	5.9	5.7	5.9	5.7	5.9	5.6	5.9	5.7	IS3025(P38)89Re.99
6	Salinity	ppt	35.5	35.9	36.1	35.7	36.2	36.5	36.4	36.7	36.7	37	APHA (22 <sup>nd</sup> Edi) 2550 B
7	Oil & Grease	mg/L	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	APHA(22 <sup>nd</sup> Edi)5520D
8	Nitrate as NO <sub>3</sub>	µmol/L	5.68	5.3	4.42	4.16	4.91	4.72	3.69	3.47	2.68	2.39	IS3025(P34)88
9	Nitrite as NO <sub>2</sub>	µmol/L	1.37	1.18	1.28	0.93	0.83	0.69	0.72	0.56	0.5	0.41	IS3025(P34)88 NEDA
10	Ammonical Nitrogen as NH <sub>3</sub>	µmol/L	3.42	3.19	2.90	2.58	2.89	2.73	2.49	2.28	2.34	2.16	IS3025(P34)88Cla.2.3
11	Phosphates as PO <sub>4</sub>	µmol/L	1.34	1.17	2.11	1.97	2.16	2	1.91	1.76	1.7	1.52	APHA(22 <sup>nd</sup> Edi) 4500 C
12	Total Nitrogen	µmol/L	10.47	9.67	8.60	7.67	8.63	8.14	6.90	6.31	5.52	4.96	IS3025(P34)88
13	Petroleum Hydrocarbon	µg/L	Not Detected	Not Detected	6.8	Not Detected	5.6	Not Detected	8.6	Not Detected	9	Not Detected	PLPL-TPH
14	Total Dissolved Solids	mg/L	36570	37112	37018	36724	37108	37509	37368	37648	37678	37914	IS3025(P16)84Re.02
15	COD	mg/L	23	Not Detected	28	Not Detected	23	17.8	23	Not Detected	23.4	19.6	APHA(22 <sup>nd</sup> Edi) 5520-D Open Reflux
<b>B</b>	<b>Phytoplankton</b>												
16.1	Chlorophyll	mg/m <sub>3</sub>	3.9	2.83	3.52	2.77	3.04	2.83	2.72	2.50	2.99	2.83	APHA (22 <sup>nd</sup> Edi) 10200-H
16.2	Phaeophytin	mg/m <sub>3</sub>	0.8	2.1	1.0	2.1	1.89	1.90	1.87	2.27	1.35	2.74	APHA (22 <sup>nd</sup> Edi) 10200-H
16.3	Cell Count	No. x 10 <sup>3</sup> /L	168	90	152	86	144	106	130	96	156	113	APHA (22 <sup>nd</sup> Edi) 10200-H


**H. T. Shah**  
 Lab Manager


**Dr. Arun Bajpai**  
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16.4	Name of Group Number and name of group species of each group	--	<i>Cheatoceerou s sp.</i> <i>Nitzschia sp.</i> <i>Thallasiosira sp.</i> <i>Coscinodiscu s sp.</i> --	<i>Navicula sp.</i> <i>Pleurosigm a sp.</i> <i>Staurorneis sp.</i> -- --	<i>Rhizosolenia sp.</i> <i>Biddulphia sp.</i> <i>Cheatoceerou s sp.</i> <i>Thallasiosira sp.</i> <i>Pleurosigma sp.</i>	<i>Navicula sp.</i> <i>Pleurosigm a sp.</i> <i>Biddulphia sp.</i> <i>Cyclotella sp.</i>	<i>Nitzschia sp.</i> <i>Cyclotella sp.</i> <i>Rhizosoleni a sp.</i> <i>Cosmarium sp.</i> --	<i>Thallassionem a sp.</i> <i>Synedra sp.</i> <i>Biddulphia sp.</i> -- --	<i>Nitzschia sp.</i> <i>Thallassiosir a sp.</i> <i>Cyclotella sp.</i> <i>Biddulphia sp.</i>	<i>Navicula sp.</i> <i>Pleurosigm a sp.</i> <i>Amphora sp.</i>	<i>Nitzschia sp.</i> <i>Thallassiosir a sp.</i> <i>Skeletonem a sp.</i> <i>Biddulphia sp.</i> <i>Cyclotella sp.</i>	<i>Navicula sp.</i> <i>Fragillari a sp.</i> <i>Melosira sp.</i> <i>Synedra sp.</i>	APHA (22 <sup>nd</sup> Edi) 10200-H
<b>C Zooplanktons</b>													
17.1	Abundance (Population)	noX10 <sup>3</sup> / 100 m <sup>3</sup>	45		38		31		29		24		APHA (22 <sup>nd</sup> Edi) 10200-G
17.2	Name of Group Number and name of group species of each group	--	Chaetognathes Gastropods Ostracods --		Ostracods Gastropods Polychaetes		Polychaetes Bivalves Mysids --		Polychaetes Molluscans Copepods --		Polychaetes Decapods Mysids Ostracods		APHA (22 <sup>nd</sup> Edi) 10200-G
17.3	Total Biomass	ml/100 m <sup>3</sup>	3.9		3.60		3.40		3.1		2.8		APHA (22 <sup>nd</sup> Edi) 10200-G
<b>D Microbiological Parameters</b>													
18.1	Total Bacterial Count	CFU/ml	1980		2140		1920		2320		2330		IS 5402:2002
18.2	Total Coliform	/ml	Absent		Absent		Absent		Absent		Absent		APHA(22 <sup>nd</sup> Edi)9221-D
18.3	Ecoli	/ml	Absent		Absent		Absent		Absent		Absent		IS:1622:1981Edi.2.4(2003-05)
18.4	Enterococcus	/ml	Absent		Absent		Absent		Absent		Absent		IS : 15186 :2002
18.5	Salmonella	/ml	Absent		Absent		Absent		Absent		Absent		IS : 5887 (P-3)
18.6	Shigella	/ml	Absent		Absent		Absent		Absent		Absent		IS : 1887 (P-7)
18.7	Vibrio	/ml	Absent		Absent		Absent		Absent		Absent		IS : 5887 (P-5)



**H. T. Shah**  
**Lab Manager**




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**RESULTS OF MARINE WATER [M12 SPM N 22°40'938" E 069°39'191"]**

SR. NO.	TEST PARAMETERS	UNIT	MAY 2020		JUNE 2020		JULY 2020		AUGUST 2020		SEPTEMBER 2020		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
1	pH	--	8.23	8.19	8.27	8.16	8.26	8.22	8.29	8.21	8.25	8.19	IS3025(P11)83Re.02
2	Temperature	oC	30.6	30.4	31.7	31.5	31.6	31.4	31	30.3	30.8	30.6	IS3025(P9)84Re.02
3	Total Suspended Solids	mg/L	193	180	218	239	238	251	217	239	224	240	IS3025(P17)84Re.02
4	BOD (3 Days @ 27 °C)	mg/L	3.2	Not Detected	3.8	Not Detected	4.0	Not Detected	3.5	Not Detected	3.1	Not Detected	IS 3025 (P44)1993Re.03Edition2.1
5	Dissolved Oxygen	mg/L	6.0	5.8	5.9	5.7	5.9	5.6	5.9	5.7	5.9	5.8	IS3025(P38)89Re.99
6	Salinity	ppt	35.4	35.7	36.1	35.6	36.2	36.6	36.4	36.7	36.8	37.1	APHA (22 <sup>nd</sup> Edi) 2550 B
7	Oil & Grease	mg/L	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	APHA(22 <sup>nd</sup> Edi)5520D
8	Nitrate as NO <sub>3</sub>	µmol/L	5.34	5.1	4.58	4.29	4.73	4.51	3.79	3.56	2.56	2.39	IS3025(P34)88
9	Nitrite as NO <sub>2</sub>	µmol/L	1.25	1.13	1.18	0.86	0.99	0.83	0.84	0.69	0.38	0.24	IS3025(P34)88 NEDA
10	Ammonical Nitrogen as NH <sub>3</sub>	µmol/L	3.36	3.00	2.15	1.93	2.31	2.17	1.73	1.56	1.57	1.32	IS3025(P34)88Cla.2.3
11	Phosphates as PO <sub>4</sub>	µmol/L	1.41	1.26	2.3	2.18	2.2	2.00	1.9	1.69	1.69	1.43	APHA(22 <sup>nd</sup> Edi) 4500 C
12	Total Nitrogen	µmol/L	9.95	9.23	7.91	7.08	8.03	7.51	6.36	5.81	4.51	3.95	IS3025(P34)88
13	Petroleum Hydrocarbon	µg/L	Not Detected	Not Detected	6.9	Not Detected	9.92	Not Detected	12	Not Detected	9.1	Not Detected	PLPL-TPH
14	Total Dissolved Solids	mg/L	36410	36938	37110	36630	37112	37510	37346	37635	37736	37994	IS3025(P16)84Re.02
15	COD	mg/L	21	Not Detected	25	Not Detected	27	19.2	22	Not Detected	24.2	19.6	APHA(22 <sup>nd</sup> Edi) 5520-D Open Reflux
<b>B</b>	<b>Phytoplankton</b>												
16.1	Chlorophyll	mg/m <sub>3</sub>	3.15	2.93	3.25	2.50	2.99	2.70	2.61	2.50	2.83	2.72	APHA (22 <sup>nd</sup> Edi) 10200-H
16.2	Phaeophytin	mg/m <sub>3</sub>	1.5	2.0	1.4	2.3	1.83	1.86	2.50	2.31	1.95	1.86	APHA (22 <sup>nd</sup> Edi) 10200-H


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16.3	Cell Count	No. x 10 <sup>3</sup> /L	170	84	152	86	136	90	122	94	136	102	APHA (22 <sup>nd</sup> Edi) 10200-H
16.4	Name of Group Number and name of group species of each group	--	<i>Rhizosolenia sp.</i> <i>Nitzschia sp.</i> <i>Biddulphia sp.</i> <i>Pleurosigma sp.</i> --	<i>Nitzschia sp.</i> <i>Coscinodiscus sp.</i> <i>Cheatoceerous sp.</i> -- --	<i>Biddulphia sp.</i> <i>Nitzschia sp.</i> <i>Coscinodiscus sp.</i> <i>Rhizosolenia sp.</i>	<i>Navicula sp.</i> <i>Synedra Foraminiferans</i>	<i>Cyclotella sp.</i> <i>Thalassiosira sp.</i> <i>Coscinodiscus sp.</i> <i>Rhizosolenia sp.</i> --	<i>Biddulphia sp.</i> <i>Synedra sp.</i> <i>Pleurosigma sp.</i> <i>Nitzschia sp.</i> --	<i>Pleurosigma sp.</i> <i>Nitzschia sp.</i> <i>Thalassiosira sp.</i> <i>Biddulphia sp.</i>	<i>Navicula sp.</i> <i>Fragillaria sp.</i> <i>Cyclotella sp.</i> <i>Nitzschia sp.</i>	<i>Nitzschia sp.</i> <i>Skeletonema sp.</i> <i>Thalassiosira sp.</i> <i>Rhizosolenia sp.</i> <i>Synedra sp.</i>	<i>Navicula sp.</i> <i>Fragillaria sp.</i> <i>Thalassiosira sp.</i> <i>Thalassiosira sp.</i>	APHA (22 <sup>nd</sup> Edi) 10200-H
<b>C Zooplanktons</b>													
17.1	Abundance (Population)	noX10 <sup>3</sup> / 100 m <sup>3</sup>	35		33		30		27		32		APHA (22 <sup>nd</sup> Edi) 10200-G
17.2	Name of Group Number and name of group species of each group	--	Siphonophores Chaetognathes Copepods Gastropods		Gastropods Polychaetes Ostracods		Polychaetes Gastropods Bivalves --		Polychaetes Gastropods Bivalves --		Polychaetes Bivalves Ostracodes Decapods		APHA (22 <sup>nd</sup> Edi) 10200-G
17.3	Total Biomass	ml/100 m <sup>3</sup>	4.0		3.7		3.50		3.40		2.8		APHA (22 <sup>nd</sup> Edi) 10200-G
<b>D Microbiological Parameters</b>													
18.1	Total Bacterial Count	CFU/ml	2120		2180		1980		2250		2310		IS 5402:2002
18.2	Total Coliform	/ml	Absent		Absent		Absent		Absent		Absent		APHA(22 <sup>nd</sup> Edi)9221-D
18.3	Ecoli	/ml	Absent		Absent		Absent		Absent		Absent		IS:1622:1981Edi.2.4(2003-05)
18.4	Enterococcus	/ml	Absent		Absent		Absent		Absent		Absent		IS : 15186 :2002
18.5	Salmonella	/ml	Absent		Absent		Absent		Absent		Absent		IS : 5887 (P-3)
18.6	Shigella	/ml	Absent		Absent		Absent		Absent		Absent		IS : 1887 (P-7)
18.7	Vibrio	/ml	Absent		Absent		Absent		Absent		Absent		IS : 5887 (P-5)



**H. T. Shah**  
Lab Manager




**Dr. Arun Bajpai**  
Lab Manager (Q)



Recognised by MoEF, New Delhi Under Sec. 12 of Environmental (Protection) Act-1986

**RESULT OF AMBIENT AIR QUALITY MONITORING****ADANI PORT – TUG BERTH 600 KL PUMP HOUSE**

Sr. No	Date of Sampling	Particulate Matter (PM10) $\mu\text{g}/\text{m}^3$	Particulate Matter (PM 2.5) $\mu\text{g}/\text{m}^3$	Sulphur Dioxide (SO2) $\mu\text{g}/\text{m}^3$	Oxides of Nitrogen (NO2) $\mu\text{g}/\text{m}^3$	Carbon Monoxide as CO $\text{mg}/\text{m}^3$	Hydrocarbon as CH <sub>4</sub> $\text{mg}/\text{m}^3$	Benzene as C <sub>6</sub> H <sub>6</sub> $\mu\text{g}/\text{m}^3$
1	12/05/2020	69.37	37.59	10.20	31.59	0.78	ND*	ND*
2	14/05/2020	85.94	47.20	6.18	33.55	0.88	ND*	ND*
3	18/05/2020	80.52	41.21	19.23	21.25	0.65	ND*	ND*
4	20/05/2020	65.62	31.64	17.60	32.43	0.55	ND*	ND*
5	25/05/2020	83.68	45.37	14.53	22.23	0.82	ND*	ND*
6	27/05/2020	71.60	42.62	21.28	38.54	0.66	ND*	ND*
7	02/06/2020	84.36	46.62	19.66	38.34	0.98	ND*	ND*
8	05/06/2020	90.28	49.33	20.46	42.67	0.63	ND*	ND*
9	09/06/2020	62.48	28.31	11.62	28.37	0.70	ND*	ND*
10	12/06/2020	83.59	47.24	15.37	33.21	0.96	ND*	ND*
11	16/06/2020	77.65	36.34	17.56	23.47	1.03	ND*	ND*
12	19/06/2020	80.64	44.21	12.28	26.36	0.49	ND*	ND*
13	23/06/2020	70.48	30.34	18.27	36.22	0.78	ND*	ND*
14	26/06/2020	86.13	48.62	16.22	31.59	1.09	ND*	ND*
15	30/06/2020	91.28	40.63	13.43	34.29	0.81	ND*	ND*
16	03/07/2020	62.52	25.47	10.50	24.37	0.77	ND*	ND*
17	10/07/2020	57.22	23.60	16.32	21.38	0.53	ND*	ND*
18	14/07/2020	80.24	44.37	13.42	32.45	0.64	ND*	ND*
19	17/07/2020	69.47	30.22	11.33	25.64	0.38	ND*	ND*
20	21/07/2020	89.36	49.24	17.59	34.25	0.80	ND*	ND*
21	24/07/2020	75.36	41.58	19.66	38.36	0.96	ND*	ND*
22	28/07/2020	82.74	45.37	14.36	28.30	0.78	ND*	ND*
23	31/07/2020	78.36	34.26	22.66	40.26	0.65	ND*	ND*
24	04/08/2020	60.83	31.26	6.47	16.59	0.60	ND*	ND*
25	07/08/2020	56.37	23.68	10.27	20.33	0.72	ND*	ND*
26	11/08/2020	62.84	28.35	7.58	23.48	0.34	ND*	ND*
27	18/08/2020	71.26	38.38	11.50	28.39	0.71	ND*	ND*
28	21/08/2020	67.62	35.46	14.58	18.53	0.49	ND*	ND*
29	25/08/2020	77.44	40.21	19.24	38.46	0.22	ND*	ND*
30	28/08/2020	63.66	26.35	13.29	22.60	0.54	ND*	ND*

Continue ...

H. T. Shah

Lab Manager



Dr. Arun Bajpai

Lab Manager (Q)



**RESULT OF AMBIENT AIR QUALITY MONITORING**

ADANI PORT – TUG BERTH 600 KL PUMP HOUSE								
Sr.No.	Date of Sampling	Particulate Matter (PM10) $\mu\text{g}/\text{m}^3$	Particulate Matter (PM 2.5) $\mu\text{g}/\text{m}^3$	Sulphur Dioxide (SO <sub>2</sub> ) $\mu\text{g}/\text{m}^3$	Oxides of Nitrogen (NO <sub>2</sub> ) $\mu\text{g}/\text{m}^3$	Carbon Monoxide as CO $\text{mg}/\text{m}^3$	Hydrocarbon as CH <sub>4</sub> $\text{mg}/\text{m}^3$	Benzene as C <sub>6</sub> H <sub>6</sub> $\mu\text{g}/\text{m}^3$
31	01/09/2020	79.62	35.57	20.44	36.51	0.29	ND*	ND*
32	04/09/2020	72.61	29.24	12.38	21.54	0.52	ND*	ND*
33	08/09/2020	82.65	44.57	17.48	31.22	0.40	ND*	ND*
34	11/09/2020	73.51	41.57	14.36	26.59	0.31	ND*	ND*
35	15/09/2020	80.37	49.31	11.22	23.40	0.68	ND*	ND*
36	18/09/2020	68.64	22.32	13.23	32.40	0.39	ND*	ND*
37	22/09/2020	88.37	47.56	16.83	30.39	0.46	ND*	ND*
38	25/09/2020	65.61	25.36	9.57	20.36	0.50	ND*	ND*
39	29/09/2020	74.54	32.45	32.54	34.58	0.32	ND*	ND*
<b>LIMIT<sup>#</sup></b>		<b>100</b>	<b>60</b>	<b>80</b>	<b>80</b>	<b>4</b>	<b>Not Specified</b>	<b>5</b>
	<b>TEST METHOD</b>	IS:5182(Part 23):Gravimetric CPCB - Method (Vol.I,May-2011)	Gravimetric-CPCB - Method (Vol.I,May-2011)	IS:5182(Part II):Improved West and Gaeke	IS:5182(Part VI):Modified Jacob & Hochheiser (NaOH-NaAsO <sub>2</sub> )	NDIR Digital Gas Analyzer	SOP: HC: GC/GCMS/Gas analyzer	IS 5182 (Part XI):2006/CPCB Method

\*Not Detected

#: Industrial, Residential, Rural and other Area Notification Dated 16<sup>th</sup> Nov.2009 as per national Ambient Air Quality Standards, CPCB New Delhi.

H. T. Shah

Lab Manager



Dr. Arun Bajpai

Lab Manager (Q)

**RESULT OF AMBIENT AIR QUALITY MONITORING**

NEAR FIRE STATION								
Sr. No.	Date of Sampling	Particulate Matter (PM10) $\mu\text{g}/\text{m}^3$	Particulate Matter (PM 2.5) $\mu\text{g}/\text{m}^3$	Sulphur Dioxide (SO <sub>2</sub> ) $\mu\text{g}/\text{m}^3$	Oxides of Nitrogen (NO <sub>2</sub> ) $\mu\text{g}/\text{m}^3$	Carbon Monoxide as CO $\text{mg}/\text{m}^3$	Hydrocarbon as CH <sub>4</sub> $\text{mg}/\text{m}^3$	Benzene as C <sub>6</sub> H <sub>6</sub> $\mu\text{g}/\text{m}^3$
1	12/05/2020	82.14	42.69	14.60	23.43	0.45	ND*	ND*
2	14/05/2020	67.69	33.60	8.55	15.67	0.49	ND*	ND*
3	18/05/2020	75.68	36.27	11.51	27.25	0.57	ND*	ND*
4	20/05/2020	54.30	26.39	19.42	29.67	0.90	ND*	ND*
5	25/05/2020	64.26	34.56	23.44	31.28	0.76	ND*	ND*
6	27/05/2020	58.32	37.56	16.27	34.20	0.50	ND*	ND*
7	02/06/2020	69.64	37.52	16.35	35.65	0.86	ND*	ND*
8	05/06/2020	79.63	42.60	18.37	31.53	0.71	ND*	ND*
9	09/06/2020	56.38	25.68	8.63	21.25	0.60	ND*	ND*
10	12/06/2020	68.65	35.60	10.17	17.21	0.38	ND*	ND*
11	16/06/2020	59.34	27.68	12.64	20.35	0.85	ND*	ND*
12	19/06/2020	64.27	32.64	7.51	15.64	0.26	ND*	ND*
13	23/06/2020	86.73	36.52	9.68	23.65	0.66	ND*	ND*
14	26/06/2020	75.44	41.23	14.48	25.22	0.77	ND*	ND*
15	30/06/2020	67.67	28.43	11.53	28.62	0.89	ND*	ND*
16	03/07/2020	81.38	42.65	8.32	19.63	0.60	ND*	ND*
17	10/07/2020	52.64	20.34	13.32	18.40	0.41	ND*	ND*
18	14/07/2020	72.53	33.52	9.66	21.51	0.52	ND*	ND*
19	17/07/2020	63.53	25.35	6.44	14.48	0.21	ND*	ND*
20	21/07/2020	54.58	35.64	15.48	31.52	0.69	ND*	ND*
21	24/07/2020	61.51	31.56	17.21	29.56	0.79	ND*	ND*
22	28/07/2020	71.56	29.43	12.34	23.55	0.30	ND*	ND*
23	31/07/2020	64.31	26.39	16.14	34.53	0.71	ND*	ND*
24	04/08/2020	75.38	36.36	12.57	21.57	0.27	ND*	ND*
25	07/08/2020	67.31	27.51	14.37	18.31	0.56	ND*	ND*
26	11/08/2020	56.24	23.60	16.31	19.27	0.19	ND*	ND*
27	18/08/2020	61.23	32.47	10.29	24.22	0.46	ND*	ND*
28	21/08/2020	73.77	42.65	19.64	28.29	0.39	ND*	ND*
29	25/08/2020	52.85	31.56	17.54	25.63	0.53	ND*	ND*
30	28/08/2020	43.54	17.26	11.30	16.62	0.50	ND*	ND*

Continue ...



H. T. Shah

Lab Manager




Dr. Arun Bajpai

Lab Manager (Q)

**RESULT OF AMBIENT AIR QUALITY MONITORING**

NEAR FIRE STATION								
Sr.No.	Date of Sampling	Particulate Matter (PM10) $\mu\text{g}/\text{m}^3$	Particulate Matter (PM 2.5) $\mu\text{g}/\text{m}^3$	Sulphur Dioxide (SO <sub>2</sub> ) $\mu\text{g}/\text{m}^3$	Oxides of Nitrogen (NO <sub>2</sub> ) $\mu\text{g}/\text{m}^3$	Carbon Monoxide as CO $\text{mg}/\text{m}^3$	Hydrocarbon as CH <sub>4</sub> $\text{mg}/\text{m}^3$	Benzene as C <sub>6</sub> H <sub>6</sub> $\mu\text{g}/\text{m}^3$
31	01/09/2020	72.38	31.51	17.60	24.22	0.38	ND*	ND*
32	04/09/2020	68.47	22.48	10.58	28.34	0.33	ND*	ND*
33	08/09/2020	75.36	39.21	14.68	23.69	0.49	ND*	ND*
34	11/09/2020	50.22	30.64	12.65	30.63	0.17	ND*	ND*
35	15/09/2020	78.65	45.37	16.51	20.68	0.53	ND*	ND*
36	18/09/2020	61.57	26.52	19.39	26.26	0.14	ND*	ND*
37	22/09/2020	56.32	24.56	13.53	25.33	0.37	ND*	ND*
38	25/09/2020	60.22	21.56	11.36	19.69	0.45	ND*	ND*
39	29/09/2020	51.55	19.56	20.61	27.57	0.22	ND*	ND*
<b>LIMIT<sup>#</sup></b>		<b>100</b>	<b>60</b>	<b>80</b>	<b>80</b>	<b>4</b>	<b>Not Specified</b>	<b>5</b>
<b>TEST METHOD</b>		IS:5182(Part 23):Gravimetric CPCB - Method (Vol.I,May-2011)	Gravimetric-CPCB - Method (Vol.I,May-2011)	IS:5182(Part II):Improved West and Gaeke	IS:5182(Part VI):Modified Jacob &Hochheiser (NaOH-NaAsO <sub>2</sub> )	NDIR Digital Gas Analyzer	SOP: HC: GC/GCMS/Gas analyzer	IS 5182 (Part XI):2006/CPCB Method

\*Not Detected

#: Industrial, Residential, Rural and other Area Notification Dated 16<sup>th</sup> Nov.2009 as per national Ambient Air Quality Standards, CPCB New Delhi.

H. T. Shah

Lab Manager



Dr. Arun Bajpai

Lab Manager (Q)



**RESULT OF AMBIENT AIR QUALITY MONITORING**

ADANI HOUSE								
Sr. No.	Date of Sampling	Particulate Matter (PM10) $\mu\text{g}/\text{m}^3$	Particulate Matter (PM 2.5) $\mu\text{g}/\text{m}^3$	Sulphur Dioxide (SO2) $\mu\text{g}/\text{m}^3$	Oxides of Nitrogen (NO2) $\mu\text{g}/\text{m}^3$	Carbon Monoxide as CO $\text{mg}/\text{m}^3$	Hydrocarbon as CH <sub>4</sub> $\text{mg}/\text{m}^3$	Benzene as C <sub>6</sub> H <sub>6</sub> $\mu\text{g}/\text{m}^3$
1	12/05/2020	63.62	34.58	18.58	33.70	0.70	ND*	ND*
2	14/05/2020	58.61	37.57	11.53	19.36	0.64	ND*	ND*
3	18/05/2020	67.27	29.45	6.27	14.37	0.84	ND*	ND*
4	20/05/2020	49.39	23.24	15.27	23.51	0.74	ND*	ND*
5	25/05/2020	69.03	30.45	17.68	27.60	0.47	ND*	ND*
6	27/05/2020	76.56	28.32	19.69	30.23	0.71	ND*	ND*
7	02/06/2020	64.35	31.57	12.44	22.67	0.80	ND*	ND*
8	05/06/2020	70.25	35.65	14.34	35.42	0.44	ND*	ND*
9	09/06/2020	50.22	22.45	16.19	32.45	0.50	ND*	ND*
10	12/06/2020	77.34	42.32	8.62	20.25	0.30	ND*	ND*
11	16/06/2020	63.25	23.45	10.64	26.43	0.79	ND*	ND*
12	19/06/2020	74.27	40.32	15.19	29.54	0.42	ND*	ND*
13	23/06/2020	68.66	29.36	11.29	21.54	0.87	ND*	ND*
14	26/06/2020	57.29	32.40	9.50	18.65	0.48	ND*	ND*
15	30/06/2020	62.59	24.24	6.36	31.24	0.62	ND*	ND*
16	03/07/2020	58.68	21.57	15.34	30.54	0.36	ND*	ND*
17	10/07/2020	45.36	16.70	10.34	24.26	0.34	ND*	ND*
18	14/07/2020	79.52	40.23	16.17	19.61	0.22	ND*	ND*
19	17/07/2020	56.31	22.62	14.29	27.64	0.26	ND*	ND*
20	21/07/2020	62.81	38.65	11.61	20.31	0.61	ND*	ND*
21	24/07/2020	70.31	35.28	13.81	33.53	0.73	ND*	ND*
22	28/07/2020	69.31	25.61	7.60	16.64	0.23	ND*	ND*
23	31/07/2020	72.34	29.61	12.67	29.64	0.49	ND*	ND*
24	04/08/2020	55.37	28.24	14.22	29.26	0.64	ND*	ND*
25	07/08/2020	62.54	25.36	12.49	24.60	0.33	ND*	ND*
26	11/08/2020	51.57	21.53	18.52	27.54	0.24	ND*	ND*
27	18/08/2020	66.38	35.44	7.57	20.39	0.55	ND*	ND*
28	21/08/2020	50.22	27.66	9.17	15.63	0.31	ND*	ND*
29	25/08/2020	68.47	33.40	13.44	18.24	0.45	ND*	ND*
30	28/08/2020	53.36	23.41	6.54	13.47	0.23	ND*	ND*

Continue ...



H. T. Shah

Lab Manager




Dr. Arun Bajpai

Lab Manager (Q)

**RESULT OF AMBIENT AIR QUALITY MONITORING**

ADANI HOUSE								
Sr. No.	Date of Sampling	Particulate Matter (PM10) $\mu\text{g}/\text{m}^3$	Particulate Matter (PM 2.5) $\mu\text{g}/\text{m}^3$	Sulphur Dioxide (SO2) $\mu\text{g}/\text{m}^3$	Oxides of Nitrogen (NO2) $\mu\text{g}/\text{m}^3$	Carbon Monoxide as CO $\text{mg}/\text{m}^3$	Hydrocarbon as CH <sub>4</sub> $\text{mg}/\text{m}^3$	Benzene as C <sub>6</sub> H <sub>6</sub> $\mu\text{g}/\text{m}^3$
31	01/09/2020	66.55	29.32	8.54	20.45	0.57	ND*	ND*
32	04/09/2020	52.41	20.66	16.31	34.24	0.47	ND*	ND*
33	08/09/2020	64.55	34.53	12.42	19.59	0.54	ND*	ND*
34	11/09/2020	58.35	37.53	10.20	21.51	0.42	ND*	ND*
35	15/09/2020	61.25	33.49	14.22	28.55	0.26	ND*	ND*
36	18/09/2020	72.43	30.53	9.84	22.34	0.18	ND*	ND*
37	22/09/2020	67.54	38.36	11.67	18.36	0.58	ND*	ND*
38	25/09/2020	55.34	19.66	6.90	23.57	0.25	ND*	ND*
39	29/09/2020	63.41	27.36	27.40	29.40	0.15	ND*	ND*
<b>LIMIT<sup>#</sup></b>		<b>100</b>	<b>60</b>	<b>80</b>	<b>80</b>	<b>4</b>	<b>Not Specified</b>	<b>5</b>
	<b>TEST METHOD</b>	IS:5182(Part 23):Gravimetric CPCB - Method (Vol.I,May-2011)	Gravimetric-CPCB - Method (Vol.I,May-2011)	IS:5182(Part II):Improved West and Gaeke	IS:5182(Part VI):Modified Jacob &Hochheiser (NaOH-NaAsO2)	NDIR Digital Gas Analyzer	SOP: HC: GC/GCMS/Gas analyzer	IS 5182 (Part XI):2006/CPCB Method

\*Not Detected

#: Industrial, Residential, Rural and other Area Notification Dated 16<sup>th</sup> Nov.2009 as per national Ambient Air Quality Standards, CPCB New Delhi.

H. T. Shah

Lab Manager



Dr. Arun Bajpai

Lab Manager (Q)

**RESULT OF AMBIENT AIR QUALITY MONITORING**

CT-3 RMU-2								
Sr.N o.	Date of Sampling	Particulate Matter (PM10) $\mu\text{g}/\text{m}^3$	Particulate Matter (PM 2.5) $\mu\text{g}/\text{m}^3$	Sulphur Dioxide (SO <sub>2</sub> ) $\mu\text{g}/\text{m}^3$	Oxides of Nitrogen (NO <sub>2</sub> ) $\mu\text{g}/\text{m}^3$	Carbon Monoxide as CO $\text{mg}/\text{m}^3$	Hydrocarbon as CH <sub>4</sub> $\text{mg}/\text{m}^3$	Benzene as C <sub>6</sub> H <sub>6</sub> $\mu\text{g}/\text{m}^3$
1	12/05/2020	89.61	45.19	22.60	37.58	0.58	ND*	ND*
2	14/05/2020	73.55	39.57	15.17	27.38	0.29	ND*	ND*
3	18/05/2020	85.68	48.36	17.50	24.49	0.54	ND*	ND*
4	20/05/2020	69.47	37.15	13.60	21.56	0.87	ND*	ND*
5	25/05/2020	77.55	42.52	18.26	29.53	0.42	ND*	ND*
6	27/05/2020	84.67	46.23	10.22	23.63	0.33	ND*	ND*
7	02/06/2020	76.83	41.28	14.51	30.44	0.92	ND*	ND*
8	05/06/2020	85.68	45.36	11.10	25.68	0.82	ND*	ND*
9	09/06/2020	70.37	35.49	19.32	36.49	0.74	ND*	ND*
10	12/06/2020	90.39	51.23	12.66	27.66	0.90	ND*	ND*
11	16/06/2020	82.69	40.23	15.66	31.43	0.64	ND*	ND*
12	19/06/2020	92.46	53.60	9.26	22.37	0.45	ND*	ND*
13	23/06/2020	75.31	34.53	13.62	32.35	0.53	ND*	ND*
14	26/06/2020	81.33	43.48	18.39	35.71	0.40	ND*	ND*
15	30/06/2020	72.63	31.61	16.47	18.89	0.56	ND*	ND*
16	03/07/2020	68.37	28.32	17.44	33.40	0.50	ND*	ND*
17	10/07/2020	64.55	31.28	15.11	29.51	0.66	ND*	ND*
18	14/07/2020	86.28	48.40	18.56	36.53	0.46	ND*	ND*
19	17/07/2020	50.28	20.45	8.94	20.69	0.32	ND*	ND*
20	21/07/2020	79.47	42.52	13.65	28.36	0.76	ND*	ND*
21	24/07/2020	83.43	46.31	10.20	23.49	0.82	ND*	ND*
22	28/07/2020	78.57	37.53	16.44	32.41	0.72	ND*	ND*
23	31/07/2020	87.31	43.57	19.26	37.53	0.45	ND*	ND*
24	04/08/2020	80.35	40.48	16.35	32.44	0.48	ND*	ND*
25	07/08/2020	70.36	29.82	18.20	28.44	0.44	ND*	ND*
26	11/08/2020	67.23	30.20	20.24	35.30	0.30	ND*	ND*
27	18/08/2020	76.25	42.40	17.56	31.55	0.66	ND*	ND*
28	21/08/2020	81.24	45.36	12.89	25.35	0.55	ND*	ND*
29	25/08/2020	73.67	38.32	9.31	29.29	0.36	ND*	ND*
30	28/08/2020	58.34	28.45	15.54	26.48	0.40	ND*	ND*


**H. T. Shah**
**Lab Manager**


**Dr. Arun Bajpai**
**Lab Manager (Q)**



**RESULT OF AMBIENT AIR QUALITY MONITORING**

CT-3 RMU-2								
Sr.No.	Date of Sampling	Particulate Matter (PM10) $\mu\text{g}/\text{m}^3$	Particulate Matter (PM 2.5) $\mu\text{g}/\text{m}^3$	Sulphur Dioxide (SO <sub>2</sub> ) $\mu\text{g}/\text{m}^3$	Oxides of Nitrogen (NO <sub>2</sub> ) $\mu\text{g}/\text{m}^3$	Carbon Monoxide as CO $\text{mg}/\text{m}^3$	Hydrocarbon as CH <sub>4</sub> $\text{mg}/\text{m}^3$	Benzene as C <sub>6</sub> H <sub>6</sub> $\mu\text{g}/\text{m}^3$
31	01/09/2020	84.58	41.23	15.64	27.22	0.62	ND*	ND*
32	04/09/2020	79.41	33.56	19.52	38.51	0.71	ND*	ND*
33	08/09/2020	87.34	47.23	22.41	41.28	0.60	ND*	ND*
34	11/09/2020	65.62	38.35	16.56	35.47	0.55	ND*	ND*
35	15/09/2020	85.33	52.36	18.35	32.88	0.74	ND*	ND*
36	18/09/2020	78.35	36.56	10.38	37.53	0.57	ND*	ND*
37	22/09/2020	83.53	44.23	14.35	28.50	0.64	ND*	ND*
38	25/09/2020	76.67	32.43	17.20	31.56	0.36	ND*	ND*
39	29/09/2020	68.33	30.72	30.86	39.54	0.78	ND*	ND*
<b>LIMIT<sup>#</sup></b>		<b>100</b>	<b>60</b>	<b>80</b>	<b>80</b>	<b>4</b>	<b>Not Specified</b>	<b>5</b>
	<b>TEST METHOD</b>	IS:5182(Part 23):Gravimetric CPCB - Method (Vol.I,May-2011)	Gravimetric-CPCB - Method (Vol.I,May-2011)	IS:5182(Part II):Improved West and Gaeke	IS:5182(Part VI):Modified Jacob &Hochheiser (NaOH-NaAsO <sub>2</sub> )	NDIR Digital Gas Analyzer	SOP: HC: GC/GCMS/Gas analyzer	IS 5182 (Part XI):2006/CPCB Method

\*Not Detected

#: Industrial, Residential, Rural and other Area Notification Dated 16<sup>th</sup> Nov.2009 as per national Ambient Air Quality Standards, CPCB New Delhi.

H. T. Shah

Lab Manager



Dr. Arun Bajpai

Lab Manager (Q)

**RESULTS OF NOISE LEVEL MONITORING**
**Result of Noise level monitoring [Day Time]**

SR. NO.	Name of Location	ADANI PORT – TUG BERTH 600 KL PUMP HOUSE				
		Result [Leq dB(A)]				
		Sampling Date & Time	27/05/2020	19/06/2020	17/07/2020	28/08/2020
1	6:00-7:00	67.3	65.2	61.4	67.4	60.1
2	7:00-8:00	65.2	62.8	63.7	62.5	63.8
3	8:00-9:00	61.4	69.9	69.8	65.9	67.4
4	9:00-10:00	68.8	63.7	73.5	66.4	62.1
5	10:00-11:00	65.5	65.5	70.1	62.8	69.8
6	11:00-12:00	69.3	60.8	65.5	61.5	65.1
7	12:00-13:00	73.2	62.9	68.1	65.9	64.2
8	13:00-14:00	70.2	63.1	64.8	69.9	68.7
9	14:00-15:00	67.4	62.8	63.7	72.1	65.1
10	15:00-16:00	64.7	68.2	65.1	74.1	60.8
11	16:00-17:00	69.4	66.4	62.4	70.6	65.9
12	17:00-18:00	66.4	70.1	60.8	71.8	62.8
13	18:00-19:00	62.2	69.1	68.8	69.8	69.1
14	19:00-20:00	68.1	66.1	64.5	64.2	62.5
15	20:00-21:00	63.8	68.4	62.1	63.7	63.7
16	21:00-22:00	67.6	63.8	65.5	62.8	68.4
<b>Day Time Limit*</b>		<b>75 Leq dB(A)</b>				

**Result of Noise level monitoring [Night Time]**

SR. NO.	Name of Location	ADANI PORT – TUG BERTH 600 KL PUMP HOUSE				
		Result [Leq dB(A)]				
		Sampling Date & Time	27/05/2020	19/06/2020	17/07/2020	28/08/2020
1	22:00-23:00	65.5	63.8	63.4	60.4	67.1
2	23:00-00:00	62.1	60.1	62.7	64.8	62.5
3	00:00-01:00	63.4	61.8	62.4	63.1	65.9
4	01:00-02:00	68.1	67.5	65.8	62.8	62.8
5	02:00-03:00	62.7	65.8	67.1	65.2	62.5
6	03:00-04:00	60.1	62.8	66.2	60.8	63.8
7	04:00-05:00	60.9	61.7	63.4	67.1	68.1
8	05:00-06:00	63.1	63.4	61.8	66.2	64.8
<b>Night Time Limit*</b>		<b>70 Leq dB(A)</b>				



H. T. Shah

Lab Manager




Dr. Arun Bajpai

Lab Manager (Q)

**RESULTS OF NOISE LEVEL MONITORING****Result of Noise level monitoring [Day Time]**

SR. NO.	Name of Location	NEAR FIRE STATION				
		Result [Leq dB(A)]				
	Sampling Date & Time	20/05/2020	09/06/2020	10/07/2020	25/08/2020	18/09/2020
1	6:00-7:00	65.3	60.4	68.1	63.8	62.5
2	7:00-8:00	69.3	65.8	61.4	60.8	66.1
3	8:00-9:00	67.3	63.4	62.8	70.5	61.3
4	9:00-10:00	65.3	69.1	65.8	72.1	68.7
5	10:00-11:00	70.2	62.4	62.8	71.8	67.1
6	11:00-12:00	67.2	72.4	69.9	68.8	62.4
7	12:00-13:00	71.2	68.2	72.1	64.4	69.5
8	13:00-14:00	68.8	63.4	65.1	62.5	65.8
9	14:00-15:00	64.3	68.1	64.8	67.1	69.4
10	15:00-16:00	66.2	65.5	65.8	63.8	64.1
11	16:00-17:00	62.2	63.1	63.4	68.7	68.7
12	17:00-18:00	61.4	60.8	68.7	65.5	72.4
13	18:00-19:00	68.4	67.6	63.4	62.9	70.1
14	19:00-20:00	64.2	66.2	70.4	68.1	68.4
15	20:00-21:00	62.3	64.4	68.1	61.8	65.3
16	21:00-22:00	65.8	68.2	62.4	68.4	61.7
<b>Day Time Limit*</b>		<b>75 Leq dB(A)</b>				

**Result of Noise level monitoring [Night Time]**

SR. NO.	Name of Location	NEAR FIRE STATION				
		Result [Leq dB(A)]				
	Sampling Date & Time	20/05/2020	09/06/2020	10/07/2020	25/08/2020	18/09/2020
1	22:00-23:00	61.4	61.7	67.4	64.9	65.5
2	23:00-00:00	62.8	65.4	65.3	69.2	64.1
3	00:00-01:00	65.1	63.8	68.2	62.5	62.3
4	01:00-02:00	63.4	69.8	62.4	61.5	68.7
5	02:00-03:00	59.4	69.3	63.4	63.8	64.1
6	03:00-04:00	60.4	67.4	61.5	60.4	62.4
7	04:00-05:00	60.8	62.4	64.7	61.8	66.7
8	05:00-06:00	62.4	65.5	61.5	62.9	63.1
<b>Night Time Limit*</b>		<b>70 Leq dB(A)</b>				

H. T. Shah

Lab Manager



Dr. Arun Bajpai

Lab Manager (Q)



**RESULTS OF NOISE LEVEL MONITORING****Result of Noise level monitoring [Day Time]**

SR. NO.	Name of Location	ADANI HOUSE				
		Result [Leq dB(A)]				
		18/05/2020	23/06/2020	07/07/2020	11/08/2020	08/09/2020
1	6:00-7:00	65.3	65.2	67.1	65.1	65.5
2	7:00-8:00	62.1	63.8	62.8	68.4	62.4
3	8:00-9:00	68.4	66.1	61.8	69.4	68.7
4	9:00-10:00	70.3	61.8	65.8	72.9	70.1
5	10:00-11:00	68.7	62.8	68.1	70.6	73.4
6	11:00-12:00	64.2	69.1	62.4	65.8	70.4
7	12:00-13:00	62.7	62.8	68.4	62.4	74.1
8	13:00-14:00	69.3	67.1	69.4	61.8	69.8
9	14:00-15:00	63.1	64.3	65.1	64.8	68.1
10	15:00-16:00	61.6	61.8	68.1	68.4	65.4
11	16:00-17:00	68.3	64.5	71.7	63.4	62.1
12	17:00-18:00	63.2	68.9	69.1	65.8	61.8
13	18:00-19:00	62.4	63.1	65.1	62.8	65.7
14	19:00-20:00	66.8	67.2	62.4	63.4	62.2
15	20:00-21:00	68.2	69.9	68.4	61.8	68.7
16	21:00-22:00	65.5	62.8	64.1	68.7	64.2
<b>Day Time Limit*</b>		<b>75 Leq dB(A)</b>				

**Result of Noise level monitoring [Night Time]**

SR. NO.	Name of Location	ADANI HOUSE				
		Result [Leq dB(A)]				
		18/05/2020	23/06/2020	07/07/2020	11/08/2020	08/09/2020
1	22:00-23:00	65.1	67.2	64.1	68.4	68.5
2	23:00-00:00	62.7	63.8	60.1	63.4	66.2
3	00:00-01:00	66.4	64.1	62.4	61.5	63.7
4	01:00-02:00	66.9	60.4	58.8	63.1	64.1
5	02:00-03:00	60.1	63.8	63.1	62.4	62.1
6	03:00-04:00	62.4	65.2	65.1	65.5	63.8
7	04:00-05:00	62.8	61.8	62.1	62.4	62.1
8	05:00-06:00	63.7	64.2	60.4	63.1	61.8
<b>Night Time Limit*</b>		<b>70 Leq dB(A)</b>				

H. T. Shah

Lab Manager



Dr. Arun Bajpai

Lab Manager (Q)

**RESULTS OF NOISE LEVEL MONITORING****Result of Noise level monitoring [Day Time]**

SR. NO.	Name of Location	CT-3 RMU-2				
		Result [Leq dB(A)]				
		15/05/2020	06/05/2020	14/07/2020	18/08/2020	29/09/2020
	<b>Sampling Date &amp; Time</b>					
1	6:00-7:00	60.2	63.7	60.8	68.4	65.1
2	7:00-8:00	58.3	60.8	63.4	65.1	62.8
3	8:00-9:00	65.4	62.8	58.4	63.7	67.5
4	9:00-10:00	67.4	67.0	65.8	65.1	70.5
5	10:00-11:00	62.2	65.5	69.4	62.7	65.5
6	11:00-12:00	68.7	68.1	61.4	65.3	68.2
7	12:00-13:00	64.4	69.5	68.5	61.8	63.1
8	13:00-14:00	68.9	70.4	62.7	65.4	67.1
9	14:00-15:00	60.3	65.1	59.4	68.7	61.5
10	15:00-16:00	62.3	66.4	62.3	62.4	64.2
11	16:00-17:00	66.2	62.8	68.1	60.7	62.5
12	17:00-18:00	63.7	65.1	62.4	63.8	69.8
13	18:00-19:00	67.5	61.9	64.4	68.4	71.1
14	19:00-20:00	69.2	62.8	62.8	71.6	69.8
15	20:00-21:00	65.1	64.7	67.7	65.8	65.4
16	21:00-22:00	69.1	69.1	68.7	62.4	64.2
<b>Day Time Limit*</b>		<b>75 Leq dB(A)</b>				

**Result of Noise level monitoring [Night Time]**

SR. NO.	Name of Location	CT-3 RMU-2				
		Result [Leq dB(A)]				
		15/05/2020	06/05/2020	14/07/2020	18/08/2020	29/09/2020
	<b>Sampling Date &amp; Time</b>					
1	22:00-23:00	68.4	64.8	68.4	63.4	66.7
2	23:00-00:00	65.5	65.4	65.1	68.1	65.5
3	00:00-01:00	62.4	63.1	63.4	66.1	62.4
4	01:00-02:00	63.1	60.4	61.4	60.4	60.4
5	02:00-03:00	60.4	58.7	60.4	63.8	62.7
6	03:00-04:00	61.8	60.3	65.1	67.2	63.3
7	04:00-05:00	63.7	64.1	62.7	69.1	67.4
8	05:00-06:00	62.8	63.8	65.2	62.8	62.1
<b>Night Time Limit*</b>		<b>70 Leq dB(A)</b>				

H. T. Shah  
Lab ManagerDr. Arun Bajpai  
Lab Manager (Q)



Recognised by MoEF, New Delhi Under Sec. 12 of Environmental (Protection) Act-1986

**RESULT OF STACK MONITORING**

SR NO	TEST PARAMETERS	UNIT	STD. LIMIT	THERMIC FLUID HEATER (BITUMEN-01)	THERMIC FLUID HEATER (BITUMEN-02)	HOT WATER SYSTEM-1	HOT WATER SYSTEM-2	TEST METHOD
<b>MAY 2020</b>								
1	Particulate Matter	mg/Nm <sup>3</sup>	<b>150</b>	17.61	--	--	22.33	IS:11255 (Part-I):1985
2	Sulfur dioxide	ppm	<b>100</b>	4.52	--	--	6.52	IS:11255 (Part-II):1985
3	Oxides of Nitrogen	ppm	<b>50</b>	28.62	--	--	33.42	IS:11255 (Part-VII):2005
<b>JUNE 2020</b>								
1	Particulate Matter	mg/Nm <sup>3</sup>	<b>150</b>	--	20.60	26.72	--	IS:11255 (Part-I):1985
2	Sulfur dioxide	ppm	<b>100</b>	--	3.73	5.62	--	IS:11255 (Part-II):1985
3	Oxides of Nitrogen	ppm	<b>50</b>	--	28.35	38.36	--	IS:11255 (Part-VII):2005
<b>JULY 2020</b>								
1	Particulate Matter	mg/Nm <sup>3</sup>	<b>150</b>	19.84	--	29.42	21.41	IS:11255 (Part-I):1985
2	Sulfur dioxide	ppm	<b>100</b>	5.66	--	6.73	7.75	IS:11255 (Part-II):1985
3	Oxides of Nitrogen	ppm	<b>50</b>	30.70	--	33.48	37.55	IS:11255 (Part-VII):2005
<b>AUGUST 2020</b>								
1	Particulate Matter	mg/Nm <sup>3</sup>	<b>150</b>	22.60	--	--	24.62	IS:11255 (Part-I):1985
2	Sulfur dioxide	ppm	<b>100</b>	4.50	--	--	6.54	IS:11255 (Part-II):1985
3	Oxides of Nitrogen	ppm	<b>50</b>	26.73	--	--	35.94	IS:11255 (Part-VII):2005
<b>SEPTEMBER 2020</b>								
1	Particulate Matter	mg/Nm <sup>3</sup>	<b>150</b>	17.31	--	34.49	--	IS:11255 (Part-I):1985
2	Sulfur dioxide	ppm	<b>100</b>	5.66	--	7.78	--	IS:11255 (Part-II):1985
3	Oxides of Nitrogen	ppm	<b>50</b>	29.27	--	37.49	--	IS:11255 (Part-VII):2005

\*Below detection limit

Results on 11 % O<sub>2</sub> Correction when Oxygen is greater than 11 %. And 12% CO<sub>2</sub> correction when CO<sub>2</sub> is less than 12%**H. T. Shah****Lab Manager****Dr. Arun Bajpai****Lab Manager (Q)**



**RESULTS OF D.G. STACK MONITORING**

30/08/2020							
SR. NO.	TEST PARAMETERS	Unit	Adani Port			GPCB Limit	Test Method
			D.G. Set-1 (500 KVA)	D.G. Set-2 (500 KVA)	D.G. Set-3 (500 KVA)		
1	Particulate Matter	mg/Nm <sup>3</sup>	18.56	20.56	15.66	150	IS:11255 (Part-I):1985
2	Sulphur Dioxide	ppm	6.44	4.47	8.30	100	IS:11255 (Part-II):1985
3	Oxide of Nitrogen	ppm	36.52	33.49	37.58	50	IS:11255 (Part-VII):2005
4	Carbon Monoxide	mg/m <sup>3</sup>	--	8.8	4.6	Not Specified	Digital Gas Analyzer
5	Hydro Carbon NMHC	ppm	--	Not Detected	Not Detected	Not Specified	Gas Chromatography

\*DG sets are used as standby, so stack monitoring is done on quarterly basis. Results on 15 % O<sub>2</sub> Correction when Oxygen is greater than 15 %

		30/08/2020			25/07/2020		
SR. NO.	TEST PARAMETERS	Unit	Adani Port			GPCB Limit	Test Method
			D.G. Set-4 (500 KVA)	D.G. Set-5 (500 KVA)	D.G. Set -6, 7 & 8 (1250 KVA, each)		
1	Particulate Matter	mg/Nm <sup>3</sup>	16.26	15.55	18.72	150	IS:11255 (Part-I):1985
2	Sulphur Dioxide	ppm	5.73	4.48	8.69	100	IS:11255 (Part-II):1985
3	Oxide of Nitrogen	ppm	30.61	33.44	38.43	50	IS:11255 (Part-VII):2005
4	Carbon Monoxide	mg/m <sup>3</sup>	7.3	9.8	--	Not Specified	Digital Gas Analyzer
5	Hydro Carbon NMHC	ppm	Not Detected	Not Detected	--	Not Specified	Gas Chromatography

\*DG sets are used as standby, so stack monitoring is done on quarterly basis. Results on 15 % O<sub>2</sub> Correction when Oxygen is greater than 15 %

H. T. Shah

Lab Manager



Dr. Arun Bajpai

Lab Manager (Q)



05/09/2020

SR. NO.	TEST PARAMETERS	Unit	CT-4			GPCB Limit	Test Method
			D.G. Set-1 (1500 KVA)	D.G. Set-2 (1500 KVA)	D.G. Set-3 (1500 KVA)		
1	Particulate Matter	mg/Nm <sup>3</sup>	24.52	27.54	20.49	150	IS:11255 (Part-I):1985
2	Sulphur Dioxide	ppm	5.48	6.21	4.27	100	IS:11255 (Part-II):1985
3	Oxide of Nitrogen	ppm	35.66	33.56	30.28	50	IS:11255 (Part-VII):2005
4	Carbon Monoxide	mg/m <sup>3</sup>	11.89	10.02	13.16	Not Specified	Digital Gas Analyzer
5	Hydro Carbon NMHC	ppm	Not Detected	Not Detected	Not Detected	Not Specified	Gas Chromatography

\*DG sets are used as standby, so stack monitoring is done on quarterly basis. Results on 15 % O2 Correction when Oxygen is greater than 15 %

04/09/2020

SR. NO.	TEST PARAMETERS	Unit	South Basin			GPCB Limit	Test Method
			D.G. Set-1 (1500 KVA)	D.G. Set-2 (1500 KVA)	D.G. Set-3 (1500 KVA)		
1	Particulate Matter	mg/Nm <sup>3</sup>	34.26	32.39	27.55	150	IS:11255 (Part-I):1985
2	Sulphur Dioxide	ppm	5.47	6.23	4.61	100	IS:11255 (Part-II):1985
3	Oxide of Nitrogen	ppm	32.37	38.51	29.48	50	IS:11255 (Part-VII):2005
4	Carbon Monoxide	mg/m <sup>3</sup>	17.51	14.02	14.62	Not Specified	Digital Gas Analyzer
5	Hydro Carbon NMHC	ppm	Not Detected	Not Detected	Not Detected	Not Specified	Gas Chromatography

\*DG sets are used as standby, so stack monitoring is done on quarterly basis. Results on 15 % O2 Correction when Oxygen is greater than 15 %

H. T. Shah

Lab Manager



Dr. Arun Bajpai

Lab Manager (Q)



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**RESULT OF CETP OUTLET**

SR. NO.	TEST PARAMETERS	UNIT	CETP OUTLET					GPCB Permissible Limit CETP OUTLET	TEST METHOD
			May-20	June-20	July-20	Aug-20	Sep-20		
1	pH	--	7.88	7.68	7.73	7.81	7.7	6 to 9	IS3025(P11)83Re.02
2	Temperature	°C	31.6	31.7	31.8	30.7	29.2	Shall Not exceed more than 5 °C above ambient water temperature	IS3025(P9)84Re.02
3	Colour	Co-pt	30	40	30	50	40	100	IS3025(P4)83Re.02
4	Total Suspended Solids	mg/L	41	59	48	56	48	100	IS3025(P17)84Re.02
5	Oil & Grease	mg/L	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	10	APHA(22 <sup>nd</sup> Edi)5520D
6	Phenolic Compound	mg/L	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	1	IS3025(P43)92Re.03
7	Fluorides	mg/L	0.62	1.58	1.28	1.10	0.92	2	APHA(22 <sup>nd</sup> Edi) 4500 F D SPANDS
8	Iron	mg/L	0.032	0.18	0.2	0.52	0.68	3	AAS APHA(22 <sup>nd</sup> Edi)3111 B
9	Zinc as Zn	mg/L	Not Detected	Not Detected	0.069	0.044	0.072	15	AAS APHA(22 <sup>nd</sup> Edi)3111 B
10	Trivalent Chromium	mg/L	0.025	0.044	Not Detected	Not Detected	Not Detected	2	AAS APHA(22 <sup>nd</sup> Edi)3111 B
11	Sulphide as S	mg/L	0.60	0.8	Not Detected	Not Detected	Not Detected	2	APHA(22 <sup>nd</sup> Edi) 4500-S
12	Ammonical Nitrogen as NH <sub>3</sub>	mg/L	28	43	45	23	31	50	IS3025(P34)88Cla.2.3
13	BOD (3 Days @ 27°C)	mg/L	32	68	53	45	52	100	IS 3025 (P44)1993Re.03Edition2.1
14	COD	mg/L	165	249	228	210	198	250	APHA(22 <sup>nd</sup> Edi) 5520-D Open Reflux
15	Chloride as Cl	mg/L	719	749	774	719	712	1000	IS3025(P32)88Re.99
16	Sulphate as SO <sub>4</sub>	mg/L	131	58.98	62	46	48	1000	APHA(22 <sup>nd</sup> Edi)4500 SO <sub>4</sub> E
17	Total Dissolved Solids	mg/L	2011	2044	2078	1829	1730	2100	IS3025(P16)84Re.02
18	Total Residual Chlorine	mg/L	Not Detected	Not Detected	Not Detected	0.6	0.8	1	APHA(22 <sup>nd</sup> Edi)4500 Cl
19	Copper as Cu	mg/L	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	3	AAS APHA(22 <sup>nd</sup> Edi)3111 B

H. T. Shah

Lab Manager



Dr. Arun Bajpai

Lab Manager (Q)





Recognised by MoEF, New Delhi Under Sec. 12 of Environmental (Protection) Act-1986

**Minimum Detection Limit [MDL]**

Ambient Air Parameters		
Sr. No.	Test Parameter	MDL
1	Particulate Matter (PM10) ( $\mu\text{g}/\text{m}^3$ )	10
2	Particulate Matter (PM 2.5) ( $\mu\text{g}/\text{m}^3$ )	10
3	Sulphur Dioxide ( $\text{SO}_2$ ) ( $\mu\text{g}/\text{m}^3$ )	5
4	Oxides of Nitrogen ( $\mu\text{g}/\text{m}^3$ )	5
5	Hydrogen Sulphide as $\text{H}_2\text{S}$ ( $\mu\text{g}/\text{m}^3$ )	6

Stack Parameters		
Sr.No.	Test Parameter	MDL
1	Particulate Matter ( $\text{mg}/\text{Nm}^3$ )	10
2	Sulphur Dioxide (ppm)	1.52
3	Oxides of Nitrogen (ppm)	2.65
4	Carbon Monoxide ( $\text{mg}/\text{Nm}^3$ )	0.1
5	Hydro Carbon NMHC (ppm)	1.0

Sea Water Parameters			
SR. NO.	TEST PARAMETERS	UNIT	MDL
1	pH	--	2
2	Temperature	$^{\circ}\text{C}$	2
3	Total Suspended Solids	$\text{mg}/\text{L}$	2
4	BOD (3 Days @ $27^{\circ}\text{C}$ )	$\text{mg}/\text{L}$	1
5	Dissolved Oxygen	$\text{mg}/\text{L}$	0.1
6	Salinity	ppt	1
7	Oil & Grease	$\text{mg}/\text{L}$	2
8	Nitrate as $\text{NO}_3$	$\mu\text{mol}/\text{L}$	0.5
9	Nitrite as $\text{NO}_2$	$\mu\text{mol}/\text{L}$	0.01
10	Ammonical Nitrogen as $\text{NH}_3$	$\mu\text{mol}/\text{L}$	0.2
11	Phosphates as $\text{PO}_4$	$\mu\text{mol}/\text{L}$	0.5
12	Petroleum Hydrocarbon	$\mu\text{g}/\text{L}$	1
13	Total Dissolved Solids	$\text{mg}/\text{L}$	10
14	COD	$\text{mg}/\text{L}$	3
15	Primary productivity	$\text{mgC}/\text{L}/\text{day}$	0.1
16	Chlorophyll	$\text{mg}/\text{m}^3$	0.1
17	Phaeophytin	$\text{mg}/\text{m}^3$	0.1
18	Cell Count	$\text{No.} \times 10^3/\text{L}$	1

Sea Sediment Parameters			
SR. NO.	TEST PARAMETERS	UNIT	MDL
1	Organic Matter	%	0.1
2	Phosphorus as P	$\mu\text{g}/\text{g}$	1
3	Petroleum Hydrocarbon	$\mu\text{g}/\text{g}$	1
4	Aluminum as Al	%	0.1
5	Manganese as Mn	$\mu\text{g}/\text{g}$	1
6	Mercury as Hg	$\mu\text{g}/\text{g}$	0.1

H. T. Shah

Lab Manager



Dr. Arun Bajpai

Lab Manager (Q)



STP Water parameter(mg/L)		
Sr. No.	Test parameter	MDL
1	pH	2
2	Total Suspended Solids (mg/L)	2
3	BOD (3 days @ 270 C) (mg/L)	1
4	Residual Chlorine (mg/L)	0.2
5	Fecal Coliform (MPN INDEX/100 mL)	1.8

ETP Water Parameters			
SR. NO.	TEST PARAMETERS	UNIT	MDL
1	Colour	Co-pt	2
2	pH	--	2
3	Temperature	°C	2
4	Total Suspended Solids	mg/L	2
5	Total Dissolved Solids	mg/L	10
6	COD	mg/L	3
7	BOD (3 Days @ 27 °C)	mg/L	1
8	Chloride as Cl	mg/L	1
9	Oil & Grease	mg/L	2
10	Sulphate as SO <sub>4</sub>	mg/L	1
11	Ammonical Nitrogen as NH <sub>3</sub>	mg/L	0.2
12	Phenolic Compound	mg/L	0.005
13	Copper as Cu	mg/L	0.01
14	Lead as Pb	mg/L	0.01
15	Sulphide as S	mg/L	0.1
16	Cadmium as Cd	mg/L	0.002
17	Fluoride as F	mg/L	0.05

**H. T. Shah****Lab Manager****Dr. Arun Bajpai****Lab Manager (Q)**



**POLLUCON** LABORATORIES PVT. LTD.

Environmental Auditors, Consultants & Analysts.  
Cleaner Production / Waste Minimization Facilitator

Recognised by MoEF, New Delhi Under Sec. 12 of Environmental (Protection) Act-1986

# "HALF YEARLY ENVIRONMENTAL MONITORING REPORT"

FOR

**adani**<sup>TM</sup>

**BORE HOLE WATER**  
**ADANI PORTS AND SPECIAL ECONOMIC ZONE LIMITED**  
**TAL: MUNDRA, KUTCH, MUNDRA – 370 421**

**MONITORING PERIOD:**  
**APRIL 2020 TO SEPTEMBER 2020**

PREPARED BY:

**Pollucon**

**POLLUCON LABORATORIES PVT.LTD.**

**PLOT NO.5/6 "POLLUCON HOUSE", OPP. BALAJI INDUSTRIAL SOCIETY,  
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**TC - 5945**

**ISO 9001:2015**

**ISO 14001:2015**

**OHSAS 18001:2007**



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**RESULTS OF BORE HOLE WATER**

SR. NO	TEST PARAMETERS	UNIT	RESULTS			TEST METHOD
			PUMP HOUSE-1	PUMP HOUSE-2	PUMP HOUSE-3	
	Sampling Date		15/07/2020	15/07/2020	15/07/2020	
1	pH	--	8.09	7.91	7.99	IS3025(P11)83Re.02
2	Salinity	ppt	4.80	2.1	2.4	APHA 2520B
3	Oil & Grease	mg/L	Not Detected	Not Detected	Not Detected	APHA(22ndEdi)5520D
4	Hydrocarbon	mg/L	Not Detected	Not Detected	Not Detected	GC/GC-MS
5	Lead as Pb	mg/L	0.039	0.041	0.031	AAS APHA(22ndEdi)3111 B
6	Arsenic as As	mg/L	Not Detected	Not Detected	Not Detected	AAS APHA 3114 B
7	Nickel as Ni	mg/L	Not Detected	Not Detected	Not Detected	AAS APHA(22ndEdi)3111 B
8	Total Chromium as Cr	mg/L	Not Detected	Not Detected	Not Detected	AAS 3111B
9	Cadmium as Cd	mg/L	Not Detected	Not Detected	0.029	AAS APHA(22ndEdi)3111 B
10	Mercury as Hg	mg/L	Not Detected	Not Detected	Not Detected	AAS APHA- 3112 B
11	Zinc as Zn	mg/L	Not Detected	0.55	0.29	AAS APHA(22ndEdi)3111 B
12	Copper as Cu	mg/L	Not Detected	Not Detected	Not Detected	AAS APHA(22ndEdi)3111 B
13	Iron as Fe	mg/L	0.35	3.1	2.95	AAS APHA(22ndEdi)3111 B
14	Insecticides/Pesticides	mg/L	Absent	Absent	Absent	GC/GC-MS
15	Depth of Water Level from Ground Level	meter	1.84	2	1.8	--


**H. T. Shah**
**Lab Manager**


**Dr. Arun Bajpai**
**Lab Manager (Q)**

SR. NO	TEST PARAMETERS	UNIT	RESULTS		TEST METHOD
			NEAR ETP OFFICE	NEAR CONTROL ROOM	
Sampling Date			15/07/2020	15/07/2020	
1	pH	--	8.01	7.89	IS3025(P11)83Re.02
2	Salinity	ppt	12.4	7.1	APHA 2520B
3	Oil & Grease	mg/L	Not Detected	Not Detected	APHA(22ndEdi)5520D
4	Hydrocarbon	mg/L	Not Detected	Not Detected	GC/GC-MS
5	Lead as Pb	mg/L	0.044	0.36	AAS APHA(22ndEdi)3111 B
6	Arsenic as As	mg/L	Not Detected	Not Detected	AAS APHA 3114 B
7	Nickel as Ni	mg/L	Not Detected	Not Detected	AAS APHA(22ndEdi)3111 B
8	Total Chromium as Cr	mg/L	Not Detected	Not Detected	AAS 3111B
9	Cadmium as Cd	mg/L	Not Detected	Not Detected	AAS APHA(22ndEdi)3111 B
10	Mercury as Hg	mg/L	Not Detected	Not Detected	AAS APHA- 3112 B
11	Zinc as Zn	mg/L	0.13	0.65	AAS APHA(22ndEdi)3111 B
12	Copper as Cu	mg/L	Not Detected	Not Detected	AAS APHA(22ndEdi)3111 B
13	Iron as Fe	mg/L	0.51	4.85	AAS APHA(22ndEdi)3111 B
14	Insecticides/Pesticides	mg/L	Absent	Absent	GC/GC-MS
15	Depth of Water Level from Ground Level	meter	2.1	2.05	--


**H. T. Shah**
**Lab Manager**


**Dr. Arun Bajpai**
**Lab Manager (Q)**

Borehole Water Parameters			
SR. NO.	TEST PARAMETERS	UNIT	MDL
1	pH	--	2
2	Salinity	mg/L	0.5
3	Oil & Grease	mg/L	2
4	Hydrocarbon	mg/L	0.01
5	Lead as Pb	mg/L	0.01
6	Arsenic as As	mg/L	0.001
7	Nickel as Ni	mg/L	0.02
8	Total Chromium as Cr	mg/L	0.025
9	Cadmium as Cd	mg/L	0.002
10	Mercury as Hg	mg/L	0.005
11	Zinc as Zn	mg/L	0.06
12	Copper as Cu	mg/L	0.01
13	Iron as Fe	mg/L	0.1
14	Insecticides/Pesticides	mg/L	0.1



H. T. Shah

Lab Manager




Dr. Arun Bajpai

Lab Manager (Q)



Recognised by MoEF New Delhi Under Sec. 12 of Environmental (Protection) Act-1986

# "HALF YEARLY ENVIRONMENTAL MONITORING REPORT"

**FOR**



**adani**<sup>TM</sup>

**WATER FRONT DEVELOPMENT PROJECT [WEST PORT]  
ADANI PORTS AND SPECIAL ECONOMIC ZONE LIMITED  
TAL: MUNDRA, KUTCH, MUNDRA – 370 421**

**MONITORING PERIOD:  
APRIL 2020 TO SEPTEMBER 2020**

**PREPARED BY:**



**Pollucon**

**POLLUCON LABORATORIES PVT.LTD.**

**PLOT NO.5/6 "POLLUCON HOUSE", OPP. BALAJI INDUSTRIAL SOCIETY,  
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**TC - 5945**

**ISO 9001:2015**

**ISO 14001:2015**

**OHSAS 18001:2007**

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**RESULTS OF STP WATER OUTLET**

SR NO	TEST PARAMETERS	Unit	West Basin STP Outlet					GPCB permissible Limit	TEST METHOD
			May-20		June-20				
			--	20/05/ 2020	04/06/ 2020	16/06/ 2020			
1	pH	--	--	7.29	7.65	7.42	<b>6.5 to 9.0</b>	IS3025(P11)83Re.02	
2	Total Suspended Solids	mg/L	--	11	14	10	<b>100</b>	IS3025(P17)84Re.02	
3	BOD (3 days @ 270 C)	mg/L	--	8.0	10	8.0	<b>30</b>	IS 3025 (P44)1993Re.03Edition2 .1	
4	Residual Chlorine	mg/L	--	0.8	0.5	0.8	--	APHA(22ndEdi)4500 Cl	
5	Fecal Coliform	MPN/10 0 ml	--	240	210	240	<b>1000</b>	APHA (22ndEdi) 9221 C&E	

SR NO	TEST PARAMETERS	Unit	West Basin STP Outlet						GPCB permissible Limit	TEST METHOD
			July-20		August-20		September-20			
			06/07/ 2020	16/07/ 2020	04/08/ 2020	--	05/09/ 2020	18/09/ 2020		
1	pH	--	7.63	7.36	7.84	--	7.11	7.79	<b>6.5 to 9.0</b>	IS3025(P11) 83Re.02
2	Total Suspended Solids	mg/L	16	14	21	--	16	18	<b>100</b>	IS3025(P17) 84Re.02
3	BOD (3 days @ 270 C)	mg/L	8	12.0	10	--	10	15	<b>30</b>	IS 3025 (P44)1993R e.03Edition2 .1
4	Residual Chlorine	mg/L	0.6	0.6	0.8	--	0.5	0.6	--	APHA(22ndE di)4500 Cl
5	Fecal Coliform	MPN/ 100 mL	220	280	240	--	320	250	<b>1000</b>	APHA (22ndEdi) 9221 C&E


**H. T. Shah**
**Lab Manager**


**Dr. Arun Bajpai**
**Lab Manager (Q)**

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**RESULT OF AMBIENT AIR QUALITY MONITORING**

WEST PORT – PMC OFFICE								
Sr. No.	Date of Sampling	Particulate Matter (PM10) µg/m <sup>3</sup>	Particulate Matter (PM2.5) 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>	Carbon Monoxide as (CO) mg/m <sup>3</sup>	Hydrocarbon as (CH <sub>4</sub> ) mg/m <sup>3</sup>	Benzene as (C <sub>6</sub> H <sub>6</sub> ) µg/m <sup>3</sup>
1	12/05/2020	83.51	43.66	19.51	20.52	0.72	ND*	ND*
2	14/05/2020	79.59	40.27	13.27	31.29	0.62	ND*	ND*
3	18/05/2020	92.37	47.25	16.46	35.46	0.53	ND*	ND*
4	20/05/2020	66.53	35.59	12.56	28.86	0.42	ND*	ND*
5	25/05/2020	75.69	41.57	15.18	24.35	0.73	ND*	ND*
6	27/05/2020	86.54	48.34	7.64	22.70	0.70	ND*	ND*
7	01/06/2020	73.57	32.58	20.24	33.64	0.42	ND*	ND*
8	04/06/2020	82.65	41.57	11.18	25.61	0.52	ND*	ND*
9	08/06/2020	90.28	48.55	14.62	20.62	0.69	ND*	ND*
10	11/06/2020	83.45	45.58	10.23	30.47	0.63	ND*	ND*
11	15/06/2020	69.66	30.65	12.37	27.28	0.89	ND*	ND*
12	18/06/2020	75.23	42.65	6.28	18.69	0.66	ND*	ND*
13	22/06/2020	86.26	46.38	17.23	35.46	0.57	ND*	ND*
14	25/06/2020	78.68	33.37	19.29	39.49	0.73	ND*	ND*
15	29/06/2020	89.30	37.55	15.65	32.48	0.36	ND*	ND*
16	02/07/2020	68.31	30.40	11.56	22.43	0.52	ND*	ND*
17	06/07/2020	74.34	38.47	20.50	30.64	0.45	ND*	ND*
18	09/07/2020	80.46	34.79	10.23	27.60	0.39	ND*	ND*
19	13/07/2020	65.68	36.34	12.51	21.56	0.70	ND*	ND*
20	16/07/2020	60.35	28.35	14.27	26.23	0.95	ND*	ND*
21	20/07/2020	82.63	41.65	16.19	32.41	0.71	ND*	ND*
22	23/07/2020	77.26	37.51	9.60	17.53	0.61	ND*	ND*
23	27/07/2020	85.21	44.28	15.66	35.32	0.84	ND*	ND*
24	30/07/2020	79.97	35.63	18.21	38.46	0.76	ND*	ND*
25	03/08/2020	69.34	35.34	17.50	32.46	0.57	ND*	ND*
26	06/08/2020	61.56	26.85	10.22	27.59	0.69	ND*	ND*
27	10/08/2020	56.32	24.50	14.27	24.39	0.82	ND*	ND*
28	20/08/2020	70.28	39.31	19.23	34.54	0.66	ND*	ND*
29	24/08/2020	66.24	34.50	13.42	30.25	0.53	ND*	ND*
30	27/08/2020	57.25	25.68	11.27	18.55	0.64	ND*	ND*

Continue...



H. T. Shah

Lab Manager




Dr. Arun Bajpai

Lab Manager (Q)





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WEST PORT – PMC OFFICE								
Sr. No.	Date of Sampling	Particulate Matter (PM10) µg/m3	Particulate Matter (PM2.5) µg/m3	Sulphur Dioxide (SO2) µg/m3	Oxides of Nitrogen (NO2) µg/m3	Carbon Monoxide as (CO) mg/m3	Hydrocarbon as (CH4) mg/m3	Benzene as (C6H6) µg/m3
31	31/08/2020	68.37	38.35	16.37	33.46	0.76	ND*	ND*
32	03/09/2020	66.23	29.44	19.59	34.28	0.86	ND*	ND*
33	07/09/2020	79.38	45.32	21.25	39.26	0.71	ND*	ND*
34	10/09/2020	68.28	32.44	15.59	30.25	0.56	ND*	ND*
35	14/09/2020	61.56	27.56	22.49	36.51	0.77	ND*	ND*
36	17/09/2020	74.52	40.24	16.43	28.47	0.82	ND*	ND*
37	21/09/2020	81.25	37.65	13.56	35.66	0.53	ND*	ND*
38	24/09/2020	60.42	26.44	20.46	26.46	0.40	ND*	ND*
39	28/09/2020	77.53	43.53	18.57	38.47	0.62	ND*	ND*
<b>LIMIT#</b>		<b>100</b>	<b>60</b>	<b>80</b>	<b>80</b>	<b>4</b>	<b>Not Specified</b>	<b>5</b>
	<b>TEST METHOD</b>	IS:5182 (Part 23):Gravimetric CPCB - Method (Vol.I,May-2011)	Gravimetric-CPCB - Method (Vol.I,May-2011)	IS:5182(Part II):Improved West and Gaeke	IS:5182(Part VI):Modified Jacob &Hochheiser (NaOH-NaAsO2)	NDIR Digital Gas Analyzer	SOP: HC: GC/GCMS/Gas analyzer	IS 5182 (Part XI):2006/CPCB Method

\*Not Detected

#: Industrial, Residential, Rural and other Area Notification Dated 16th Nov.2009 as per national Ambient Air Quality Standards, CPCB New Delhi.

**H. T. Shah****Lab Manager****Dr. Arun Bajpai****Lab Manager (Q)**

Recognised by MoEF, New Delhi Under Sec. 12 of Environmental (Protection) Act-1986

WEST PORT - HORTI CULTURE CABIN								
Sr. No.	Date of Sampling	Particulate Matter (PM10) µg/m <sup>3</sup>	Particulate Matter (PM2.5) 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>	Carbon Monoxide as (CO) mg/m <sup>3</sup>	Hydrocarbons as (CH <sub>4</sub> ) mg/m <sup>3</sup>	Benzene as (C <sub>6</sub> H <sub>6</sub> ) µg/m <sup>3</sup>
1	12/05/2020	58.45	26.22	12.51	16.38	0.46	ND*	ND*
2	14/05/2020	90.29	31.53	19.47	23.49	0.92	ND*	ND*
3	18/05/2020	53.68	19.47	21.60	42.62	0.56	ND*	ND*
4	20/05/2020	71.50	40.24	23.47	24.54	0.36	ND*	ND*
5	25/05/2020	63.44	35.86	8.52	28.35	0.85	ND*	ND*
6	27/05/2020	78.52	38.41	15.40	18.23	0.95	ND*	ND*
7	01/06/2020	68.66	29.48	13.52	26.32	0.81	ND*	ND*
8	04/06/2020	52.68	27.56	8.64	19.53	0.62	ND*	ND*
9	08/06/2020	60.48	32.40	6.41	15.30	0.74	ND*	ND*
10	11/06/2020	75.30	41.24	14.52	21.53	0.56	ND*	ND*
11	15/06/2020	62.70	25.35	9.59	17.60	0.64	ND*	ND*
12	18/06/2020	53.66	28.65	11.29	24.30	0.80	ND*	ND*
13	22/06/2020	64.60	35.40	7.59	29.27	0.49	ND*	ND*
14	25/06/2020	58.64	26.48	15.26	22.55	0.34	ND*	ND*
15	29/06/2020	76.71	34.24	10.58	25.25	0.30	ND*	ND*
16	02/07/2020	59.34	27.36	9.60	17.65	0.66	ND*	ND*
17	06/07/2020	46.31	24.23	16.27	23.22	0.82	ND*	ND*
18	09/07/2020	67.65	30.65	8.63	20.25	0.55	ND*	ND*
19	13/07/2020	49.38	26.31	6.30	15.36	0.63	ND*	ND*
20	16/07/2020	56.31	23.69	12.32	19.36	0.53	ND*	ND*
21	20/07/2020	76.54	32.48	10.23	26.33	0.77	ND*	ND*
22	23/07/2020	68.66	28.65	13.47	21.28	0.68	ND*	ND*
23	27/07/2020	51.61	22.23	11.58	18.68	0.49	ND*	ND*
24	30/07/2020	60.24	29.32	15.63	33.48	0.40	ND*	ND*
25	03/08/2020	63.22	21.26	10.20	20.56	0.32	ND*	ND*
26	06/08/2020	56.34	23.48	8.66	15.38	0.62	ND*	ND*
27	10/08/2020	48.34	20.56	11.87	19.23	0.47	ND*	ND*
28	20/08/2020	59.22	34.57	13.39	22.34	0.58	ND*	ND*
29	24/08/2020	70.31	37.61	9.36	28.67	0.71	ND*	ND*
30	27/08/2020	44.29	16.51	6.57	13.69	0.56	ND*	ND*

Continue...



H. T. Shah

Lab Manager




Dr. Arun Bajpai

Lab Manager (Q)

Recognised by MoEF, New Delhi Under Sec. 12 of Environmental (Protection) Act-1986

WEST PORT - HORTI CULTURE CABIN								
Sr. No.	Date of Sampling	Particulate Matter (PM10) µg/m3	Particulate Matter (PM2.5) µg/m3	Sulphur Dioxide (SO2) µg/m3	Oxides of Nitrogen (NO2) µg/m3	Carbon Monoxide as (CO) mg/m3	Hydrocarbon as (CH4) mg/m3	Benzene as (C6H6) µg/m3
31	31/08/2020	54.32	24.52	12.59	29.32	0.37	ND*	ND*
32	03/09/2020	55.66	19.35	12.50	24.25	0.77	ND*	ND*
33	07/09/2020	66.41	38.20	15.63	30.47	0.46	ND*	ND*
34	10/09/2020	59.44	27.56	13.68	22.66	0.50	ND*	ND*
35	14/09/2020	52.34	20.27	17.49	31.57	0.44	ND*	ND*
36	17/09/2020	69.53	24.52	8.70	24.58	0.60	ND*	ND*
37	21/09/2020	76.76	42.62	10.68	32.37	0.37	ND*	ND*
38	24/09/2020	68.32	31.61	18.32	19.54	0.25	ND*	ND*
39	28/09/2020	58.64	28.44	14.51	33.51	0.49	ND*	ND*
<b>LIMIT#</b>		<b>100</b>	<b>60</b>	<b>80</b>	<b>80</b>	<b>4</b>	<b>Not Specified</b>	<b>5</b>
	<b>TEST METHOD</b>	IS:5182 (Part 23):Gravimetric CPCB - Method (Vol.I,May-2011)	Gravimetric-CPCB - Method (Vol.I,May-2011)	IS:5182(Part II):Improved West and Gaeke	IS:5182(Part VI):Modified Jacob &Hochheiser (NaOH-NaAsO2)	NDIR Digital Gas Analyzer	SOP: HC: GC/GCMS/Gas analyzer	IS 5182 (Part XI):2006/CPCB Method

\*Not Detected

#: Industrial, Residential, Rural and other Area Notification Dated 16th Nov.2009 as per national Ambient Air Quality Standards, CPCB New Delhi.


**H. T. Shah**
**Lab Manager**


**Dr. Arun Bajpai**
**Lab Manager (Q)**



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WEST PORT - WEST BASIN STP								
Sr. No.	Date of Sampling	Particulate Matter (PM10) µg/m <sup>3</sup>	Particulate Matter (PM2.5) 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>	Carbon Monoxide as (CO) mg/m <sup>3</sup>	Hydrocarbons as (CH <sub>4</sub> ) mg/m <sup>3</sup>	Benzene as (C <sub>6</sub> H <sub>6</sub> ) µg/m <sup>3</sup>
1	12/05/2020	66.57	23.47	15.37	28.32	0.77	ND*	ND*
2	14/05/2020	84.31	35.69	25.60	41.22	0.47	ND*	ND*
3	18/05/2020	70.52	43.57	13.51	32.65	0.93	ND*	ND*
4	20/05/2020	76.23	32.40	16.27	25.30	0.64	ND*	ND*
5	25/05/2020	51.25	28.39	12.72	19.58	0.61	ND*	ND*
6	27/05/2020	69.37	25.43	14.27	31.47	0.90	ND*	ND*
7	01/06/2020	84.30	35.57	18.49	30.50	0.94	ND*	ND*
8	04/06/2020	63.76	38.49	6.53	15.66	0.78	ND*	ND*
9	08/06/2020	78.38	42.36	12.63	24.20	0.85	ND*	ND*
10	11/06/2020	89.60	50.29	8.86	19.55	0.71	ND*	ND*
11	15/06/2020	72.66	34.52	14.58	22.65	0.82	ND*	ND*
12	18/06/2020	65.21	32.52	16.51	29.41	0.98	ND*	ND*
13	22/06/2020	76.30	39.44	13.60	34.42	0.87	ND*	ND*
14	25/06/2020	86.24	36.53	11.24	32.68	0.60	ND*	ND*
15	29/06/2020	61.22	27.52	17.48	28.45	0.77	ND*	ND*
16	02/07/2020	76.93	32.44	7.19	15.27	0.80	ND*	ND*
17	06/07/2020	62.61	35.61	18.27	27.67	0.97	ND*	ND*
18	09/07/2020	57.37	25.31	6.55	25.47	0.92	ND*	ND*
19	13/07/2020	60.23	29.48	14.29	18.33	0.85	ND*	ND*
20	16/07/2020	67.55	33.44	16.26	23.45	0.74	ND*	ND*
21	20/07/2020	70.54	36.32	12.19	28.27	0.87	ND*	ND*
22	23/07/2020	84.21	45.37	17.57	36.25	0.78	ND*	ND*
23	27/07/2020	77.25	34.23	19.22	26.26	0.88	ND*	ND*
24	30/07/2020	69.52	39.44	13.59	30.21	0.65	ND*	ND*
25	03/08/2020	74.24	41.57	13.37	24.21	0.63	ND*	ND*
26	06/08/2020	69.33	30.56	6.28	13.51	0.74	ND*	ND*
27	10/08/2020	62.46	27.56	15.29	22.33	0.72	ND*	ND*
28	20/08/2020	75.61	43.61	17.54	31.30	0.73	ND*	ND*
29	24/08/2020	61.35	32.44	11.25	25.34	0.84	ND*	ND*
30	27/08/2020	52.69	22.43	14.25	15.64	0.77	ND*	ND*

Continue...



H. T. Shah

Lab Manager




Dr. Arun Bajpai

Lab Manager (Q)



Recognised by MoEF, New Delhi Under Sec. 12 of Environmental (Protection) Act-1986

WEST PORT - WEST BASIN STP								
Sr. No.	Date of Sampling	Particulate Matter (PM10) µg/m <sup>3</sup>	Particulate Matter (PM2.5) 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>	Carbon Monoxide as (CO) mg/m <sup>3</sup>	Hydrocarbon as (CH <sub>4</sub> ) mg/m <sup>3</sup>	Benzene as (C <sub>6</sub> H <sub>6</sub> ) µg/m <sup>3</sup>
31	31/08/2020	64.27	33.44	10.26	26.56	0.61	ND*	ND*
32	03/09/2020	60.29	25.42	15.30	27.55	0.98	ND*	ND*
33	07/09/2020	86.22	48.47	17.57	35.52	0.85	ND*	ND*
34	10/09/2020	78.31	35.54	10.33	18.56	0.64	ND*	ND*
35	14/09/2020	68.63	30.44	14.35	26.53	0.81	ND*	ND*
36	17/09/2020	55.32	20.53	18.25	22.70	0.94	ND*	ND*
37	21/09/2020	87.62	34.54	12.19	29.54	0.63	ND*	ND*
38	24/09/2020	54.22	22.58	16.46	23.29	0.54	ND*	ND*
39	28/09/2020	71.58	37.55	11.68	19.50	0.78	ND*	ND*
<b>LIMIT<sup>#</sup></b>		<b>100</b>	<b>60</b>	<b>80</b>	<b>80</b>	<b>4</b>	<b>Not Specified</b>	<b>5</b>
	<b>TEST METHOD</b>	IS:5182(Part 23):Gravimetric CPCB - Method (Vol.I,May-2011)	Gravimetric-CPCB - Method (Vol.I,May-2011)	IS:5182 (Part II):Improved West and Gaeke	IS:5182 (Part VI):Modified Jacob &Hochheiser (NaOH-NaAsO <sub>2</sub> )	NDIR Digital Gas Analyzer	SOP: HC: GC/GCMS/ Gas analyzer	IS 5182 (Part XI):2006/CPC B Method

\*Not Detected

#: Industrial, Residential, Rural and other Area Notification Dated 16th Nov.2009 as per national Ambient Air Quality Standards, CPCB New Delhi.

**H. T. Shah****Lab Manager****Dr. Arun Bajpai****Lab Manager (Q)**

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**RESULTS OF NOISE LEVEL MONITORING**
**Result of Noise level monitoring [Day Time]**

SR. NO.	Name of Location	WEST PORT - PMC OFFICE				
		Result [Leq dB(A)]				
	Sampling Date & Time	14/05/2020	25/06/2020	23/07/2020	13/08/2020	03/09/2020
1	6:00-7:00	64.2	61.9	67.4	62.4	63.1
2	7:00-8:00	62.1	65.3	62.5	68.4	61.2
3	8:00-9:00	67.4	69.2	64.8	65.5	66.8
4	9:00-10:00	69.3	62.1	65.5	69.8	68.2
5	10:00-11:00	71.3	69.1	62.1	65.5	70.5
6	11:00-12:00	73.2	71.4	61.3	60.1	69.8
7	12:00-13:00	68.5	65.1	63.8	63.7	62.4
8	13:00-14:00	64.2	62.3	64.7	68.4	68.5
9	14:00-15:00	62.6	61.8	65.5	65.8	62.4
10	15:00-16:00	67.4	65.1	62.8	67.4	64.8
11	16:00-17:00	66.2	62.2	64.9	69.4	62.7
12	17:00-18:00	62.2	68.2	68.4	66.1	69.9
13	18:00-19:00	65.4	63.1	69.2	62.4	63.5
14	19:00-20:00	68.4	65.7	65.1	65.5	64.1
15	20:00-21:00	68.1	61.4	69.9	62.1	62.1
16	21:00-22:00	64.1	66.8	67.4	64.8	61.8
<b>Day Time Limit*</b>		<b>75 Leq dB(A)</b>				

**Result of Noise level monitoring [Night Time]**

SR. NO.	Name of Location	WEST PORT - PMC OFFICE				
		Result [Leq dB(A)]				
	Sampling Date & Time	14/05/2020	25/06/2020	23/07/2020	13/08/2020	03/09/2020
1	22:00-23:00	66.3	65.7	68.4	65.7	60.2
2	23:00-00:00	64.2	66.9	65.2	62.8	61.5
3	00:00-01:00	69.3	63.4	63.1	61.4	64.2
4	01:00-02:00	64.2	61.9	60.4	63.8	62.8
5	02:00-03:00	60.2	62.4	67.4	61.0	61.2
6	03:00-04:00	66.2	63.8	64.2	65.4	68.4
7	04:00-05:00	64.1	60.4	62.3	61.8	64.7
8	05:00-06:00	62.4	65.1	61.8	63.7	61.8
<b>Night Time Limit*</b>		<b>70 Leq dB(A)</b>				



H. T. Shah

Lab Manager




Dr. Arun Bajpai

Lab Manager (Q)



Recognised by MoEF, New Delhi Under Sec. 12 of Environmental (Protection) Act-1986

**Result of Noise level monitoring [Day Time]**

SR. NO.	Name of Location	WEST PORT - HORTI CULTURE CABIN				
		Result [Leq dB(A)]				
		Sampling Date & Time	12/05/2020	04/06/2020	16/07/2020	17/08/2020
1	6:00-7:00	59.3	59.2	58.4	63.1	62.4
2	7:00-8:00	64.3	63.1	62.4	62.8	65.5
3	8:00-9:00	62.2	61.8	63.1	62.7	69.1
4	9:00-10:00	65.7	66.9	68.4	60.4	66.7
5	10:00-11:00	68.4	69.7	65.7	63.7	65.1
6	11:00-12:00	64.3	71.5	64.1	64.4	62.3
7	12:00-13:00	69.9	68.7	60.5	68.1	68.8
8	13:00-14:00	65.4	65.4	62.9	62.4	67.5
9	14:00-15:00	64.3	69.1	67.7	69.1	65.1
10	15:00-16:00	62.2	62.4	68.2	63.4	62.2
11	16:00-17:00	68.3	68.7	64.1	66.8	68.5
12	17:00-18:00	65.5	64.1	60.4	70.1	63.1
13	18:00-19:00	68.5	62.8	62.1	68.1	61.8
14	19:00-20:00	63.2	64.3	65.8	65.2	69.9
15	20:00-21:00	61.4	60.1	63.1	64.1	70.1
16	21:00-22:00	60.3	62.7	64.4	62.8	62.4
<b>Day Time Limit*</b>		<b>75 Leq dB(A)</b>				

**Result of Noise level monitoring [Night Time]**

SR. NO.	Name of Location	WEST PORT - HORTI CULTURE CABIN				
		Result [Leq dB(A)]				
		Sampling Date & Time	12/05/2020	04/06/2020	16/07/2020	17/08/2020
1	22:00-23:00	65.3	63.4	62.4	62.1	62.7
2	23:00-00:00	60.1	65.4	65.1	60.4	68.4
3	00:00-01:00	58.3	62.8	60.4	58.4	65.4
4	01:00-02:00	63.2	59.4	60.8	56.1	68.4
5	02:00-03:00	66.2	60.6	58.4	60.4	63.4
6	03:00-04:00	62.4	63.4	59.4	62.7	61.5
7	04:00-05:00	66.4	61.4	65.5	60.8	67.1
8	05:00-06:00	64.8	63.4	61.7	61.8	63.4
<b>Night Time Limit*</b>		<b>70 Leq dB(A)</b>				


**H. T. Shah**
**Lab Manager**


**Dr. Arun Bajpai**
**Lab Manager (Q)**

Recognised by MoEF, New Delhi Under Sec. 12 of Environmental (Protection) Act-1986

**Result of Noise level monitoring [Day Time]**

SR. NO.	Name of Location	WEST PORT - WEST BASIN STP				
		Result [Leq dB(A)]				
	Sampling Date & Time	25/05/2020	15/06/2020	20/07/2020	06/08/2020	21/09/2020
1	6:00-7:00	63.2	60.4	63.4	63.4	68.7
2	7:00-8:00	67.3	65.4	68.1	68.8	71.4
3	8:00-9:00	69.3	68.1	62.7	62.1	65.4
4	9:00-10:00	65.4	61.8	65.5	70.1	69.1
5	10:00-11:00	73.2	70.6	70.6	69.4	62.4
6	11:00-12:00	68.3	68.3	68.8	72.1	68.1
7	12:00-13:00	61.3	65.1	72.1	65.2	61.9
8	13:00-14:00	66.3	62.9	65.4	62.1	60.5
9	14:00-15:00	62.4	66.7	69.2	66.8	68.8
10	15:00-16:00	68.8	63.1	60.4	67.1	65.2
11	16:00-17:00	68.2	61.9	65.3	69.9	63.1
12	17:00-18:00	65.2	62.2	63.7	73.4	61.9
13	18:00-19:00	64.2	68.8	61.7	62.4	68.8
14	19:00-20:00	69.4	63.4	68.4	60.5	62.1
15	20:00-21:00	65.5	65.5	67.5	63.1	63.4
16	21:00-22:00	62.2	61.8	66.2	65.4	65.7
<b>Day Time Limit*</b>		<b>75 Leq dB(A)</b>				

**Result of Noise level monitoring [Night Time]**

SR. NO.	Name of Location	WEST PORT - WEST BASIN STP				
		Result [Leq dB(A)]				
	Sampling Date & Time	25/05/2020	15/06/2020	20/07/2020	06/08/2020	21/09/2020
1	22:00-23:00	64.2	62.7	65.8	65.7	65.1
2	23:00-00:00	62.1	66.1	62.4	63.8	63.8
3	00:00-01:00	65.3	63.4	60.1	62.8	67.4
4	01:00-02:00	68.4	68.4	63.4	64.1	65.1
5	02:00-03:00	65.2	62.8	68.4	69.4	68.1
6	03:00-04:00	69.6	60.4	66.1	67.0	64.2
7	04:00-05:00	66.3	63.8	67.1	68.1	62.8
8	05:00-06:00	62.2	65.5	62.4	62.4	66.1
<b>Night Time Limit*</b>		<b>70 Leq dB(A)</b>				



H. T. Shah

Lab Manager




Dr. Arun Bajpai

Lab Manager (Q)



Recognised by MoEF New Delhi Under Sec. 12 of Environmental (Protection) Act-1986

**RESULTS OF D.G. STACK MONITORING**

17/06/2020						
SR. NO.	TEST PARAMETERS	Unit	West Basin		GPCB Limit	Test Method
			D.G. Set-1 (1500 KVA)	D.G. Set-2 (1500 KVA)		
1	Particulate Matter	mg/Nm <sup>3</sup>	21.83	22.74	150	IS:11255 (Part-I):1985
2	Sulphur Dioxide	ppm	6.24	4.77	100	IS:11255 (Part-II):1985
3	Oxide of Nitrogen	ppm	35.62	33.80	50	IS:11255 (Part-VII):2005

\*DG sets are used as standby, so stack monitoring is done on quarterly basis. Results on 15 % O2 Correction when Oxygen is greater than 15 %

H. T. Shah

Lab Manager



Dr. Arun Bajpai

Lab Manager (Q)





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**MINIMUM DETECTION LIMIT [MDL]**

Ambient Air Parameter		
Sr. No.	Test parameter	MDL
1	Particulate Matter (PM10) ( $\mu\text{g}/\text{m}^3$ )	10
2	Particulate Matter (PM 2.5) ( $\mu\text{g}/\text{m}^3$ )	10
3	Sulphur Dioxide ( $\text{SO}_2$ ) ( $\mu\text{g}/\text{m}^3$ )	5
4	Oxides of Nitrogen ( $\mu\text{g}/\text{m}^3$ )	5
5	Carbon Monoxide as CO ( $\text{mg}/\text{m}^3$ )	0.1
6	Hydrocarbon as $\text{CH}_4$ ( $\mu\text{g}/\text{m}^3$ )	150
7	Benzene as $\text{C}_6\text{H}_6$ ( $\text{mg}/\text{m}^3$ )	2

STP Water parameter (mg/L)		
Sr. No.	Test parameter	MDL
1	pH	2
2	Total Suspended Solids (mg/L)	2
3	BOD (3 days @ 270 C) (mg/L)	1
4	Residual Chlorine (mg/L)	0.2
5	Fecal Coliform (MPN INDEX/100 mL)	1.8

Stack Parameters		
Sr.No.	Test Parameter	MDL
1	Particulate Matter ( $\text{mg}/\text{Nm}^3$ )	10
2	Sulphur Dioxide (ppm)	1.52
3	Oxides of Nitrogen (ppm)	2.65
4	Carbon Monoxide ( $\text{mg}/\text{Nm}^3$ )	0.1
5	Haydro Carbon NMHC (ppm)	1.0

H. T. Shah

Lab Manager



Dr. Arun Bajpai

Lab Manager (Q)

**Monthly Average Report**  
**Ambient Air Quality Monitoring**

**Name and Address of Client** : M/s. Adani Power (Mundra) Ltd.  
Village: Tunda & Siracha,  
Tal. Mundra, Dist.: Kutch.  
GUJARAT – 370 435.

**Month of Monitoring** : April - 2020

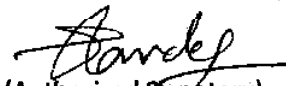
**Name of Location** : Village - Siracha

**ID No.** : URA/ID/A-20/04/001

Sr. No.	Sampling Date	Concentration in Ambient Air ( $\mu\text{g}/\text{m}^3$ )					
		PM <sub>10</sub> $\mu\text{g}/\text{M}^3$	PM <sub>2.5</sub> $\mu\text{g}/\text{M}^3$	Sulphur Dioxide (SO <sub>2</sub> ) $\mu\text{g}/\text{M}^3$	Nitrogen Dioxide (NO <sub>2</sub> ) $\mu\text{g}/\text{M}^3$	Ozone (O <sub>3</sub> ) $\mu\text{g}/\text{M}^3$	Mercury (Hg) $\mu\text{g}/\text{M}^3$
GPCB Permissible Limit (TWA for 24 hrs.)		100	60	80	80	100	N.A.
1.	07/04/2020	62.1	24.8	14.7	20.3	13.8	BDL
<b>Average</b>		<b>62.1</b>	<b>24.8</b>	<b>14.7</b>	<b>20.3</b>		--

**Analysis Method Reference:** SPM - IS: 5182 (Part 4), 1999, PM<sub>10</sub> - IS: 5182 (Part 23), 2006, PM<sub>2.5</sub>- Guidelines by CPCB (Vol-1), SO<sub>2</sub> - IS: 5182 (Part 2), 2001, NO<sub>x</sub> - IS: 5182 (Part 6), 2006, Hg:AAS by VGA Method -3112 B APHA 22 Edison&Hg: 2 ppb O<sub>3</sub>: IS – 5182 (Part 9) 2009 Ozone BDL limit: 5  $\mu\text{g}/\text{m}^3$

**UniStar Environment &  
Research Labs Pvt. Ltd.**

  
(Authorized Signatory)

**Monthly Average Report**  
**Ambient Air Quality Monitoring**

**Name and Address of Client** : M/s. Adani Power (Mundra) Ltd.  
Village: Tunda & Siracha,  
Tal. Mundra, Dist.: Kutch.  
GUJARAT – 370 435.

**Month of Monitoring** : April - 2020

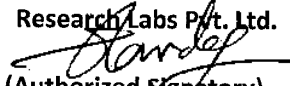
**Name of Location** : Village - Kandagara

**ID No.** : URA/ID/A-20/04/002

Sr. No.	Sampling Date	Concentration in Ambient Air ( $\mu\text{g}/\text{m}^3$ )					
		PM <sub>10</sub> $\mu\text{g}/\text{M}^3$	PM <sub>2.5</sub> $\mu\text{g}/\text{M}^3$	Sulphur Dioxide (SO <sub>2</sub> ) $\mu\text{g}/\text{M}^3$	Nitrogen Dioxide (NO <sub>2</sub> ) $\mu\text{g}/\text{M}^3$	Ozone (O <sub>3</sub> ) $\mu\text{g}/\text{M}^3$	Mercury (Hg) $\mu\text{g}/\text{M}^3$
GPCB Permissible Limit (TWA for 24 hrs.)		100	60	80	80	100	N.A.
1.	07/04/2020	66.4	27.6	14.8	22.6	18.6	BDL
<b>Average</b>		<b>66.4</b>	<b>27.6</b>	<b>14.8</b>	<b>22.6</b>		--

**Remark:** Calibrated equipment & instruments were used during monitoring & analysis of above identified sample.

**Analysis Method Reference:** SPM– IS: 5182 (Part 4), 1999, PM<sub>10</sub>– IS: 5182 (Part 23), 2006, PM<sub>2.5</sub>- Guidelines by CPCB (Vol-1), SO<sub>2</sub>– IS: 5182 (Part 2), 2001, NO<sub>x</sub>– IS: 5182 (Part 6), 2006, Hg:AAS by VGA Method -3112 B APHA 22 Edison&Hg: 2 ppb O<sub>3</sub>: IS – 5182 (Part 9) 2009Ozone BDL limit: 5  $\mu\text{g}/\text{m}^3$

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**Monthly Average Report**  
**Ambient Air Quality Monitoring**

**Name and Address of Client :** M/s. Adani Power (Mundra) Ltd.  
Village:Tunda&Siracha,  
Tal. Mundra, Dist.: Kutch.  
GUJARAT – 370 435.

**Month of Monitoring :** April - 2020

**Name of Location :** Village - Wandh

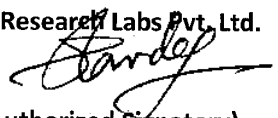
**ID No. :** URA/ID/A-20/04/003

Sr. No.	Sampling Date	Concentration in Ambient Air ( $\mu\text{g}/\text{m}^3$ )					
		PM <sub>10</sub> $\mu\text{g}/\text{M}^3$	PM <sub>2.5</sub> $\mu\text{g}/\text{M}^3$	Sulphur Dioxide (SO <sub>2</sub> ) $\mu\text{g}/\text{M}^3$	Nitrogen Dioxide (NO <sub>2</sub> ) $\mu\text{g}/\text{M}^3$	Ozone (O <sub>3</sub> ) $\mu\text{g}/\text{M}^3$	Mercury (Hg) $\mu\text{g}/\text{M}^3$
GPCB Permissible Limit (TWA for 24 hrs.)		100	60	80	80	100	N.A.
1.	07/04/2020	69.3	30.8	17.3	22.9	20.3	BDL
<b>Average</b>		<b>69.3</b>	<b>30.8</b>	<b>17.3</b>	<b>22.9</b>		--

**Remark:** Calibrated equipment & instruments were used during monitoring & analysis of above identified sample.

**Analysis Method Reference:** SPM - IS: 5182 (Part 4), 1999, PM<sub>10</sub> - IS: 5182 (Part 23), 2006, PM<sub>2.5</sub>- Guidelines by CPCB (Vol-1), SO<sub>2</sub> - IS: 5182 (Part 2), 2001, NO<sub>x</sub> - IS: 5182 (Part 6), 2006, Hg:AAS by VGA Method -3112 B APHA 22 Edison&Hg: 2 ppb O<sub>3</sub>: IS – 5182 (Part 9) 2009Ozone BDL limit: 5  $\mu\text{g}/\text{m}^3$

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**Monthly Average Report**  
**Ambient Air Quality Monitoring**

**Name and Address of Client** : M/s. Adani Power (Mundra) Ltd.  
Village: Tunda & Siracha,  
Tal. Mundra, Dist.: Kutch.  
GUJARAT – 370 435.

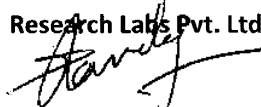
**Month of Monitoring** : May - 2020

**Name of Location** : Village - Siracha

**ID No.** : URA/ID/A-20/05/001

Sr. No.	Sampling Date	Concentration in Ambient Air ( $\mu\text{g}/\text{m}^3$ )					
		PM <sub>10</sub> $\mu\text{g}/\text{M}^3$	PM <sub>2.5</sub> $\mu\text{g}/\text{M}^3$	Sulphur Dioxide (SO <sub>2</sub> ) $\mu\text{g}/\text{M}^3$	Nitrogen Dioxide (NO <sub>2</sub> ) $\mu\text{g}/\text{M}^3$	Ozone (O <sub>3</sub> ) $\mu\text{g}/\text{M}^3$	Mercury (Hg) $\mu\text{g}/\text{M}^3$
GPCB Permissible Limit (TWA for 24 hrs.)		100	60	80	80	100	N.A.
1.	19/05/2020	66.5	25.4	11.2	21.3		--
2.	22/05/2020	75.7	31.2	16.1	23.8		--
3.	26/05/2020	71.9	26.9	12.4	19.7	18.3	BDL
4.	29/05/2020	59.4	23.3	13.2	20.4		--
<b>Average</b>		<b>68.4</b>	<b>26.7</b>	<b>13.2</b>	<b>21.3</b>		--

**Analysis Method Reference:** SPM - IS: 5182 (Part 4), 1999, PM<sub>10</sub> - IS: 5182 (Part 23), 2006, PM<sub>2.5</sub>- Guidelines by CPCB (Vol-1), SO<sub>2</sub> - IS: 5182 (Part 2), 2001, NO<sub>x</sub> - IS: 5182 (Part 6), 2006, Hg:AAS by VGA Method -3112 B APHA 22 Edison&Hg: 2 ppb O<sub>3</sub>: IS – 5182 (Part 9) 2009 Ozone BDL limit: 5  $\mu\text{g}/\text{m}^3$

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MoEF&CC (GOI) Recognized Environmental Laboratory under the EPA-1986 (12.01.2020 to 17.03.2023)

QCI-NABET Accredited EIA Consultant Organization

GPCB Recognized Environmental Auditor (Schedule-II)

ISO 9001:2015 Certified Company

ISO 45001:2018 Certified Company

**Monthly Average Report**  
**Ambient Air Quality Monitoring**

**Name and Address of Client** : M/s. Adani Power (Mundra) Ltd.  
Village: Tunda & Siracha,  
Tal. Mundra, Dist.: Kutch.  
GUJARAT – 370 435.

**Month of Monitoring** : May - 2020

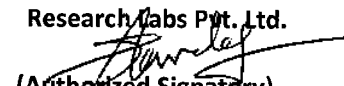
**Name of Location** : Village - Kandagara

**ID No.** : URA/ID/A-20/05/002

Sr. No.	Sampling Date	Concentration in Ambient Air ( $\mu\text{g}/\text{m}^3$ )					
		PM <sub>10</sub> $\mu\text{g}/\text{M}^3$	PM <sub>2.5</sub> $\mu\text{g}/\text{M}^3$	Sulphur Dioxide (SO <sub>2</sub> ) $\mu\text{g}/\text{M}^3$	Nitrogen Dioxide (NO <sub>2</sub> ) $\mu\text{g}/\text{M}^3$	Ozone (O <sub>3</sub> ) $\mu\text{g}/\text{M}^3$	Mercury (Hg) $\mu\text{g}/\text{M}^3$
GPCB Permissible Limit (TWA for 24 hrs.)		100	60	80	80	100	N.A.
1.	19/05/2020	61.3	23.6	13.9	21.2		--
2.	22/05/2020	74.3	30.9	14.2	20.2		--
3.	26/05/2020	76.7	32.6	14.8	22.6	17.4	BDL
4.	29/05/2020	65.9	27.7	11.7	18.5		--
<b>Average</b>		<b>69.5</b>	<b>28.7</b>	<b>13.7</b>	<b>20.6</b>		--

**Remark:** Calibrated equipment & instruments were used during monitoring & analysis of above identified sample.

**Analysis Method Reference:** SPM– IS: 5182 (Part 4), 1999, PM<sub>10</sub>– IS: 5182 (Part 23), 2006, PM<sub>2.5</sub>– Guidelines by CPCB (Vol-1), SO<sub>2</sub>– IS: 5182 (Part 2), 2001, NO<sub>x</sub>– IS: 5182 (Part 6), 2006, Hg:AAS by VGA Method -3112 B APHA 22 Edison&Hg: 2 ppb O<sub>3</sub>: IS – 5182 (Part 9) 2009Ozone BDL limit: 5  $\mu\text{g}/\text{m}^3$

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**Monthly Average Report**  
**Ambient Air Quality Monitoring**

**Name and Address of Client** : M/s. Adani Power (Mundra) Ltd.  
Village:Tunda&Siracha,  
Tal. Mundra, Dist.: Kutch.  
GUJARAT – 370 435.

**Month of Monitoring** : May - 2020

**Name of Location** : Village - Wandh

**ID No.** : URA/ID/A-20/05/003

Sr. No.	Sampling Date	Concentration in Ambient Air ( $\mu\text{g}/\text{m}^3$ )					
		PM <sub>10</sub> $\mu\text{g}/\text{M}^3$	PM <sub>2.5</sub> $\mu\text{g}/\text{M}^3$	Sulphur Dioxide (SO <sub>2</sub> ) $\mu\text{g}/\text{M}^3$	Nitrogen Dioxide (NO <sub>2</sub> ) $\mu\text{g}/\text{M}^3$	Ozone (O <sub>3</sub> ) $\mu\text{g}/\text{M}^3$	Mercury (Hg) $\mu\text{g}/\text{M}^3$
GPCB Permissible Limit (TWA for 24 hrs.)		<b>100</b>	<b>60</b>	<b>80</b>	<b>80</b>	<b>100</b>	<b>N.A.</b>
1.	19/05/2020	75.6	30.8	19.4	24.8		--
2.	22/05/2020	68.9	26.8	15.3	22.9		--
3.	26/05/2020	74.1	28.2	14.8	26.3	21.6	BDL
4.	29/05/2020	81.2	36.3	18.1	23.7		--
<b>Average</b>		<b>75.0</b>	<b>30.5</b>	<b>16.9</b>	<b>24.4</b>		--

**Remark:** Calibrated equipment & instruments were used during monitoring & analysis of above identified sample.

**Analysis Method Reference:** SPM - IS: 5182 (Part 4), 1999, PM<sub>10</sub> - IS: 5182 (Part 23), 2006, PM<sub>2.5</sub>- Guidelines by CPCB (Vol-1), SO<sub>2</sub> - IS: 5182 (Part 2), 2001, NO<sub>x</sub> - IS: 5182 (Part 6), 2006, Hg:AAS by VGA Method -3112 B APHA 22 Edison&Hg: 2 ppb O<sub>3</sub>: IS – 5182 (Part 9) 2009Ozone BDL limit: 5  $\mu\text{g}/\text{m}^3$

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**Monthly Average Report**  
**Ambient Air Quality Monitoring**

**Name and Address of Client** : M/s. Adani Power (Mundra) Ltd.  
Village:Tunda&Siracha,  
Tal. Mundra, Dist.: Kutch.  
GUJARAT – 370 435.

**Month of Monitoring** : June - 2020

**Name of Location** : Village - Wandh

**ID No.** : URA/ID/A-20/06/003

Sr. No.	Sampling Date	Concentration in Ambient Air ( $\mu\text{g}/\text{m}^3$ )					
		PM <sub>10</sub> $\mu\text{g}/\text{M}^3$	PM <sub>2.5</sub> $\mu\text{g}/\text{M}^3$	Sulphur Dioxide (SO <sub>2</sub> ) $\mu\text{g}/\text{M}^3$	Nitrogen Dioxide (NO <sub>2</sub> ) $\mu\text{g}/\text{M}^3$	Ozone (O <sub>3</sub> ) $\mu\text{g}/\text{M}^3$	Mercury (Hg) $\mu\text{g}/\text{M}^3$
GPCB Permissible Limit (TWA for 24 hrs.)		100	60	80	80	100	N.A.
1.	02/06/2020	74.9	25.2	15.2	23.8		--
2.	05/06/2020	66.0	23.7	13.4	18.3		--
3.	08/06/2020	85.1	32.0	20.5	16.5		--
4.	11/06/2020	77.3	33.6	14.3	27.1		--
5.	16/06/2020	62.7	29.3	23.8	19.5	20.4	BDL
6.	19/06/2020	64.6	28.8	18.5	25.2		--
7.	23/06/2020	Rainfall					
8.	26/06/2020	67.5	33.5	22.1	21.6		--
<b>Average</b>		<b>71.2</b>	<b>29.5</b>	<b>18.3</b>	<b>21.7</b>		--

**Remark:** Calibrated equipment & instruments were used during monitoring & analysis of above identified sample.

**Analysis Method Reference:** SPM - IS: 5182 (Part 4), 1999, PM<sub>10</sub> - IS: 5182 (Part 23), 2006, PM<sub>2.5</sub>- Guidelines by CPCB (Vol-1), SO<sub>2</sub> - IS: 5182 (Part 2), 2001, NO<sub>x</sub> - IS: 5182 (Part 6), 2006, Hg:AAS by VGA Method -3112 B APHA 22 Edison&Hg: 2 ppb O<sub>3</sub>: IS – 5182 (Part 9) 2009Ozone BDL limit: 5  $\mu\text{g}/\text{m}^3$

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**Monthly Average Report**  
**Ambient Air Quality Monitoring**

**Name and Address of Client** : M/s. Adani Power (Mundra) Ltd.  
Village: Tunda & Siracha,  
Tal. Mundra, Dist.: Kutch.  
GUJARAT – 370 435.

**Month of Monitoring** : June - 2020

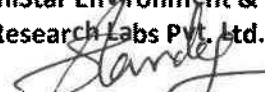
**Name of Location** : Village - Kandagara

**ID No.** : URA/ID/A-20/06/002

Sr. No.	Sampling Date	Concentration in Ambient Air ( $\mu\text{g}/\text{m}^3$ )					
		PM <sub>10</sub> $\mu\text{g}/\text{M}^3$	PM <sub>2.5</sub> $\mu\text{g}/\text{M}^3$	Sulphur Dioxide (SO <sub>2</sub> ) $\mu\text{g}/\text{M}^3$	Nitrogen Dioxide (NO <sub>2</sub> ) $\mu\text{g}/\text{M}^3$	Ozone (O <sub>3</sub> ) $\mu\text{g}/\text{M}^3$	Mercury (Hg) $\mu\text{g}/\text{M}^3$
GPCB Permissible Limit (TWA for 24 hrs.)		100	60	80	80	100	N.A.
1.	02/06/2020	86.5	23.8	20.8	22.5		--
2.	05/06/2020	51.8	18.3	16.1	24.3		--
3.	08/06/2020	63.4	22.5	16.3	20.7		--
4.	11/06/2020	56.1	19.9	18.7	16.7		--
5.	16/06/2020	76.7	24.8	13.1	21.4	17.2	BDL
6.	19/06/2020	54.2	23.8	13.4	17.5		--
7.	23/06/2020	Rainfall					
8.	26/06/2020	72.2	27.1	14.5	22.2		--
<b>Average</b>		<b>65.8</b>	<b>22.9</b>	<b>16.1</b>	<b>20.8</b>		--

**Remark:** Calibrated equipment & instruments were used during monitoring & analysis of above identified sample.

**Analysis Method Reference:** SPM– IS: 5182 (Part 4), 1999, PM<sub>10</sub>– IS: 5182 (Part 23), 2006, PM<sub>2.5</sub>– Guidelines by CPCB (Vol-1), SO<sub>2</sub>– IS: 5182 (Part 2), 2001, NO<sub>x</sub>– IS: 5182 (Part 6), 2006, Hg:AAS by VGA Method -3112 B APHA 22 Edison&Hg: 2 ppb O<sub>3</sub>: IS – 5182 (Part 9) 2009Ozone BDL limit: 5  $\mu\text{g}/\text{m}^3$

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**Monthly Average Report**  
**Ambient Air Quality Monitoring**

**Name and Address of Client** : M/s. Adani Power (Mundra) Ltd.  
Village: Tunda & Siracha,  
Tal. Mundra, Dist.: Kutch.  
GUJARAT – 370 435.

**Month of Monitoring** : June - 2020

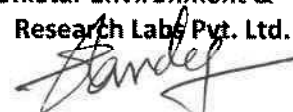
**Name of Location** : Village - Siracha

**ID No.** : URA/ID/A-20/06/001

Sr. No.	Sampling Date	Concentration in Ambient Air ( $\mu\text{g}/\text{m}^3$ )					
		PM <sub>10</sub> $\mu\text{g}/\text{M}^3$	PM <sub>2.5</sub> $\mu\text{g}/\text{M}^3$	Sulphur Dioxide (SO <sub>2</sub> ) $\mu\text{g}/\text{M}^3$	Nitrogen Dioxide (NO <sub>2</sub> ) $\mu\text{g}/\text{M}^3$	Ozone (O <sub>3</sub> ) $\mu\text{g}/\text{M}^3$	Mercury (Hg) $\mu\text{g}/\text{M}^3$
GPCB Permissible Limit (TWA for 24 hrs.)		100	60	80	80	100	N.A.
1.	02/06/2020	61.3	27.2	13.3	24.4		--
2.	05/06/2020	57.3	23.9	15.5	22.3		--
3.	08/06/2020	76.9	26.8	19.4	25.4		--
4.	11/06/2020	45.6	21.5	15.7	20.8		--
5.	16/06/2020	65.0	27.7	18.1	21.3	13.8	BDL
6.	19/06/2020	73.3	32.2	18.5	18.5		--
7.	23/06/2020	Rainfall					
8.	26/06/2020	69.1	31.0	17.3	23.4		--
<b>Average</b>		<b>64.1</b>	<b>27.2</b>	<b>16.8</b>	<b>22.3</b>		--

**Analysis Method Reference:** SPM - IS: 5182 (Part 4), 1999, PM<sub>10</sub> - IS: 5182 (Part 23), 2006, PM<sub>2.5</sub>- Guidelines by CPCB (Vol-1), SO<sub>2</sub> - IS: 5182 (Part 2), 2001, NO<sub>x</sub> - IS: 5182 (Part 6), 2006, Hg: AAS by VGA Method -3112 B APHA 22 Edison & Hg: 2 ppb O<sub>3</sub>: IS - 5182 (Part 9) 2009 Ozone BDL limit: 5  $\mu\text{g}/\text{m}^3$

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**Monthly Average Report**  
**Ambient Air Quality Monitoring**

**Name and Address of Client** : M/s. Adani Power (Mundra) Ltd.  
Village: Tunda & Siracha,  
Tal. Mundra, Dist.: Kutch.  
GUJARAT – 370 435.

**Month of Monitoring** : July - 2020

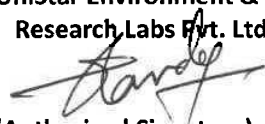
**Name of Location** : Village - Siracha

**ID No.** : URA/ID/A-20/07/001

Sr. No.	Sampling Date	Concentration in Ambient Air ( $\mu\text{g}/\text{m}^3$ )					
		PM <sub>10</sub> $\mu\text{g}/\text{M}^3$	PM <sub>2.5</sub> $\mu\text{g}/\text{M}^3$	Sulphur Dioxide (SO <sub>2</sub> ) $\mu\text{g}/\text{M}^3$	Nitrogen Dioxide (NO <sub>2</sub> ) $\mu\text{g}/\text{M}^3$	Ozone (O <sub>3</sub> ) $\mu\text{g}/\text{M}^3$	Mercury (Hg) $\mu\text{g}/\text{M}^3$
GPCB Permissible Limit (TWA for 24 hrs.)		100	60	80	80	100	N.A.
1.	03/07/2020	68.8	24.2	19.3	14.7		--
2.	07/07/2020	Rainfall					
3.	10/07/2020						
4.	14/07/2020						
5.	17/07/2020						
6.	20/07/2020	58.3	17.2	15.8	13.5	14.7	BDL
7.	24/07/2020	77.1	16.8	16.4	19.2		--
8.	28/07/2020	61.3	25.4	17.2	20.5		--
<b>Average</b>		<b>66.4</b>	<b>20.9</b>	<b>17.2</b>	<b>17.0</b>		--

**Analysis Method Reference:** SPM - IS: 5182 (Part 4), 1999, PM<sub>10</sub> - IS: 5182 (Part 23), 2006, PM<sub>2.5</sub>- Guidelines by CPCB (Vol-1), SO<sub>2</sub> - IS: 5182 (Part 2), 2001, NO<sub>x</sub> - IS: 5182 (Part 6), 2006, Hg:AAS by VGA Method -3112 B APHA 22 Edison&Hg: 2 ppbO<sub>3</sub>: IS – 5182 (Part 9) 2009Ozone BDL limit: 5  $\mu\text{g}/\text{m}^3$

**UniStar Environment &  
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**Monthly Average Report**  
**Ambient Air Quality Monitoring**

**Name and Address of Client** : M/s. Adani Power (Mundra) Ltd.  
Village: Tunda & Siracha,  
Tal. Mundra, Dist.: Kutch.  
GUJARAT – 370 435.

**Month of Monitoring** : July - 2020

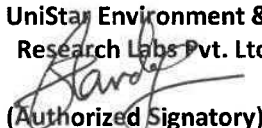
**Name of Location** : Village - Kandagara

**ID No.** : URA/ID/A-20/07/002

Sr. No.	Sampling Date	Concentration in Ambient Air ( $\mu\text{g}/\text{m}^3$ )					
		PM <sub>10</sub> $\mu\text{g}/\text{M}^3$	PM <sub>2.5</sub> $\mu\text{g}/\text{M}^3$	Sulphur Dioxide (SO <sub>2</sub> ) $\mu\text{g}/\text{M}^3$	Nitrogen Dioxide (NO <sub>2</sub> ) $\mu\text{g}/\text{M}^3$	Ozone (O <sub>3</sub> ) $\mu\text{g}/\text{M}^3$	Mercury (Hg) $\mu\text{g}/\text{M}^3$
GPCB Permissible Limit (TWA for 24 hrs.)		100	60	80	80	100	N.A.
1.	03/07/2020	55.3	28.6	15.5	15.1		--
2.	07/07/2020	Rainfall					
3.	10/07/2020						
4.	14/07/2020						
5.	17/07/2020						
6.	20/07/2020	58.1	22.6	17.3	22.7	16.3	BDL
7.	24/07/2020	61.6	19.5	16.6	13.5		--
8.	28/07/2020	70.5	28.3	21.8	21.7		--
<b>Average</b>		<b>61.4</b>	<b>24.8</b>	<b>17.8</b>	<b>18.3</b>		--

**Remark:** Calibrated equipment & instruments were used during monitoring & analysis of above identified sample.

**Analysis Method Reference:** SPM– IS: 5182 (Part 4), 1999, PM<sub>10</sub>– IS: 5182 (Part 23), 2006, PM<sub>2.5</sub>- Guidelines by CPCB (Vol-1), SO<sub>2</sub>– IS: 5182 (Part 2), 2001, NO<sub>x</sub>– IS: 5182 (Part 6), 2006, Hg:AAS by VGA Method -3112 B APHA 22 Edison&Hg: 2 ppb O<sub>3</sub>: IS – 5182 (Part 9) 2009Ozone BDL limit: 5  $\mu\text{g}/\text{m}^3$

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**Monthly Average Report**  
**Ambient Air Quality Monitoring**

**Name and Address of Client** : **M/s. Adani Power (Mundra) Ltd.**  
Village:Tunda&Siracha,  
Tal. Mundra, Dist.: Kutch.  
GUJARAT – 370 435.

**Month of Monitoring** : July - 2020

**Name of Location** : Village - Wandh

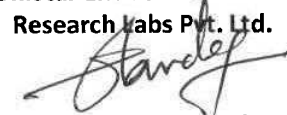
**ID No.** : **URA/ID/A-20/07/003**

Sr. No.	Sampling Date	Concentration in Ambient Air ( $\mu\text{g}/\text{m}^3$ )					
		PM <sub>10</sub> $\mu\text{g}/\text{M}^3$	PM <sub>2.5</sub> $\mu\text{g}/\text{M}^3$	Sulphur Dioxide (SO <sub>2</sub> ) $\mu\text{g}/\text{M}^3$	Nitrogen Dioxide (NO <sub>2</sub> ) $\mu\text{g}/\text{M}^3$	Ozone (O <sub>3</sub> ) $\mu\text{g}/\text{M}^3$	Mercury (Hg) $\mu\text{g}/\text{M}^3$
GPCB Permissible Limit (TWA for 24 hrs.)		100	60	80	80	100	N.A.
1.	03/07/2020	75.1	30.3	23.3	18.8		--
2.	07/07/2020	Rainfall					
3.	10/07/2020						
4.	14/07/2020						
5.	17/07/2020						
6.	20/07/2020	73.7	35.0	20.9	24.3	18.8	BDL
7.	24/07/2020	65.3	24.6	17.1	14.8		--
8.	28/07/2020	78.7	36.9	16.8	23.9		--
<b>Average</b>		<b>73.2</b>	<b>31.7</b>	<b>19.5</b>	<b>20.5</b>		--

**Remark:** Calibrated equipment & instruments were used during monitoring & analysis of above identified sample.

**Analysis Method Reference:** SPM - IS: 5182 (Part 4), 1999, PM<sub>10</sub> - IS: 5182 (Part 23), 2006, PM<sub>2.5</sub>- Guidelines by CPCB (Vol-1), SO<sub>2</sub> - IS: 5182 (Part 2), 2001, NO<sub>x</sub> - IS: 5182 (Part 6), 2006, Hg:AAS by VGA Method -3112 B APHA 22 Edison&Hg: 2 ppb O<sub>3</sub>: IS – 5182 (Part 9) 2009Ozone BDL limit: 5  $\mu\text{g}/\text{m}^3$

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**Monthly Average Report**  
**Ambient Air Quality Monitoring**

**Name and Address of Client** : M/s. Adani Power (Mundra) Ltd.  
Village: Tunda & Siracha,  
Tal. Mundra, Dist.: Kutch.  
GUJARAT – 370 435.

**Month of Monitoring** : August - 2020

**Name of Location** : Village - Siracha

**ID No.** : URA/ID/A-20/08/001

Sr. No.	Sampling Date	Concentration in Ambient Air ( $\mu\text{g}/\text{m}^3$ )					
		PM <sub>10</sub> $\mu\text{g}/\text{M}^3$	PM <sub>2.5</sub> $\mu\text{g}/\text{M}^3$	Sulphur Dioxide (SO <sub>2</sub> ) $\mu\text{g}/\text{M}^3$	Nitrogen Dioxide (NO <sub>2</sub> ) $\mu\text{g}/\text{M}^3$	Ozone (O <sub>3</sub> ) $\mu\text{g}/\text{M}^3$	Mercury (Hg) $\mu\text{g}/\text{M}^3$
GPCB Permissible Limit (TWA for 24 hrs.)		100	60	80	80	100	N.A.
1.	04/08/2020	63.8	27.8	15.2	16.3	12.8	BDL
2.	07/08/2020	Rainfall					
3.	10/08/2020	52.0	21.7	13.0	19.4		--
4.	14/08/2020	Rainfall					
5.	18/08/2020						
6.	21/08/2020						
7.	25/08/2020						
8.	28/08/2020						
<b>Average</b>		<b>57.9</b>	<b>24.8</b>	<b>14.1</b>	<b>17.9</b>		--

**Analysis Method Reference:** SPM - IS: 5182 (Part 4), 1999, PM<sub>10</sub> - IS: 5182 (Part 23), 2006, PM<sub>2.5</sub>- Guidelines by CPCB (Vol-1), SO<sub>2</sub> - IS: 5182 (Part 2), 2001, NO<sub>x</sub> - IS: 5182 (Part 6), 2006, Hg:AAS by VGA Method -3112 B APHA 22 Edison&Hg: 2 ppb O<sub>3</sub>: IS – 5182 (Part 9) 2009 Ozone BDL limit: 5  $\mu\text{g}/\text{m}^3$

s

**UniStar Environment &  
Research Labs Pvt. Ltd.**

  
(Authorized Signatory)

MoEF&CC (GOI) Recognized Environmental Laboratory under the EPA-1986 (12.01.2020 to 17.03.2023)

QC-NABET Accredited EIA Consultant Organization

GPCB Recognized Environmental Auditor (Schedule-II)

ISO 9001:2015 Certified Company

ISO 45001:2018 Certified Company

**Monthly Average Report**  
**Ambient Air Quality Monitoring**

**Name and Address of Client** : M/s. Adani Power (Mundra) Ltd.  
Village: Tunda & Siracha,  
Tal. Mundra, Dist.: Kutch.  
GUJARAT – 370 435.

**Month of Monitoring** : August - 2020

**Name of Location** : Village - Kandagara

**ID No.** : URA/ID/A-20/08/002

Sr. No.	Sampling Date	Concentration in Ambient Air ( $\mu\text{g}/\text{m}^3$ )					
		PM <sub>10</sub> $\mu\text{g}/\text{M}^3$	PM <sub>2.5</sub> $\mu\text{g}/\text{M}^3$	Sulphur Dioxide (SO <sub>2</sub> ) $\mu\text{g}/\text{M}^3$	Nitrogen Dioxide (NO <sub>2</sub> ) $\mu\text{g}/\text{M}^3$	Ozone (O <sub>3</sub> ) $\mu\text{g}/\text{M}^3$	Mercury (Hg) $\mu\text{g}/\text{M}^3$
GPCB Permissible Limit (TWA for 24 hrs.)		100	60	80	80	100	N.A.
1.	04/08/2020	64.0	28.6	14.8	14.7	14.5	BDL
2.	07/08/2020	Rainfall					
3.	10/08/2020	58.1	22.6	13.3	18.9		--
4.	14/08/2020	Rainfall					
5.	18/08/2020						
6.	21/08/2020						
7.	25/08/2020						
8.	28/08/2020						
<b>Average</b>		<b>61.0</b>	<b>25.6</b>	<b>14.1</b>	<b>16.8</b>		--

**Remark:** Calibrated equipment & instruments were used during monitoring & analysis of above identified sample.

**Analysis Method Reference:** SPM– IS: 5182 (Part 4), 1999, PM<sub>10</sub>– IS: 5182 (Part 23), 2006, PM<sub>2.5</sub>- Guidelines by CPCB (Vol-1), SO<sub>2</sub>– IS: 5182 (Part 2), 2001, NO<sub>x</sub>– IS: 5182 (Part 6), 2006, Hg:AAS by VGA Method -3112 B APHA 22 Edison&Hg: 2 ppb O<sub>3</sub>: IS – 5182 (Part 9) 2009Ozone BDL limit: 5  $\mu\text{g}/\text{m}^3$

**UniStar Environment &  
Research Labs Pvt. Ltd.**

  
(Authorized Signatory)



**Monthly Average Report**  
**Ambient Air Quality Monitoring**

**Name and Address of Client** : **M/s. Adani Power (Mundra) Ltd.**  
Village:Tunda&Siracha,  
Tal. Mundra, Dist.: Kutch.  
GUJARAT – 370 435.

**Month of Monitoring** : August - 2020

**Name of Location** : Village - Wandh

**ID No.** : **URA/ID/A-20/08/003**

Sr. No.	Sampling Date	Concentration in Ambient Air ( $\mu\text{g}/\text{m}^3$ )					
		PM <sub>10</sub> $\mu\text{g}/\text{M}^3$	PM <sub>2.5</sub> $\mu\text{g}/\text{M}^3$	Sulphur Dioxide (SO <sub>2</sub> ) $\mu\text{g}/\text{M}^3$	Nitrogen Dioxide (NO <sub>2</sub> ) $\mu\text{g}/\text{M}^3$	Ozone (O <sub>3</sub> ) $\mu\text{g}/\text{M}^3$	Mercury (Hg) $\mu\text{g}/\text{M}^3$
GPCB Permissible Limit (TWA for 24 hrs.)		100	60	80	80	100	N.A.
1.	04/08/2020	76.4	34.9	16.2	20.1	15.8	BDL
2.	07/08/2020	Rainfall					
3.	10/08/2020	60.2	26.3	14.3	15.6		--
4.	14/08/2020	Rainfall					
5.	18/08/2020						
6.	21/08/2020						
7.	25/08/2020						
8.	28/08/2020						
<b>Average</b>		<b>68.3</b>	<b>30.6</b>	<b>15.3</b>	<b>17.9</b>		--

**Remark:** Calibrated equipment & instruments were used during monitoring & analysis of above identified sample.

**Analysis Method Reference:** SPM - IS: 5182 (Part 4), 1999, PM<sub>10</sub> - IS: 5182 (Part 23), 2006, PM<sub>2.5</sub>- Guidelines by CPCB (Vol-1), SO<sub>2</sub> - IS: 5182 (Part 2), 2001, NO<sub>x</sub> - IS: 5182 (Part 6), 2006, Hg:AAS by VGA Method -3112 B APHA 22 Edison&Hg: 2 ppb O<sub>3</sub>: IS – 5182 (Part 9) 2009Ozone BDL limit: 5  $\mu\text{g}/\text{m}^3$

**UniStar Environment &  
Research Labs Pvt. Ltd.**

  
**(Authorized Signatory)**

**Monthly Average Report**  
**Ambient Air Quality Monitoring**

**Name and Address of Client** : M/s. Adani Power (Mundra) Ltd.  
Village: Tunda & Siracha,  
Tal. Mundra, Dist.: Kutch.  
GUJARAT – 370 435.

**Month of Monitoring** : September - 2020

**Name of Location** : Village - Siracha

**ID No.** : URA/ID/A-20/09/001

Sr. No.	Sampling Date	Concentration in Ambient Air ( $\mu\text{g}/\text{m}^3$ )					
		PM <sub>10</sub> $\mu\text{g}/\text{M}^3$	PM <sub>2.5</sub> $\mu\text{g}/\text{M}^3$	Sulphur Dioxide (SO <sub>2</sub> ) $\mu\text{g}/\text{M}^3$	Nitrogen Dioxide (NO <sub>2</sub> ) $\mu\text{g}/\text{M}^3$	Ozone (O <sub>3</sub> ) $\mu\text{g}/\text{M}^3$	Mercury (Hg) $\mu\text{g}/\text{M}^3$
GPCB Permissible Limit (TWA for 24 hrs.)		100	60	80	80	100	N.A.
1.	04/09/2020	45.5	16.1	11.7	14.3		--
2.	08/09/2020	65.7	21.0	17.6	23.5		--
3.	11/09/2020	77.6	35.2	16.5	17.8		--
4.	15/09/2020	35.3	13.8	10.3	12.5		--
5.	18/09/2020	64.1	28.2	16.5	21.7		--
6.	22/09/2020	45.9	20.5	14.2	17.5		--
7.	25/09/2020	64.2	24.4	19.4	20.5	16.4	BDL
8.	29/09/2020	68.7	26.3	18.9	15.4		--
<b>Average</b>		<b>58.4</b>	<b>23.2</b>	<b>15.6</b>	<b>17.9</b>		--

**Analysis Method Reference:** SPM - IS: 5182 (Part 4), 1999, PM<sub>10</sub> - IS: 5182 (Part 23), 2006, PM<sub>2.5</sub> - Guidelines by CPCB (Vol-1), SO<sub>2</sub> - IS: 5182 (Part 2), 2001, NO<sub>x</sub> - IS: 5182 (Part 6), 2006, Hg: AAS by VGA Method -3112 B APHA 22 Edison & Hg: 2 ppb O<sub>3</sub>: IS - 5182 (Part 9) 2009 Ozone BDL limit: 5  $\mu\text{g}/\text{m}^3$

**UniStar Environment &  
Research Labs Pvt. Ltd.**

  
(Authorized Signatory)

**Monthly Average Report**  
**Ambient Air Quality Monitoring**

**Name and Address of Client** : M/s. Adani Power (Mundra) Ltd.  
Village: Tunda & Siracha,  
Tal. Mundra, Dist.: Kutch.  
GUJARAT – 370 435.

**Month of Monitoring** : September - 2020

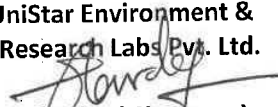
**Name of Location** : Village - Kandagara

**ID No.** : URA/ID/A-20/09/002

Sr. No.	Sampling Date	Concentration in Ambient Air ( $\mu\text{g}/\text{m}^3$ )					
		PM <sub>10</sub> $\mu\text{g}/\text{M}^3$	PM <sub>2.5</sub> $\mu\text{g}/\text{M}^3$	Sulphur Dioxide (SO <sub>2</sub> ) $\mu\text{g}/\text{M}^3$	Nitrogen Dioxide (NO <sub>2</sub> ) $\mu\text{g}/\text{M}^3$	Ozone (O <sub>3</sub> ) $\mu\text{g}/\text{M}^3$	Mercury (Hg) $\mu\text{g}/\text{M}^3$
GPCB Permissible Limit (TWA for 24 hrs.)		100	60	80	80	100	N.A.
1.	04/09/2020	46.1	18.8	11.4	13.7		--
2.	08/09/2020	39.3	12.1	12.3	17.8		--
3.	11/09/2020	67.0	29.1	18.9	22.2		--
4.	15/09/2020	58.5	20.7	14.1	14.2		--
5.	18/09/2020	75.9	36.3	15.3	18.9		--
6.	22/09/2020	66.1	23.1	13.7	18.3		--
7.	25/09/2020	72.9	36.2	19.6	23.1	15.9	BDL
8.	29/09/2020	68.5	23.1	17.1	21.5		--
<b>Average</b>		<b>61.8</b>	<b>24.9</b>	<b>15.3</b>	<b>18.7</b>		--

**Remark:** Calibrated equipment & instruments were used during monitoring & analysis of above identified sample.

**Analysis Method Reference:** SPM– IS: 5182 (Part 4), 1999, PM<sub>10</sub>– IS: 5182 (Part 23), 2006, PM<sub>2.5</sub>- Guidelines by CPCB (Vol-1), SO<sub>2</sub>– IS: 5182 (Part 2), 2001, NO<sub>x</sub>– IS: 5182 (Part 6), 2006, Hg:AAS by VGA Method -3112 B APHA 22 Edison&Hg: 2 ppb O<sub>3</sub>: IS – 5182 (Part 9) 2009Ozone BDL limit: 5  $\mu\text{g}/\text{m}^3$

**UniStar Environment &  
Research Labs Pvt. Ltd.**  
  
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**Monthly Average Report**  
**Ambient Air Quality Monitoring**

**Name and Address of Client** : M/s. Adani Power (Mundra) Ltd.  
Village:Tunda&Siracha,  
Tal. Mundra, Dist.: Kutch.  
GUJARAT – 370 435.

**Month of Monitoring** : September - 2020

**Name of Location** : Village - Wandh


**ID No.** : URA/ID/A-20/09/003

Sr. No.	Sampling Date	Concentration in Ambient Air ( $\mu\text{g}/\text{m}^3$ )					
		PM <sub>10</sub> $\mu\text{g}/\text{M}^3$	PM <sub>2.5</sub> $\mu\text{g}/\text{M}^3$	Sulphur Dioxide (SO <sub>2</sub> ) $\mu\text{g}/\text{M}^3$	Nitrogen Dioxide (NO <sub>2</sub> ) $\mu\text{g}/\text{M}^3$	Ozone (O <sub>3</sub> ) $\mu\text{g}/\text{M}^3$	Mercury (Hg) $\mu\text{g}/\text{M}^3$
GPCB Permissible Limit (TWA for 24 hrs.)		100	60	80	80	100	N.A.
1.	04/09/2020	71.7	29.6	18.1	24.2		--
2.	08/09/2020	64.2	24.4	15.4	16.5		--
3.	11/09/2020	78.1	31.5	18.6	22.5		--
4.	15/09/2020	56.6	20.1	14.5	13.8		--
5.	18/09/2020	72.3	36.2	12.9	15.1		--
6.	22/09/2020	65.5	23.1	17.1	18.5		--
7.	25/09/2020	74.8	33.2	19.5	17.8	18.4	BDL
8.	29/09/2020	67.0	29.1	21.7	22.2		--
<b>Average</b>		<b>68.8</b>	<b>28.4</b>	<b>17.2</b>	<b>18.8</b>		--

**Remark:** Calibrated equipment & instruments were used during monitoring & analysis of above identified sample.

**Analysis Method Reference:** SPM - IS: 5182 (Part 4), 1999, PM<sub>10</sub> - IS: 5182 (Part 23), 2006, PM<sub>2.5</sub>- Guidelines by CPCB (Vol-1), SO<sub>2</sub> - IS: 5182 (Part 2), 2001, NO<sub>x</sub> - IS: 5182 (Part 6), 2006, Hg:AAS by VGA Method -3112 B APHA 22 Edison&Hg: 2 ppb O<sub>3</sub>: IS – 5182 (Part 9) 2009Ozone BDL limit: 5  $\mu\text{g}/\text{m}^3$

UniStar Environment &  
Research Labs Pvt. Ltd.

  
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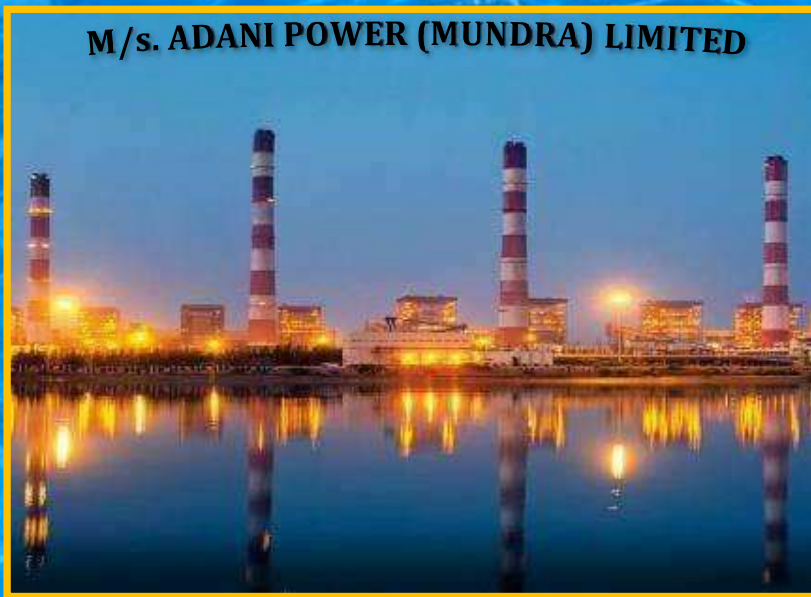


# MARINE MONITORING REPORT

September- 2020(Monsoon)

FOR

M/s. ADANI POWER (MUNDRA) LIMITED



At

Tunda & Siracha,  
Tal. Mundra, Dist.: Kutch.  
KUTCH, GUJARAT - 370 435

Prepared by



## PREFACE

**M/s. Adani Power (Mundra) Limited (APMuL)** is a subsidiary company of Adani Group engaged in imported coal based thermal power plant at Mundra near village Tunda&Siracha, Taluka Mundra District Kutch, Gujarat has entrusted the work of carrying out Marine Monitoring to **M/s. UniStar Environment and Research Labs Pvt. Ltd., Vapi.**

Adani Power (Mundra) Limited has commissioned the first supercritical 660 MW unit in the country, engaged in imported coal based thermal power plant with capacity of 4620 MW at Mundra near village Tunda & Siracha, Taluka Mundra District Kutch, Gujarat. Has entrusted the work of carrying out Marine Monitoring to **M/S.UniStar Environment and Research Labs Pvt. Ltd., Vapi.**

The marine monitoring involves Physio-chemical and biological analysis of Marine water. Marine water quality of Sub-tidal and Intertidal regions, Flora and Fauna analysis in marine water area and Benthos in inter-tidal and sub-tidal analysis for the coastal area near Adani Power plant (Mundra) Limited. Water sample are collected from five location (station) and Benthos sample are collected from High water and low water transect area. Samples are brought to the laboratory by field sampling team and the analysis was carried out in our laboratory and the results are presented in this report.

These Marine Monitoring reports provide a data obtained from monitoring and analysis activities undertaken during (monsoon) September 2020.

Date: 21/09/2020

**M/S.UniStar Environment and  
Research Labs Pvt. Ltd.**

White house, Char Rasta,  
Vapi-396 191

**Sampling by**



**(Bhavin Patel)**

**Report Prepared By**



**(Shweta Rana)**

**Approved by**



**(Jaivik Tandel)**

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## INTRODUCTION

### 1.1 Background

Adani Power (Mundra) Limited (APMuL) is engaged in imported coal based thermal power plant with capacity of 4620 MW at Mundra near village Tunda&Siracha, Taluka Mundra District Kutch, Gujarat.

Adani Power (Mundra) Limited (APMuL) is largest single location private coal based power plant in the world it is created history by synchronizing the first super-critical technology based 660MW generating unit at Mundra. This is not only the first super-critical generating unit in the country but also the fastest project implementation ever by any power developer in the country. The Phase III of the Mundra Project, which is based on supercritical technology, has received 'Clean Development Mechanism (CDM) Project' certification from United Nations Framework Convention on Climate Change (UNFCCC). This is the world's first thermal project based on supercritical technology to be registered as CDM Project under UNFCCC.

Adani Power (Mundra) Limited (APMuL) assessing marine environment it involves Physio-chemical and biological analysis of Marine water. Marine water quality of Sub-tidal and Intertidal regions, Flora Phytoplankton's and Phytopigments and Fauna analysis in marine water area it includes Zooplanktons, Benthos in inter-tidal and sub-tidal analysis for the coastal area near power plant marine outfall water mixing and Sea intake, with special reference to intake channel and seawater discharge.

This report is prepare by the **M/S.UniStar Environment and Research Labs Pvt. Ltd.**, at the instance of APMuL and addresses the marine environmental issues related to the APMuL's operational power plant.

## 1.2 Objectives:

- a) Physico chemical seawater parameter to be analyzed for understands the water quality in study area.
- b) The prevailing marine biological status of the study area is evaluated based on the quantitative and qualitative data on marine life namely Phytoplankton, zooplankton, Chlorophyll & Pheophytin, Sub-tidal/ intertidal Macro benthos.
- c) To recommend adequate marine environmental management measures

## 1.3 Study program:

### Period:

The field investigation is completed during September 2020 and sampling team was planned in such a manner so as to get a detailed picture of the marine environment characteristics of the study area and Sampling and analysis for marine environment has been carried out by **M/S.UniStar Environment and Research Labs Pvt. Ltd.**

### Study Station locations:

A total of five subtidal station and three intertidal transects was selected for the sampling, here we are given exact location and their position were sampled.

**Table 1: Station locations and co ordinates**

Subtidal Station			
Station	Locations	Co ordinates	
1	Intake point	22°48' 30.'50"N	69°32'57.84"E
2	Mouth of intake point	22°47'07.20"N	69°32'06.50"E
3	West port area	22°45'27.70"N	69°34'50.63"E
4	Outfall area	22°44' 40.56"N	69°36'26.61"E
5	Outfall area	22°45'12.60"N	69°36'44.54"E

Intertidal transect			
I	High Tide water level	22°47'07.55" N	69°32'16.91" E
	Low Tide water level	22°47'06.38"N	69°32'11.62"E
II	High Tide water level	22°45'58.72" N	69°34'35.41" E
	Low Tide water level	22°45'57.74" N	69°34'35.05" E
III	High Tide water level	22°44' 52.21" N	69°36'41.64"E
	Low Tide water level	22°44' 51.23" N	69°36'39.28" E

Figure 1.1: Study marine stations location map



## 1.4 Sampling

### a) Sampling frequency:

All Sampling subtidal stations were monitored during flood to ebb. Water samples were collected in duplicate (surface and bottom) for assessing water quality and marine biological characteristics.

Intertidal sampling was completed during low tide, for assessed Macro benthic fauna samples were collect in duplicate from each transects.

### b) Sampling methodology:

- Niskin (5 litre capacity) with a mechanism for closing at a desired depth using messenger was used for collecting sub–surface water samples. Sampling at the surface was done using a clean polyethylene bucket. Known volume of water sample (1 L) was preserved with 4% Lugol’s iodine solution.
- For the analysis of Benthos, sub tidal sediment samples were collected using Van-veen grab covering an area of 0.04 m<sup>2</sup>. Intertidal samples were collected using metal quadrant. Samples were sieved with 500 µ metal sieve and preserved with Rose Bengal-Formalin solution.
- For Zooplankton oblique hauls were made using Heron Tranter net attached with calibrated flow meter. After collection, samples were preserved with 5% formalin.

### C) Methods of analysis:

**I) Physicochemical Parameter:** Samples were analyses by using analytical methods for estimations of Temperature, Turbidity, PH, SS, Salinity, DO, BOD, COD, Phosphate, Total nitrogen, Nitrite, Nitrate, Phenols and PHc.

**II) Biological Samples:** Phytoplankton, Zooplankton and Macro benthos.

**a) Phytoplankton:** Sample for cell count was preserved in Lugol’s iodine solution, and identification of phytoplankton was done under a compound microscope using Sedgwick Rafter slide.

**b) Chlorophyll:** For the estimation of chlorophyll *a* and Pheophytin, the extinction of the acetone extract was measured using Turner Flurometer before and after treatment with dilute acid respectively.



c) **Zooplankton:** Volume (biomass) was obtained by displacement method. A portion (25-50 %) of the sample was analyzed under a microscope for faunal composition and population count.

d) **Benthos:** The total Macro benthos population (sub tidal & intertidal) was estimated as number of 1 m<sup>2</sup> area and biomass on wet weight basis.

## WATER QUALITY

### 2.1 Marine Water quality:

Sea water samples have been collected during September 2020 (Monsoon)

From Five locations, which are listed in Table 2

**Table 2: Water sampling locations, September 2020(Monsoon)**

Station no.	Location	Tide
1	Intake point	Flood
2	Intake point	Ebb to Flood
3	West port area	Flood to Ebb
4	Outfall area	Flood
5	Outfall area	Flood to Ebb

### 2.2 Physico chemical Water analysis result:

All the water sampled, which is collected by sampling team is brought to the lab for Physico chemical analysis. The marine water quality at different collected stations are measured during this investigation is presented in Table No.3

**Table: 3 Physico chemical Water Analysis Result**

Sr. No.	Parameters	Station 1		Station 2		Test Method Permissible
		Surface	Bottom	Surface	Bottom	
<b>PHYSICAL QUALITY</b>						
1.	pH @ 25 ° C	8.02	7.99	8.08	7.84	IS 3025(Part 11)1983
2.	Temperature (°C )	30	29	29.5	29	IS 3025(Part 9)1984
3.	Turbidity (NTU)	0.1	0.1	0.1	1	IS 3025(Part 10)1984
<b>CHEMICAL QUALITY</b>						
1.	Total Suspended Solids (mg/l)	28	44	52	62	(APHA 23 <sup>rd</sup> Ed.,2017,2540- D)
2.	Biochemical Oxygen Demand (BOD) (mg/l)	4.8	4.4	5.3	4.8	IS 3025(Part 44)1993Amd.01
3.	Sulphate as SO <sub>4</sub> (mg/l)	2459	2492	2212	2382	(APHA 23 <sup>rd</sup> Ed.,2017,4500- SO4 E)
4.	Ammonical Nitrogen(μmol/l)	2.2	2.6	BDL(MD L:2.0)	3.9	(APHA 23 <sup>rd</sup> Ed.,2017,4500- NH3 B)
5.	Salinity (ppt)	34.2	34.10	36.20	36.10	By Calculation
6.	Dissolved Oxygen (mg/l)	5.4	5.2	6.2	5.9	IS 3025(Part 38)1989,
7.	Total Nitrogen (μmol/l)	8.6	5.4	4.5	5.7	(APHA 23 <sup>rd</sup> Ed.,2017,4500-O,B),
8.	Dissolved Phosphate (μmol/l)	0.16	0.14	BDL(MD L:0.1)	BDL(MD L:0.1)	APHA 23 <sup>rd</sup> Ed.,2017,4500 NH3 - B
9.	Nitrate (μmol/l)	0.9	0.6	0.6	0.7	(APHA 23 <sup>rd</sup> Ed.,2017,4500-P,D)
10.	Nitrite (μmol/l)	0.6	0.7	0.9	0.3	(APHA 23 <sup>rd</sup> Ed.,2017,4500 NO3-B)
11.	Phenol(μmol/l)	BDL(MD L:0.01)	6	10	12	APHA 23 <sup>rd</sup> Ed.,2017,4500NO2B
12.	PHc (ppb)	4	N.D.	2.7	0.5	IS 3025(Part 43)1992Amd.02

Note: MDL = Minimum Detection Limit (MDL: 0.01) and N.D. = Not detectable

Sr. No	Parameters	Station 3		Station 4		Test Method Permissible
		Surface	Bottom	Surface	Bottom	
<b>PHYSICAL QUALITY</b>						
1.	pH @ 25 ° C	8.08	7.73	7.98	7.97	IS 3025(Part 11)1983
2.	Temperature °C	29	29	30	30	IS 3025(Part 9)1984
3.	Turbidity (NTU)	1	1	0.1	0.1	IS 3025(Part 10)1984
<b>CHEMICAL QUALITY</b>						
1.	Total Suspended Solids (mg/l)	54	44	16	67	(APHA 23 <sup>rd</sup> Ed.,2017,2540-D)
2.	Biochemical Oxygen Demand (BOD) (mg/l)	3.8	4.2	5.6	6.2	IS 3025(Part 44)1993Amd.01
3.	Sulphate as SO <sub>4</sub> (mg/l)	2260	2434	2310	2446	(APHA 23 <sup>rd</sup> Ed.,2017,4500-SO4 E)
4.	Ammonical Nitrogen(μmol/l)	5.4	1.1	3.2	5.4	(APHA 23 <sup>rd</sup> Ed.,2017,4500-NH3 B)
5.	Salinity (ppt)	36.07	36.25	35.01	35.19	By Calculation
6.	Dissolved Oxygen (mg/l)	5.9	5.8	5.9	5.8	IS 3025(Part 38)1989,
7.	Total Nitrogen (μmol/l)	8.7	8.4	4.8	5.4	(APHA 23 <sup>rd</sup> Ed.,2017,4500-O,B),
8.	Dissolved Phosphate (μmol/l)	BDL(MD L:0.1)	1.2	0.11	0.18	APHA 23 <sup>rd</sup> Ed.,2017,4500 NH3 - B
9.	Nitrate (μmol/l)	0.6	3.7	2.5	7.1	(APHA 23 <sup>rd</sup> Ed.,2017,4500-P,D)
10.	Nitrite (μmol/l)	0.6	0.4	0.9	0.9	(APHA 23 <sup>rd</sup> Ed.,2017,4500 NO3-B)
11.	Phenol(μmol/l)	22	13	4	10	APHA 23 <sup>rd</sup> Ed.,2017,4500NO2B
12.	PHc (ppb)	1.3	4.6	4.6	1.2	IS 3025(Part 43)1992Amd.02

Note: MDL = Minimum Detection Limit (MDL: 0.01) and N.D. = Not detectable

Sr. No.	Parameters	Station 5		Test Method Permissible
		Surface	Bottom	
<b>PHYSICAL QUALITY</b>				
1.	pH @ 25 ° C	7.74	7.92	IS 3025(Part 11)1983
2.	Temperature ( °C )	29	29.5	IS 3025(Part 9)1984
3.	Turbidity (NTU)	0.1	0.1	IS 3025(Part 10)1984
<b>CHEMICAL QUALITY</b>				
1.	Total Suspended Solids	48	72	(APHA 23 <sup>rd</sup> Ed.,2017,2540- D)
2.	Biochemical Oxygen Demand (BOD) (mg/l)	4.3	6.2	IS 3025(Part 44)1993Amd.01
3.	Sulphate as SO <sub>4</sub> (mg/l)	2772	2482	(APHA 23 <sup>rd</sup> Ed.,2017,4500-SO4 E)
4.	Ammonical Nitrogen(μmol/l)	5.4	2.2	(APHA 23 <sup>rd</sup> Ed.,2017,4500-NH3 B)
5.	Salinity (ppt)	35.92	35.10	By Calculation
6.	Dissolved Oxygen (mg/l)	5.9	4.9	IS 3025(Part 38)1989,
7.	Total Nitrogen (μmol/l)	12.2	5.4	(APHA 23 <sup>rd</sup> Ed.,2017,4500-O,B),
8.	Dissolved Phosphate (μmol/l)	BDL(MDL:0.1)	BDL(MDL:0.1)	APHA 23 <sup>rd</sup> Ed.,2017,4500 NH3 - B
9.	Nitrate (μmol/l)	0.6	1.3	(APHA 23 <sup>rd</sup> Ed.,2017,4500-P,D)
10.	Nitrite (μmol/l)	0.6	0.6	(APHA 23 <sup>rd</sup> Ed.,2017,4500 NO3-B)
11.	Phenol(μmol/l)	23	4.2	APHA 23 <sup>rd</sup> Ed.,2017,4500NO2B
12.	PHc(ppb)1M Level	2.5	0.3	IS 3025(Part 43)1992Amd.02

Note: MDL = Minimum Detection Limit (MDL: 0.01) and N.D. = Not detectable

**a) Temperature:** Marine water temperature of the study area was checked on site, so surface & bottom water temperature observed in the study area in range between 29°C to 30°C. The water temperature generally varied in accordance with the prevailing air temperature, tidal activity and seasonal variation.



**b) pH:** The pH of the water is generally buffering effect, influenced by the freshwater and anthropogenic discharge from land. The observed pH in the study area in range of 7.74 to 8.08 at surface level and 7.73 to 7.99 at bottom level.

**c) Salinity:** Salinity which is an indicator of seawater, the standard average salinity of sea water is 34 to 36 ppt, which is variable depending on the riverine flow, any fresh water discharge from landward side, rainy season and temperature in study area. Average salinity (ppt) for monsoon study is 34.02 to 36.20 ppt at surface water as well as 34.01 to 36.10 ppt at bottom water.

**d) DO & BOD:** High Dissolve oxygen level is measured of good oxidizing conditions in an aquatic environment. In unpolluted waters equilibrium is maintained between its generation through photosynthesis and dissolution from the atmosphere, and consumption by the respiration and decay of organic matter in a manner that Dissolve oxygen levels are close to or above saturation value.

Dissolve oxygen level of the study area is varied from 5.4 mg/l to 6.2 mg/l at water surface level & 4.9 mg/l to 5.9 mg/l at water bottom level. The comparison of average Dissolve oxygen value of monsoon period is 5.6 mg/l which show the good oxidizing conditions in study area aquatic environment.

BOD was generally indicating effective consumption of oxidisable matter in that water body. BOD of the study area is varied from 3.8 mg/l to 5.6 mg/l at water surface level and 4.2 mg/l to 6.2 mg/l at water bottom level.

**e) Nutrients:** Dissolved phosphorus and nitrogen compounds serve as the nutrients for phytoplankton which is the primary producer in aquatic food chain. Phosphorous compounds are present predominantly as reactive phosphate while combined nitrogen is present as nitrate, nitrite and ammonium species. So nutrient concentration (phosphate -nitrate - nitrite) in the study area is Phosphate range 0.11 to 1.2  $\mu\text{mol/l}$  in at Surface water and 0.14 to 0.18  $\mu\text{mol/l}$  at Bottom water , Nitrate range 0.6 to 2.5  $\mu\text{mol/l}$  in surface water and 0.6 to 7.1  $\mu\text{mol/l}$  at bottom water, Nitrite range 0.6 to 0.9  $\mu\text{mol/l}$  in surface level and 0.3 to 0.9  $\mu\text{mol/l}$  at bottom level. This nutrient concentration values indicate water healthiness.

**f) PHc and phenol:** The observed Phenol in the study area in range of 4 to 23  $\mu\text{mol/l}$  at surface level and 4.2 to 13  $\mu\text{mol/l}$  at bottom level. The level of PHc in the study area in range of 1.3 to 4.6  $\mu\text{g/l}$  at surface level and 0.3 to 4.6  $\mu\text{g/l}$  at bottom level.

**g) Total suspended solids:** The suspended solids generally constitute clay, silt and sand from the bed sediment and that from the upstream as well as contributed through shore erosion. Anthropogenic discharges also contribute to suspended solids in the form of contaminants such as oil and solid waste in polluted area. Suspended solids in the study area are little variable, surface area range observed 16 to 54mg/l as well as bottom area range is 44 to 72 mg/l.

### **BIOLOGICAL CHARACTERISTICS (BIODIVERSITY STUDIES):**

Marine environment is unique ecosystems involve the complex interaction between abiotic and biotic components. Any change in the abiotic factors leads to change in aquatic organisms (biotic factor). The human interventions always compromise the health of marine ecosystem by disturbing the ecological balance. Hence the assessment of the biotic components along with abiotic factors is an integral part of Environmental assessment and monitoring study. During the present study at APL the abundance and distribution of marine organisms (plankton and benthos) were studied as part of routine environmental monitoring.

#### **3.1 Planktonic Forms:**

The name plankton is derived from the Greek word “planktons”, meaning “wanderer” or “drifter”. While some forms of plankton are capable of independent movement and can swim up to several hundred meters in a single day, their position is primarily determined by currents in the body of water they inhabit. By definition, organisms classified as "plankton" are unable to resist ocean currents. Plankton is primarily divided into broad functional groups:

1. Phytoplankton
2. Zooplankton

This scheme divides the plankton community into broad producer and consumer groups.

#### **a) Phytoplankton:**

The organisms responsible for primary production in all aquatic ecosystems are known as “phytoplankton.” These miraculous microscopic organisms not only form the base of life in our oceans, but also produce up to 90% of the oxygen in our atmosphere.

Phytoplankton is microscopic plants that live in the ocean, freshwater and other terrestrial based water systems. There are many species of phytoplankton, each of which has a characteristic shape, size and function. Marine species of phytoplankton grow abundantly in oceans around the world and are the foundation of the marine food chain. Marine Phytoplankton is the producing (autotrophic) component in the ocean. There are fourteen

classes of phytoplankton. Each class of phytoplankton contains unique attributes in size, cell structure, nutrients and function.

**b) Zooplankton:**

Zooplankton are the consumer organism, incapable of making its own food from light or inorganic compounds, and feeds on organisms or the remains of other organisms to get the energy necessary for survival. They are primarily depends on the phytoplankton and other small organisms groups for their nutritional needs.

**3.2 Significance of Phytoplankton and Zooplankton:**

Phytoplankton are the major primary producers of organic matter in the aquatic ecosystem. They contribute up to 90% in primary productivity in the Oceanic environment. As part of photosynthesis process they produce organic compounds from carbon dioxide with the help of sunlight and inorganic compound. Collectively, they directly or indirectly support the entire animal population, and thus form the basis of most marine food webs. Phytoplankton also helps in the carbon dioxide sequestration process. The significance of zooplanktons is found in their role in transferring biological production from phytoplankton to large organisms in the marine food web and to the sea floor. A large number of phytoplankton species are grazed upon by the microscopic protozoan, tunicates, copepods and other crustaceans. These in turn become food for other animals further linking the food web. Therefore, variability in the reproduction of copepods would affect the survival of young fish that depend on them.

**Table: 4 Test methods for Phytoplankton & Zooplankton analysis**

Sr. no.	Test performed	Method
1	Phytoplankton	APHA, Edition 21, Part 10000, 10200 F
2	Zooplankton	APHA, Edition 21, Part 10000, 10200 G

**3.3 Phytoplankton:**

Phytoplankton sampling was carried out at 5 stations. At each station water samples were collected from surface and bottom waters. The sampling location is given in following table.5

**Table 5: Phytoplankton Sampling Station**

Station	Location	Co ordinates		Water depth	Tide
1	Intake point	22°48' 30.50"N	69°32'57.84"E	6 m	Flood
2	Intake point Mouth area	22°47'07.20"N	69°32'06.50"E	6.5 m	Ebb - Flood
3	West port area	22°45'27.70"N	69°34'50.63"E	10 m	Flood - Ebb
4	Outfall area	22°44' 40.56"N	69°36'26.61"E	6 m	Flood
5	Outfall area	22°45'12.60"N	69°36'44.54"E	5 m	Flood - Ebb

A Niskin sampler with a closing mechanism at a desired depth was used for collecting sub surface water samples. Surface samples were collected using a clean polyethylene bucket. Samples were stored in amber colored plastic containers fitted with inert cap liners. Further Lugol's solution was added to preserve the phytoplankton cells for further enumeration. The identification of phytoplankton were carried out under a microscope using Sedgwick Rafter slide.

### 3.3.1 Microscopic Observations

For phytoplankton enumeration 0.5 ml of the sample was taken on Sedgwick-Rafter counting cells. The identification was done using a microscope under 40X or 100X magnification. The standard keys given by Desikachary, 1959; Sournia, 1974; Tomas 1997; Horner, 2002 were used for the identification of phytoplankton cells. Species were identified to a genus level.

### 3.3.2 Phytoplankton Diversity

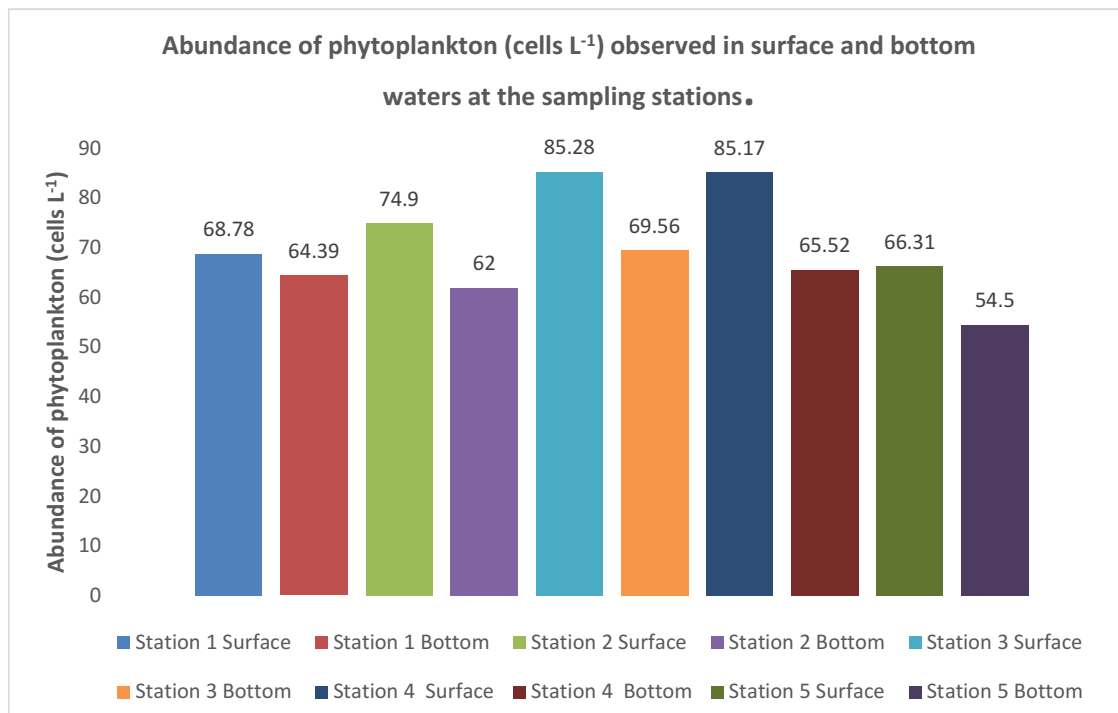
During the sampling period a total of 38 phytoplankton genera (31 diatom genera and 6 dinoflagellate genera) were observed in sampled water. Diatom genera includes, Amphipleura sp, Amphiprora sp, Amphora sp., Bacillaria sp., Biddulphia sp., Chaetoceros sp., Cocconeis sp., Coscinodiscus sp., Cylindrotheca sp., Diploneis sp., Ditylum sp., Fragillaria sp., Gramatophora sp., Gyrosigma sp., Lauderia sp., Leptocylindrus sp. Melosira sp., Navicula sp., Nitzschia sp., Odontella sp., Pinnularia sp., Pleurosigma sp., Rhizosolenia sp., Scrippsiella sp., Skeletonema sp., Surirella sp., Thalassionema sp., Thalassiosira sp., Thalassiothrix sp. and Trachyneis sp.. Whereas, dinoflagellate includes Ceratium sp., Dinophysis sp., Noctiluca sp., Peridinium sp., Prorocentrum sp. and Protoperdinium sp. were identified from sub-tidal and intertidal region. Average phytoplankton abundance recorded in surface waters was



76.08±5.12 cells x 10<sup>2</sup>/l, whereas, in bottom waters phytoplankton abundance was 63.19±8.72 cells x 10<sup>2</sup>/l.

The phytoplankton abundance in the study region was ranged from 66.31 cells x 10<sup>2</sup>/l to 85.28 cells 10<sup>2</sup>/l in surface waters. In surface water samples, highest phytoplankton abundance was observed at surface water of Station 3 (85.28 cells 10<sup>2</sup>/l), whereas in bottom water samples, the highest phytoplankton abundance was recorded at Station 3 (69.56 cells 10<sup>2</sup>/l). The phytoplankton community in the sampling area was dominated by Thalassionema sp. (13.04%), Rhizosolenia sp. (9.94%), Rhizosolenia sp , Nitzschia sp.. (8.71%) and Coscinodiscus sp. (4.89%).

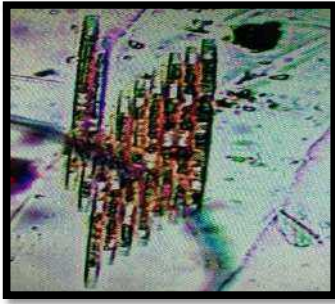
The increase abundance of phytoplanktons at particular station might be due to nutrients. Phytoplankton, like land plants, require nutrients such as nitrate, phosphate, silicate, and calcium at various levels depending on the species and also increase density of single genus for example Thalassionema sp. The study shows that marine water around APMuL, Mundra are healthy supported for growth of phytoplankton species.



**Graph 1.2: Abundance of phytoplankton (cells L<sup>-1</sup>) observed in surface and bottom waters at the sampling stations.**

**Table 6: Phytoplankton composition and abundance (Cells x 10<sup>2</sup>/l) at sub-tidal and inter-tidal stations in the coastal waters of APMuL, Mundra during September, 2020 (S=Surface; B=Bottom).**

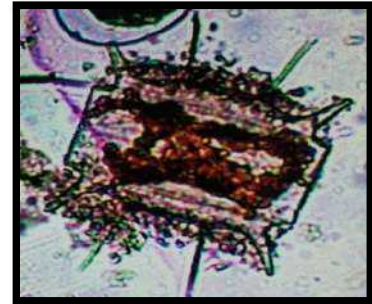
Phytoplankton genera	Sampling Stations										AVG
	Station 1		Station 2		Station 3		Station 4		Station 5		
	S	B	S	B	S	B	S	B	S	B	
<i>Amphipleura sp</i>	1.8	1.4	0	0	0	0	0.3	0	1.3	0.8	0.56
<i>Amphora sp.</i>	0.3	0.4	1.2	0.8	0	0	0.3	0.2	0	0	0.32
<i>Amphora sp.</i>	0.6	0.5	1.8	0.5	0.24	0.1	0.2	0.5	0.6	0.3	0.534
<i>Bacteriastrum</i>	0.5	0	0.2	0	0	0.2	0	0.5	0	0.5	0.19
<i>Biddulphia sp.</i>	1.3	0.8	1.4	0.9	1.3	1.1	0.2	0.3	0.6	0.4	0.83
<i>Chaetoceros sp.</i>	0.1	0.12	0.2	0	0.35	0.14	0.3	0.1	0.2	0	0.151
<i>Cocconeis sp.</i>	0.5	0	0.2	0	0	0	0.1	0	0	0.2	0.1
<i>Coscinodiscus sp.</i>	2.4	1	4.6	3.1	6.4	4.5	7.3	5.4	8.8	5.4	4.89
<i>Cylindrotheca sp.</i>	0.3	0.8	0.6	0	0	0.6	0.5	0.5	0.3	0.2	0.38
<i>Diploneis sp.</i>	0.3	0.26	0.3	1.3	0.2	1.7	1.7	0.6	2.1	0.9	0.936
<i>Ditylum sp.</i>	0.9	0.5	0.4	0	0.4	0.2	0.4	0.1	0.64	0.2	0.374
<i>Fragillaria sp.</i>	1.28	2.4	1.6	0.8	3.65	2.2	5.7	3.5	5.8	4.1	3.103
<i>Gyrosigma sp.</i>	1.2	0.8	5.4	1.1	0.5	0.3	1.2	0.8	0	0	1.13
<i>Lauderia sp.</i>	1.2	0.15	0.8	0.34	0.78	0.1	0.3	0.5	0.4	0	0.457
<i>Leptocylindrus sp.</i>	0.5	0.16	0.7	0.21	0.34	0.1	0.12	0	0.7	0.2	0.303
<i>Melosira sp.</i>	1.2	0	0	0.6	1.32	0.8	0.7	0.3	1.2	0.6	0.672
<i>Navicula sp.</i>	6.5	3.9	1.4	6.9	8.8	7.9	10.4	6.8	8.4	6.6	6.76
<i>Nitzschia sp.</i>	8.7	12.5	7.8	5.7	11.8	10.2	8.2	5.8	6.5	9.9	8.71
<i>Pinnularia sp.</i>	0.9	0.3	0.2	0.15	0.7	0.2	0.3	0.2	0	0	0.295
<i>Pleurosigma sp.</i>	1.7	0.5	0.4	0.6	1.2	1.5	1.5	1.3	1.67	0.8	1.117
<i>Rhizosolenia sp.</i>	1.9	6.8	14.8	6.9	17.1	15.3	12.6	10.6	5.5	7.9	9.94
<i>Scrippsiella sp.</i>	0.8	0	2.7	0.7	1.1	0.2	0.6	0.8	0.8	0.4	0.81
<i>Skeletonema sp.</i>	1.8	4.6	2.7	4.9	2.2	0	3.1	1.62	0.4	0.6	2.192
<i>Surirella sp.</i>	5.5	3.9	2.7	8.7	3.6	2.5	5.4	3.2	4.4	2.2	4.21
<i>Thalassionema sp.</i>	18.5	13.4	10.4	9.5	15.4	14.2	17.2	15.7	8.9	7.2	13.04
<i>Thalassiosira sp.</i>	0	0	0	0	0.2	0	0.4	0	0.4	0	0.1
<i>Thalassiothrix sp.</i>	2.7	4.9	4.6	4.3	3.1	1.62	0.4	0.6	0.8	0.6	2.362
<i>Trachyneis sp.</i>	0	0.2	0	0	0	0.2	0.2	0	0	0.2	0.08
<b>Dinoflagellates</b>											
<i>Ceratium sp.</i>	2.7	1.8	3.8	0.9	2.2	2.1	3.1	2.8	3.7	3.2	2.63
<i>Dinophysis sp.</i>	0.6	0.5	0.4	0.2	0.4	0.2	0.3	0.7	0.8	0.6	0.47
<i>Noctiluca sp.</i>	0.2	0	0.5	0.2	0	0	0.3	0.4	0.5	0.1	0.22
<i>Peridinium sp.</i>	0.6	0.4	0.8	0.5	0.2	0	0.3	0.2	0.7	0.3	0.4
<i>Prorocentrum sp.</i>	1.1	0.8	1.5	1.4	1.4	1.4	1.3	1.2	0	0	1.01
<i>Proto-peridinium sp.</i>	0.2	0.6	0.8	0.8	0.4	0	0.25	0.3	0.2	0.1	0.365
<b>Total abundance (cells x 10<sup>2</sup>/l)</b>	<b>68.78</b>	<b>64.39</b>	<b>74.9</b>	<b>62</b>	<b>85.28</b>	<b>69.56</b>	<b>85.17</b>	<b>65.52</b>	<b>66.31</b>	<b>54.5</b>	<b>69.64</b>



*Fragillaria sp*



*Rhizosolenia sp.*



*Biddulphia sp*



*Coscinodiscus sp.*



*Pleurosigma sp*



*Ceratium sp.*

**1.3: Phytoplankton diversity observed in surface and bottom waters at the sampling stations**

**3.4 Zooplankton:**

Zooplankton samples were collected at 5 selected locations. The sampling details are given in following table 7.

**Table 7: Zooplankton Sampling Station**

Station	Location	Co ordinates		Water depth	Tide
1	Intake point	22°48' 30.50"N	69°32'57.84"E	6 m	Flood
2	intake point	22°47'07.20"N	69°32'06.50"E	6.5 m	Ebb - Flood
3	West port area	22°45'27.70"N	69°34'50.63"E	12 m	Flood - Ebb
4	Outfall area	22°44' 40.56"N	69°36'26.61"E	5 m	Flood
5	Outfall area	22°45'12.60"N	69°36'44.54"E	6 m	Flood - Ebb

Oblique hauls for Zooplankton were made using Heron Tranter net with calibrated flow meter. Samples were preserved with formalin and stored in plastic containers with inert cap liners till further analysis.

#### **3.4.1 Microscopic Observations**

For quantification of zooplankton, 0.5 ml of the sample was taken in zooplankton counting chamber. The identification was carried out under Stereomicroscope at 45X or 100X magnification. The zooplanktons were identified using standard identification keys given by Kasturirangan 1963; Santhanam and Srinivasan, 1994 and Conway et al., 2003 etc. Species were identified to group level.

#### **3.4.2 Zooplankton Diversity**

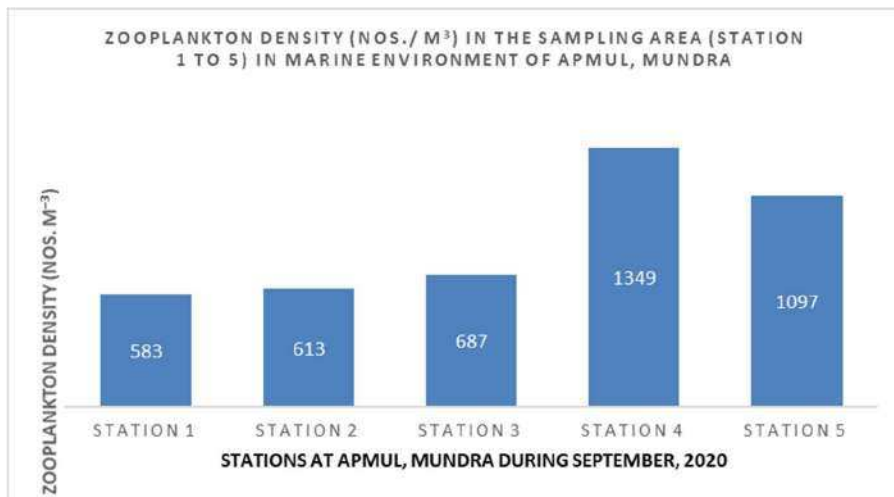
Zooplankton standing stock in terms of abundance revealed substantial spatial variation within all stations. Zooplankton biomass (ml/m<sup>3</sup>) and density (no.s/m<sup>3</sup>) is presented in Table 3. Among all the stations, least zooplankton biomass of 0.235 ml/m<sup>3</sup> was recorded at Station 1 while, maximum biomass was reported at Station 5 (0.468 ml/m<sup>3</sup>). Minimum zooplankton population density was reported at Station 1 (583 nos./m<sup>3</sup>), whereas, maximum density reported at station 4 (1349 nos./m<sup>3</sup>).

A maximum 11 groups of Zooplankton consisting of Copepods, Copepod nauplii, Decapoda (euphausids and shrimps), Amphipoda, Oikoplura, fish larvae, polychate larvae, Gastropod larvae, Crustacean larvae (brachyuran and anomuran crab larvae), Bivalve larvae, Fish and shrimp eggs were identified from study area. (Table 4). Copepods and copepod nauplii, which on an average constituted 62.52% and 24.6% of total zooplankton density respectively in all the stations. Fish and decapods eggs are another major group reported from study area contributing 8.67% of total zooplankton density at all stations. Crustacean larvae (brachyuran and anomuran crab larvae) is another group of importance which mainly consist of zoea stage larvae contributed 5.01%. Decapods, gastropod larvae and eggs of shrimps and fishes are another major group reported in study area. Occurrence of copepods and their nauplii as well as crustacean larvae, decapods and fish larvae/eggs in zooplankton samples suggest that the study area has fair production potentials for live food organism's resources for fish and shellfishes.



**Table 8: Total abundance, biomass and groups of zooplankton at the sampling stations**

Stations	Biomass (ml/m <sup>3</sup> )	Population (no./m <sup>3</sup> )	Total groups	Zooplankton groups observed in the study
ST-1	0.235	583	10	Amphipods, Crustacean-larvae, Chaetognaths , Decapoda (euphausids and shrimps) Polychaetes , Lamellibranchs, Siphonophores , Lucifer sp.Ctenophores and others
ST-2	0.298	613	9	Copepod, Copepod nauplii, Decapoda (euphausids and shrimps), Amphipoda, Gastropod larvae, Crustacean larvae, Bivalve larvae, Fish and decapods egg
ST-3	0.315	687	6	Copepod, Decapods (euphausids and shrimps), Polychate larvae, Crustacean larvae, Bivalve larvae, Fish eggs.
ST-4	0.468	1349	11	Amphipoda, Bivalve larvae, Copepod, Copepod nauplii, Crustacean larvae, Decapoda (euphausids and shrimps), Polychate larvae, Okiopleura, Bivalve larvae, Fish larvae and decapods egg
ST-5	0.407	1097	9	Decapoda (euphausids and shrimps), Gastropod larvae, Crustacean larvae, Bivalve larvae, Fish larvae and decapods egg



**Graph 1.4: Zooplankton density (nos./ m<sup>3</sup>) in the sampling area (station 1 to 5) in marine environment of APMUL, Mundra**

**Table 9: Density (Nos. m<sup>-3</sup>) and contribution (% , in parentheses) of various zooplankton groups at station 1 to 5 in the APMuL marine waters, Mundra during September, 2020**

Zooplankton group	Station 1	Station 2	Station 3	Station 4	Station 5
Copepods	450 (77.70%)	481 (82.50%)	398(57.93%)	649 (94.47%)	0
Copepods nauplii	65 (11.15%)	201 (34.48%)	105 (15.28%)	437 (63.61%)	0
Decapoda (shrimps and euphausiids)	12(2.06%)	5 (0.86%)	39 (5.68%)	51 (7.42%)	507 (73.85%)
Amphipoda	2 (0.41%)	6(1.03%)	0	33 (4.80%)	305 (44.40%)
Oikoplura	0	0	0	12 (0.85%)	0
Fish larvae	0	0	38 (5.53%)	42 (6.11%)	182 (26.49%)
Polychate larvae	3(0.51%)	1 (0.13%)	12 (1.17%)	11(1.60%)	17(2.47%)
Gastropod larvae	1 (0.17%)	0	8(1.16%)	16 (2.33%)	10 (0.52%)
Crustacean larvae	3 (0.51%)	8 (1.37%)	8 (1.17%)	23 (3.35%)	29(3.49%)
Bivalve larvae	11 (1.89%)	6 (1.03%)	23 (3.35%)	31(4.51%)	21 (0.90%)
Eggs (fish and shrimps)	0	11 (1.89%)	56 (8.16%)	56 (8.15%)	26 (1.04%)
<b>Total density (nos/m<sup>3</sup>)</b>	<b>583</b>	<b>613</b>	<b>687</b>	<b>1349</b>	<b>1097</b>
<b>Total biomass (ml/m<sup>3</sup>)</b>	<b>0.235</b>	<b>0.298</b>	<b>0.315</b>	<b>0.468</b>	<b>0.407</b>



***Mysida***



***Copepoda***



***Harpacticoida***



***Ostracods***

**1.5 Microphotographs of zooplanktons reported at sampling stations**

### 3.5 Benthic Fauna

The benthic zone is the ecological region at the lowest level of a water (such as an ocean or a lake) which include the sediment surface and some sub-surface layers. The superficial layer of sediment is an integral part of the benthic zone, as it influences greatly the biological activity which takes place there. Organisms living in this zone are called benthos. They generally live in close relationship with the substrate bottom; many such organisms are attached to the bottom. Some benthic organisms are mainly dwelling at the bottom of the substratum but at times may travel upwards in the water column. They may also occupy rock crevices, organic debris and other microhabitat at the bottom. The benthic invertebrates ranges from microscopic (e.g. micro invertebrates, <10 microns) to a few tens of centimeters or more in length (e.g. macro invertebrates, >50 cm).

Benthic organisms are morphologically different from that planktonic organisms. Many are adapted to live on the substrate (bottom). In benthic habitats they can be considered as dominant creatures. These organisms adapted to deep-water pressure so cannot survive in the upper parts of the water column. Since light does not penetrate very deep ocean-water, the benthic organisms often depends on the organic matter falling from the upper water column as their main energy source. This dead and decaying matter sustains the benthic food chain. The most benthic organisms in are scavengers or detritivores. These organisms by virtue of being relatively stationary, are constantly exposed to changes undergoing in overlying water, and hence, respond very well to aquatic pollution. The macro benthic population is very sensitive to environmental perturbation and is highly influenced by the physicochemical characteristics of water, nature of substratum, food, predation and other factors. The density of benthic invertebrates also fluctuates widely with the changes in the season.

#### 3.5.1 Significance of benthic macro invertebrates

The biomass of benthic organisms in estuaries and coastal embayment is often high. It declines if communities are affected by prolonged periods of poor water quality especially when anoxia and hypoxia are common. Burrowing and tube-building by deposit-feeding benthic organisms (bioturbations) helps to mix the sediment and enhances decomposition of organic matter. Nitrification and denitrification are also enhanced because a range of

oxygenated and anoxic micro-habitats are created. For example, the area of oxic-anoxic boundaries and the surface area available for diffusive exchange are increased by tube-building macro invertebrates. Loss of nitrification and denitrification (and increased ammonium efflux from sediment) in coastal and estuarine systems is an important cause of hysteresis, which can cause a shift from clear water to a turbid state.

The loss of benthic suspension-feeders can further enhance turbidity levels because these organisms filter suspended particles including planktonic algae, and they enhance sedimentation rates through bio deposition (*i.e.* voiding of their wastes and unwanted food). Changes in the macro fauna (and flora) cause changes in nutrient storage pools. Macro fauna are also important constituents of fish diets and thus are an important link for transferring energy and nutrients between trophic levels, also driving pelagic fish and crustacean production. For these reasons the benthic organisms are extremely important indicators of environmental change.

### 3.5.2 Methodology

To enumerate the macro-benthic population sediment samples were collected from 5 sub-tidal and 3 inter-tidal transects. The details are as mentioned in the table (11 & 12). Sample was collected in the month of September 2020.

**Table 10: Test method for Benthos analysis**

Sr. No	Test performed	Method
1	Benthos	APHA, Edition 21, Part 10000,10500 A-10500 D

**Table 11: Sub-tidal Benthos Sampling Sites**

Station	Location	Co ordinates		Sediment quality
1	Intake point	22°48' 30.'50"N	69°32'57.84"E	Silty clay
2	intake point	22°47'07.20"N	69°32'06.50"E	Silty clay
3	West port area	22°45'27.70"N	69°34'50.63"E	Silty clay
4	Outfall area	22°44' 40.56"N	69°36'26.61"E	Sandy
5	Outfall area	22°45'12.60"N	69°36'44.54"E	Silty clay



**Table 12: Sub-tidal Benthos Sampling Sites**

Transect	Location	Co ordinates	Intertidal expose area (m)	Sediment quality
I	High water level	22°47'07.55" N	42 m	Sandy
	Low water level	22°47'06.38" N		Silty-sand
II	High water level	22°45'58.72" N	54 m	Sandy
	Low water level	22°45'57.74" N		Silty-sand
III	High water level	22°44' 52.21" N	47m	Sandy
	Low water level	22°44' 51.23" N		Sandy

For the analysis of Benthos subtidal sediment samples were collected using Van-veen grab as well as intertidal samples were collected using metal quadrant.

The total Macro benthos population (sub tidal & intertidal) was estimated as number of 1 m<sup>2</sup> area and biomass on wet weight basis.

### 3.5.3 Handling and Preservation

The samples were first sieved with 500 µ size metal sieve and then washed with sea water. Sieving yields residual mixture of benthic organisms and detritus matter. The organisms were handpicked using forceps and paint brush. After sorting, macro benthic organisms were identified to the group level. Organisms were preserved in 10% formalin.

### 3.5.4 Identification

Identification of the organisms was done under stereo-microscope. Day, 1967, Fauchald, 1977 were used as standard reference for identification of the macro invertebrates.

### 3.5.5 Benthic Diversity

During September'2020(Monsoon) study, abundant macrobenthos richness and biomass was stated at sub-tidal stations than inter-tidal stations at APMuL, Mundra. The macrobenthos biomass was measured from 5.26 mg m<sup>-2</sup> to 8.92 mg m<sup>-2</sup> from Station-4 and stations-2 respectively at APMuL marine monitoring area. Whereas, least density of benthic macro organisms was reported as 325 nos. m<sup>-2</sup> whereas, highest density was reported as 795 nos. m<sup>-2</sup> respectively at Station 4 and Station 2. Polychaete species contributed (63.21%) to the total macrobenthic abundance at these stations followed by crustaceans (32.87%). Polychaetes belongs to family Ampharetidae, Capitellidae, Nereidae and Glyceridae were dominated the macrobenthic population at the sampling region. More occurrence of this group could indicate the organic carbon enhancement in the sediment. Generally, the

presence of polychate, sipuncula worms and amphipods suggest availability of food organisms for higher raiders in the study area.

The macrobenthos biomass was measured from 0.56 mg m<sup>-2</sup> to 4.25 mg m<sup>-2</sup> from IT-3(HTL) and IT-1(LTL) and all stations at APMuL marine monitoring area. Whereas, least density of benthic macro organisms was reported as 31 nos. m<sup>-2</sup> at station IT-3 (HW) whereas, highest density was reported as 498 nos. m<sup>-2</sup> at Station IT-1 (LW). Polychaete species contributed (63.56%) to the total macrobenthic abundance at these stations followed by sipuncula (23.38%).

**Table 13: Standing stock and abundance of sub tidal macro benthos**

Station	Biomass (g. m <sup>-2</sup> )	Abundance (no. m <sup>-2</sup> )	Total Group (No.)	Major Group
ST-1	7.85	650	6	Amphipoda , Bivalvia,Cumaceans Polychaeta, Isopoda, and Sipunculids
ST-2	8.92	795	8	Amphipoda ,Bivalvia, Gastropods, Polychaeta, Isopoda, Sipunculids,Tanaids and Otracods
ST-3	6.46	632	7	Amphipoda ,Bivalvia, Gastropods, Polychaeta, Isopoda, Amphipoda and Sipunculids
ST-4	5.26	325	6	Bivalvia,Gastropods, Polychaeta, Isopoda, Sipunculids, and Pisces
ST-5	5.73	410	5	Bivalvia, Brachyurans, Polychaeta, Isopoda, and Sipunculids

**Table 14: Standing stock and abundance of intertidal macro benthos**

Station	Biomass (mg. m <sup>-2</sup> )	Abundance (no. m <sup>-2</sup> )	Total Group	Macro benthic groups observed in the study
IT-1 (LW)	4.25	498	6	Bivalvia, Cumaceans, Polychaeta, Isopoda, and Sipunculids and Ampipods.
IT-1 (HW)	2.89	256	5	Polychaeta, Isopoda, Amphipoda, Gastropods and Sipunculids
IT-2 (LW)	3.54	379	7	Bivalvia, Cumaceans, Polychaeta, Isopoda, Amphipoda, Penaeids, Bivalve and Sipunculids
IT-2 (HW)	1.95	78	5	Polychaeta, Isopoda, Penaeids, Bivalve and Sipunculids
IT-3 (LW)	0.89	42	4	Gastropods, Polychaeta, Bivalve and Mysids and Tanaids
IT-3 (HW)	0.56	31	4	Polychaeta, Penaeids, Bivalve and Tanaids

**Note:** LW-low water during low tide; HW: high water during high tide

**Sub tidal region:**

The sediment texture in sub-tidal stations (Station1 to Station 5) was comprised of Sandy and muddy.

**Inter tidal region:**

The sediment texture at the intertidal stations was silty-clay, which directly influencing the distribution of the macrobenthic population. The fluctuation in tidal level and exposure time also influence the occurrence of benthic organisms in the inter-tidal transects.



*Cossura sp.*



*Polychaete larvae*



*Amphipoda*



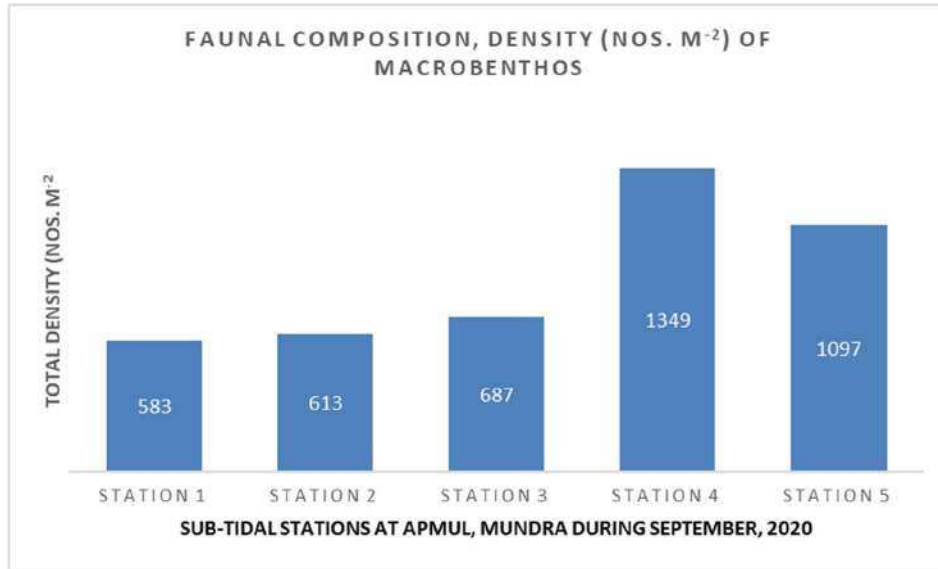
*Bivalvia*

**1.6 Microphotographs of macro benthic organisms.**

**Table 15: Faunal composition, density (nos. m<sup>-2</sup>) of macrobenthos from the sediments collected at High Tide Levels (HTL) and Low Tide Levels (LTL) in inter-tidal region at APMUL, Mundra during September 2020**

Faunal Group	Intertidal stations (IT)					
	IT-1 (LW)	IT-1 (HW)	IT-2 (LW)	IT-2 (HW)	IT-3 (LW)	IT-3 (HW)
<b>Phylum Mollusca</b>						
Bivalves and gastropods	159	86	141	36	12	21
<b>Phylum Sipuncula</b>						
Sipunculids	12	21	45	14	0	0
<b>Phylum Annelida</b>						
Ampharetidae	15	0	5	0	0	0
Capitellidae	65	20	23	0	5	0
Cossuridae	56	14	16	0	6	0
Eunicidae	8	23	12	0	0	0
Nereidae	76	88	92	12	0	0
Glyceridae	43	0	4	0	15	3
<b>Phylum Arthropoda</b>						
Amphipods	38	0	29	4	2	4
Isopods	26	4	12	12	0	0
Tanaids	0	0	0	0	2	3
<b>Total Density (nos. m<sup>-2</sup>)</b>	<b>498</b>	<b>256</b>	<b>379</b>	<b>78</b>	<b>42</b>	<b>31</b>





**Graph 1.7: Sub-tidal macro benthos at different sampling stations in APMuL, Mundra marine monitoring area during September 2020**

### 3.6 Phytoplankton pigments (Chlorophyll and Pheophytin)

#### Chlorophyll and Pheophytin concentration:

Marine phytoplankton contains the essential as well as accessory pigment similar as that of terrestrial plants. Chlorophyll is the essential photosynthetic, green molecule responsible for energy fixation in the process of photosynthesis. The energy fixed by the phytoplankton gets transfer to higher tropic level in the food web through grazing process by the consumers. Chlorophyll is a measure of algal biomass and it acts as an empirical link between nutrient concentrations.

Algal chlorophyll forms a series of degradation products upon degradation. In addition to Chlorophyll the naturally occurring pigments in algal cells, a filtered water sample will also contain colored degradation products of these pigments. The nature of these degradation products depends on which part of the chlorophyll molecule that is affected. As chlorophyll degrades, the initial step is either the loss of the magnesium from the center of the molecule or the loss of the phytol tail. This results in the formation of the molecule, *phaeophytin*. Depending on the parent molecule a number of distinct molecules like phaeophytins, chlorophyllides, and pheophorbides can be produced. Thus in addition to Chlorophyll *a* filtered sea water contains colored degradation products of phytoplankton pigments.

**Figure 1.8: The Degradation Pathways of Chlorophyll**



**Table 16: Method of analysis for Chlorophyll a and Pheophytin**

Sr. no	Test performed	Method
1	Chlorophyll <i>a</i> and Pheophytin	APHA, Edition 21, Part 10000, 10200 H (with some modification)

**3.6.1 Estimation of Chlorophyll *a* and Pheophytin:**

- Sampling locations were same as that of the plankton samples. Surface water samples were collected in clean plastic dark bottles.
- Water samples were filtered through Whattman glass microfiber filters (GF/F: 47 mm) and paper was macerated in 90% acetone and one night stored in the dark at 4°C.
- The extraction slurry was transferred to 15 ml centrifugation tube and centrifuged at ~2000 rpm for 10 min.
- The extract was decanted into a 15 ml centrifuge tube, volume was adjusted to 10 ml with 90% acetone.
- Clarified extract was transferred to cuvette. Chlorophyll fluorescence was measured using Turner Flurometer.
- The extract was then acidified in the cuvette with 0.1 ml of 0.1 N NH<sub>4</sub>Cl. The acidified extract is gently agitated and phaeophytin fluorescence was measured using Turner Flurometer (after acidification).

**3.6.2 Results**

Movement of phytoplankton biomass expressed in terms of Chlorophyll a (Chl a) and phaeophytin at sub-tidal and inter-tidal stations in the marine environment of APMuL, Mundra is presented in Table 1. In sub-tidal region, concentrations of Chl a ranged from 1.18 to 3.49 mg m<sup>-3</sup> at surface (station 1 and station 3, respectively) and from 0.73 to 2.74 mg m<sup>-3</sup> at bottom, (station 5 and station 2, respectively). The content of phaeophytin in surface waters ranged from 0.69 to 1.63 mg m<sup>-3</sup> (station 1 and station 4, respectively) and from 0.45 to 1.39 mg m<sup>-3</sup> in the bottom waters (station 5 and station 3, respectively). The measured concentrations of Chl a and Phaeophytin showed a marginally elevated levels in the surface waters as compared to the bottom waters. The small variations observed between the surface and bottom waters could be due to the natural biological variability intrinsic to such dynamic

ecosystems. The lower Chl a and Pheophytin values recorded at station 5 were attributed to the outfall discharge at station 5 compared to the other stations. The concentration of phaeophytin is a measure of the dead cells and is an indirect indicator of biotic and abiotic anxiety conditions of the algae leading to weakening of chlorophyll a. The ratio from concentrations of chlorophyll a and phaeophytin in an aquatic ecosystem suggest balance between the growth and mortality of phytoplankton life. In healthy environments, ratios of chlorophyll a to phaeophytin generally exceed 1.2. Ratios of Chl a to phaeophytin in the sub-tidal and inter-tidal study area of APMuL, Mundra ranged from 1.39 to 2.28 (Table 1). The ratios of the concentrations of chl a and phaeophytin in the sampled stations were generally high (>1) in all stations indicating that the appropriate conditions prevailed for the phytoplankton growth.

**Table 17: Chlorophyll  $\alpha$  and Pheophytin (mg/l)**

Sampling locations	Chlorophyll $\alpha$ mg m <sup>-3</sup>	Pheophytin mg m <sup>-3</sup>	Chl $\alpha$ : Pheophytin ratio
Station-1 Surface	1.18	0.69	1.71
Station-1 Bottom	1.02	0.59	1.73
Station-2 Surface	2.74	1.54	1.78
Station-2 Bottom	1.59	1.14	1.39
Station-3 Surface	3.49	1.53	2.28
Station-3 Bottom	2.64	1.39	1.90
Station-4 Surface	3.33	1.63	2.04
Station-4 Bottom	1.86	0.92	2.02
Station-5 Surface	1.41	0.83	1.70
Station-5 Bottom	0.73	0.45	1.62

### 3.7 Conclusion

- In sub-tidal region, concentrations of Chl a ranged from 1.18 to 3.49 mg m<sup>-3</sup> at surface (station 1 and station 3, respectively) and from 0.73 to 2.74 mg m<sup>-3</sup> at bottom, (station 5 and station 2, respectively). The content of phaeophytin in surface waters ranged from 0.69 to 1.63 mg m<sup>-3</sup> (station 1 and station 4, respectively) and from 0.45 to 1.39 mg m<sup>-3</sup> in the bottom waters (station 5 and station 3, respectively). The small variations observed between the surface and bottom waters could be due to the natural biological variability intrinsic to such dynamic ecosystems.

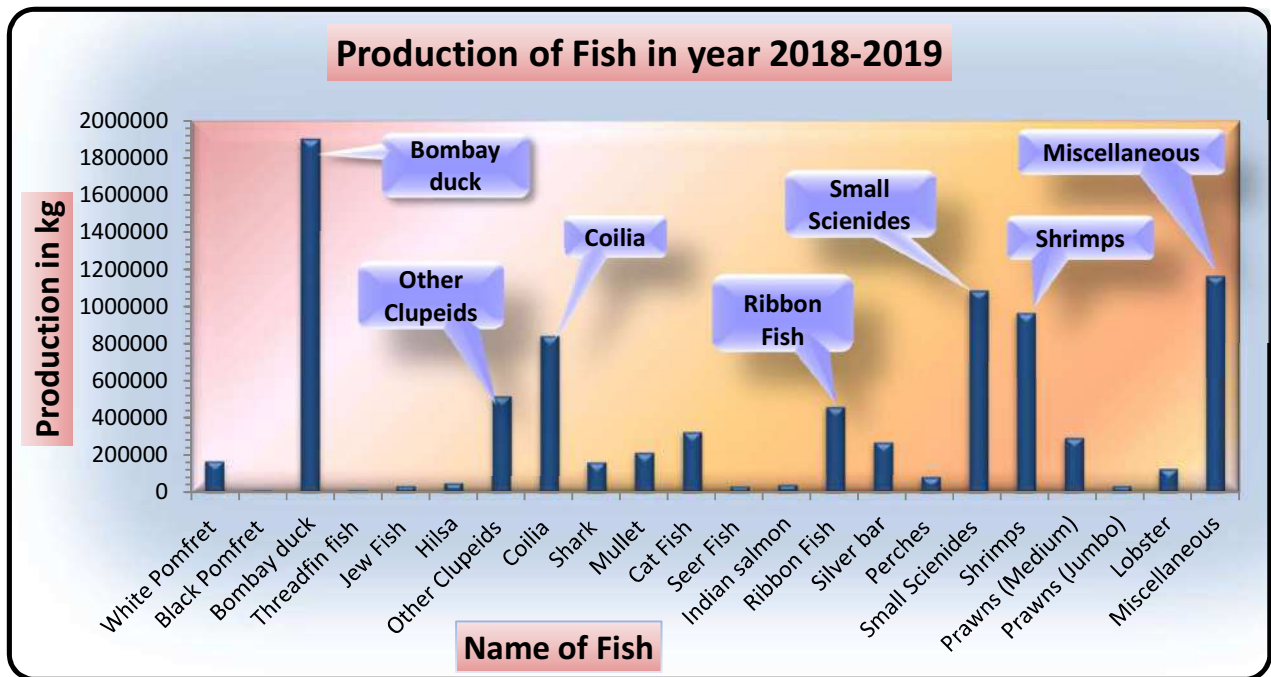
- The phytoplankton abundance in the study region was ranged from 66.31 cells x 10<sup>2</sup>/l to 85.28 cells 10<sup>2</sup>/l (Table 2) in surface waters. In surface water samples, highest phytoplankton abundance was observed at surface water of Station 3 (85.28 cells 10<sup>2</sup>/l), whereas in bottom water samples, the highest phytoplankton abundance was recorded at Station 3 (69.56 cells 10<sup>2</sup>/l). The study shows that marine water around APMuL, Mundra are healthy supported for growth of phytoplankton species.
- Occurrence of copepods and their nauplii as well as crustacean larvae, decapods and fish larvae/eggs in zooplankton samples suggest that the study area has fair production potentials for live food organism's resources for fish and shellfishes. Copepods and copepod nauplii, which on an average constituted 62.52% and 24.6% of total zooplankton density respectively in all the stations. Fish and decapods eggs are another major group reported from study area contributing 8.67% of total zooplankton density at all stations.
- During September'2020(Monsoon) study, abundant macrobenthos richness and biomass was stated at sub-tidal stations than inter-tidal stations at APMuL, Mundra. The macrobenthos biomass was measured from 5.26 mg m<sup>-2</sup> to 8.92 mg m<sup>-2</sup> from Station-4 and stations-2 respectively.
- Comprehensive sampling data investigation reveals that the physicochemical and marine biological parameters of the post monsoon (September'2020\_Monsoon) analyses data persisted and not differed from the baseline monitoring data. However, the unstable intertidal benthic dead shells deposit as the effect of natural tidal currents and exchange with sediment bearing movement moves the disbursement of the benthic fauna,
- The biological parameters considered for the present monitoring study are phytoplankton pigments and cell count, zooplankton standing stock and population, macrobenthic biomass and population status is steady and vigorous in our study stations. Generally, the presence of polychate, sipuncula worms and amphipods suggest availability of food organisms for higher raiders in the study area



#### 4.0 FISH PRODUCTION

Table 18: Fisheries Data of year 2018-19 at (Mundra)

Name of fish	Production in Kg
White Pomfret	168300
Black Pomfret	8656
Bombay duck	1904701
Threadfin fish	10427
Jew Fish	32681
Hilsa	48405
Other Clupeids	520114
Coilia	843800
Shark	161780
Mullet	214729
Cat Fish	326499
Seer Fish	29711
Indian salmon	39373
Ribbon Fish	462689
Silver bar	271419
Perches	83063
Small Scienides	1089071
Shrimps	968498
Prawns (Medium)	295164
Prawns (Jumbo)	32348
Lobster	125694
Miscellaneous	1166470



Graph 1.9: Production of Fish (Spp.) During the Year 2018-19 in Kg

**Table 19: Center wise FISH Production (in Kg)**

District: Kutch

Year :2018-19

Sr.No	Name of fish	Salaya	Modhava	Tragdi	Navinal	Zarpra	Mundra
1	2	3	4	5	6	7	8
1	White pomfret	69305	34283	5429	12018	7051	8583
2	Black pomfret	1217	508	0	0	2848	0
3	Bombay duck	115645	96696	312233	0	11603	172637
4	Thread fin	0	0	0	602	1593	0
5	Jew fish	0	4431	4001	0	0	2337
6	Hilsa	0	1012	0	0	855	2011
7	Other clupeids	32955	34079	31953	18312	18536	38242
8	Coilia	55665	35927	137282	3381	6330	100932
9	Shark	11665	14918	23657	285	2232	8258
10	Mullet	15023	52960	8020	10991	6634	5136
11	Cat fish	51645	27917	34451	10928	6367	31082
12	Eel	0	0	3250	0	0	0
13	Leather jacket	0	0	2931	0	2715	0
14	Seer Fish	15294	3167	0	3562	0	0
15	Indian Salmon	7480	0	0	417	8606	0
16	Ribbon Fish	171543	16659	28566	12500	4335	24073
17	Silver bar	37852	10670	7125	3781	23335	3376
18	Perches	2405	11115	2932	0	0	5220
19	Small scieniedes	71591	106711	136749	6278	35133	128812
20	Shrimps	64567	45955	133061	8342	28056	110797
21	Prawns(Mediu)	17519	26358	64181	1243	4058	19834
22	prawns(Jambo)	0	0	8073	1223	3000	0
23	Lobster	50538	1918	27045	17487	28706	0
24	Crabs	0	794	0	0	11537	1720
25	Miscellaneous	80819	71545	73231	25570	98001	98108
	<b>TOTAL</b>	<b>872728</b>	<b>597623</b>	<b>1044170</b>	<b>136920</b>	<b>311531</b>	<b>761158</b>

Cont...

(Source: State Fisheries Department Kutch)

Sr.No.	Name of fish	Lunee	KukSar	Bhadre svar	Sangad	Kandla	Mithaport	TOTAL
1	2	9	10	11	12	14	15	16
1	White pomfret	3414	10852	5674	2095	8587	1009	168300
2	Black pomfret	0	0	0	2567	0	1516	8656
3	Bombay duck	259836	202900	479725	123601	111731	18094	1904701
4	Thread fin	0	0	0	5397	2215	620	10427
5	Jew fish	1497	2634	1434	904	14903	540	32681
6	Hilsa	0	0	0	1002	35656	7869	48405
7	Other clupeids	42444	56576	120860	28097	78348	19712	520114
8	Coilia	168436	72442	153497	55018	31990	22900	843800
9	Shark	35133	7846	35982	3111	15381	3312	161780
10	Mullet	102	17102	12885	19559	39687	26630	214729
11	Cat fish	51188	22523	47366	9089	28448	5495	326499
12	Eel	0	0	365	0	802	0	4417
13	Leather jacket	0	0	0	0	0	0	5646
14	Seer Fish	0	0	0	3202	752	3734	29711
15	Indian Salmon	0	0	9040	0	13830	0	39373
16	Ribbon Fish	62610	42389	54112	10761	20902	14239	462689
17	Silver bar	6526	7105	105105	2816	63100	628	271419
18	Perches	1587	1655	6352	0	37007	14790	83063
19	Small scieniedes	142119	118270	116476	56847	117544	52541	1089071
20	Shrimps	119769	107253	226104	50179	58139	16276	968498
21	Prawns(Medium)	41982	23801	64585	5636	22119	3848	295164
22	prawns(Jambo)	1252	0	2202	5771	8903	1924	32348
23	Lobster	0	0	0	0	0	0	125694
24	Crabs	0	12172	11260	0	17307	19602	74392
31	Miscellaneous	134171	114530	211003	87896	92380	79216	1166470
	<b>TOTAL</b>	<b>1072066</b>	<b>820050</b>	<b>1664027</b>	<b>473548</b>	<b>819731</b>	<b>314495</b>	<b>8888047</b>

#### 4.1 Observations of Fish Production

- The highest annual fish production during the Year 2018-19 in the Mundra is of Bombay Duck (1904701 kg) and the lowest production is of Seer Fish (29711 kg).
- The highest fish production during the year 2018-19 was recorded in Bhadresvar Landing Centre whereas lowest at Navinal Landing Centre.

(Source: State Fisheries Department of Kutch)

**Table 20: Names of the Marine Monitoring Team Members**

Sr. No.	Name of Person
1.	Mr. Kalyan De (Marine Scientist)
2.	Mr. Vijay Thanki (Env. Chemist)
3.	Mr. Pravin Singh (Env. Chemist)
4.	Miss. Shweta A. Rana (Env. Microbiologist)
5.	Dr. Shivanagouda Sanagoudra (Marine Biologist)



**DIFFERENT TYPES OF SAMPLING PHOTOGRAPHS**

\*\*\*\*\*



# **Annexure – 4**

## Chiragsing Rajput

---

**From:** Chiragsing Rajput  
**Sent:** Wednesday, May 13, 2020 4:34 PM  
**To:** 'ro-gpcb-kute@gujarat.gov.in'; rowz.bpl-mef@nic.in; mefcc.ia3@gmail.com; monitoring-ec@nic.in; ms-gpcb@gujarat.gov.in  
**Cc:** Shalin Shah; Azharuddin Kazi; Vivek Gundraniya; Kripa Shah; Mahendra Kumar Ghrilahre (Mahendra.Ghrilahare@adani.com); Ashvin Kumar Patni; Dhanesh Tank  
**Subject:** Intimation Letter\_Restart of Environment Monitoring Activities\_APSEZ, Mundra  
**Attachments:** Letter\_Restart Environmental Monitoring\_12.05.2020.pdf

Dear Sir,

In reference to trailing mail, please find attached intimation letter regarding of restarting of environmental monitoring activities within Adani Ports and SEZ Limited, Mundra (Kutch) from 12<sup>th</sup> May, 2020 after getting requisite permission from Port authority / district administration.

Kindly consider above submission and oblige.

Thanks & Regards  
Chiragsing Rajput

---

**From:** Chiragsing Rajput  
**Sent:** Monday, April 6, 2020 6:14 PM  
**To:** 'ro-gpcb-kute@gujarat.gov.in' <ro-gpcb-kute@gujarat.gov.in>; rowz.bpl-mef@nic.in; mefcc.ia3@gmail.com; monitoring-ec@nic.in; 'ms-gpcb@gujarat.gov.in' <ms-gpcb@gujarat.gov.in>  
**Cc:** Shalin Shah <Shalinm.Shah@adani.com>; Azharuddin Kazi <Azharuddin.Kazi@adani.com>; Vivek Gundraniya <vivek.gundraniya@adani.com>; Kripa Shah <Kripa.Shah@adani.com>; Mahendra Kumar Ghrilahre (Mahendra.Ghrilahare@adani.com) <Mahendra.Ghrilahare@adani.com>; Ashvin Kumar Patni <AshvinKumar.Patni@adani.com>; Dhanesh Tank <Dhanesh.Tank@adani.com>  
**Subject:** Intimation Letter\_Stoppage of Environment Monitoring due to COVID-19\_APSEZ, Mundra

Dear Sir,

Please find attached intimation letter w.r.t. stoppage of environmental monitoring within Adani Ports & SEZ Limited, Mundra, Kutch (Gujarat) since 23<sup>rd</sup> March, 2020 considering COVID-19 Pandemic lockdown.

So kindly consider this submission and oblige.

Thanks & Regards,  
Chiragsing Rajput  
Environment Cell | Adani Ports & Special Economic Zone Ltd.  
Mob +91 9687678443 | Ext: 52132 | [chiragsing.rajput@adani.com](mailto:chiragsing.rajput@adani.com) | [www.adani.com](http://www.adani.com)  
Adani House, 1<sup>st</sup> Floor, P.O. Box 1, Mundra 370421, Gujarat, India.

**adani**

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Our Values: Courage | Trust | Commitment



APSEZ/EnvCell/2020-21/006

Date: 12.05.2020

To,

**Regional Officer,**

**Regional Office – East Kutch**

Gujarat Pollution Control Board,

Gandhidham – 370201.

**Subject:** Intimation for Restart of environmental monitoring within APSEZ, Mundra (Kutch, Gujarat).

**Ref.:** Our letter & E-mail dated 06.04.2020 (**Annexure – A**)

Dear Sir,

With reference to above stated subject, we would like intimate you that, we have stopped the environmental monitoring activities within APSEZ, Mundra since 23<sup>rd</sup> March, 2020 due to COVID – 19 Pandemic lockdown and same has been intimated to your good office vide our letter as well as E-mail dated 06.04.2020.

Now we have restarted environmental monitoring activities within APSEZ, Mundra from 12<sup>th</sup> May, 2020 after obtaining requisite permissions from Port authority and district administration.

This is for your kind information and reference.

Thanks & Regards

**For, Adani Ports and Special Economic Zone Limited**

**Shalin Shah**

**(Head – Environment)**

**CC To:**

1. Member Secretary, GPCB – Head Office, Paryavaran Bhavan, Sector 10 A, Gandhi Nagar – 382 010.
2. APCCF, Regional Office (WZ), MoEF&CC, Regional Office (WZ), E-5, Kendriya Paryavaran Bhawan, Arera Colony, Link Road No. – 3, Bhopal – 462 016.
3. The Director (IA Division), Ministry of Environment, Forests & Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi-110003.

## Chiragsing Rajput

---

**From:** Chiragsing Rajput  
**Sent:** Monday, April 6, 2020 6:14 PM  
**To:** 'ro-gpcb-kute@gujarat.gov.in'; rowz.bpl-mef@nic.in; mefcc.ia3@gmail.com; monitoring-ec@nic.in; 'ms-gpcb@gujarat.gov.in'  
**Cc:** Shalin Shah; Azharuddin Kazi; Vivek Gundraniya; Kripa Shah; Mahendra Kumar Ghritlahre (Mahendra.Ghritlahare@adani.com); Ashvin Kumar Patni; Dhanesh Tank  
**Subject:** Intimation Letter\_Stoppage of Environment Monitoring due to COVID-19\_APSEZ, Mundra  
**Attachments:** Letter\_Stoppage of Envionmental Monitoring due to COVID-19.pdf

Dear Sir,

Please find attached intimation letter w.r.t. stoppage of environmental monitoring within Adani Ports & SEZ Limited, Mundra, Kutch (Gujarat) since 23<sup>rd</sup> March, 2020 considering COVID-19 Pandemic lockdown.

So kindly consider this submission and oblige.

Thanks & Regards,  
Chiragsing Rajput

Environment Cell | Adani Ports & Special Economic Zone Ltd.

Mob +91 9687678443 | Ext: 52132 | [chiragsing.rajput@adani.com](mailto:chiragsing.rajput@adani.com) | [www.adani.com](http://www.adani.com)

Adani House, 1<sup>st</sup> Floor, P.O. Box 1, Mundra 370421, Gujarat, India.



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APSEZ/EnvCell/2020-21/001

Date: 06.04.2020

To,

**Regional Officer,**

**Regional Office – East Kutch**

Gujarat Pollution Control Board,

Gandhidham – 370201.

**Subject:** Intimation for stoppage of environmental monitoring within APSEZ, Mundra (Kutch, Gujarat) during COVID – 19 Pandemic lockdown.

**Ref.:** Regulatory Permission obtained by APSEZ, Mundra (Kutch, Gujarat) as per attached **Annexure – 1.**

Dear Sir,

With reference to above stated subject, we would like intimate you that, in compliance to various regulatory permissions granted by MoEF&CC / SEIAA as well as SPCB for various project, M/s. Adani Ports and SEZ Limited, Mundra (Kutch, Gujarat) has been regularly carrying out post environment clearance, monitoring (environmental attributes viz. Air, Water, Noise, Soil, Marine etc.) through NABL accredited / MoEF recognized laboratory and same is being reported/submitted to regulatory body periodically.

However, considering the current scenario of COVID – 19 Pandemic lockdown, we were forced to stop the Environmental Monitoring from 23<sup>rd</sup> March, 2020 and same shall be restarted after completion of this lockdown period and/or when the condition is normalized (as directed by district administration/State/Central Govt.). The date of restart of Environment Monitoring, shall be communicated to your good office.

Kindly consider our above submission and oblige.

Thanks & Regards

**For, Adani Ports and Special Economic Zone Limited**



**Shalin Shah**  
**(Head – Environment)**

**CC To:**

1. Member Secretary, GPCB – Head Office, Paryavaran Bhavan, Sector 10 A, Gandhi Nagar – 382 010
2. APCCF, Regional Office (WZ), MoEF&CC, Regional Office (WZ), E-5, Kendriya Paryavaran Bhawan, Arera Colony, Link Road No. – 3, Bhopal – 462 016
3. The Director (IA Division), Ministry of Environment, Forests & Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi-110003

Adani Ports and Special Economic Zone Ltd  
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Gujarat, India

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info@adani.com  
www.adani.com

## ANNEXURE – 1

### REGULATORY PERMISSIONS

Sr. No.	Permission for	Ref. No. & Dated
<b>Environmental / CRZ clearance from MoEF&amp;CC / SEIAA</b>		
1.	Handling facility of General Cargo / LPG /Chemicals and their storage terminal	F. No. J-16011/13/95-IA.III, 25 <sup>th</sup> August, 1995
2.	Port expansion project including dry/break bulk cargo container terminal, railway link and related ancillary and back-up facilities	F. No. J-16011/40/99-IA.III, 20 <sup>th</sup> September, 2000
3.	Single Point Mooring (SPM), Crude Oil Terminal (COT) and connecting pipes	F. No. J-16011/30/2003-IA-III, 21 <sup>st</sup> July, 2004
4.	Development of Multipurpose berth (Terminal- 2)	F. No. 11-84/2006- IA.III, 5 <sup>th</sup> February, 2007
5.	Water Front Development Project	F. No. 10-47/2008- IA.III, 12 <sup>th</sup> & 19 <sup>th</sup> January, 2009, 7 <sup>th</sup> October, 2015
6.	Township and area development project	Letter No. SEIAA/GUJ/EC/8(b)/44 /2010, 20 <sup>th</sup> February, 2010
7.	Establishment of Common Effluent Treatment Plant (CETP) of 17 MLD	Letter no. SEIAA/GUJ/EC/7(h)/43/2010, 20 <sup>th</sup> February, 2010
8.	Multi Product SEZ, Desalination, Sea Water Intake, Outfall Facility and Pipeline	F. No. 10-138/2008-IA.III, 15 <sup>th</sup> July, 2014
<b>Consent to Operate from SPCB</b>		
1.	Mundra Port Terminal ( <b>PCB ID: 17739</b> ) for handling, storage and distribution of Dry, Liquid and Containerized Cargo	Order No. AWH-83561, Dated 09.02.2017
2.	WFDP – West Port ( <b>PCB ID: 35427</b> ) for Dry cargo handling	Order No. AWH-79241, Dated 28.07.2016
3.	SPM and Pipeline for Crude Oil Terminal ( <b>PCB ID: 37436</b> )	Order No. WH-86980, Dated 30.08.2017
4.	Multi Product SEZ ( <b>PCB ID: 31463</b> )	Order No. AWH-88998, Dated 23.11.2017
5.	MUPL – CETP ( <b>PCB ID: 10605</b> ) for 2.5 MLD Capacity	Order No. AWH-79311, Dated 29.07.2016
6.	AMSIPL ( <b>PCB ID: 10602</b> ) for township and area development	Order No. AWH-89533, Dated 05.12.2017
7.	APSEZ, Residential colony ( <b>PCB ID: 17738</b> ) for STPs (350 + 250 KLD) & RO Plant (10 KLPH)	Order No. AWH-81075, Dated 12.09.2016
8.	MLPTPL ( <b>PCB ID: 53331</b> ) for handling, storage and distribution of LPG	Order No. AWH-103906, Dated 09.11.2019

# **Annexure – 5**

To,

Regional Officer

Gujarat Pollution Control Board (East – Kutch),  
Gandhidham,  
Kutch – 370201.

**Subject: Intimation regarding revised time line for completion of Effluent Treatment Plant modification work**

**Reference:**

1. CC&A Order No. AWH – 83561, dated 09.01.2017, Valid till 20.11.2021
2. Our letter dated 10.06.2020 (Annexure – 1)

Dear Sir,

With reference to above stated subject and references, we have submitted tentative time bound action plan for completion of ETP modification work till 15<sup>th</sup> Sep, 2020 considering ease of lock down and availability of manpower to complete the work vide our letter dated 10<sup>th</sup> June, 2020.

However due to heavy incessant rainfall in Mundra region during last one month and non-availability of adequate labour strength, the modification work could not be completed as per given time line. Hence the revised time line for completion of ETP modification work considering all the aspects is to be considered as 15<sup>th</sup> November 2020.

Till the completion of above said work, kindly allow us to discharge industrial effluent + domestic sewage generated from APSEZ, Mundra (PCB ID: 17739) in to CETP operated by M/s. MPSEZ Utilities Ltd. (PCB ID: 10605) for treatment and disposal.

However, we shall try to complete the work on top priority and same shall be intimated to your good office as and when this activity is completed and ETP is re-commissioned.

Thanking you,

For, Adani Ports and Special Economic Zone Limited



Shalin Shah  
(Head – Environment)

CC To:

Unit Head (Kutch), Gujarat Pollution Control Board, Gandhinagar – 382010.

Adani Ports and Special Economic Zone Ltd  
Adani House,  
PO Box No. 1  
Mundra, Kutch 370 421  
Gujarat, India  
CIN: L63090GJ1998PLC034182

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Fax +91 2838 25 51110  
info@adani.com  
www.adani.com

Registered Office: Adani Corporate House, Shantigram, Nr. Vaishno Devi Circle, S.G. Highway, Khodiyar, Ahmedabad – 382421, Gujarat, India

*Shalin Shah*  
15-09-2020  
Received  
Gujarat Pollution Control Board  
Regional Office  
Kutch (East)



# **Annexure – 6**



## GUJARAT POLLUTION CONTROL BOARD

PARYAVARAN BHAVAN

Sector-10-A, Gandhinagar 382010

Phone : (079) 23222425

(079) 23222152

Fax : (079) 23232156

Website : www.gpcb.gov.in

### Application For CTE After TOR

File No : GPCB/ (PCB ID. - 17739)

To,  
**M/s. Adani Ports & Special Economic Zone Ltd.,**  
169/P, AT-NAVINAL ISLAND, MUNDRA, KUTCH,  
City :Mundra ,  
Dist : Kutch East ,  
Taluka : Mundra

Sub: Consent to Establish (After obtaining Terms Of Rrference For Environment Clearance) under Section 25 of Water Act 1974 and Section 21 of Air Act 1981.

Ref: (1) Your online application No. 175853 dated 27/04/2020

(2) TOR issued by Central Authority vide their letter no. 10-24/2019-IA-III Dated 17/05/2019

Sir,

Without prejudice to the powers of this Board under the Water (Prevention and Control of Pollution) Act-1974, the Air Act-1981 and the Environment (Protection) Act-1986 and without reducing your responsibilities under the said Acts in any way, this is to inform you that this Board grants **Consent to Establish (After obtaining Terms Of Rrference For Environment Clearance) under Section 25 of Water Act 1974 and Section 21 of Air Act 1981** for manufacturing of products as mentioned into the application of Environment Clearance (EC) for which TOR is granted vide letter under reference no (2) above.

#### **Consent To Establish Is Granted Subject To The Following Conditions: -**

- 1) The validity period of this CTE shall be Seven Years from the issue of this order.
- 2) Applicant shall strictly comply with all conditions stipulated by competent authority in the order of Environment Clearance to be issued in reference to TOR issued vide letter under reference No. : 2 above.
- 3) The applicant shall however , not without the prior concern of the Board. Bring into use any new or altered outlet for the discharge of effluent or gaseous emission or sewage waste from the proposed industrial plant. The applicant is required to make applications to this Board for this purpose in the prescribed forms under the provisions of the water Act - 1974, the Air - 1981 and the Environment (Protection) Act - 1986.

For and on behalf of  
Gujarat Pollution Control Board

**K. B. Chaudhary**  
ROH - Kutch East

- This order is issued to 169/P, AT-NAVINAL ISLAND, MUNDRA, KUTCH, City :Mundra, Dist : Kutch East, Taluka : Mundra (17739) for CTE amendment after obtaining EC.

# **Annexure – 7**

### Cost of Environmental Protection Measures

Sr. No.	Activity	Cost incurred (INR in Lacs)			Budgeted Cost (INR in Lacs)
		2018 – 19	2019 – 20	2020 – 21 (Till Sep'20)	2020 – 21
1.	Environmental Study / Audit and Consultancy	6.7	0.33	2.0	51.0
2.	Legal & Statutory Expenses	4.42	0.84	10.09	11.0
3.	Environmental Monitoring Services	20.36	21.74	8.46	30.0
4.	Hazardous / Non Hazardous Waste Management & Disposal	95.72	108.43	44.34	119.8
5.	Environment Days Celebration and Advertisement / Business development	0.28	1.5	0.94	10.0
6.	Treatment and Disposal of Bio-Medical Waste	1.21	1.62	1.08	1.68
7.	Mangrove Plantation, Monitoring & Conservation	47.0	Nil	Nil	Nil
8.	Other Horticulture Expenses	579.32	734.18	490	910
9.	O&M of Sewage Treatment Plant and Effluent Treatment Plant (including STP, ETP of Port & SEZ & Common Effluent Treatment Plant)	144.29	110.18	81.09	160.08
10.	Expenditure of Environment Dept. (Apart from above head)	109.28	105.13	41.44	107.44
<b>Total</b>		<b>1008.58</b>	<b>1083.95</b>	<b>679.44</b>	<b>1401.0</b>



# **Annexure – 8**

APSEZL/EnvCell/2020-21/077

Date: 26.09.2020

To,

**Regional Officer,**  
Regional Office (East – Kutch),  
Gujarat Pollution Control Board,  
Gandhidham – 370201.

**Subject:** Submission of compliance to observation/suggestion/instruction made by GPCB officials during inspection.

**Reference:** GPCB Inspection letter dated 25.09.2020, PCB ID: 17739 (**Annexure – A**)

Dear Sir,

With reference to the above mentioned subject and references, APSEZ is submitting the compliance details of your instruction are as below:

**Our Reply against your Observation / Suggestion:**

Observation / Suggestion	Our Reply / Compliance
Point No. 1	<ul style="list-style-type: none"> <li>As per the standard practise, ETP sludge generated are packed in HDPE bags and stored in designated Central Hazardous waste storage area.</li> <li>All the hazardous waste are handled and stored in line to Hazardous waste Rules, 2016, amended till date.</li> <li>As per the communication received, GPCB authorised disposal site (Ambuja Cement Limited, Kodinar) is not in operational condition to due to monsoon (maintenance). All the ETP sludge, will be disposed inline to HWM rules 2016 and same will be intimated to your good office.</li> <li>The ETP Sludge generated during tank and SDB cleaning during modification process packed in HDPE Bags and stored near-by ETP, which has been transferred to the Central Hazardous Waste Storage Area having appropriate facilities. Photographs showing the same are attached as <b>Annexure – B</b>.</li> </ul>
Point No. 2	<ul style="list-style-type: none"> <li>We are complying with all the conditions stipulated in EC and point wise half yearly compliance report of the same is also being submitted to the regulatory authorities on regularly basis. Acknowledge copy of latest report submitted for the period Oct'19 to Mar'20 is attached as <b>Annexure – C</b>.</li> <li>The site was also inspected by RO-MOEF&amp;CC, Bhopal in line with EC &amp; CRZ Clearance compliance and all points/conditions were found to be satisfactorily complied.</li> </ul>
Point No. 3	<p>APSEZ has already implemented various safeguard measures for abatement of fugitive dust emissions, as under</p> <ul style="list-style-type: none"> <li>Covered Storage godown to the extent possible</li> </ul>

Adani Ports and Special Economic Zone Ltd  
Adani House,  
PO Box No. 1  
Mundra, Kutch 370 421  
Gujarat, India  
CIN: L63090GJ1998PLC034182

Tel +91 2838 25 5000  
Fax +91 2838 25 51110  
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www.adani.com

Registered Office: Adani Corporate House, Shantigram, Nr. Vaishno Devi Circle, S.G. Highway, Khodiyar, Ahmedabad – 382421, Gujarat, India

APSEZL/EnvCell/2020-21/077

Date: 26.09.2020

To,

**Regional Officer,**  
Regional Office (East – Kutch),  
Gujarat Pollution Control Board,  
Gandhidham – 370201.

**Subject:** Submission of compliance to observation/suggestion/instruction made by GPCB officials during inspection.

**Reference:** GPCB Inspection letter dated 25.09.2020, PCB ID: 17739 (**Annexure – A**)

Dear Sir,

With reference to the above mentioned subject and references, APSEZ is submitting the compliance details of your instruction are as below:

**Our Reply against your Observation / Suggestion:**

Observation / Suggestion	Our Reply / Compliance
Point No. 1	<ul style="list-style-type: none"> <li>As per the standard practise, ETP sludge generated are packed in HDPE bags and stored in designated Central Hazardous waste storage area.</li> <li>All the hazardous waste are handled and stored in line to Hazardous waste Rules, 2016, amended till date.</li> <li>As per the communication received, GPCB authorised disposal site (Ambuja Cement Limited, Kodinar) is not in operational condition to due to monsoon (maintenance). All the ETP sludge, will be disposed inline to HWM rules 2016 and same will be intimated to your good office.</li> <li>The ETP Sludge generated during tank and SDB cleaning during modification process packed in HDPE Bags and stored near-by ETP, which has been transferred to the Central Hazardous Waste Storage Area having appropriate facilities. Photographs showing the same are attached as <b>Annexure – B</b>.</li> </ul>
Point No. 2	<ul style="list-style-type: none"> <li>We are complying with all the conditions stipulated in EC and point wise half yearly compliance report of the same is also being submitted to the regulatory authorities on regularly basis. Acknowledge copy of latest report submitted for the period Oct'19 to Mar'20 is attached as <b>Annexure – C</b>.</li> <li>The site was also inspected by RO-MOEF&amp;CC, Bhopal in line with EC &amp; CRZ Clearance compliance and all points/conditions were found to be satisfactorily complied.</li> </ul>
Point No. 3	<p>APSEZ has already implemented various safeguard measures for abatement of fugitive dust emissions, as under</p> <ul style="list-style-type: none"> <li>Covered Storage godown to the extent possible</li> </ul>

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Received  
Gujarat Pollution Control Board  
Regional Office

Registered Office: Adani Corporate House, Shantigram, Nr. Vaishno Devi Circle, S.G. Highway, Khodiyar, Ahmedabad – 382421, Gujarat, India

Observation / Suggestion	Our Reply / Compliance
	<ul style="list-style-type: none"><li>• Tarpaulin Cover on dry cargo stored in open stack yard</li><li>• Sweeping dust machine for road and open area</li><li>• Photographs showing the same is attached as <b>Annexure - D</b></li></ul> <p>Regular Environment Monitoring is being carried out through NABL / MoEF&amp;CC accredited laboratory, in the upwind and down wind direction. Results of the same, shows that all parameters are within NAAQS standard.</p>

APSEZ is submitting the compliances regularly and hope the above mentioned submission is in line with requirement.

Thanking you,

For, **Adani Ports and Special Economic Zone Limited**



**Shalin Shah**  
(Head - Environment)

**Copy to:**

**Unit Head (Kutch Unit),**  
Gujarat Pollution Control Board,  
Paryavaran Bhavan, Sector - 10A,  
Gandhinagar - 382010.

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Gujarat, India  
CIN: L63090GJ1998PLC034182

Registered Office: Adani Corporate House, Shantigram, Nr. Valshno Devi Circle, S.G. Highway, Khodiyar, Ahmedabad - 382421, Gujarat, India



ANNEXURE – A

GPCB Inspection Letter



ગુજરાત પ્રદુષણ નિયંત્રણ બોર્ડ

પ્રાદેશિક કચેરી : કચ્છ (પૂર્વ)

દિનદયાલ પોર્ટ ટ્રસ્ટનું વહીવટ મકાન રૂમ નં. ૨૧૫, ૨૧૬, ૨૧૭, બીજો માળ,  
સેક્ટર નં. ૮, ગાંધીધામ-૩૭૦૨૦૧, કચ્છ. ફોન : ૦૨૮૩૭-૨૩૦૮૨૮


પ્રતિ, Adani Ports & SEZ


તારીખ : ૨૬/૦૫/૨૦૨૦


જીપીસીઝી આઈડી : ૧૭૭૩૫

ગુજરાત પ્રદુષણ નિયંત્રણ બોર્ડના અધિકારીઓ દ્વારા આપના એકમની આજરોજ જુદા જુદા પર્યાવરણીય નિયમોને આધિન સ્થળ મુલાકાત લેવામાં આવેલ. આપના એકમના સ્થળ મુલાકાત દરમિયાન કરેલ અવલોકનો, આપે આપેલ માહિતી / દસ્તાવેજો અને પર્યાવરણીય નિયમોની જોગવાઈ આદીન, આપને નીચે મુજબ સુચનાઓ આપવામાં આવે છે જેની પૂર્ણતા / સ્પષ્ટતા અંગેનો અહેવાલ (એમ્પલાયન્સ રીપોર્ટ) આ આદેશ મળ્યાની તારીખથી કામગીરીના દિવસ-૩ માં લેખિત/એલઈએન/ઇલેક્ટ્રોનિક માધ્યમ માસૂલે બોર્ડની વડી કચેરી ગુજરાત પ્રદુષણ નિયંત્રણ બોર્ડ, પર્યાવરણ ભવન, સેક્ટર ૧૦-એ, ગાંધીનગર-૩૮૨૦૧૦ ને આ કચેરીની જાણ હેઠળ અચૂક મોકલી આપશો.

- (i) મુલાકાત દરમિયાન, ETP નજીક open મા અંદાજીત ૭૦ to ૮૦ Bvgs (1 Bvg - ૨૦ to ૨૫ kg બેલક્રામ) ETP કમ્પાઉન્ડ રાખેલ ઘાસી પ્રાવેલ છે તો તેનો proper storage માં ભાગલ તરવા.
- (ii) EC ની શરતોનું ચુસ્તપણે પાલન તથા.
- (iii) મુલાકાત દરમિયાન, storage યાર્ડ મા Fugitive emission નોવા મનેલ છે તો તેનું control તરવા માટે ધ્યાન પગલા લેવા.

  
Harsh Patel  
(AEE)

  
Preeti Patel  
(AEE)

  
એકમના પ્રતિનિધિનું નામ અને હોદ્દો  
Chirag Rajput  
(Deputy Manager)

**ANNEXURE – B**

**Photographs showing ETP Sludge Stored in Central HW Storage Area**



## ANNEXURE – C

Acknowledge EC Compliance Report submission**Chiragsing Rajput**

**From:** Chiragsing Rajput  
**Sent:** Tuesday, May 19, 2020 5:22 PM  
**To:** rowz.bpl-mef@nic.in  
**Cc:** brnaidu.cpcb@nic.in; westzonepcb@yahoo.com; mefcc.ia3@gmail.com; monitoring-ec@nic.in; direnv@gujarat.gov.in; ro-gpcb-kute@gujarat.gov.in; ms-gpcb@gujarat.gov.in; Shalin Shah; Azharuddin Kazi; Mahendra Kumar Ghritlahre; Ashvin Kumar Patni; Dhanesh Tank; Devendra Banthia; Ranjan Chaudri; Kaushal Singh; muruganmudaliyar  
**Subject:** Half Yearly EC Compliance Report Submission - APSEZ, Mundra - WFDP 2009 (Oct'19 to Mar'20)  
**Attachments:** 5. EC Compliance Report\_WFDP-2009\_Oct'19 to Mar'20.pdf



Ports and  
Logistics

APSEZL/EnvCell/2020-21/022

To

**Additional Principal Chief Conservator of Forests (C),**

Ministry of Environment, Forest and Climate Change,

Regional Office (WZ), E-5, Kendriya

Paryavaran Bhawan, Arera Colony,

Link Road No. – 3, Bhopal – 462 016.

E-mail: [rowz.bpl-mef@nic.in](mailto:rowz.bpl-mef@nic.in)

**Sub** : Half yearly Compliance report for Environment and CRZ Cleara Development Project at Mundra, Dist. Kutch, Gujarat.

**Ref** : i) Environment and CRZ clearance granted to M/s Adani Ports & S dated 12<sup>th</sup> January, 2009 and 19<sup>th</sup> January, 2009 bearing MoEF lt IA.III.

ii) Environment and CRZ clearance Extension order grant Development Project at Mundra in Kutchh District (Gujarat) October, 2015 bearing MoEF letter No. 10-47/2008- IA.III.

iii) Ministry's Order dated 18.09.2015

**Dear Sir,**

Please refer to the above cited reference for the said subject matter. In connec to state that copy of the compliance report for the Environmental and CRZ Clea October – 2019 to March – 2020 is being submitted through soft copy (e-mail c

o/c

## adani

Ports and  
Logistics

APSEZL/EnvCell/2020-21/018

Date: 19.05.2020

To  
**Additional Principal Chief Conservator of Forests (C),**  
Ministry of Environment, Forest and Climate Change,  
Regional Office (WZ), E-5, Kendriya  
Paryavaran Bhawan, Arera Colony,  
Link Road No. - 3, Bhopal - 462 016.  
E-mail: [rowz.bpl-mef@nic.in](mailto:rowz.bpl-mef@nic.in)

**Sub** : Half yearly Compliance report of Environment and CRZ Clearance for "Handling facility of General Cargo / LPG /Chemicals and their storage terminal at Navinal Island, Mundra taluka of Kutch district, Gujarat"

**Ref** : Environment and CRZ clearance granted to M/s Adani Ports & SEZ Limited vide letter dated 25<sup>th</sup> August, 1995 bearing no. J-16011/13/95-IA,III

Dear Sir,

Please refer to the above cited reference for the said subject matter. In connection to the same, it is to state that copy of the compliance report for the Environmental and CRZ Clearance for the period of October - 2019 to March - 2020 is being submitted through soft copy (e-mail communication).

Kindly consider above submission and acknowledge.

Thank you,  
Yours Faithfully,

For, **M/s Adani Ports and Special Economic Zone Limited**



**Avinash Rai**  
Chief Executive Officer  
Mundra & Tuna Port

3-6-20  
Received  
Gujarat Pollution Control Board  
Regional Office  
Kutch (East)

Encl: As above (CD attached)

Copy to:

- 1) The Director (IA Division), Ministry of Environment, Forests & Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi-110003
  - 2) Zonal Officer, Regional Office, CPCB - Western Region, Parivesh Bhawan, Opp. VMC Ward Office No. 10, Subhanpura, Vadodara - 390 023
  - 3) Member Secretary, GPCB - Head Office, Paryavaran Bhawan, Sector 10 A, Gandhi Nagar - 382 010
  - 4) The Director, Forests & Environment Department, Block - 14, 8<sup>th</sup> floor, Sachivalaya, Gandhi Nagar - 382 010
- ✓ Regional Officer, Regional Office GPCB (Kutch-East), Gandhidham, 370201

Adani Ports and Special Economic Zone Ltd  
Adani House,  
PO Box No. 1  
Mundra, Kutch 370 421  
Gujarat, India  
CIN: L63090GJ1998PLC034182

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Fax +91 2838 25 51110  
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www.adani.com

Registered Office: Adani House, Shantigram, S G Highway, Ahmedabad 382 421, Gujarat, India

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**ANNEXURE – D**

**Photographs showing Covered Dry Cargo Storage Godown, Open Storage Yard with Cover & Sweeping Machine**



**Covered Storage Godown**



**Dry Cargo Storage with Terpaulin Cover**



**Road Sweeping through Sweeping Machine**

APSEZ/EnvCell/2020-21/078

Date: 26.09.2020

To,

**Regional Officer,**  
Regional Office (East – Kutch),  
Gujarat Pollution Control Board,  
Gandhidham – 370201.

**Subject:** Submission of compliance to observation/suggestion/instruction made by GPCB officials during inspection.

**Reference:** GPCB Inspection letter dated 25.09.2020, PCB ID: 35427 (**Annexure – A**)

Dear Sir,

With reference to the above mentioned subject and references, APSEZ is submitting the compliance details of your instruction are as below:

**Our Reply against your Observation / Suggestion:**

Observation / Suggestion	Our Reply / Compliance
Point No. 1	<ul style="list-style-type: none"> <li>We are complying with all the conditions stipulated in EC and point wise half yearly compliance report of the same is also being submitted to the regulatory authorities on regularly basis. Acknowledge copy of latest report submitted for the period Oct'19 to Mar'20 is attached as <b>Annexure – B</b>.</li> <li>The site was also inspected by RO-MOEF&amp;CC, Bhopal in line with EC &amp; CRZ Clearance compliance and all points/conditions were found to be satisfactorily complied.</li> </ul>
Point No. 2	<ul style="list-style-type: none"> <li>APSEZ has already implemented various safeguard measures for abatement of fugitive dust emissions, as under -                             <ol style="list-style-type: none"> <li>Regular sprinkling on road and other open area</li> <li>Regular cleaning of roads</li> <li>Dry fog Dust Suppression System (DSS) in hopper, transfer towers and conveyor belts</li> <li>Use of water mist canon</li> <li>Closed type conveyor belts</li> <li>Regular sprinkling on coal heaps</li> <li>Installation of wind breaking wall having 16 m height</li> <li>Development of greenbelt along the periphery of the storage yards/back up area</li> <li>Mechanized handling system for coal</li> <li>Wagon loading and truck loading through closed silo</li> <li>Transportation of cargo through covered vehicles and rain wagons</li> </ol> </li> <li>Photographs showing the same are attached as <b>Annexure – C</b>.</li> </ul>
Point No. 3	<ul style="list-style-type: none"> <li>We have developed the adequate greenbelt around the coal hips and storage yard having plant species which can be grown up in saline / reclaimed area to abate the fugitive dust emission. The total</li> </ul>

Adani Ports and Special Economic Zone Ltd  
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PO Box No. 1  
Mundra, Kutch 370 421  
Gujarat, India  
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Fax +91 2838 25 51110  
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Registered Office: Adani Corporate House, Shantigram, Nr. Vaishno Devi Circle, S.G. Highway, Khodiyar, Ahmedabad – 382421, Gujarat, India



APSEZ/EnvCell/2020-21/078

Date: 26.09.2020

To,

**Regional Officer,**  
Regional Office (East – Kutch),  
Gujarat Pollution Control Board,  
Gandhidham – 370201.

**Subject:** Submission of compliance to observation/suggestion/instruction made by GPCB officials during inspection.

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Point No. 2	<ul style="list-style-type: none"> <li>APSEZ has already implemented various safeguard measures for abatement of fugitive dust emissions, as under -                             <ol style="list-style-type: none"> <li>Regular sprinkling on road and other open area</li> <li>Regular cleaning of roads</li> <li>Dry fog Dust Suppression System (DSS) in hopper, transfer towers and conveyor belts</li> <li>Use of water mist canon</li> <li>Closed type conveyor belts</li> <li>Regular sprinkling on coal heaps</li> <li>Installation of wind breaking wall having 16 m height</li> <li>Development of greenbelt along the periphery of the storage yards/back up area</li> <li>Mechanized handling system for coal</li> <li>Wagon loading and truck loading through closed silo</li> <li>Transportation of cargo through covered vehicles and rain wagons</li> </ol> </li> <li>Photographs showing the same are attached as <b>Annexure – C</b>.</li> </ul>
Point No. 3	<ul style="list-style-type: none"> <li>We have developed the adequate greenbelt around the coal hips and storage yard having plant species which can be grown up in saline/ reclaimed area to abate the fugitive dust emission. The total</li> </ul>

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Received  
Gujarat Pollution Control Board  
Regional Office  
Kutch (East)

Registered Office: Adani Corporate House, Shantigram, Nr. Vaishno Devi Circle, S.G. Highway, Khodiyar, Ahmedabad – 382421, Gujarat, India

Observation / Suggestion	Our Reply / Compliance
	<p>developed greenbelt area within West Port premises is 94.35 Ha with approx. 2.7 Lacs saplings.</p> <ul style="list-style-type: none"> <li>• We have also developed three layer plantation around the road side and open area.</li> <li>• Further Greenbelt development will be carried out inline to the expansion plan, as proposed to MoEF&amp;CC.</li> <li>• Photographs showing the same are attached as <b>Annexure - D</b>.</li> </ul>
Point No. 4	<ul style="list-style-type: none"> <li>• We are complying with the Coal handling Guidelines and its point wise compliance report is attached as <b>Annexure - E</b>.</li> </ul>

APSEZ is submitting the compliances regularly and hope the above mentioned submission is in line with requirement.

Thanking you,

For, **Adani Ports and Special Economic Zone Limited**



**Shalin Shah**  
(Head - Environment)

**Copy to:**

**Unit Head (Kutch Unit),**  
Gujarat Pollution Control Board,  
Paryavaran Bhavan, Sector - 10A,  
Gandhinagar - 382010.

Adani Ports and Special Economic Zone Ltd    Tel +91 2838 25 5000  
Adani House,    Fax +91 2838 25 51110  
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Mundra, Kutch 370 421    www.adani.com  
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Registered Office: Adani Corporate House, Shantigram, Nr. Vaishno Devi Circle, S.G. Highway, Khodiyar, Ahmedabad - 382421, Gujarat, India



ANNEXURE – A

GPCB Inspection Letter



ગુજરાત પ્રદુષણ નિયંત્રણ બોર્ડ

પ્રાદેશિક કચેરી : કચ્છ (પૂર્વ)

દિનદવાલ પોર્ટ ટ્રસ્ટનું વહીવટ મકાન રૂમ નં. ૨૧૫, ૨૧૬, ૨૧૭, બીજો માળ,  
સેક્ટર નં. ૮, ગાંધીધામ-૩૭૦૨૦૧, કચ્છ. ફોન : ૦૨૮૩૬-૨૩૦૮૨૮


પ્રતિ,

તારીખ : ૨૬/૦૧/૨૦૨૦


ગ્રામીણી આઈડી : ૩૬૫૦૭

ગુજરાત પ્રદુષણ નિયંત્રણ બોર્ડના અધિકારીઓ દ્વારા આપના એકમની આજરોજ જુદા જુદા પર્યાવરણીય નિયમોને આધિન સ્થળ મુલાકાત લેવામાં આવેલ. આપના એકમના સ્થળ મુલાકાત દરમ્યાન કરેલ અવલોકનો, આપે આપેલ માહિતી / દસ્તાવેજો અને પર્યાવરણીય નિયમોની જોગવાઈ આદીન, આપને નીચે મુજબ સુચનાઓ આપવામાં આવે છે જેની પૂર્તતા / સ્પષ્ટતા અંગેનો અહેવાલ (કોમ્પલાયન્સ રીપોર્ટ) આ આદેશ મળ્યાની તારીખથી કામકાજના દિવસ-૩ માં લેખિત/એક્ઝાઇબેન/ઇલેક્ટ્રોનિક માધ્યમ મારફતે બોર્ડની વડી કચેરી ગુજરાત પ્રદુષણ નિયંત્રણ બોર્ડ, પર્યાવરણ ભવન, સેક્ટર ૧૦-એ, ગાંધીધામ-૩૮૨૦૧૦ ને આ કચેરીની જાણ ફેરવણ અચૂક મોકલી આપશો.

- i) EC ની શરતોનું ચુસ્તપણે પાલન ત્યુ.
- ii) મુલાકાત દરમ્યાન, highly fugitive emission ઘટાને માટે જો તથા water sprinkling system operation ના ઘટાને માટે જો તો fugitive emission ભાગ્યે જ તવા કમી પાલા લેવા.
- iii) Coal Handling guideline મુજબ, coal storage યુનિટ ની આજુબાજુ three rows plantation with tall growing trees હોવા.
- iv) Coal Handling guideline નું ચુસ્તપણે પાલન ત્યુ અને coal handling guideline ના point wise compliance report જુ તવા.

  
એકમના પ્રતિનિધિનું નામ અને હોદ્દો  
Chirag Rajput  
(Deputy Manager)

  
Harsh Patel  
(AEE)

  
Preeti Patel  
(AEE)

## ANNEXURE – B

Acknowledge EC Compliance Report submission**Chiragsing Rajput**

**From:** Chiragsing Rajput  
**Sent:** Tuesday, May 19, 2020 5:22 PM  
**To:** rowz.bpl-mef@nic.in  
**Cc:** brnaidu.cpcb@nic.in; westzonepcb@yahoo.com; mefcc.ia3@gmail.com; monitoring-ec@nic.in; direnv@gujarat.gov.in; ro-gpcb-kute@gujarat.gov.in; ms-gpcb@gujarat.gov.in; Shalin Shah; Azharuddin Kazi; Mahendra Kumar Ghritlahre; Ashvin Kumar Patni; Dhanesh Tank; Devendra Banthia; Ranjan Chaudri; Kaushal Singh; muruganmudaliyar  
**Subject:** Half Yearly EC Compliance Report Submission - APSEZ, Mundra - WFDP 2009 (Oct'19 to Mar'20)  
**Attachments:** 5. EC Compliance Report\_WFDP-2009\_Oct'19 to Mar'20.pdf

Ports and  
Logistics

APSEZL/EnvCell/2020-21/022

To

**Additional Principal Chief Conservator of Forests (C),**

Ministry of Environment, Forest and Climate Change,

Regional Office (WZ), E-5, Kendriya

Paryavaran Bhawan, Arera Colony,

Link Road No. – 3, Bhopal – 462 016.

E-mail: [rowz.bpl-mef@nic.in](mailto:rowz.bpl-mef@nic.in)

**Sub** : Half yearly Compliance report for Environment and CRZ Cleara  
Development Project at Mundra, Dist. Kutch, Gujarat.

**Ref** : i) Environment and CRZ clearance granted to M/s Adani Ports & S  
dated 12<sup>th</sup> January, 2009 and 19<sup>th</sup> January, 2009 bearing MoEF lt  
IA.III.  
ii) Environment and CRZ clearance Extension order grant  
Development Project at Mundra in Kutchh District (Gujarat)  
October, 2015 bearing MoEF letter No. 10-47/2008- IA.III.  
iii) Ministry's Order dated 18.09.2015

**Dear Sir,**

Please refer to the above cited reference for the said subject matter. In connec  
to state that copy of the compliance report for the Environmental and CRZ Clea  
October – 2019 to March – 2020 is being submitted through soft copy (e-mail c

Adani Ports and Special Economic Zone Ltd Tel +91 2838 25 5000  
Adani House, Fax +91 2838 25 51110  
PO Box No. 1 info@adani.com  
Mundra, Kutch 370 421 www.adani.com  
Gujarat, India  
CIN: L63090GJ1998PLC034182

o/c

## adani

Ports and  
Logistics

APSEZL/EnvCell/2020-21/018

Date: 19.05.2020

To  
**Additional Principal Chief Conservator of Forests (C),**  
Ministry of Environment, Forest and Climate Change,  
Regional Office (WZ), E-5, Kendriya  
Paryavaran Bhawan, Arera Colony,  
Link Road No. - 3, Bhopal - 462 016.  
E-mail: [rowz.bpl-mef@nic.in](mailto:rowz.bpl-mef@nic.in)

**Sub** : Half yearly Compliance report of Environment and CRZ Clearance for "Handling facility of General Cargo / LPG /Chemicals and their storage terminal at Navinal Island, Mundra taluka of Kutch district, Gujarat"

**Ref** : Environment and CRZ clearance granted to M/s Adani Ports & SEZ Limited vide letter dated 25<sup>th</sup> August, 1995 bearing no. J-16011/13/95-IA,III

Dear Sir,

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Kindly consider above submission and acknowledge.

Thank you,

Yours Faithfully,

For, **M/s Adani Ports and Special Economic Zone Limited**



**Avinash Rai**  
Chief Executive Officer  
Mundra & Tuna Port

3-6-20  
Received  
Gujarat Pollution Control Board  
Regional Office  
Kutch (East)

Encl: As above (CD attached)

Copy to:

- 1) The Director (IA Division), Ministry of Environment, Forests & Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi-110003
  - 2) Zonal Officer, Regional Office, CPCB - Western Region, Parivesh Bhawan, Opp. VMC Ward Office No. 10, Subhanpura, Vadodara - 390 023
  - 3) Member Secretary, GPCB - Head Office, Paryavaran Bhawan, Sector 10 A, Gandhi Nagar - 382 010
  - 4) The Director, Forests & Environment Department, Block - 14, 8<sup>th</sup> floor, Sachivalaya, Gandhi Nagar - 382 010
- ✓ Regional Officer, Regional Office GPCB (Kutch-East), Gandhidham, 370201

Adani Ports and Special Economic Zone Ltd  
Adani House,  
PO Box No. 1  
Mundra, Kutch 370 421  
Gujarat, India  
CIN: L63090GJ1998PLC034182

Tel +91 2838 25 5000  
Fax +91 2838 25 51110  
info@adani.com  
www.adani.com

Registered Office: Adani House, Shantigram, S G Highway, Ahmedabad 382 421, Gujarat, India

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**ANNEXURE – C**

**Photographs showing Control Measures for Fugitive Dust Emission**



**Water Sprinkling on Coal Hip**



**Water Sprinkling on Open Area**



**Dry Fog Dust Suppression System**



**Water Sprinkling on Road side**



**Closed Silos for Truck & Wagon Loading**



**Closed Conveyor System**



**Wind Breaking Wall 16m Height**







Mechanized Handling System



Coal Transportation through Covered Truck & Rail Wagon



Dump Pond with Drainage System



Dust Sweeping through Road Sweeping Machine

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**ANNEXURE – D**

**Photographs showing Green Belt / Plantation**







Sr. No.	Condition	Compliance Status
		<ul style="list-style-type: none"> <li>• Regular sprinkling on road and other open area</li> <li>• Regular cleaning of roads through sweeping machine</li> <li>• Dry fog Dust Suppression System (DSS) in hopper, transfer towers and conveyor belts</li> <li>• Use of water mist canon</li> <li>• Regular sprinkling on coal heaps through fixed firefighting system, water bowser and tender</li> <li>• Installation of wind breaking wall having 16 m height</li> <li>• Development of greenbelt along the periphery of the storage yards/back up area</li> <li>• Mechanized handling system for coal</li> <li>• Wagon loading and truck loading through closed silo</li> <li>• Transportation of cargo through covered vehicles and rail wagons</li> </ul> <p>Photographs are attached as <b>Annexure – C.</b></p>
<b>(B)</b>	<b>Storage &amp; Handling Criteria</b>	
6.	Coal handling unit/Agency shall store coal in such a way that coal heap should not be higher than 5 meter and clear distance between two adjoining heaps at G.L. should be 5 meters, so that in case of fire, approach is available.	<p>Coal handling guideline is general guideline for all Coal handling unit/agency. Applicability of this condition is more relevant to those units which are located near residential / urban areas. At our port we have adopted state of art advanced/sophisticated pollution control measures. Which in true spirit are adequate to control fugitive dust.</p> <p>Adequate height of coal heap is being maintained below wind breaking wall. In addition regular water sprinkling is being done through water sprinkler as well as fire monitor is deployed for wetting coal heaps. Adequate distance between two adjoining heap is provided for easy approach for firefighting.</p> <p>16 m wind breaking wall is provided in L-shape size towards landwards side around the coal storage yards. Photographs are attached as <b>Annexure – C.</b></p>





Sr. No.	Condition	Compliance Status
		<p>Photographs are attached as <b>Annexure – C</b>.</p> <p>Also Green belt has been developed around the coal storage yard. Photographs are attached as <b>Annexure – D</b>.</p>
15.	<p>Continuous water sprinkling shall be carried out on the top of the heap at regular intervals to prevent dusting, fire &amp; smoke. To prevent fugitive emission during loading/unloading, fixed pipe network with sufficient water storage and pump shall be installed. Water sprinkling shall be carried out at each and every stage of handling to avoid generation of coal dust or other dust within premises.</p>	<p>For Continuous water sprinkling on the top of coal heap, automated water sprinkling is installed and operated.</p> <p>Water storage tank of 2.2 ML capacity is provided inside port.</p> <p>Entire network of coal handling starting from coal unloading to coal loading is provided with Dry Fog Dust Suppression System.</p> <p>Photographs are attached as <b>Annexure – C</b>.</p>
16.	<p>Coal Handling Unit / Agency shall ensure regular sweeping of coal dust from internal and main roads and also ensure that there is adequate space for free movement of vehicles.</p>	<p>We are keeping dedicated 4 meter wide approach roads in all coal storage yards for free vehicular movements.</p> <p>Regular sweeping of road is being done through sweeping machine.</p> <p>Photographs showing the same are attached as <b>Annexure – C</b>.</p>
17.	<p>The following adequate Air Pollution Control Measures shall be installed and to be operated efficiently.</p>	<p>Air Pollution control measures as mentioned in point No. 5 above is in place.</p>
	<p>a) Dust containment cum suppression system for the coal stack, loading and unloading.</p>	<p>While loading and unloading of coal we are maintaining the required moisture content based on type of coals. Hence, it avoids coal spillages and fugitive.</p> <p>Moreover, we have placed 432 nos. of sprinklers and 278 hydrants, 26 wet riser system &amp; 11 dry riser system of firefighting at coal yard. Water sprinklers are used based on the requirement on specific coal stack and dusting area within the backup yard.</p> <p>Photographs showing the same are attached as <b>Annexure – C</b>.</p>
	<p>b) Construction of effective wind breaking wall suitable to local condition to prevent the suspension of particles from the heaps.</p>	<p>16 m wind breaking wall is provided in L-shape size towards landwards side around the coal storage yards.</p>







Sr. No.	Condition	Compliance Status																																																									
	implementation of the environmental guidelines.	that all the developers are operating in line to the issued, statutory clearances.																																																									
28.	<p>The concentration of the following parameters in the ambient air within the premises and a distance of 10 meters from the source (other than the stack/vent) shall not exceed the following levels.</p> <table border="1"> <thead> <tr> <th rowspan="2">PARAMETERS</th> <th colspan="2">PERMISSIBLE LIMIT</th> </tr> <tr> <th>Annual</th> <th>24 Hrs Average</th> </tr> </thead> <tbody> <tr> <td>Particulate Matter-10 (PM<sub>10</sub>)</td> <td>60 Microgram/M<sup>3</sup></td> <td>100 Microgram/M<sup>3</sup></td> </tr> <tr> <td>Particulate Matter- 2.5 (PM<sub>2.5</sub>)</td> <td>40 Microgram/M<sup>3</sup></td> <td>60 Microgram/M<sup>3</sup></td> </tr> <tr> <td>SO<sub>2</sub></td> <td>50 Microgram/M<sup>3</sup></td> <td>80 Microgram/M<sup>3</sup></td> </tr> <tr> <td>NO<sub>x</sub></td> <td>40 Microgram/M<sup>3</sup></td> <td>80 Microgram/M<sup>3</sup></td> </tr> </tbody> </table>	PARAMETERS	PERMISSIBLE LIMIT		Annual	24 Hrs Average	Particulate Matter-10 (PM <sub>10</sub> )	60 Microgram/M <sup>3</sup>	100 Microgram/M <sup>3</sup>	Particulate Matter- 2.5 (PM <sub>2.5</sub> )	40 Microgram/M <sup>3</sup>	60 Microgram/M <sup>3</sup>	SO <sub>2</sub>	50 Microgram/M <sup>3</sup>	80 Microgram/M <sup>3</sup>	NO <sub>x</sub>	40 Microgram/M <sup>3</sup>	80 Microgram/M <sup>3</sup>	<p>Ambient Air Quality (twice in a week), and Noise (once in a month) level monitoring at 3 locations are being carried out by NABL and MoEF&amp;CC accredited agency namely M/s. Pollucon Laboratories Pvt. Ltd. Summary of the same for duration from Oct-19 to Mar-20 is mentioned below.</p> <p><b>AAQM and noise sampling locations: 3 Nos.</b></p> <table border="1"> <thead> <tr> <th>Parameter</th> <th>Unit</th> <th>Max</th> <th>Min</th> <th>Perm. Limit<sup>s</sup></th> </tr> </thead> <tbody> <tr> <td>PM<sub>10</sub></td> <td>µg/m<sup>3</sup></td> <td>95.39</td> <td>50.22</td> <td>100</td> </tr> <tr> <td>PM<sub>2.5</sub></td> <td>µg/m<sup>3</sup></td> <td>58.3</td> <td>18.22</td> <td>60</td> </tr> <tr> <td>SO<sub>2</sub></td> <td>µg/m<sup>3</sup></td> <td>28.7</td> <td>6.83</td> <td>80</td> </tr> <tr> <td>NO<sub>2</sub></td> <td>µg/m<sup>3</sup></td> <td>43.6</td> <td>14.55</td> <td>80</td> </tr> <tr> <td><b>Noise</b></td> <td><b>Unit</b></td> <td><b>Max</b></td> <td><b>Min</b></td> <td><b>Perm. Limit<sup>s</sup></b></td> </tr> <tr> <td>Day Time</td> <td>dB(A)</td> <td>74.3</td> <td>58.3</td> <td>75</td> </tr> <tr> <td>Night Time</td> <td>dB(A)</td> <td>69.6</td> <td>57.3</td> <td>70</td> </tr> </tbody> </table> <p>The above results shows that all parameters are within NAAQS</p>	Parameter	Unit	Max	Min	Perm. Limit <sup>s</sup>	PM <sub>10</sub>	µg/m <sup>3</sup>	95.39	50.22	100	PM <sub>2.5</sub>	µg/m <sup>3</sup>	58.3	18.22	60	SO <sub>2</sub>	µg/m <sup>3</sup>	28.7	6.83	80	NO <sub>2</sub>	µg/m <sup>3</sup>	43.6	14.55	80	<b>Noise</b>	<b>Unit</b>	<b>Max</b>	<b>Min</b>	<b>Perm. Limit<sup>s</sup></b>	Day Time	dB(A)	74.3	58.3	75	Night Time	dB(A)	69.6	57.3	70
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## Environment Management System at Coal Terminal (West Port)



Strategically Adani Ports & SEZ Ltd. developed its coal terminal (West Port) at Mundra. Since from conceptualisation to operation phase various environmental consideration are implemented and being practiced, which make terminal efficient and largest coal terminal of india. Following are various sustainable environmental initiatives adopted at west port:

### **Dry Fog Dust Suppression System :**

Coal unloaded through Grab Sampler Unit (GSU) is being transferred through conveyer belt to coal stock pile. Entire coal handling system starting from GSU to coal stock pile & from coal stock pile to wagon/truck loading silos is provided with Dry Fog Dust Suppression System.



The "Dry Fog" (water atomization with compressed air) Dust Control System works on the principle of agglomeration. Dust particles released from a material handling plant which become air borne, are made to pass through a blanket of extremely fine dry fog.

Water is mixed with compressed air in a ratio through our highly efficient acoustic nozzles which produces millions of miniscule water droplets (0 to 30 microns in size) in the form of a DENSE DRY FOG, which when kept entrapped within an enclosure at a dust generating transfer point, can efficiently contain and control even fine dust particle.

The basic principle of dry fog system is generation of like size water nozzles droplets and its collision with dust particles causing agglomeration with other dust particles and its growth in size & mass. Finally, the mass becomes large and heavy enough to settle back on to the source material where they are carried thru the process without any special handling. This entrapment phenomenon of the dust particle is accomplished by an economical, practical and patented enclosure design typically for the belt conveyor transfer points with the help of baffles creating multiple highly effective fine particle scrubbing chambers within the enclosure for effective suppression.

Among the three Key factors of dust suppression only Confinement and Precipitation concept is applicable for Dry Fog System

#### **Water Dust Suppression System :**

Apart from Dry Fogging System, in order to prevent fugitive dusting from coal stock piles, a well established network of water dust suppression system is installed at entire coal stock yard. Wet dust suppression system having different capacity water jets, which is being operated at regular time, which make coal stock pile wet and prevent fugitive dusting from stock pile even during high wind speed.



The water type dust suppression system is used to spray water on the coal stockpiles at the yards and thereby suppress the dust generated from the stockpiles. In this system, 3 nos. centrifugal pumps (2w+1s) (WP-2A/2B/2C) with drive motor are provided to draw water from tank and to supply to the sprinklers. The sprinklers are placed at 45 M spacing along the length of each stockpile. Gate valve is provided at inlet of pumps for necessary isolation of water. 1 no. gate valve, 1 no. non-return valve are provided at outlet of each pump. Each sprinkler will have globe valve and piston operated normally closed type solenoid valve to start / stop spraying water as per requirement. Pressure gauge is provided to indicate outlet pressure of the pump. Pressure transmitter is provided at the common outlet pipe of the pumps. In the event of any discharge valve failing to open, pressure will build up and pressure transmitter will give signal to PLC and PLC will give command to trip the pump after a set delay of time. High and low level switch is provided in the water storage tank, so that when water level in the tank is low, pump will automatically trip to avoid dry running. High level switch is interlocked with motorized butterfly valve at tank inlet.

- Water dust suppression system is provided for 6 nos. stockpiles A, B, C, D, E & F.
- 3 nos. centrifugal pumps (2w+1s) (WP-2A/2B/2C) with drive motor are provided to draw water from RCC tank and to supply to the sprinklers to spray water on the surface of coal stockpiles. These sprinklers are connected with ring main header water pipe line.
- Automatic (through water pressure) swivelling part circle sprinklers are provided along the length of the stockpile at 45 M spacing on both side of each stockpile.
- Each sprinkler is connected to main header pipeline through globe valve and solenoid valve. The spraying will be started / stopped through globe valve manually / solenoid valve automatically and sequentially as per programming in PLC.
- The surface of stockpile will be wetted by operating any two sprinklers from opposite sides on each stockpile. However, at any time maximum 4 nos. sprinklers can operate, i.e. maximum 2 stockpiles can be taken into sprinkler operation. The water quantity has been designed accordingly.
- Each sprinkler is having discharge capacity of 620 LPM (for 4 nos. smaller stockpiles) and 892 LPM (for 2 nos. bigger stockpiles) respectively.



## Wagon Loading Silos (WLS) & Truck Loading Silos(TLS) :

West port having 02 nos. of wagon loading silos & 03 nos. of truck loading silos, which provide environment friendly material handling compare to any other mechanised machine loading system. WLS & TLS have minimal fugitive dusting while loading wagon.

A sophisticated WLS & TLS system at west port is capable to load & truck in minimum time with negligible fugitive emission. So it reduce handling time of rack & truck and it provide environment friendly & efficient operation, which enable port to handle large volume of coal.

APSEZL insist that each coal rack & coal loaded trucks transported from port is being covered with tarpaulin in order to minimise fugitive dusting in transit route.





**Stacker cum Reclaimer & closed conveying system :**

West port having total 06 nos. of stacker cum reclaimer machine and 02 nos. of separate reclaimer. All stackers are provided with dust suppression systems.



Apart from this, entire port is provided with closed conveying system to control fugitive dust emission. In addition each transfer point of closed conveyer have been provided with dry fogging system.



### **Dump Pond :**

In order to discharge surface run off from stock piles. A well designed dump pond has been constructed near each stock pile. Surface run off water as well as fire fighting water goes to the dump pond, which is designed considering the monsoon intensity and adequate to collect surface run off in heavy rainfall also. Dump pond provide adequate time to settle sediment at bottom of pond and sediment free water conforming the discharge norms goes to drainage system.



### **Fire Fighting System :**

As west port is handling huge quantity of coal in a single point. It becomes very crucial to prevent fire incident , which otherwise occurs leads to major fire incident, which is ultimately loss of natural resource and also incremental in atmospheric emission. APSEZL west port having well equipped fire fighting team with available infrastructure. Team is capable and competent to combat against any kind of fire eventuality.

### **Occupational Health Centre :**

West port having full time occupational health centre to provide facility to all employees and contract employees. Bio medical waste generated from OHC is being handled as per BMW Rules - 2016.

### **Greenbelt at West Port :**

Since planning stage APSEZL have developed well established green belt to arrest fugitive dusting. Total 94.35 Ha. area of west port is covered under greenbelt, which includes 206772 nos. of trees, 63331 nos. of palm, 24112 sq.m. of shrubs & 22854 sq.m of lawn. Drip Irrigation system & sprinklers are installed for watering green belt.





#### **Road Sweeping Machine :**

Entire west port is being designed with state of the art technology for efficient and environment friendly handling of coal. Even though material handling area provided with well-established dust suppression systems, in order to collect fine particle matters to get air borne due to vehicular movement. We have provided various types of road sweeping machines, which is round the clock move over the paved area and on roads to collect fine and coarse dust particles. Collected dust is being recycled in the material handling cycle.



#### **Road Network:**

Entire west have been provided with well established road network. In entire west port 33.0 Km road have been constructed using of bitumen whereas 9 Km road have been constructed using paver block. Paver blocks used have been made using fly ash from adani power.



## Waste Management :

### 1. Hazardous Waste Management:

Hazardous Waste is being handled, managed and disposed inline with statutory clearance obtained from regulatory authorities.

Dedicated hazardous waste storage area provided having appropriate facilities.



### 2. Non-Hazardous Waste Management:

A well-established system for segregation of dry & wet waste is in place. All wet waste (Organic waste) is being segregated & utilized for compost manufacturing and/or biogas generation for cooking purpose. The compost is further used by in house horticulture team for greenbelt development. Whereas dry recyclable waste is being sorted in various categories. Presently manual sorting is being done for sorting of different types of solid waste. Segregated recyclable materials such as Paper, Plastic, Cardboard, PET Bottles, Glass etc. are then sent to respective recycling units, whereas remaining non-recyclable waste is baled and sent to cement plant (M/s. Sanghi Industries Ltd., Kutch and/or M/s. Ambuja Cement Ltd., Kodinar) for Co-processing as RDF (Refused Derived Fuel).



Material Recovery Facility



## Water Treatment:

Domestic waste water generated from various utility buildings is being fully collected and being transfer to the Sewage Treatment Plant of 55 KLD capacities. Treated water from sewage plant is being utilised for greenbelt and horticulture activity.

## Environmental Monitoring :

West port having well established Environment Management Team, which is on regular basis check the Ambient Air Quality, Noise level of surrounding areas, as well as regular marine monitoring is being also perform. All the measures and technology adopted by APSEZL at west port providing a better environment at port and surrounding environment. Monitoring parameter are observed within the prescribed norms, which reflect the success of west port to provide environment friendly and efficient operation of entire port.

### Monitoring Schedule



Particular	Frequency	Remarks
Ambient Air Quality Monitoring	Twice a week & monthly	Once a month full monitoring of all NAAQMS parameters & twice a week monitoring of PM2.5, PM10, SO2 & NOx
Stack Emission Monitoring	Half Yearly	PM, SO2, NOx
Ambient Noise Level Monitoring	Once a month	Ambient noise level monitoring
Marine Monitoring	Once a month	Physical, Chemical, Biological parameter monitoring & sediments monitoring
STP water quality monitoring	Twice in a month	Physical, chemical & Biological parameters

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# **Annexure – 9**

July 23, 2020

**M/S Adani Ports And Sez Limited & Their Respective Rights  
And Interest**

At Navinal Island, Po Box No. 1, Mundra, Kutch, Kachchh,  
Gujarat-370421

Pan Card Number : AAACG7917K

Dear Customer,

**Sub: Business Public Liability Insurance (Under PLI Act 1991) Policy No: 3133201064226305000**

We thank you for having preferred us for your *Insurance* requirements. We at HDFC ERGO General Insurance believe ***insurance*** as not only to be an assurance to indemnify in the event of unfortunate circumstances, but one that signifies protection and support, which you can count on when you need it most.

The Insurance Policy enclosed herewith is a written agreement providing confirmation of our responsibility towards you that puts insurance coverage into effect against stipulated perils.

Please note that the policy has been issued based on the information contained in the proposal form and / or documents received from you or your representative / broker.

Name of the Intermediary: Ace Insurance Brokers Pvt Ltd  
Intermediary Code: 21037952

Where the proposal form is not received, information obtained from you or your representative /broker, whether orally or otherwise, is captured in the policy document.

If you wish to contact us in reference to your existing policy and /or other general insurance solutions offered by us, you may write to our correspondence address as mentioned below. Alternatively, you may visit our website [www.hdfcergo.com](http://www.hdfcergo.com). To enable us to serve you better, you are requested to quote your Policy Number in all correspondences.

Thanking you once again for choosing HDFC ERGO General Insurance Company Limited and looking forward to many more years of association.

Yours sincerely,



Authorised Signatory



## Public Liability Insurance (Under PLI Act 1991)

### SCHEDULE

Policy No: 3133201064226305000

Item 1.	Insured	:	M/S Adani Ports And Sez Limited & Their Respective Rights And Interest
Item 2.	Producer	:	Ace Insurance Brokers Pvt Ltd
Item 3.	Financial Interest	:	Not Applicable
Item 4.	Mailing address of the Insured	:	At Navinal Island, Po Box No. 1, Mundra, Kutch, Kachchh, Gujarat, 370421.
Item 5.	Pan Card Number	:	AAACG7917K
Item 6.	Business	:	Other not mentioned above
Item 7.	Policy Period	:	From 00:01 hours : 01 April 2020 To (Midnight) : 31 March 2021
Item 8.	Premium	:	Rs. 21,996.00
Item 9.	Premium & Coverage Statement	:	Refer to Page 2
	9.1 Premium Computation		
	9.2 Insurance Limits & Excess		
Item 10.	Clauses, Conditions & Warranties :		

Form Number	Form Name	Effective Date	Date Issued
PL-02-0032	Policy Schedule	1 April 2020	23 July 2020
PL-02-0031	Insurance contract	1 April 2020	23 July 2020

Subject otherwise to terms and conditions of Public Liability Insurance Policy.

Signed for and on behalf of HDFC ERGO General Insurance Company Limited, on 23 July 2020



Authorised Signatory

GST Registration No: 24AABCL5045N1ZE. The contract will be cancelled ab intio in case; the consideration under the policy is not realized.

" The stamp duty of ₹ 0.50 paid by Demand Draft, vide Receipt/Challan no. CSD/293/2020/385/2020 dated 24/01/2020 as prescribed in Government of Maharashtra Order No. Mudrank-2017/CR.97/M-1, dated the 09th January 2018".

**Note:** Where the proposal form is not received, information obtained from insured, whether orally or otherwise, is captured in the policy document. Discrepancies, if any, in the information contained in the policy document may be pointed out by an insured within 15 days from the policy issue date after which information contained in the policy document shall be deemed to have been accepted as correct.

<b>Branch</b>	206, Sec Fl. Shopper Plaza Iv,Opp. Bsnl Tel Exch Rd, Navarangpura Ahmedabad, 380006. Tel.: +91-79-39883600
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**Warranties :**

Warranted that there are no known losses and /or circumstances leading to losses (except for the claims and / or circumstances already reported to HDFC ERGO General Insurance Co. Ltd.

This policy document is issued basis the information provided though request for quotation and/ or unsigned proposal form and / or other details provided by the insured / insurance intermediary and/ or though discussions and our final quote sheet issued to you enabling the insurer to decide the terms and conditions of insurance contract.

Your are requested to inform us within 15 days of receipt of the policy document in the event of any error or omission in the information provided.

**Broker Name : Ace Insurance Brokers Pvt Ltd**

**Broker Code : 21037952**

## Premium & Coverage Statement

(Item. 9 of Schedule, Attached to and forming part of Policy No: 3133201064226305000)

### 9.1 Premium Computation

Premium Details	Amount (Rs.)
Net Premium	10,998.00
	.00
Add: Contribution to Environment Relief Fund	10,998.00
Total Premium	21,996.00
Invoice Number :	0072200408461
GSTN :	24AAACG7917K1ZH
Place of Supply	Gujarat
SAC Code	997139

### 9.2 Insurance Limits & Excess

#### Insurance Limits

Details	Amount (Rs.)
Each Accident Insurance Limit	50,000,000.00
Aggregate Insurance Limit	150,000,000.00

#### Excess

Compulsory Excess	NA
Voluntary Excess	NA

**Public Liability Insurance (Under PLI Act 1991)****1. OPERATIVE CLAUSE**

WHEREAS the Insured named in the Schedule hereto and carrying on the business described in the said schedule has applied to HDFC ERGO GENERAL INSURANCE COMPANY LIMITED (hereinafter called 'the Company') for the indemnity hereinafter contained and has made a written proposal and declaration which shall be the basis of this contract and is deemed to be incorporated herein and has paid the premium and statutory contribution towards the Environment Relief Fund as consideration for or on account of such indemnity in accordance with the manner prescribed under Section 64VB of the Insurance Act, 1938 and as per the provisions of the Public Liability Insurance Act and the rules framed there under.

NOW THIS POLICY WITNESSETH that subject to the terms, conditions and exclusions herein contained or endorsed or otherwise expressed herein, to indemnify the Insured or Owner against the statutory liability arising out of accidents occurring during the currency of the policy due to handling of hazardous substances as provided for in the said Act and the Rules framed thereunder.

**2. DEFINITIONS**

For the purpose of this policy, the following terms shall have the meaning as set forth hereunder:

- (i) "Act" unless otherwise specifically mentioned shall mean the Public Liability Insurance Act 1991 as amended from time to time;
- (ii) "Accident" means an accident involving a fortuitous, sudden or unintentional occurrence while handling any hazardous substance resulting in continuous, intermittent or repeated exposure to death of, or injury to any person or damage to any property but does not include an accident by reason only of war or radioactivity;
- (iii) "Handling" in relation to any hazardous substance means the manufacture, processing, treatment, package, storage, transportation by vehicle, use, collection, destruction, conversion, offering for sale, transfer or the like of such hazardous substance;
- (iv) "Hazardous Substance" and group means any substance or preparation which is defined as hazardous substance under the Public Liability Insurance Act, 1991 and the Rules framed thereunder;
- (v) "Owner" or "Insured" means a person who owns, or has control over handling of any hazardous substance at the time of accident and includes:
  - (a) in the case of a firm, any of its partners
  - (b) in the case of an association, any of its members, and
  - (c) in the case of a company, any of its directors, managers, secretaries or other officers who is/are directly in charge of, and is/are responsible to the company for the conduct of the business of the company;
- (vi) "Turnover" shall mean
  - (a) In case of Manufacturing Units - Entire annual gross sales turnover including all levies and taxes of manufacturing units handling hazardous substance as defined in the Public Liability Insurance Act, 1991. For the purpose of this insurance, the term "Units" shall mean all operations being carried out in the manufacturing complex in one location.
  - (b) In case of Godowns/ Warehouse Owners – Total annual rental receipts of premises handling hazardous substance as defined in the Public Liability Insurance Act, 1991.
  - (c) In case of Transport Operators – Total annual freight receipts



(d) In all other cases – Total annual gross receipts

### 3. EXCLUSIONS

The Company shall not be liable:

- (i) for any wilful or intentional non-compliance of any statutory requirements;
- (ii) in respect of fines, penalties, punitive and /or exemplary damages;
- (iii) under any law or legislation except in so far as provided for in Section 8 (1) & 8 (2) of the Act;
- (iv) in respect of damage to property owned, leased or hired or under hire purchase or on loan to the Insured or otherwise in the Insured or Owner's control, care or custody;
- (v) for any liability directly or indirectly occasioned by, happening through or in consequence of war, invasion, act of foreign enemy, hostilities (whether war be declared or not) civil war, rebellion, revolution, insurrection or military or usurped power;
- (vi) for any liability directly or indirectly caused by or contributed to by:
  - (a) Ionising radiation or contamination by radioactivity from any nuclear fuel or from any nuclear waste from the combustion of nuclear fuel
  - (b) the radioactive, toxic, explosive or other hazardous properties of any explosive nuclear assembly or nuclear component thereof;
- (vii) for matter outside the scope of Public Liability Insurance Act, 1991.
- (viii) in respect of losses/liability arising outside India.

### 4. CONDITIONS

- 1) The Insured Owner shall give written notice to the Company as soon as reasonable practicable of any claim made against the Insured Owner or of any specific event or circumstance that may give rise to a claim. The Insured Owner shall immediately give to the Company copies of notice of application forwarded by the Collector and all such additional information and/or assistance that the company may require.
- 2) No admission, offer, promise or payment shall be made or given by or on behalf of the Insured owner under this policy without the written consent of the Company.
- 3) The Company shall not be liable for any claim for relief made after five years from the date of occurrence of the accident.
- 4) The Insured Owner shall keep record of annual turnover, and at the time of renewal of insurance declare such turnover and all other details as may be required by the Company. The Company shall at all reasonable times have full rights to call for and examine such records.
- 5) If at the time of happening of any accident resulting in a claim under the policy there be any other insurance covering the same liability,

then the Company shall not be liable to pay or contribute more than its rateable proportion of such liability.

- 6) The Company may cancel this policy by giving seven days' notice in writing of such cancellation to the Insured's last known address and in such an event the Company will return a pro-rata portion of the premium (subject to a minimum retention of 25 per cent of the annual premium) for the unexpired part of the insurance.

The policy may also be cancelled by the Insured by giving thirty days' notice in writing to the Company, in which event the Company will retain premium at short period scale as set forth in the table below, provided there is no claim under the policy during the Policy Period.

In case of any claim under the policy no refund of premium shall be allowed.

The Company shall have no obligation to give notice that the policy is due for renewal or renew this policy upon expiration or termination.

Table of Short Period Scales	
Period of Risk(Not exceeding)	Premium to be retained by the Company (% of the Annual Rate).
1 week	10%
1 month	25%
2 months	35%
3 months	50%
4 months	60%
6 months	75%
8 months	85%
Exceeding 8 months	Total Annual Premium

- 7) If the Company shall disclaim by the Insured Owner for any claim hereunder and such claim shall not within 12 calendar months from the date of such disclaimer have been made the subject matter of a suit in a competent Court of Law. Then the claim for all practical purpose shall be deemed to have been abandoned and shall not thereafter be recoverable hereunder or be made the subject matter of any suit.
- 8) The Company shall not be liable to make any payment in respect of any claim if such be in any manner fraudulent or support by any person on behalf of the insured Owner and/or if the insurance has been continued in consequence of any material misstatement or non-disclosure of any material information by or on behalf of the Insured Owner. In such a case if the Company pays any amount to the claimant due to any statutory provision such amount shall be recoverable from the Insured Owner.
- 9) The policy and the Schedule shall be read together as one contract and any word or expression to which a specific meaning has been assigned in the Act and the Rules framed there under or this policy shall bear such as specific meaning.
- 10) Any dispute regarding interpretation of the terms, conditions and exceptions of the Policy shall be determined in accordance with the law and practice of a court of competent jurisdiction within India.
- 11) Any person who has a grievance against the Company, may himself or through his legal heirs make a complaint in writing to the Insurance Ombudsman in accordance with the procedure contained in The Redressal of Public Grievance Rules, 1998 (Ombudsman Rules). Proviso to Rule 16(2) of the Ombudsman Rules however, limits compensation that may be awarded by the Ombudsman, to the lower of compensation necessary to cover the loss suffered by the insured as a direct consequence of the insured peril or Rs. 20 lakhs Rupees Twenty Lakhs Only) inclusive of ex-gratia and other expenses. A copy of the said Rules shall be made available by the Company upon prior written request by the Insured.

**GRIEVANCE REDRESSAL PROCEDURE**

If you have a grievance that you wish us to redress, you may contact us with the details of your grievance through:

- Call Centre ( Toll free helpline )  
1800 2 700 700 (accessible from any Mobile and Landline within India)  
1800 226 226 (accessible from any MTNL and BSNL Lines)
- Emails - [grievance@hdfcergo.com](mailto:grievance@hdfcergo.com)
- Designated Grievance Officer in each branch.
- Company Website - [www.hdfcergo.com](http://www.hdfcergo.com)
- Fax : 022 - 66383699
- Courier : Any of our Branch office or corporate office

You may also approach the Complaint & Grievance (C&G) Cell at any of our branches with the details of your grievance during our working hours from Monday to Friday.

If you are not satisfied with our redressal of your grievance through one of the above methods, you may contact our Head of Customer Service at

The Complaint & Grievance Cell ,  
HDFC ERGO General Insurance Company Ltd.  
D-301, 3rd Floor, Eastern Business District (Magnet Mall),  
LBS Marg, Bhandup (West),  
Mumbai - 400078. Maharashtra

In case you are not satisfied with the response / resolution given / offered by the C&G cell, then you can write to the Principal Grievance Officer of the Company at the following address

To the Principal Grievance Officer  
HDFC ERGO General Insurance Company Limited  
D-301, 3rd Floor, Eastern Business District (Magnet Mall),  
LBS Marg, Bhandup (West),  
Mumbai - 400078. Maharashtra  
e-mail: [principalgrievanceofficer@hdfcergo.com](mailto:principalgrievanceofficer@hdfcergo.com)

You may also approach the nearest Insurance Ombudsman for resolution of your grievance. The contact details of Ombudsman offices are mentioned below if your grievance pertains to:

- Insurance claim that has been rejected or dispute of a claim on legal construction of the policy
- Delay in settlement of claim
- Dispute with regard to premium
- Non-receipt of your insurance document

Names of Ombudsman and Addresses of Ombudsmen Centers	
Jurisdiction	Office Address
Gujarat, Dadra & Nagar Haveli, Daman and Diu	AHMEDABAD. Office of the Insurance Ombudsman, 2nd floor, Ambica House, Near C.U. Shah College, 5, Navyug Colony, Ashram Road, Ahmedabad - 380 014 Tel.: 079 - 27546150 / 27546139 Fax: 079 - 27546142 Email: bimalokpal.ahmedabad@gbic.co.in
Karnataka	BENGALURU - Shri. M. Parshad Office of the Insurance Ombudsman, Jeevan Soudha Building, PID No. 57-27-N-19, Ground Floor, 19/19, 24th Main Road, JP Nagar, 1st Phase, Bengaluru - 560 078. Tel.: 080 - 26652048/ 26652049 Email: bimalokpal.bengaluru@gbic.co.in
Madhya Pradesh, Chattisgarh	BHOPAL - Shri. R K Srivastava Office of the Insurance Ombudsman, Janak Vihar Complex, 2nd Floor, 6, Malviya Nagar, Opp. Airtel Office, Near New Market, Bhopal - 462 003 Tel.: 0755 - 2769201 / 2769202 Fax: 0755 - 2769203 Email: bimalokpal.bhopal@gbic.co.in
Orissa.	BHUBANESHWAR - Shri. B. N. Mishra Office of the Insurance Ombudsman, 62, Forest park, Bhubneshwar - 751 009. Tel.: 0674 -2596461 /2596455 Fax: 0674 - 2596429 Email: bimalokpal.bhubaneswar@gbic.co.in
Punjab, Haryana, Himachal Pradesh, Jammu & Kashmir, Chandigarh	CHANDIGARH - Office of the Insurance Ombudsman, S.C.O. No.101, 102 & 103, 2nd Floor, Batra Building, Sector 17 - D, Chandigarh - 160 017. Tel.: 0172 -2706196 / 2706468 Fax: 0172 - 2708274 Email: bimalokpal.chandigarh@gbic.co.in
Tamil Nadu, Pondicherry Town and Karaikal (which are part of Pondicherry).	CHENNAI - Shri Virander Kumar Office of the Insurance Ombudsman, Fatima Akhtar Court, 4th Floor, 453, Anna Salai, Teynampet, CHENNAI - 600 018 Tel.:044 - 24333668 / 24335284, Fax: 044 - 24333664 Email: bimalokpal.chennai@gbic.co.in
Delhi	DELHI - Smt. Sandhya Baliga Office of the Insurance Ombudsman, 2/2 A, Universal Insurance Building, Asaf Ali Road, New Delhi - 110 002. Tel.: 011 - 23239633 / 23237532 Fax: 011 - 23230858 Email: bimalokpal.delhi@gbic.co.in
Assam, Meghalaya, Manipur, Mizoram, Arunachal Pradesh, Nagaland and Tripura.	GUWAHATI - Office of the Insurance Ombudsman, Jeevan Nivesh, 5th Floor, Nr. Panbazar over bridge, S.S. Road, Guwahati - 781001(ASSAM). Tel.: 0361 - 2132204 / 2132205 Fax: 0361 -2732937 Email: bimalokpal.guwahati@gbic.co.in
Andhra Pradesh, Telangana, Yanam and part of Territory of Pondicherry.	HYDERABAD - Shri. G. Rajeswara Rao Office of the Insurance Ombudsman, 6-2-46, 1st floor, "Moin Court", Lane Opp. Saleem Function Palace, A. C. Guards, Lakdi-Ka-Pool, Hyderabad - 500 004. Tel.: 040 -65504123 / 23312122 Fax: 040 - 23376599 Email: bimalokpal.hyderabad@gbic.co.in
Rajasthan	JAIPUR - Shri. Ashok K. Jain Office of the Insurance Ombudsman, Jeevan Nidhi - II Bldg., Gr. Floor, Bhawani Singh Marg, Jaipur - 302 005. Tel.: 0141-2740363 Email: Bimalokpal.jaipur@gbic.co.in



Kerala, Lakshadweep, Mahe-a part of Pondicherry.	ERNAKULAM - Shri. P. K. Vijayakumar Office of the Insurance Ombudsman, 2nd Floor, Pulinat Bldg., Opp. Cochin Shipyard, M. G. Road, Ernakulam - 682 015. Tel.: 0484 - 2358759 /2359338 Fax: 0484 - 2359336 Email: bimalokpal.ernakulam@gbic.co.in
West Bengal, Sikkim, Andaman & Nicobar Islands.	KOLKATA - Shri. K. B. Saha Office of the Insurance Ombudsman, Hindustan Bldg. Annexe, 4th Floor, 4, C.R. Avenue, Kolkata - 700 072. Tel.: 033 - 22124339 / 22124340 Fax : 033 - 22124341 Email: bimalokpal.kolkata@gbic.co.in
Districts of Uttar Pradesh : Laitpur, Jhansi, Mahoba, Hamirpur, Banda, Chitrakoot, Allahabad, Mirzapur, Sonbhadra, Fatehpur, Pratapgarh, Jaunpur, Varanasi, Gazipur, Jalaun, Kanpur, Lucknow, Unnao, Sitapur, Lakhimpur, Bahraich, Barabanki, Raebareli, Sravasti, Gonda, Faizabad, Amethi, Kaushambi, Balrampur, Basti, Ambedkarnagar, Sultanpur, Maharajgang, Santkabirnagar, Azamgarh, Kushinagar, Gorkhpur, Deoria, Mau, Ghazipur, Chandauli, Ballia, Sidharathnagar	LUCKNOW - Shri. N. P. Bhagat Office of the Insurance Ombudsman, 6th Floor, Jeevan Bhawan, Phase-II, Nawal Kishore Road, Hazratganj, Lucknow - 226001 Tel.: 0522 - 2231330 / 2231331 Fax: 0522 - 2231310 Email: bimalokpal.lucknow@gbic.co.in
Goa, Mumbai Metropolitan Region excluding Navi Mumbai & Thane.	MUMBAI - Shri. A. K. Dasgupta Office of the Insurance Ombudsman, 3rd Floor, Jeevan Seva Annexe, S. V. Road, Santacruz (W), Mumbai - 400 054. Tel.: 022 - 26106552 / 26106960 Fax: 022 -26106052 Email: bimalokpal.mumbai@gbic.co.in
State of Uttaranchal and the following Districts of Uttar Pradesh: Agra, Aligarh, Bagpat, Bareilly, Bijnor, Budaun, Bulandshehar, Etah, Kanoj, Mainpuri, Mathura, Meerut, Moradabad, Muzaffarnagar, Oraiyya, Pilibhit, Etawah, Farrukhabad, Firozbad, Gautambodhanagar, Ghaziabad, Hardoi, Shahjahanpur, Hapur, Shamli, Rampur, Kashganj, Sambhal, Amroha, Hathras, Kanshiramnagar, Saharanpur.	NOIDA - Shri. Ajesh Kumar Office of the Insurance Ombudsman, Bhagwan Sahai Palace 4th Floor, Main Road, Naya Bans, Sector 15, Distt: Gautam Buddh Nagar, U.P-201301. Tel.: 0120-2514250 / 2514251 /2514253 Email: bimalokpal.noida@gbic.co.in
Bihar, Jharkhand.	PATNA - Shri. Sadasiv Mishra Office of the Insurance Ombudsman, 1st Floor, Kalpana Arcade Building, Bazar Samiti Road, Bahadurpur, Patna 800 006 Tel.: 0612-2680952. Email: bimalokpal.patna@gbic.co.in
Maharashtra, Area of Navi Mumbai and Thane excluding Mumbai Metropolitan Region.	PUNE - Shri. A. K. Sahoo Office of the Insurance Ombudsman, Jeevan Darshan Bldg., 3rd Floor, C.T.S. No.s. 195 to 198, N.C. Kelkar Road, Narayan Peth, Pune - 411 030. Tel.: 020 - 32341320 Email: bimalokpal.pune@gbic.co.in

# **Annexure – 10**

## Compliance Report of EMP & Mitigation Measures

Sr. No.	Suggested Measures	Compliance Status
<b>✂ Construction Phase:</b>		
1	Proper care is warranted while dredging which should be in a controlled manner. It should also be insured that reclamation, dredging, widening and slop stabilization measures do not significantly alter the stabilized erosional-accretional regime and prevailing rate of exchange of water between the outer area of the intricate creek system as well as the free flow of tidal water, to protect the mangroves.	<p>All construction and operation activities as well as dredging and reclamation activities are being carried out as per the approvals.</p> <p>Please refer condition no. 8 &amp; 9 of the CRZ recommendation compliance report for further details.</p>
2	Good sanitation, water and fuel should be made available to the work force. Labour colonies should be set-up landward of the HTL and away from mangrove.	<p>Most of the construction labours resides in the nearby villages where all basic facilities are easily available. However, for those residing near the construction site, infrastructure facilities such as water supply, fuel, sanitation, first aid, ambulance etc. are provided by APSEZ. Details were submitted as a part of compliance report submission for the period Apr'17 to Sep'17.</p> <p>Please refer general condition no. ii of the EC &amp; CRZ clearance for further details.</p>
<b>✂ Operation Phase:</b>		
1	Wastewater such as generated during cleaning of jetties, floor washing, domestic use etc. should be collected in a settling pond and released to marine environment only after ascertaining that it is free from oil and SS. The toilets on the jetties must have compact sewage treatment facilities.	<p>Entire quantity of sewage generated from APSEZ premises is being treated in designated ETP / STP and treated sewage is used for Horticulture purposes.</p> <p>Please refer specific condition no. xii of the EC &amp; CRZ clearance or further details.</p>
2	Dust should be routinely monitored at the vantage points and corrective measures such as water sprinkling should be practiced if it increases beyond permissible limits.	<p>Ambient Air Quality (twice in a week) monitoring is being carried out by NABL and MoEF&amp;CC accredited agency namely M/s. Pollucon Laboratories Pvt. Ltd.</p> <p>Adequate safeguard measures are being taken for abatement of dust emissions.</p> <p>Please refer specific condition no. xi of the EC &amp; CRZ clearance or further details.</p>

Sr. No.	Suggested Measures	Compliance Status
3	It should be ensured that the effluent released into the Gulf meets the prescribed GPCB criteria at all times.	Entire quantity of effluent / sewage generated from APSEZ premises is being treated in designated ETP / STP and treated water is being utilized on land for Horticulture purposes after compliance with GPCB standards.  Please refer specific condition no. xii of the EC & CRZ clearance or further details.
4	Appropriate spill response scheme (Tier-1 to Tier-3) should be in place to minimize impacts on marine environment, should a spill occur.	Oil spill contingency plan is in place to handle Tier 1 level oil spills considering different accident scenarios, and the vulnerable areas are identified and mitigation plan is prepared. Oil spill contingency response plan updated on 01.10.2019 is in place and implemented. Details of the same were submitted along with last half yearly compliance report for the period Oct'19 to Mar'20. And there is no further change.
5	MPSEZL should commit mangrove restoration programme through afforestation in a defined time frame over larger and promising areas and should monitored periodically and protect from anthropogenic pressures.	APSEZ has carried out mangrove afforestation in 2890 ha. area across the coast of Gujarat.  Please refer specific condition no. i & vii of the EC & CRZ clearance or further details.
6	A comprehensive marine quality monitoring programme with periodic investigations at predetermined locations should be undertaken by a specialized agency.	Marine monitoring is being carried out once in a month by NABL and MoEF&CC accredited agency namely M/s. Pollucon Laboratories Pvt. Ltd.  Please refer specific condition no. ix of the EC & CRZ clearance or further details.
7	The dust and noise levels at pre-decided locations including the jetty sites should be periodically monitored and remedial action taken if the levels exceed the prescribed norms.	Ambient Air Quality (twice in a week) and Noise (once in a month) monitoring are being carried out by NABL and MoEF&CC accredited agency namely M/s. Pollucon Laboratories Pvt. Ltd.  Please refer specific condition no. xi of the EC & CRZ clearance or further details.
8	MPSEZL should establish an Environment Management Cell (EMC) directly under the control of the Chief Executive.	M/s APSEZL has a well structured Environment Management Cell, staffed with qualified manpower for implementation of the Environment Management Plan at site. Site team report to General Manager (Environment) at



Sr. No.	Suggested Measures	Compliance Status
		Corporate, who heads the Environment Management Cell who directly reports to the top management. The details of the same were submitted along with last half yearly compliance report for the period Oct'19 to Mar'19. And there is no further change.

# **Annexure – 11**

Expense Details for Fisherfolk Amenities work in different core areas								
Sr.	Details	2016-17	2017-18	2018-19	2019-20	April to Sep-20	TOTAL	AMT IN LACS
Expenditure Details (Amount in Rs.)								
1	Vidya Deep Yojana	2069300	193000	2087000	1771000	0	6120300	61.20
2	Vidya Sahay Yojana	552580	495000	691000	708000	95046	2541626	25.42
3	Adani Vidya Mandir – Shaping Lives	4200000	4030000	3472000	6434020	1593805	19729825	197.30
4	SENIOR CITIZEN HEALTH CARD	0	8430000	1750000	2975000	42000	13197000	131.97
5	FINANCIAL SUPPORT TO POOR PATIENTS	4439507	1275000	813000	1296063	518785	8342355	83.42
6	Machhimar Kaushalya Vardhan Yojana	188708	200000	397000	73000	0	858708	8.59
7	Machhimar Sadhan Sahay Yojana	0	0	315000	522000	0	837000	8.37
8	Machhimar Awas Yojana	4592106	1165000	0	2311000	0	8068106	80.68
9	Machhimar Shudhh Jal Yojana	2236050	2700000	2038000	1773000	714625	9461675	94.62
10	Sughad Yojana	1367300	170000	0	192000	0	1729300	17.29
11	Machhimar Akshay kiran Yojana	860850	100000	68000	0	0	1028850	10.29
12	Machhimar Suraksha Yojana			0	0	0	0	0.00
13	Machhimar Ajivika Uparjan Yojana-Mangroves plantation	1558800	500000	1382000	1400000	1900272	6741072	67.41
14	Bandar Svachhata Yojana	106400	50000	0	0	0	156400	1.56
15	Cricket league and Cycle Marathon	432000	657119	638000	610800	0	2337919	23.38
16	Sports Material For Children & Youth at Vasahats	197797	0	0	0	0	197797	1.98
17	New Pilot Initiative for Polyculture	398240	160000	0	0	0	558240	5.58
18	New Pilot Initiative for Cage farming Asian Seabass & Lobster	864000	660000	0	0	0	1524000	15.24
19	Sea Weed Culture Project	0	0	0	200000	0	200000	2.00
20	Mangrove Biodiversity Project	0	0	1890000	684000	0	2574000	25.74
		<b>24063638</b>	<b>20785119</b>	<b>15541000</b>	<b>20949883</b>	<b>4864533</b>	<b>86204173</b>	<b>862.04</b>

# **Annexure – 12**



## Compliance Report of CIA Study Environment Management Plan

S. No.	Identified environmental and social impacts for the fully developed scenario (year 2030)	Type of Impact & Magnitude	Environment management plans adopted or being adopted by APSEZ as per permits, clearances, applicable regulations and guidelines etc.	Additional Risk Mitigation Measures/ESMP	Responsible agency	Timeframe for implementation	Compliance
<b>1</b>	<b>Land Use Change</b>						
1.1	<p>It is predicted that the built up land in the rural areas would increase by an order 50% from the baseline 2015.</p> <p>New settlements near the SEZ area might create slums.</p> <p>Unorganized urban development leading to poor sanitation and proliferation of vectors and disease.</p>	Level - 1	<p>APSEZ has developed two townships (Shantivan and Samudra) presently accommodating 1668 households. Necessary permissions from concerned authorities were already obtained for the development of townships and Associated infrastructure facilities.</p>	<p>The existing townships will be expanded to accommodate about 4 lakh people when the APSEZ is fully developed.</p>	APSEZ	As and when Required	<p>APSEZ has developed two townships (Shantivan and Samudra) accommodating 2180 households and associated infrastructure facilities. Accommodation is made available for all interested employees working within Adani group &amp; SEZ industries. Out of which 89% Occupancies are accommodated within the townships and rest are available for employees working within APSEZ.</p> <p>At present 45 nos. of industries (processing &amp; non-processing) are operating within the SEZ. Township facilities are also made by some of SEZ industries within Mundra town for their employees with basic infrastructure facilities and requirements.</p> <p>Most of the employees working in SEZ industries are residing in Mundra township having all basic requirements and associated facilities.</p> <p>The existing social infrastructure facilities are adequate for present development at APSEZ. The existing townships with associated</p>

S. No.	Identified environmental and social impacts for the fully developed scenario (year 2030)	Type of Impact & Magnitude 1	Environment management plans adopted or being adopted by APSEZ as per permits, clearances, applicable regulations and guidelines etc.	Additional Risk Mitigation Measures/ESMP	Responsible agency	Timeframe for implementation	Compliance
							<p>facilities will be expanded as per requirement.</p> <p>APSEZ has also been granted permission for receiving domestic sewage @ 2.5 MLD from Mundra village (which was earlier discharged in to open area within Mundra region) in to wastewater treatment plant for treatment and disposal. APSEZ has already started receiving of domestic sewage from Mundra, which will abate the poor sanitation and unhygienic condition within Mundra region. Total project cost for laying domestic sewage underground pipeline with other associated facilities from Mundra to APSEZ is <b>362 Lacs</b>.</p>
1.2	Once the project is fully developed, due to increase in built up land in the APSEZ area, there will be an increase in the storm water runoff from the facility.	Level-1	The study area experiences scanty rainfall less than 400 mm/year. Considering the natural gradient, ASPEZ have designed and implemented storm water drains in the existing facility to meet the peak daily rainfall of 440	Technical feasibility study can be carried out to explore the possibility of developing storm water collection ponds to utilize maximum possible storm water runoff for dust suppression in the coal yard areas during non-rainy days.	APSEZ	Technical Study - one time, Implementation - Continual process	<p>Presently, 42% of the total SEZ area (8434.5890 Ha) is developed. Based on technical studies, APSEZ has developed adequate storm water facilities that meets with daily demand as per recorded highest rainfall.</p> <p>At present all existing coal yards are designed with drain, for collection of water during water sprinkling and rainfall, which is carried away to dump pond. Supernatant water from dump pond is being collected and used for dust suppression activities or after sedimentation, discharged to sea. Photographs of showing the drain and dump pond has been submitted in along with last EC compliance report (Sept 19 to March 20).</p>

S. No.	Identified environmental and social impacts for the fully developed scenario (year 2030)	Type of Impact & Magnitude 1	Environment management plans adopted or being adopted by APSEZ as per permits, clearances, applicable regulations and guidelines etc.	Additional Risk Mitigation Measures/ESMP	Responsible agency	Timeframe for implementation	Compliance
			mm/hr. Hence flooding of water in the neighboring areas is not envisaged.				During the compliance period (April 2020 to Sept 2020) the maximum recorded rain fall was <b>46 mm/hr.</b> , which was much less than the design capacity of existing storm water drainage system. So our existing storm water management facility is adequate to handle the storm water runoff from the area. Hence flooding of water in the neighboring areas is not envisaged.
			As per the directions given in the environmental clearance issued for the proposed Multi-Product SEZ and CRZ clearance for Desalination, sea water intake, outfall facility and pipeline project, the master plan of the project was designed and being implemented without	The channel depth in all the natural streams shall be maintained to accommodate peak flood flow during the monsoon and periodical de-silting activities in the natural streams passing through the APSEZ area	APSEZ, District Administration* and Irrigation department	As and When Required	Presently there is no Desalination plant, sea water intake and outfall facility developed as part of EC & CRZ clearance of Multiproduct SEZ. The project will be designed and implemented without disturbing the natural flow of rainwater in all the seasonal streams.

S. No.	Identified environmental and social impacts for the fully developed scenario (year 2030)	Type of Impact & Magnitude 1	Environment management plans adopted or being adopted by APSEZ as per permits, clearances, applicable regulations and guidelines etc.	Additional Risk Mitigation Measures/ESMP	Responsible agency	Timeframe for implementation	Compliance
			disturbing the natural flow of rainwater in all the seasonal streams.				
1.3	Due to conservation and protection of mangroves in the designated conservation area, it has been predicted that the current mangrove footprint area would marginally increase in next 15 years due to natural growth. This will enhance the overall biodiversity in the local coastal ecosystem.	Positive Impact with ecological benefits	In addition to conservation of the identified 1254 ha mangrove areas around Mundra port and SEZ, APSEZ has taken up large scale mangrove afforestation activities in an area of more than 2800 ha at various locations across the coast of Gujarat state in consultation with various organizations	APSEZ will continue mangrove afforestation as per the commitment made with concerned regulatory authority	APSEZ	Short Term	<p>APSEZ has carried out mangrove afforestation in 2890 ha. area across the coast of Gujarat till date.</p> <p>No further mangrove afforestation is pending w.r.t. commitment made with concerned regulatory authority for APSEZ, Mundra project.</p> <p>As per study conducted by NCSCM in 2017, mangrove cover in and around APSEZ, Mundra has increased from 2094 Ha to 2340 ha (as compared between 2011 to 2017). The analysis has shown an overall growth of 246 ha. The cost for said study was INR 3.15 Cr.</p> <p>Further work has been assigned to NCSCM in March 2020 as part of compliance for the action plan "Monitoring of mangrove cover". The cost of the said work is INR 23.56 Lacs.</p>
1.4	Development		Detailed hydro-	It is recommended to	APSEZ	Continual	



S. No.	Identified environmental and social impacts for the fully developed scenario (year 2030)	Type of Impact & Magnitude 1	Environment management plans adopted or being adopted by APSEZ as per permits, clearances, applicable regulations and guidelines etc.	Additional Risk Mitigation Measures/ESMP	Responsible agency	Timeframe for implementation	Compliance
	activities along the coast might cause certain changes in hydro-dynamic characteristics along the shoreline. Shoreline of any area also can be influenced by storm surges and other natural processes.		dynamic modelling and shoreline change prediction for a fully developed APSEZ facility has been studied. The study reveals that the erosion and accretion in the study area at the end of 15th year will be within the designated criteria of $\pm 0.5$ m/year, which reconfirms that the waterfront development activities of APSEZ would pose insignificant impact on the Mundra shoreline.	map the coastal morphology (Shoreline) at least once in three years		Process	Shoreline assessment study will be conducted in FY 2020-21.
2	Regional Traffic Management Plan						

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2.1	<p>The projected traffic data as per the EIA Report of Multi-Product Special Economic Zone, the peak vehicular traffic from the port and SEZ operations (including supporting facilities and colony) could be in the order of 18,300 and 10,400 vehicles per day respectively.</p> <p>There could be a possible increase in traffic congestions on village-</p>	Level-1	<p>As per the master plan of APSEZ, eight artillery roads will be connected to either state highway or national highway for evacuating the goods from APSEZ. None of these roads are passing through settlements, thereby avoiding traffic congestions in the respective villages. The carrying capacity of the eight artillery roads connecting APSEZ is estimated to be about 16,000</p>	<p>Additional road as per master plan will be built in future based on the overall progress of the project. Currently about 25% of cargo from APSEZ is transported by Rail and the same will be enhanced to 40% when the facility is fully developed in future. This will further reduce the traffic volumes on the regional road network.</p>	APSEZ	As and When Required	<p>Presently 42% of the total SEZ area (8434.5890 Ha) is developed.</p> <p>Existing road/rail/conveyer infrastructure facilities are adequate to evacuate the existing cargo. Further, APSEZ's cargo evacuation through rail / conveyer has increased to 56 %, thereby reducing the usage of road.</p> <p>Additional road facilities will be built as per master plan considering future development.</p> <p>The facilities for transportation of cargo other than road will be enhanced considering future development, which will reduce the traffic volumes on the regional road Network.</p>

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	highway intersections and road accidents.		<p>PCU/hr as against the envisaged peak traffic volume of 4,500 PCU/hr.</p> <p>Out of eight artillery roads considered in APSEZ master plan, seven roads were already developed and functional.</p>				
			<p>APSEZ has been imparting Driver Training Programs to all their contractors to enhance awareness on road safety.</p>	<p>APSEZ can undertake technical feasibility of implementing Intelligent Transport System (ITS) for the freight carriers associated with their development activities.</p>	<p>APSEZ &amp; GSRDC*</p>	<p>Long Term</p>	<p>APSEZ is being imparting the regular in-house classroom and on-job training to the all drivers and employees on below topics:</p> <ul style="list-style-type: none"> <li>• Basic induction Training for drivers</li> <li>• ITV Driver Training</li> <li>• ITV Driver Induction for Supervisor</li> <li>• Defensive Driving</li> <li>• Defensive Driving &amp; BBS</li> <li>• Traffic Management &amp; Road Signage</li> <li>• Driving safety training</li> <li>• RORO Driver training</li> <li>• Defensive Driving &amp; Emergency Action Plan</li> <li>• Drivers Responsibilities &amp; Safe driving</li> </ul>

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							<ul style="list-style-type: none"> <li>Emergency Rescue (Vehicle) Training</li> </ul> <p>Approx. 1282 Participants (On roll and contractual manpower) were benefitted from above trainings in FY 2020-21 (till the sept 2020). The same will be continued in future also.</p> <p>APSEZ has also implemented the Remote traffic management system (RTMS) to manage the traffic movements and capturing the violations to further improve the system.</p> <p>Following steps were taken by APSEZ to reduce the accidents.</p> <ul style="list-style-type: none"> <li>✓ Installation of approx. 100 Nos. of cameras which is being operated at ISCR (Integrated security control room) to monitor &amp; manage the traffic system in APSEZ on real time basis.</li> <li>✓ Installation of 02 Nos. RTMS - Remote traffic management system (having combination of Radar + OCR camera + LED display board - showing speed limit) to recognize the over speeded vehicles, so that timely capture the same and avoid any road accidents.</li> </ul>
<b>3</b>	<b>Water resources Management and sewage treatment &amp; disposal Plan</b>						
3.1	For a fully developed APSEZ facility,	No-Impact	APSEZ is meeting the current water	As per the master plan and permissions granted under EC,	APSEZ	As and When Required	Currently there are two fresh water sources available with APSEZ. <b>Desalination Plant – 47 MLD</b>



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	water demand will be in the order of 4,30,000 m <sup>3</sup> /day (430 MLD). APSEZ will be sourcing majority of the water from the captive desalination plants, which will be developed in progressive manner.		demand through Narmada water supply scheme and 47 MLD captive desalination plant at site. Necessary water allocation from concerned authorities was obtained and the same will be renewed from time to time as per the directions of state government.	APSEZ will be developing progressively 4,50,000 m <sup>3</sup> /day (450 MLD) of desalination plants to meet the future demand. Hence stress on regional water resources due to these developmental projects will be less significant.			<p><b>Narmada water through GWIL – 11 MLD</b> (sanctioned capacity).</p> <p>Current water demand for APSEZ along with SEZ industries including Adani Power Plant is around 30 MLD.</p> <p>So presently, these sources are adequate to fulfill the current fresh water requirement of APSEZ.</p> <p>The desalination plant of additional capacities will be installed on modular basis considering future requirement of APSEZ.</p>
3.2	Existing water demand in the Mundra taluk is estimated as 8500 m <sup>3</sup> /day (@55 lpcd) and the potable and sanitation water needs	Level-2	Adani Foundation has been contributing to various watershed development projects in the Mundra region to enhance	Adani Foundation is planning to implement the various water resource conservation programs in next ten years under various schemes.	APSEZ and CGWB*	Long Term	<p>Water needs of APSEZ is being met through existing Desalination Plant of APSEZ and Narmada canal supplied by the GWIL which may be further enhanced on modular basis, At present Ground water is not utilized for any activities of APSEZ.</p> <p>However various works are being carried out by Adani Foundation continuously under Water Conservation Work to achieve water security in</p>

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	would increase to 37,000 m <sup>3</sup> /day (@125 lpcd) in future when the area is fully grown into larger municipality due to induced economic growth. Water demand of the local communities is met through Narmada water supply system to some extent, but largely depending on the ground water in the study area. Mundra block is reported to be a safe ground block		ground water resources in the area. Adani Foundation has contributed about Rs. 300 Lakhs so far for the development of 18 check dams.				<p>Mundra region by Adani Foundation. Following works are carried out as a part of water conservation work since April – 2018.</p> <ul style="list-style-type: none"> <li>• Under “<b>Sujlam Suflam Jal Abhiyan campaign</b>” AF Mundra had completed deepening work in <b>26 pond</b> works as per given target by District Collector Kutch in <b>19 villages</b>. Total excavation done <b>51723 Cum</b>. Total storage capacity created <b>51.72 million liters</b>. These works done as per government guidelines.</li> <li>• Under “<b>Participatory Ground Water Management</b>” work we have created artificial recharge borewell in Borana, Mangara &amp; Dhruv village.</li> <li>• Participatory Ground Water Management in ten villages with holistic approach for <b>Kankavati Sandstone Aquifer Programme</b>. With the objective of to preserve the rain water to reduce the impact of salinity and recharge the ground water (the main source of water) to facilitate the Agricultural activities as well as for drinking water.</li> <li>• Drip Irrigation 823 Farmers benefitted in coordination with Gujrat Green Revolution Company</li> <li>• Ground recharge activities (<b>pond deepening work for more than 52 ponds</b>) individually and 26 ponds under Sujlam Suflam Jal Abhiyan leading to a significant increase in water table and higher returns to the farmers</li> <li>• <b>Roof Top Rain Water Harvesting 54 Nos.</b> which is having <b>10,000 litre</b> storage which is sufficient for one year drinking water purpose for 5 people family.</li> <li>• Recharge Bore well <b>75 Nos</b> which is best ever option to conserve ground water Drip Irrigation</li> </ul>

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	as on date. Due to influx of people and rapid urbanization due to the economic development, there could be some stress on the ground water resources in future.						<p>823 Farmers benefitted in coordination with Gujrat Green Revolution Company</p> <ul style="list-style-type: none"> <li>• Participatory Ground Water Management in ten villages with holistic approach for Kankavati Sandstone Aquifer Programme</li> <li>• As per Average Calculation more than <b>450 hac. area</b> benefitted with increased in <b>109 MCFT</b> water Quantity</li> </ul> <p>Adani foundation has spent approx. INR 3853.7 lakhs from April – 2018 to Sep – 2020 for CSR activities which also includes water conservation projects as mentioned above.</p>
3.3	It is estimated that about 60,000 m <sup>3</sup> /day (60 MLD) of sewage will be generated from the APSEZ facility when the project is fully developed.	No Impact	Seven sewage treatment plants with an aggregate capacity of 3.1 MLD have already built at APSEZ. Treated sewage is utilized for greenbelt development and sewage is not discharged into either seasonal natural streams	APSEZ is permitted to develop decentralized sewage treatment plants of total 62 MLD capacities. Existing sewage treatment facilities will be augmented progressively based on the development at APSEZ in future. Similar to existing practices, treated sewage will be utilized for greenbelt development.	APSEZ	As and When Required	<p>Current installed capacity of wastewater treatment plants is 6.1 MLD (ETP, STPs &amp; CETP) for treatment of effluent &amp; sewage generated at various locations.</p> <p>Out of 45 only 4 industries within the SEZ are sending their partially treated industrial as well as domestic effluent to the CETP confirming to CETP inlet norms for further treatment and final disposal. Other SEZ industries have their own STPs / ETPs for treatment of wastewater generated from their industrial operation and discharging the treated water on land for horticulture purpose within their premises as per specific permission granted by SPCB.</p> <p>APSEZ also granted permission to treat 2.5</p>

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			or marine environment.				<p>MLD of sewage generated from Mundra village through CETP and STP.</p> <p>Presently avg. 1.8 MLD of wastewater (in to ETP, STPs &amp; CETP) is treated and being utilized on land for horticulture purpose within APSEZ premises during Apr'20 to Sep'20. Existing wastewater treatment plants are adequate to treat and handle the total effluent / sewage load considering current development.</p> <p>Existing wastewater treatment facilities will be augmented or new plants will be developed on modular basis considering future requirement.</p>
<b>4</b>	<b>Air quality management Plan</b>						
4.1	Although all the regulated activities in the study area will be adopting promulgated emission norms, total air emission mass discharge from the study area would increase.	Level-2	APSEZ and other thermal power plants have obtained valid consent to operate and have been operating the facilities as per the emission norms stipulated in respective consent orders. APSEZ and other two	All existing and new industrial establishments will obtain requisite consents from GPCB and adhere to the stipulated emission norms regulations and guidelines issued by authorities from time to time.	APSEZ And Other Industries	Continual Process	<p>APSEZ has been granted requisite permissions from the concerned authorities with stipulated norms for air emission (flue gas as well as ambient air).</p> <p>Ambient Air Quality monitoring is being carried out by NABL accredited and MoEF&amp;CC authorized agency namely M/s. Pollucon Laboratory Pvt. Ltd. as per NAAQ standards, 2009. Stack emission monitoring is also being carried out on regular basis. Reports of the same are being submitted to the concerned authorities on regular basis.</p> <p>Adani power plant has installed continuous emission and air quality monitoring</p>



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			power plants are monitoring the ambient air quality on regular intervals as per GPCB/CPCB guidelines and the data is analyzed and presented to GPCB on monthly basis. Both the thermal power plants located within the study area have installed continuous emission and air quality monitoring instruments as per CPCB directive.				<p>instruments as per CPCB Directive and submitting the reports also. Another power plant of CGPL is outside APSEZ area.</p> <p>The AAQM summary for last six months (April'20 to Sept'20) are as below. Locations: 17 Nos. (APSEZ – 12 + APL – 5 including 3 villages) Frequency: Twice in a week</p> <table border="1"> <thead> <tr> <th>Parameter</th> <th>Unit</th> <th>Max</th> <th>Min</th> <th>Perm. Limit<sup>§</sup></th> </tr> </thead> <tbody> <tr> <td>PM<sub>10</sub></td> <td>µg/m<sup>3</sup></td> <td>94.51</td> <td>35.34</td> <td>100</td> </tr> <tr> <td>PM<sub>2.5</sub></td> <td>µg/m<sup>3</sup></td> <td>53.6</td> <td>12.13</td> <td>60</td> </tr> <tr> <td>SO<sub>2</sub></td> <td>µg/m<sup>3</sup></td> <td>32.54</td> <td>6.18</td> <td>80</td> </tr> <tr> <td>NO<sub>2</sub></td> <td>µg/m<sup>3</sup></td> <td>42.67</td> <td>12.50</td> <td>80</td> </tr> </tbody> </table> <p><sup>§</sup> as per NAAQ standards, 2009 Values recorded confirms to the stipulated standards.</p> <p>Approx. INR 8.46 Lakh is spent for environmental monitoring activities during the FY 20120-21 (till the sept 2020) which also includes ambient air quality monitoring.</p> <p>Other industries located within the SEZ have obtained requisite permissions from the competent authorities for their respective plant and they also carried out environmental monitoring within their premises to comply with the permission granted. The same has</p>	Parameter	Unit	Max	Min	Perm. Limit <sup>§</sup>	PM <sub>10</sub>	µg/m <sup>3</sup>	94.51	35.34	100	PM <sub>2.5</sub>	µg/m <sup>3</sup>	53.6	12.13	60	SO <sub>2</sub>	µg/m <sup>3</sup>	32.54	6.18	80	NO <sub>2</sub>	µg/m <sup>3</sup>	42.67	12.50	80
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							<p>been ensured by APSEZ as well as SPCB during their regular visits. APSEZ carries out regular visits/inspections of member industries within SEZ and last visit was conducted during March &amp; April 2019 for EMS &amp; compliance verification. During compliance verification, it was verified that monitoring of air emission was well within the permissible standards based on analysis reports. Same will be continued in future also.</p> <p>The monitoring reports of industries within SEZ are also being submitted to the regulatory authorities as a part of half yearly Compliance report of EC for Multi-Product SEZ.</p>
				<p>A common air quality management committee may be framed under the guidance of the State Pollution Control Board and district administration to manage regional level emission inventory data that can help to manage regional level air quality management goals.</p>	<p>APSEZ and Other Industries, Stakeholders, District Administration and GPCB*</p>	<p>Long Term And Continual</p>	<p>APSEZ will co-operate and comply with the directions from concerned regulatory authorities for air quality management within APSEZ area. However at present, APSEZ has formed Internal Environment Monitoring Committee, involving officials from APSEZ, Adani Power Limited and other member units with following role and responsibilities:</p> <ul style="list-style-type: none"> <li>• Identification of sources of air &amp; noise emission and its dispersion in surrounding villages</li> <li>• Remedial measures to eliminate, control, reduce or capture air &amp; noise emission</li> <li>• Identify available resource to abate the air and noise emission</li> </ul>

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							<ul style="list-style-type: none"> <li>• Required additional resources for control of air and noise emission</li> <li>• Drinking water and its testing of all the available fresh water sources in surrounding villages</li> <li>• Identify any surrounding villages affected by organization's improper waste disposal mechanism.</li> </ul> <p>Last committee meeting was conducted on dated 29<sup>th</sup> Sept 2020, and below were the point of discussion for way forward.</p> <ul style="list-style-type: none"> <li>• Maintain the existing practice to control the emission in terms of Air, Water and Noise.</li> <li>• Ensure for proper covering of trucks / vehicles carrying coal / cargo to reduce spillages on road</li> <li>• Carry out study about impact on ground water quality due to continuous extraction or any other factors.</li> <li>• Inclusion of Ambient Air Quality and Noise Monitoring station covering surrounding villages by APSEZ considering further development and statutory clearances.</li> </ul> <p>Minutes of meeting is attached as <b>Annexure-A</b>.</p> <p>APSEZ and all the industries within SEZ are in compliance to NAAQS and same is being ensured by APSEZ. The monitoring reports of industries within SEZ are being submitted to</p>

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							the regulatory authorities as part of half yearly Compliance report of EC for Multi-Product SEZ.
4.2	Release of particulate emissions from handling and storage of coal at the port and power plants would influence PM10 and PM2.5 concentration in the background air. This could pose some health impacts such as asthma and COPD etc. among the local communities.	Health Impact	APSEZ has been implementing the following management plan to control emissions as per the applicable regulations and similar practices will be adopted in future: Entire bulk material handling facilities are mechanized. Regular water sprinkling on road and other open areas, regular cleaning of roads, dry fog dust suppression systems (DSS)	All industries located in the APSEZ shall adhere to the emissions norms and minimum stack height guidelines issued by CPCB and consent to operate issued by Gujarat Pollution Control Board from time to time.	APSEZ and Other Industries	Continual Process	<p>Following safeguard measures are taken by APSEZ for abatement of dust emissions.</p> <ul style="list-style-type: none"> <li>• Adequate stack heights to the Boilers, D.G. Sets, TFHs &amp; HWGs for proper dispersion of pollutants within APSEZ</li> <li>• Using of liquid &amp; Gaseous fuels instead of solid fuels in Boilers, Thermic fluid heaters and hot water generators.</li> <li>• Regular sprinkling on road and other open area</li> <li>• Regular cleaning of roads</li> <li>• Dry fog Dust Suppression System (DSS) in hopper, transfer towers and conveyor belts</li> <li>• Use of water mist canon</li> <li>• Closed type conveyor belts</li> <li>• Regular sprinkling on coal heaps</li> <li>• Covering other types of dry bulk cargo heaps</li> <li>• Installation of wind breaking wall</li> <li>• Development of greenbelt along the periphery of the storage yards/back up area</li> <li>• Mechanized handling system for coal and other dry bulk cargo</li> <li>• Wagon loading and truck loading through closed silo</li> </ul>



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			in hoppers, transfer towers and conveyor belts, use of water mist canon, covered conveyor belts, regular sprinkling on coal heaps,				<p>Adequate air pollution control measures like ESPs, FGDs, Bag Filters, etc. and adequate stack heights provisions are implemented within the thermal power plant.</p> <p>The stack monitoring summary for last six months (April'20 to Sept'20) are as below. Total Nos. of Stacks: 22 Nos. Frequency: Monthly / Half Yearly</p> <table border="1"> <thead> <tr> <th>Parameter</th> <th>Unit</th> <th>GPCB Limit</th> <th>Min</th> <th>Max</th> </tr> </thead> <tbody> <tr> <td>PM</td> <td>mg/nm<sup>3</sup></td> <td>150</td> <td>13.8</td> <td>34.5</td> </tr> <tr> <td>SO<sub>2</sub></td> <td>Ppm</td> <td>100</td> <td>3.3</td> <td>8.7</td> </tr> <tr> <td>NO<sub>x</sub></td> <td>ppm</td> <td>50</td> <td>26.7</td> <td>39.8</td> </tr> </tbody> </table> <p>Values recorded confirms to the stipulated standards.</p> <p>Approx. INR 8.46 Lakh is spent for environmental monitoring activities during the FY 2020-21 (till the sept 2020) which also includes stack monitoring.</p> <p>All other industries located within SEZ are adhere to provide adequate stack height and pollution control measures for proper dispersion of pollutants as per respective permissions granted by the board. The same is being inspected and ensured by APSEZ as well as SPCB officials on regular basis.</p>	Parameter	Unit	GPCB Limit	Min	Max	PM	mg/nm <sup>3</sup>	150	13.8	34.5	SO <sub>2</sub>	Ppm	100	3.3	8.7	NO <sub>x</sub>	ppm	50	26.7	39.8
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			covering of other types of				As mentioned above, presently, APSEZ has formed Internal Environment Monitoring																				

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			dry bulk cargo heaps by protective materials, installation of wind breaking wall, development of greenbelt along the periphery of the storage yards/back up area and mechanized handling system for coal and other dry bulk cargo and Wagon loading and truck loading through closed silo. Both thermal power plants in the study area have installed electrostatic precipitators on the boilers and are meeting the emission norms	An internal Coal Dust Management Working Group shall be formed by APSEZ to effectively co-ordinate the approach to coal dust management and monitoring	APSEZ and Other Industries, Concerned Stake holders, District Administration*	Long Term	<p>Committee, involving Officials of APSEZ, Adani Power Limited &amp; other member units, with specific role and responsibilities as defined above.</p> <p>The dry cargo is being handled by mechanized system and transported by covered conveyer system, trucks and rail wagons.</p> <p>Wind breaking wall is provided around the coal storage yards of APSEZ as well as Adani Power Plant.</p> <p>Adequate air pollution control measures like ESPs, FGDs, Bag Filters, etc. and adequate stack heights provisions within the thermal power plant for proper dispersion of pollutants.</p> <p>Green belt / plantation is provided around the periphery of dry cargo storage area and regular water sprinkling is also being done to abate the dust emission from coal hips.</p> <p>Last committee meeting was conducted on dated 29<sup>th</sup> Sept 2020, and below were the point of discussion for way forward.</p> <ul style="list-style-type: none"> <li>• Maintain the existing practice to control the emission in terms of Air, Water and Noise.</li> <li>• Ensure for proper covering of trucks / vehicles carrying coal / cargo to reduce spillages on road</li> </ul>

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			as per the respective ECs granted. Due to installation of tall stacks as per CPCB guidelines and EC conditions, the relative air pollution impacts due to release of emissions from two power plants is insignificant.				<ul style="list-style-type: none"> <li>Carry out study about impact on ground water quality due to continuous extraction or any other factors.</li> <li>Inclusion of Ambient Air Quality and Noise Monitoring station covering surrounding villages by APSEZ considering further development and statutory clearances.</li> </ul> <p>Minutes of meeting is attached as <b>Annexure-A</b>.</p>
4.3	Ships are one of the significant sources of SO <sub>2</sub> and NO <sub>x</sub> emissions in the study area. Marine diesel engines on the ships often utilize fuel oils that might contain higher sulphur content. As	Level-2	A Standard Operating Procedure (SOP) has been developed to be included as a part of APSEZ environment management plan that all ships	The current global limit for Sulphur content of ships fuel oil is 3.5 % m/m (mass by mass). According to MARPOL, the new global cap on sulphur in the marine vessel fuels will be 0.50% m/m by the 1st January 2025. APSEZ should explore the possibility of providing shore power	APSEZ and Ship Owners	Long Term	<p>The ships coming to the APSEZ is complying with MARPOL and other shipping rules and regulations.</p> <p>APSEZ has already started providing shore power supply to the tugs (11 Nos.), dredgers (2 Nos.) and barges (1 No.). The feasibility of shore power will be explored and implemented on large scale for the visiting vessels to reduce idling stage ship emissions.</p>

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	<p>per the international best practices, these marine diesel engines are designed to meet MARPOL regulations with NOX emissions less than 14.4 gram/Kwhr of engine. Due to lower stack heights of the marine diesel engine, ship emissions often gets dispersed in the local environment and might pose risk of fumigation during the early morning and evening hours due to</p>		<p>anchored at the port are adopting the MARPOL4 regulations.</p>	<p>to the ships at the port to reduce idling stage ship emissions.</p>			



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	atmospheric inversion break-up periods.						
4.4	Road vehicle emissions will be other major contributors to the air pollution in the region when the facility is fully developed.	Level-2	Not Applicable	Due to implementation of Bharat VI fuels (MoEF&CC)6 in near future the vehicular and diesel engine emissions will be reduced by about 50% from the current national levels. APSEZ should develop a robust contractor environmental policy to ensure that Bharat Stage VI emission norms are adopted by all their contractors and sub-contractors.	APSEZ and All Industries	Short Term	Presently, cargo evacuation through rail & conveyer has increased to 56 %, thereby reducing the usage of road.  Vehicles having valid PUC certificate are only being allowed to enter within APSEZ area.  In future, APSEZ will also explore the feasibility of using Electric Vehicles for internal cargo movement.
5	Noise emissions						
	Noise emissions are envisaged from port operations,		Due to adoption of various mechanized operations at the waterfront development,	APSEZ, all the tenant industries and facilities within APSEZ are required to undertake noise monitoring at their facilities to	APSEZ	Continual	Below Safeguard measures are already taken for abatement of noise emissions. <ul style="list-style-type: none"> <li>• Development of greenbelt along the periphery of the operational area.</li> <li>• D.G. Sets having Acoustic enclosures.</li> <li>• Maintenance of plant machineries and equipments on regular frequency.</li> </ul>

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5.1	industrial operations and power plants in the study area. Any increase in noise levels beyond three decibels from the background levels would be perceived as noise nuisance (USEPA)7.	Level-1	the noise emissions from the port cargo handling will be minimal. An adequate greenbelt is being developed by APSEZ to further reduce any residual impacts due to noise emissions from the facility. Periodic noise level monitoring programs were adopted by APSEZ. Predicted noise levels were found to be well within the designated noise standards for Industrial facilities.	demonstrate the compliance with the Noise level standards. Continuous noise recording units can be installed by APSEZ at facility boundary to address the community grievances, when ever required. To assess the overall site wide compliance and also to address any community grievances related to noise issues due to operation of APSEZ facilities.		Process	<p>Noise monitoring is being carried out by NABL accredited and MoEF&amp;CC authorized agency namely M/s. Pollucon Laboratory Pvt. Ltd. as per permission granted and reports are being submitted to the concerned authorities on regular basis.</p> <p>The noise monitoring summary for last six months (April'20 to Sept'20) are as below.</p> <p>Locations: 12 Nos. Frequency: Once in a month (24 hourly)</p> <table border="1"> <thead> <tr> <th>Noise</th> <th>Unit</th> <th>Max</th> <th>Min</th> <th>Perm. Limit<sup>s</sup></th> </tr> </thead> <tbody> <tr> <td>Day Time</td> <td>dB(A)</td> <td>74.1</td> <td>54.3</td> <td>75</td> </tr> <tr> <td>Night Time</td> <td>dB(A)</td> <td>69.8</td> <td>50.4</td> <td>70</td> </tr> </tbody> </table> <p style="text-align: right;"><sup>s</sup> as per GPCB standards</p> <p>Approx. INR 8.46 Lakh is spent for environmental monitoring activities during the FY 2020-21 (till the sept 2020) which includes noise monitoring.</p> <p>All the results are well within the standards. From this it can be inferred that there no impacts on the surrounding community.</p> <p>All other industries located in the APSEZ are adhere to monitor and control the ambient</p>	Noise	Unit	Max	Min	Perm. Limit <sup>s</sup>	Day Time	dB(A)	74.1	54.3	75	Night Time	dB(A)	69.8	50.4	70
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							<p>noise level as per permission granted by SPCB and same is being confirmed by APSEZ as well as SPCB on regular basis.</p> <p>Further, till date APSEZ has not received any grievances/notice for noise issues from any of the stakeholders.</p>
				<p>In order to address the public grievances related to noise from the facility, an internal Noise Management Committee can be formed by APSEZ to investigate the root cause and to develop and implement noise mitigation plans in the specific zones.</p>	APSEZ	Continual Process	<p>As mentioned above, presently, APSEZ has formed Internal Environment Monitoring Committee, involving Officials of APSEZ, Adani Power Limited &amp; other member units, having role and responsibilities as defined above.</p> <p>Last committee meeting was conducted on dated 29<sup>th</sup> Sept 2020, and below were the point of discussion for way forward.</p> <ul style="list-style-type: none"> <li>• Maintain the existing practice to control the emission in terms of Air, Water and Noise.</li> <li>• Ensure for proper covering of trucks / vehicles carrying coal / cargo to reduce spillages on road</li> <li>• Carry out study about impact on ground water quality due to continuous extraction or any other factors.</li> <li>• Inclusion of Ambient Air Quality and Noise Monitoring station covering surrounding villages by APSEZ considering further development and statutory clearances.</li> </ul> <p>Minutes of meeting is attached as <b>Annexure-A</b>.</p>

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							No grievance received for noise related issues and it is observed that ambient noise level are well within the permissible standards.
<b>6</b>	<b>Surface water quality (Terrestrial and Marine )</b>						
6.1	In general, release of untreated wastewater from industrial facilities would pose threat to water quality of streams, estuaries and marine water bodies.	Level -1	As per the master plan of APSEZ, 67 MLD of wastewater is expected to be generated from the fully developed project scenario, for which necessary permissions to set up decentralized CETPs of various capacities are already obtained. Presently a CETP capacity of 2.5 MLD is in place. Presently member units treat their effluents to	As per the master plan of APSEZ, the existing CETP shall be augmented to 67 MLD in progressive manner based on the future demand. The facility should limit the marine discharge of treated industrial wastewater to 16 MLD as per the permits. Remaining treated wastewater shall be utilized for horticulture purpose.	APSEZ	As and When Required	<p>APSEZ has installed Common Effluent Treatment Plant (CETP) having 2.5 MLD capacities for treatment of partially treated effluent and sewage generated from industries within SEZ.</p> <p>Currently, CETP receives 571 KLD hydraulic load and considering the current development scenario, existing CETP is adequate to treat and handle the total effluent load coming from industries within SEZ.</p> <p>Out of 45 only 4 industries within SEZ are sending their partially treated industrial as well as domestic effluent to the CETP confirming CETP inlet norms for further treatment and final disposal. Other industries within SEZ have their own STPs / ETPs for treatment of wastewater generated from their industrial operation and discharging the treated water on land for horticulture purpose within their premises as per permission granted by SPCB.</p> <p>The capacities of CETP will be enhanced on modular basis as per future requirement.</p> <p>Presently avg. 1.8 MLD (from CETP, ETP &amp;</p>



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			meet the CETP inlet norms and then send it to CETP. Treated wastewater from CETP meets the stipulated discharge norms for utilization for greenbelt development within the APSEZ areas.				STPs) of treated water is being utilized on land for horticulture purpose within APSEZ premises and no discharge is made to any other source.
			Online wastewater quality monitoring systems are installed at CETP to ensure quality of treated effluent meets the requisite discharge norms. No wastewater from CETP is discharged into	Efforts shall be made to recycle complete treated wastewater for port operations and industrial operations of APSEZ in future based on a detailed techno-economic feasibility study.	APSEZ	Based on outcome Techno-feasibility Study	Online continuous effluent monitoring system installed at the discharge point of CETP to track any deviation from discharge norms.  Presently entire quantity of treated water from CETP is used for gardening / horticulture purpose within APSEZ premises.

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			natural bodies as on date..				
			Runoff during monsoon from coal storage yards is collected in sedimentation ponds (dump pond) to remove any residual dust particulates for further disposal into sea	Storm water runoff from the facility during the first rain shall be sampled and analyzed for the presence of heavy metals or other criteria pollutants to adopt corrective and preventive actions to protect the marine water quality. All red and hazard category industry within APSEZ shall adopt spill prevention and control program and no effluents shall be discharged into storm water-drains.	APSEZ	Continual	<p>There are provision of drains around coal stack yard to carry to runoff water to dump ponds. This water is either used for dust suppression or after sedimentation (to remove residual dust), is allowed disposal to sea.</p> <p>Presently Marine monitoring is being carried out once in a month by NABL and MoEF&amp;CC accredited agency namely M/s. Pollucon Laboratory Pvt. Ltd. The analysis reports of the same are being submitted to the concerned authorities on regular basis.</p> <p>The marine water quality monitoring summary for last six months (April'20 to Sept'20) is as per below.</p> <p>Locations: 14 Nos. (APSEZ – 9 + APL – 5) Frequency: Once in a Month</p>

S. No.	Identified environmental and social impacts for the fully developed scenario (year 2030)	Type of Impact & Magnitude 1	Environment management plans adopted or being adopted by APSEZ as per permits, clearances, applicable regulations and guidelines etc.	Additional Risk Mitigation Measures/ESMP	Responsible agency	Timeframe for implementation	Compliance																																														
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			Detailed marine hydrodynamic modelling studies revealed that the current and proposed dredged soil disposal practices, sea water intake and outfall facilities and desalination plant outfall etc have shown insignificant	Good dredging practices shall be adopted by APSEZ: (i).Improving the dredging accuracy (ii).Improving onboard automation and monitoring, (iii). Reduce spill and loss, (iv). evaluating the need for installing silt screens near mangrove areas during the dredging phase operations, (v). Environment friendly dredging activities can	APSEZ	Long Term	<p>No capital dredging has been done, since Apr 2015. Dredged material generated during maintenance dredging is being disposed at designated locations within deep sea as identified by NIO.</p> <p>Dredging Management plan is adopted for carrying out dredging and management of dredge material. Presently there are 3 nos. (2 Nos. Cutter suction + 1 No. Trailer suction) of dredgers are in operation for dredging.</p> <p>Marine monitoring is being carried out once in a month by NABL and MoEF&amp;CC accredited agency namely M/s. Pollucon Laboratory Pvt. Ltd. The analysis reports of the same are being submitted to the concerned authorities on</p>																																														

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			impact on the marine eco-system. As part of the comprehensive environmental monitoring program, APSEZ has been adopting marine water and sediment quality monitoring on monthly basis.	be undertaken in such a way that the overall turbidity levels near the mangrove and ecologically sensitive zones shall not exceed 100 NTU or 200 mg/l of TSS (10% lethal level of fish) Existing marine monitoring program shall be continued as per the directions of MoEF&CC and GPCB.			regular basis. Summary of marine water for the last six months is as mentioned above.  The same practice will be continued in future also as per direction by MoEF&CC as well as GPCB.  Monitoring will be focused near ecological sensitive area in case of need to carryout capital dragging near such areas.
<b>7</b>	<b>Groundwater quality and salinity ingress</b>						
7.1	While Mundra block is enjoying safe ground water status as on date (based on the data published by CGWB), due to induced economic and population growth, use of ground	Level-2	APSEZ is not utilizing ground water for any type of use. APSEZ is meeting the current water demand through Narmada water supply scheme and 47 MLD captive desalination plant at site.	A dedicated desalination plant of capacity 4,50,000 m <sup>3</sup> /day (450 MLD) will be developed in progressive manner to meet the APSEZ requirements.	APSEZ	As and When Required	Present source of water for various project activities is desalination plant of APSEZ and/or Narmada water through Gujarat Water Infrastructure Limited and same is sufficient to meet the present water demand.  APSEZ does not draw any ground water.  The desalination plant of additional capacities will be installed on modular basis considering future development and requirement.



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	water resources by the local people might increase in Mundra region. This might increase the TDS and chloride levels in the ground water in future.						
7.2	Due to induced growth in the region, pressure on the available ground water source would increase and this could pose some threat to salinity ingress.	Level-2	Ground water is not drawn by APSEZ for its operations. Natural streams (seasonal rivers) passing through the APSEZ area will not be disturbed, the micro-watershed in the area will not be disturbed. Due to the above reasons,	The Govt. of Gujarat, Narmada, Water Resources, Water Supply & Kalpsar Dept.,(WRD)12 has been implementing various salinity ingress prevention projects	District Administration*	Long Term	APSEZ will co-operate and comply with the directions from concerned regulatory authorities.  APSEZ does not draw any ground water for the fresh water requirement.

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			<p>the possibility of salinity ingress due to APSEZ development is not envisaged. Mundra and Anjar blocks fall under fresh water to medium salinity zones. It can be observed that little variation was observed in the ground water salinity levels from year 2013 to 2016 across the Mundra and Anjar blocks. This aspect confirms that the overall salinity ingress from the shore into the land due to existing APSEZ facilities and power</p>				

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			plant outfalls are less significant.																																																																										
				While the individual industries in the study area will continue to undertake ground water quality monitoring as per the environmental clearances issued for the respective projects, a regional level ground water conservation action committee can be formed under the guidance of state ground water board and district Administration.	All Concerned Stakeholders, District Administration and CGWB*	Continual Process	<p>APSEZ (8 Locations – half yearly) &amp; Adani Power Ltd. (5 Locations – quarterly) is carrying out ground water sampling and reports of the same are being submitted to the regulatory authorities on regular basis.</p> <p>The summary of APSEZ ground water quality monitoring for last six months (April'20 to Sept'20) are as below.</p> <table border="1"> <thead> <tr> <th>Sr. No.</th> <th>Parameter</th> <th>Unit</th> <th>Min</th> <th>Max</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>pH</td> <td>--</td> <td>7.10</td> <td>8.31</td> </tr> <tr> <td>2</td> <td>Salinity</td> <td>ppt</td> <td>2.10</td> <td>21.00</td> </tr> <tr> <td>3</td> <td>Oil &amp; Grease</td> <td>mg/L</td> <td>0.00</td> <td>0.00</td> </tr> <tr> <td>4</td> <td>Hydrocarbon</td> <td>mg/L</td> <td>0.00</td> <td>0.00</td> </tr> <tr> <td>5</td> <td>Lead as Pb</td> <td>mg/L</td> <td>0.03</td> <td>0.36</td> </tr> <tr> <td>6</td> <td>Arsenic as As</td> <td>mg/L</td> <td>0.00</td> <td>0.00</td> </tr> <tr> <td>7</td> <td>Nickel as Ni</td> <td>mg/L</td> <td>0.00</td> <td>0.00</td> </tr> <tr> <td>8</td> <td>Total Chromium as Cr</td> <td>mg/L</td> <td>0.02</td> <td>0.06</td> </tr> <tr> <td>9</td> <td>Cadmium as Cd</td> <td>mg/L</td> <td>0.03</td> <td>0.03</td> </tr> <tr> <td>10</td> <td>Mercury as Hg</td> <td>mg/L</td> <td>0.00</td> <td>0.00</td> </tr> <tr> <td>11</td> <td>Zinc as Zn</td> <td>mg/L</td> <td>0.09</td> <td>0.65</td> </tr> <tr> <td>12</td> <td>Copper as Cu</td> <td>mg/L</td> <td>0.00</td> <td>0.00</td> </tr> <tr> <td>13</td> <td>Iron as Fe</td> <td>mg/L</td> <td>0.11</td> <td>4.85</td> </tr> </tbody> </table>	Sr. No.	Parameter	Unit	Min	Max	1	pH	--	7.10	8.31	2	Salinity	ppt	2.10	21.00	3	Oil & Grease	mg/L	0.00	0.00	4	Hydrocarbon	mg/L	0.00	0.00	5	Lead as Pb	mg/L	0.03	0.36	6	Arsenic as As	mg/L	0.00	0.00	7	Nickel as Ni	mg/L	0.00	0.00	8	Total Chromium as Cr	mg/L	0.02	0.06	9	Cadmium as Cd	mg/L	0.03	0.03	10	Mercury as Hg	mg/L	0.00	0.00	11	Zinc as Zn	mg/L	0.09	0.65	12	Copper as Cu	mg/L	0.00	0.00	13	Iron as Fe	mg/L	0.11	4.85
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15	Depth of Water Level from Ground Level	meter	1.75	2.50													
8	<b>Waste Management</b>																
	Solid waste will be generated		APSEZ has been adopting Zero waste	APSEZ will continue to adopt Zero Waste Initiative and wastes			Presently APSEZ has implemented Zero waste Initiatives as per 5R (Reduce, Reuse, Recycle, Recover & Reprocess) principles of waste										



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8.1	from industrial activities of APSEZ and other permitted facilities in the study area including Mundra town. These wastes would contain recyclable material, construction debris, organic waste, inert material and e-waste etc. In the absence of any organized source segregation programs and material recycling strategies and infrastructure facilities, these wastes	Level-2	Initiatives and the entire waste generated from existing operations is segregated and disposed to recycling vendors, thereby APSEZ has achieved zero landfill status as on date.	will be segregated at source and disposed to various recycling vendors, co-processing in cement plants. This initiative helps not only to reduce the waste to landfill significantly, but also to recycle the materials there by avoiding ecological impacts.	APSEZ	Continual Process	<p>management. At present, APSEZ has developed material recovery facility for 6.0 TPD capacities. A well-established system for segregation of dry &amp; wet waste is in place. All wet waste (Organic waste) is being segregated &amp; utilized for compost manufacturing and/or biogas generation for cooking purpose. The compost is further used by in house horticulture team for greenbelt development. Whereas dry recyclable waste is being sorted in various categories. Presently manual sorting is being done for sorting of different types of solid waste. Segregated recyclable materials such as Paper, Plastic, Cardboard, PET Bottles, Glass etc. are then sent to respective recycling units, whereas remaining non-recyclable waste is bailed and sent to cement plants for Co-processing as RDF (Refused Derived Fuel). The same practice will be continued in future also. APSEZ has also been recognized for Zero Waste to Landfill certification from reputed organization. Copy of certificate has been submitted in earlier EC compliance report (Oct 19 to March 20).</p> <p>APSEZ will continue proper solid waste management in his operational area.</p>

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	will enter into environment and would pose long term health impacts.						
8.2	Considering an average solid waste generation of 0.25 Kg/person/day, the estimated solid waste from facilities within APSEZ will be in the order of 100 TPD (36,500 TPA).	Level-2	APSEZ has made a provision for central waste management facilities within the existing site based on the future needs. As part of the Zero Waste Initiatives, no landfill facilities will be installed at APSEZ.	The existing waste segregation and material recycling facilities will be augmented to dispose safely the wastes generated from APSEZ areas. Solid Waste Management Program shall be adopted and implemented as per Municipal Solid Waste Management Rules 2016 and Construction Waste Management Rules 2016	APSEZ	Continual Process	
8.3	About 35 TPD (13,000 TPA) of solid waste would be generated from the proposed	Level-2	As per the MSW Rules 2016 all the industrial facilities and SEZs are required to adopt waste	Solid Waste Management Program shall be adopted and implemented as per Municipal Solid Waste Management Rules 2016 and Construction Waste	All Industries	Continual Process	

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	industrial areas located outside the APSEZ area.		segregation facilities at the respective properties and non-recyclable waste shall be disposed to landfill sites.	Management Rules 2016			Industries located within the SEZ area are also complying with the waste management rules stipulated by statutory authorities and same is also being confirmed by APSEZ as well SPCB on regular basis.
9	<b>Ecological aspects (terrestrial and marine)</b>						
9.1	About 1576 ha of shrub forest land contiguous to APSEZ area is applied for land diversion for various developmental activities. This might have certain level of changes in the biodiversity in	Level -1	It is noted that the designated forest land is free from any native vegetation and comprises of Prosopis juliflora. It is also noted that no endangered species are present at the shrub forests that are applied for land diversion.	APSEZ has approached concerned authorities for diversion of designated forest land. Suitable compensatory afforestation plan shall be adopted based on the recommendations and directions of the concerned authorities. Due to adoption of compensatory afforestation program through a scientific manner, the overall ecological footprint in the district will be	APSEZ/State Forest Department*	Long Term	Stage – 1 forest Clearance for about 1576.81 Ha Forest land has been obtained. Presently APSEZ is in the process of compliance to the stage – 1 Forest Clearance conditions, for further submitting to Govt. authorities for issuance of Stage-2 Forest Clearance.

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	the study area.		It is also noted that no forest produce is reported from this designated forest land parcel due to lack of economic importance of plant species reported in the shrub forest. It is also noted that no tribal lands are located in the designated forest land parcel. Hence there will not be any change in biodiversity due to the proposed diversion.	increased. Due to plantation of native tree species as part of greenbelt development, the overall biodiversity of the region will increase considerably when the project is fully developed.			
	Mangrove conservation		No development activities will be undertaken	Mangrove footprint			As per study conducted by NCSCM in 2017, mangrove cover in and around APSEZ, Mundra has increased from 2094 Ha to 2340 ha (as compared between 2011 to 2017). The analysis



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9.2	<p>areas are located adjacent to the APSEZ area. Accidental discharges of industrial effluents into the marine environment would pose certain ecological risk.</p>	Level -1	<p>within mangrove conservation areas. APSEZ has taken up large scale mangrove afforestation activities in an area of more than 2800 ha at various locations across the coast of Gujarat state in consultation with various organizations. The Adani Foundation introduced 'Mangrove Nursery Development and Plantation' scheme in the area as an alternative income generating</p>	and health status shall be monitored annually	APSEZ	Continual Process	<p>has shown an overall growth of 246 ha. The cost for said study was INR 3.15 Cr</p> <p>Further work has been assigned to NCSCM in March 2020 as part of compliance for the action plan "Monitoring of mangrove cover". The cost of the said work is INR 23.56 Lacs.</p> <p>Other than this, Bio diversity Project has been developed by Adani Foundation with three species Rhizophora Mucronata ,Ceripos Tagal, Ceriops Decandra with good growth at Luni Bandar. Mangrove plantation done at Luni sea coast with fisher folk community during World Environment Day Celebration.</p> <p>Web talk show was organized on the occasion of "World Mangrove days On Multi species Mangrove bio diversity with Joint effort of GUIDE and Adani Foundation, Mundra.</p>

S. No.	Identified environmental and social impacts for the fully developed scenario (year 2030)	Type of Impact & Magnitude	Environment management plans adopted or being adopted by APSEZ as per permits, clearances, applicable regulations and guidelines etc.	Additional Risk Mitigation Measures/ESMP	Responsible agency	Timeframe for implementation	Compliance																
			activity for the people of the region.																				
9.3	Outfall from the thermal power plants desalination and CETP would pose certain level of impact on the marine environment.	Level-1	A detailed marine hydro-dynamic and dispersion modelling of the study area indicates that the background temperature and salinity at mangrove conservation area will not increase from the prevailing background levels as the outfalls are located far away. APSEZ and respective power plants in the study area have been monitoring the marine water quality status	All approved marine outfalls shall be monitored for salinity, temperature and other designated parameters as per consent to establish issued by GPCB. Existing marine environmental monitoring program shall be continued.	APSEZ and Concerned Industry	Continual Process	<p>Presently marine monitoring is being carried out by the Adani power plant at the marine outfall locations and reports are being submitted to the concerned authorities on regular basis.</p> <p>APSEZ is carrying out Marine monitoring once in a month at 9 locations in deep sea by NABL and MoEF&amp;CC accredited agency namely M/s. Pollucon Laboratory Pvt. Ltd. The analysis reports of the same are being submitted to the concerned authorities on regular basis.</p> <p>Adani power plant is also doing marine water quality at 5 locations (2 locations at outfall location) in deep sea by NABL and MoEF&amp;CC accredited agency namely M/s. Unistar Environment &amp; Research Labs Pvt. Ltd. The analysis reports of the same are being submitted to the concerned authorities on regular basis. The summary of marine water quality is shown above.</p> <p>The comparison of marine water results between CIA and current monitoring data are as below.</p> <table border="1"> <thead> <tr> <th rowspan="2">Parameter</th> <th rowspan="2">Unit</th> <th colspan="2">Max</th> <th colspan="2">Min</th> </tr> <tr> <th>CIA</th> <th>Present</th> <th>CIA</th> <th>Present</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Parameter	Unit	Max		Min		CIA	Present	CIA	Present						
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			on monthly basis for the stipulated environmental and ecological parameters.				<table border="1"> <tr> <td>Temp.</td> <td>°C</td> <td>30.2</td> <td>31.8</td> <td>28</td> <td>29</td> </tr> <tr> <td>Salinity</td> <td>ppt</td> <td>41.8</td> <td>36.8</td> <td>34.9</td> <td>34.2</td> </tr> </table> <p>As per above results, it can be seen that there is no major deviation in the concentration of parameters and thus indicates that impacts are insignificant.</p>	Temp.	°C	30.2	31.8	28	29	Salinity	ppt	41.8	36.8	34.9	34.2
Temp.	°C	30.2	31.8	28	29														
Salinity	ppt	41.8	36.8	34.9	34.2														
9.4	<b>Terrestrial Ecology:</b> Study area doesn't have any notified national parks or ecological sanctuaries. Since the area falls under dry deciduous shrubs. Due to scanty rains in the area, the overall natural green-cover/vegetation in the area is very small.	Level-1	APSEZ has developed greenbelt in an area of 550ha as against the committed area of 430ha. A dedicated nursery is set up to promote plantation. APSEZ have undertaken a plantation with about 9.6 Lakh fully grown trees.	The compensatory afforestation area to be monitored annually to check the survival rate of the plantation.	APSEZ	Continual Process	<p>APSEZ has developed its own "Dept. of Horticulture" which is taking measures/ steps for terrestrial plantation/greenbelt development. APSEZ, Individual SEZ Industries and Adani Power Plant has developed total 628 ha. area as greenbelt with plantation more than 9 Lacs saplings within the APSEZ area including SEZ industries &amp; Adani Power Plant.</p> <p>Dedicated horticulture department is maintaining and monitoring the terrestrial green belt development on regular basis to check the survival rate of plantation.</p> <p>Total expenditures of the horticulture dept. during the FY 2020-21 (till sept 2020) within APSEZ is INR 490 lakh.</p>												

S. No.	Identified environmental and social impacts for the fully developed scenario (year 2030)	Type of Impact & Magnitude	Environment management plans adopted or being adopted by APSEZ as per permits, clearances, applicable regulations and guidelines etc.	Additional Risk Mitigation Measures/ESMP	Responsible agency	Timeframe for implementation	Compliance
10	Socio-economic aspects						
10.1	Population growth in the Mundra region was reported to be in the order of 85% during the past decade (2001-2011). Further expansion of the urban area could be possible due to induced economic growth in the region. Increase in population will have a additional need for public infrastructure in the region.	Level-1	Dedicated townships are developed within APSEZ area with necessary community infrastructures such as hospital, school, recreational facilities, sewage treatment and waste collection facilities. Adani Foundation has been undertaking various CSR programs under the principal themes such as education, community health, sustainable livelihood and rural infrastructure. About Rs. 97 Cr	The existing townships will be expanded to accommodate about 4lakh people when the project activity is fully developed.	APSEZ	As and When Required	<p>APSEZ has developed two townships (Shantivan and Samudra) accommodating 2180 households and associated infrastructure facilities. Accommodation is made available for all interested employees working within Adani group &amp; SEZ industries. Out of which 89% Occupancies are accommodated within the townships and rest are available for employees working within APSEZ.</p> <p>At present 45 nos. of industries (processing &amp; non-processing) are operating within the SEZ. Township facilities are also made by SEZ industries within Mundra town for their employees having basic infrastructure facilities and requirements. Most of the employees working in SEZ industries are residing in Mundra township having all basic requirements and associated facilities.</p> <p>The existing social infrastructure facilities are adequate to accommodate the people considering present APSEZ development. The existing townships with associated facilities will be expanded as per requirement. Other infrastructure facilities have been developed for people are as follows.</p> <ul style="list-style-type: none"> <li>Multi-Specialty Hospital</li> </ul>



S. No.	Identified environmental and social impacts for the fully developed scenario (year 2030)	Type of Impact & Magnitude 1	Environment management plans adopted or being adopted by APSEZ as per permits, clearances, applicable regulations and guidelines etc.	Additional Risk Mitigation Measures/ESMP	Responsible agency	Timeframe for implementation	Compliance
			has been spent on various CSR activities in the Mundra region since 2010. Similar community development programs (based on need based assessment) will be continued in future as well with allocation of appropriate budget.				<ul style="list-style-type: none"> <li>• School</li> <li>• Commercial complex</li> <li>• Religious place</li> </ul> <p>APSEZ is actively working with local community (including fishermen community) around the project area and provides required support for their livelihood and other concerns through the CSR arm – Adani Foundation in the main five persuasions is mentioned below.</p> <ul style="list-style-type: none"> <li>• Community Health</li> <li>• Sustainability Livelihood – Fisher Folk</li> <li>• Education</li> <li>• Rural Infrastructures</li> <li>• Skill Development</li> </ul> <p>Adani foundation has spent approx. INR 3853.7 lakhs from April – 2018 to Sep – 2020 for CSR activities including cost of rural infrastructure projects development.</p> <p>Major works carried out since April 2018 as a part of CSR activities are as below.</p> <ul style="list-style-type: none"> <li>• Pond Deepening work at Vadala &amp; Mota Bhadiya</li> <li>• Artificial recharge borewell in Borana, Mangara &amp; Dhrub village.</li> <li>• Under Dignity of Drivers Project, Adani Foundation has constructed Resting Shed for Drivers entering in SEZ Premises. Total</li> </ul>

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							<p>50 beds are constructed, drinking water and sanitation plus recreational – TV Facilities.</p> <ul style="list-style-type: none"> <li>• Construction of 45 Toilet block and proper bathing place for labours.</li> <li>• RO Plant – Samaghogha, Siracha village &amp; Vallabh Vidyalaya at Mundra</li> <li>• Basic sanitation facility (18 Nos) at Balvadi, medical centre and retiring places at labour settlements</li> <li>• Ground recharge activities (pond deepening work for more than 52 ponds) individually and 26 ponds under Sujlam Suflam Jal Abhiyan were built leading to a significant increase in water table and higher returns to the farmers.</li> <li>• Roof Top Rain Water Harvesting 54 Nos. and Recharge Bore well 75 Nos.</li> <li>• Drip Irrigation 823 Farmers benefitted in coordination with Gujrat Green Revolution Company</li> <li>• Participatory Ground Water Management in ten villages with holistic approach for Kankavati Sandstone Aquifer Programme.</li> <li>• Development of Prisha Park at Mundra.</li> <li>• Pond Bund strengthening at Zarpara Village</li> </ul> <p>Similar community development programs (based on need based assessment) will be continued in future as well with allocation of appropriate budget.</p>

S. No.	Identified environmental and social impacts for the fully developed scenario (year 2030)	Type of Impact & Magnitude 1	Environment management plans adopted or being adopted by APSEZ as per permits, clearances, applicable regulations and guidelines etc.	Additional Risk Mitigation Measures/ESMP	Responsible agency	Timeframe for implementation	Compliance
10.2	The overall sex ratio was found to reduce by 28% in the Mundra taluk (study area) during the period 2001 - 2011. This could be attributed to increase in influx of working men in the region due to rapid economic development. Similar trend might continue in future due to induced economic growth in the region.	Level-2	Adani foundation is taking up several girl child education programs as part of CSR activities to create awareness about girl child protection.	Suitable regional level awareness programs on the girl child protection and encouragement programs in line with state and national policies shall be adopted under Corporate Social Responsibility programs in association with district authorities.	APSEZ, Other development projects and District Administration*	Long Term	<p>Major works carried out since April 2018 as a part of CSR activities to create awareness about girl child protection are as below.</p> <ul style="list-style-type: none"> <li>• The Adani Foundation provided scholarship support to motivation and encouragement of fishermen boys and girls for higher education under this program. APSEZ provide 100% fees support to girls as a scholarship. This year total 78 students are being facilitated by Adani foundation.</li> <li>• Separate sanitation facilities for girl child in schools.</li> <li>• Total 8770 haemoglobin screenings of RPA woman and adolescent girls was carried out in year 2017-18. Which helps in controlling anaemia in women and indirectly malnutrition.</li> <li>• Beti Vadhavo Programme was organized in 32 Villages in the presence of Village Sarpanch and other leaders in year 2017-18. We explained people about the various topics i.e. importance of girl child, Sex Ratio, Gender Equality and laws regarding Child abortion. This initiative was well accepted by community and we have observed a visible change in their mindset. We have facilitated 560 daughters with Kit (Small Bed sheet, Mosquito net, Soap and Cream with nutritious food for mother) To create awareness about</li> </ul>

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							<p>health, personal hygiene, child education and nutritional diet in fishermen community, various awareness programs have been organized.</p> <ul style="list-style-type: none"> <li>• Project Suposhan is initiated with the Motive .... Curb malnutrition amongst Children, Adolescent girls and Women in our CSR villages. <ul style="list-style-type: none"> <li>✓ 100beneficiaries covered in Menstrual Hygiene Day - with slogan called "RED-ACHHA HAI"</li> <li>✓ 204 beneficiaries covered in Breastfeeding Week</li> <li>✓ 320beneficiaries covered in National Deworming Day</li> <li>✓ 20 villages covered in celebration of NATIONAL NUTRITION MONTH</li> <li>✓ 42 FAMILY COUNSELLING</li> </ul> </li> <li>• To reduce malnutrition and anemia amongst Children 95 % &amp; adolescent girls and pregnant &amp; lactating women by 70 % in three years</li> <li>• Reduction IMR and MMR</li> <li>• Support Awareness &amp; Cover 100 % Vaccination taken by Child &amp; women.</li> <li>• SuPoshan Thanksgiving program was organized. In this webinar DDO, CDPO Mundra and other dignitiaries remained present and appreciated the efforts to overcome malnourishment in Mundra and Bitta.</li> </ul>

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							About Rs. 38 Cr has been spent on various CSR activities in the Mundra region since April 2018 till Sep 2020 including cost of community health and education for woman and girl child.
10.4	<p>Due to economic growth leading to rapid urbanization, which prompts the need for healthcare facilities in the region.</p> <p>For an influx of 6 lakh people from APSEZ operations and additional 3 Lakh from induced growth by the year by 2030 (fully developed scenario), total hospitals facilities with about 540 beds would be required.</p>	Level-2	Adani hospitals, Mundra is setup by Adani group near Samudra township with a goal to provide primary and secondary health care services to Adani group employees and the local populace of Mundra. The existing 100 bed Adani hospital at Mundra has been catering the services ranging from wellness and preventative care.	APSEZ will explore other possibilities to augment the primary and secondary healthcare facilities in future depending on the growth scenario at APSEZ development.	APSEZ	Long Term	<p>Adani hospitals (Multi-specialty), Mundra is having 100 bed facility and same is setup by Adani group near Samudra township.</p> <p>Primary health center and community health center are in place within the Mundra taluka.</p> <p>Other than this Adani foundation is doing various activities as part of community health. The details of last year are as below.</p> <p><b>Community Health – Mundra</b></p> <ul style="list-style-type: none"> <li>• 11 Rural Clinic – 8 from Mundra &amp; 3 from Anjar block treated; <b>8196 patients</b>.</li> <li>• <b>31 villages</b> covered, with <b>109 types</b> of general and lifesaving medicines through Mobile healthcare unit <b>6879 patients</b> benefited during six month.</li> <li>• Provided dialysis treatment to <b>6 patients</b> of kidney failure <b>236 times</b>.</li> <li>• <b>Citizen project - 8672 Card holders</b> of <b>68 villages</b> get benefit under this project.</li> <li>• <b>2921 sr. citizen patients</b> benefited during six month - <b>8000 limit</b> for three year per patients</li> <li>• <b>470</b> Needy patients had been facilitated with Medical Support OPD &amp; IPD treatment with token charges during this six month.</li> <li>• <b>1150</b> health calendar were distributed to various PHC, CHC and ICDS department of Mundra,</li> </ul>



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							<p>Mandvi, Nakhtrana, Lakhpat, Abadasa, Anjar &amp; Gandidham block.</p> <ul style="list-style-type: none"> <li>• 594 Protein Powder packet distributed to ANC woman of Utthan villages and TB patient of Mundra block.</li> <li>• Total 18698 &amp; 10380 IPD / OPD facilities provided project wise and AHMPL subsequently during six months</li> </ul> <p>Adani foundation has spent approx. INR 3853.7 lakhs from April – 2018 to Sep – 2020 for CSR activities cost including cost of community health.</p> <p>Present Hospital facilities are adequate to avail the medical treatment for Mundra region considering present development. Other Occupational Health centres, primary health centres and community health centres are also in place in Mundra to take care the people residing in Mundra. Adani group is also operating high quality health care services to the people of Kutch at G. K. General Hospital, Bhuj having 750 beds facilities on public private partnership (PPP) model, which is 60 km far from Mundra.</p> <p>APSEZ will explore other possibilities to augment the primary and secondary healthcare facilities in future depending on the future development at APSEZ.</p>
	Due to rapid economic		APSEZ has been giving				4830 Man-days work was provided over 236 Fishermen family during this six months by Adani Hospital. The Foundation has also supported

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10.5	<p>development in the region, several employment opportunities can be generated to the local people.</p> <p>When the area is fully developed by the end of 2030, the working population of the Mundra taluk would increase from current level of 55,000 to as high as 4,00,000, which will be 45% of the total envisaged population in Mundra Taluk by the end of 2030.</p>		<p>preferences to people from Gujarat for providing employment opportunities based on eligibility and skills. In Mundra, special programmes have been conducted by Adani Foundation to enhance the employability of youth from fisherfolk communities. Based on the need assessment results, several livelihood options have been introduced by the Adani Skill Development Centre, Mundra. In these centres, youth can join and get</p>	<p>APSEZ is committed to provide support for fishermen livelihood activities and has submitted a detailed 5 years plan to MoEF&amp;CC with a total budget of Rs.13.5 Cr.</p>	APSEZ	Short Term	<p>Pagadiya fishermen as painting laborers by providing them with employment and job in various fields.</p> <p>Adani Skill Development Centre (ASDC) is playing a pivotal role in implementing sustainable development in the state. The objective of this Centre is to impart different kinds of training to the students of 10<sup>th</sup>, 12<sup>th</sup>, college or ITI from surrounding areas.</p> <p>During this year Total 440 people trained in various trainings to enhance socio economic development. 324 students Enrolled in Online Training.</p> <p>APSEZ is carrying out various initiatives specific to the Fisherfolk community which includes:</p> <ul style="list-style-type: none"> <li>• Vidya Deep Yojana</li> <li>• Vidya Sahay Yojana – Scholarship Support</li> <li>• Adani Vidya Mandir</li> <li>• Fisherman Approach in SEZ</li> <li>• Machhimar Arogya Yojana</li> <li>• Machhimar Kaushalya Vardhan Yojana</li> <li>• Machhimar Sadhan Sahay Yojana</li> <li>• Machhimar Awash Yojana</li> <li>• Machhimar Shudhh Jal Yojana</li> <li>• Sughad Yojana</li> <li>• Machhimar Akshay kiran Yojana</li> </ul>

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			vocational training for a number of technical and non-technical skills. An industrial Training Institute is set up at APSEZ, Mundra, to enhance the skill levels of the local youth to maximum possible extent.				<ul style="list-style-type: none"> <li>• Machhimar Suraksha Yojana</li> <li>• Machhimar Ajivika Uparjan Yojana</li> <li>• Bandar Svachhata Yojana</li> </ul> <p>These initiatives are planned for the period 2016 – 2021 with a committed expense of INR 13.5 Cr as submitted earlier in detail in the report namely "Silent Transformation of Fisher folk at Mundra", .</p> <p>Till, Sep 2020 (Since 2016-17) approx. 8.62 Cr. INR, has already been spent in support for fishermen livelihood activities.</p>

## ANNEXURE - A

Date: 29<sup>th</sup> Sep, 2020

### Minutes of Meeting (MoM)

**Subject:** Committee Meeting w.r.t. Environment Management Plan (EMP) suggested in Cumulative Impact Assessment Study of Mundra Region (Virtual Platform)

**Agenda of Meeting:**

1. Air Quality Management
2. Noise Level Management
3. Regional Ground Water Quality Management and Water Conservation

**Date & Time of Meeting:** 17<sup>th</sup> Sep, 2020 (4:00 to 5:30 PM)

**Details of Committee Members / Attendees:**

1. Azhar Kazi (APSEZ, Mundra)
2. Mahendrakumar Ghrilahre (APSEZ, Mundra)
3. Chiragsing Rajput (APSEZ, Mundra)
4. Ashvinkumar Patni (APSEZ, Mundra)
5. Vivek Gundraniya (APSEZ, Mundra)
6. Mukesh Patel (Adani Power Ltd., Mundra)
7. Shailesh Prajapati (Adani Power Ltd., Mundra)
8. Naimesh Kakkad (Mundra Solar PV Ltd., Mundra)

**Points Discussed:**

1. Frequency of environmental monitoring as per statutory permission granted
2. Comparison of monitored data with permissible limits, which shows all the parameters are Sharing of unit wise Ambient Air Quality, Ambient Noise and Ground water quality data
3. All the monitored data are well within the permissible limit.
4. Environmental Monitoring (AAQM) in 3 surrounding villages by Adani Power and 1 village by MSPVL, which shows all parameters are well within the standard limit.
5. Ground water quality monitoring in 3 surrounding villages by Adani Power on quarterly basis.
6. Air Pollution Control Measures provided for the flue gas emission
7. Various control measures / action taken for control the air and noise emission well within the permissible standards by individual unit.
8. High salinity is a concern for the ground water quality. Due to continuous extraction of ground water by surrounding villagers the salinity may be increased.

9. PCC done in APSEZ Outfall channel up to APL road culvert to reduce the salinity ingress in ground water.
10. Good practices implemented by unit for environment preservation and conservation.

**Action Points:**

1. Maintain the existing practice to control the emission in terms of Air, Water and Noise.
2. Ensure for proper covering of trucks / vehicles carrying coal / cargo to reduce spillages on road
3. Carry out study about impact on ground water quality due to continuous extraction or any other factors.
4. Inclusion of Ambient Air Quality and Noise Monitoring station covering surrounding villages by APSEZ considering further development and statutory clearances
5. Visit to Outfall channel for monitoring of its leakages towards sea side.
6. Involvement of Representative from individual SEZ member units to discuss the EMS provided and maintained in their particular unit.