

## Bhagwat Swaroop Sharma

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**From:** Bhagwat Swaroop Sharma  
**Sent:** Wednesday, May 29, 2024 7:07 PM  
**To:** [ecompliance-guj@gov.in](mailto:ecompliance-guj@gov.in); [iro.gandhingr-mefcc@gov.in](mailto:iro.gandhingr-mefcc@gov.in)  
**Cc:** [ec-rdw.cpcb@gov.in](mailto:ec-rdw.cpcb@gov.in); [ro-gpcb-kute@gujarat.gov.in](mailto:ro-gpcb-kute@gujarat.gov.in); [ms-gpcb@gujarat.gov.in](mailto:ms-gpcb@gujarat.gov.in); [mefcc.ia3@gmail.com](mailto:mefcc.ia3@gmail.com); [monitoring-ec@nic.in](mailto:monitoring-ec@nic.in); [direnv@gujarat.gov.in](mailto:direnv@gujarat.gov.in); Anil Trivedi; Sujalkumar Shah  
**Subject:** Half Yearly EC Compliance Report Submission - APSEZ, Mundra - Port Expansion 2000 period of Oct 2023 to March 2024  
**Attachments:** EC Compliance Report\_2000-Port Expansion\_Oct23 to Mar24.pdf



**APSEZL/EnvCell/2024-25/007**

**Date:** 29.05.2024

To  
**The Inspector General of Forest / Scientist C,**  
Integrated Regional Office (IRO),  
Ministry of Environment, Forest and Climate Change,  
Aranya Bhawan, A Wing, Room No. 409,  
Near CH 3 Circle, Sector – 10A,  
Gandhinagar – 382007.  
E-mail: [ecompliance-guj@gov.in](mailto:ecompliance-guj@gov.in), [iro.gandhingr-mefcc@gov.in](mailto:iro.gandhingr-mefcc@gov.in)

**Sub** : Half yearly Compliance report of Environment Clearance under CRZ notification for "Port expansion project including dry/break bulk cargo container terminal, railway link and related ancillary and back-up facilities at Mundra Port, Dist. Kutch in Gujarat by M/s. Adani Ports & SEZ Limited."

**Ref** : Environment clearance under CRZ notification granted to M/s Adani Ports & SEZ Limited vide letter dated 20<sup>th</sup> September 2000 bearing no. J-16011/40/99-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 2023 to March 2024 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**

A handwritten signature in blue ink, appearing to read "Bhagwat Swaroop Sharma".

**Bhagwat Swaroop Sharma**  
**Head – Environment**  
**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) The Zonal Officer, Regional Office, CPCB – Western Region, Parivesh Bhawan, Opp. VMC Ward Office No. 10, Subhanpura, Vadodara – 390023.
- 3) The Member Secretary, GPCB – Head Office, Paryavaran Bhavan, Sector 10 A, Gandhi Nagar – 382010.
- 4) The Director, Forests & Environment Department, Block – 14, 8<sup>th</sup> floor, Sachivalaya, Gandhi Nagar – 382010.
- 5) The Regional Officer, Regional Office GPCB (Kutch-East), Gandhidham – 370201.

To

**The Inspector General of Forest / Scientist C,**

Integrated Regional Office (IRO),

Ministry of Environment, Forest and Climate Change,

Aranya Bhawan, A Wing, Room No. 409,

Near CH 3 Circle, Sector – 10A,

Gandhinagar – 382007.

E-mail: [ecompliance-guj@gov.in](mailto:ecompliance-guj@gov.in), [iro.gandhingr-mefcc@gov.in](mailto:iro.gandhingr-mefcc@gov.in)

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**Bhagwat Swaroop Sharma**

**Head – Environment**

**Mundra & Tuna Port**

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- 5) The 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

# Environmental Clearance Compliance Report



Port Expansion Project including Dry/Break Bulk Cargo Container Terminal, Railway Link and related Ancillary and Back-up facilities at Mundra Port, Dist. Kutch, Gujarat

**Adani Ports and SEZ Limited**

For the Period of:  
October – 2023 to March – 2024

## Index

Sr. No.	Particulars	Page Nos.	
1	<b>Environment and CRZ Compliance Report</b>	1-51	
2	<b>Annexures</b>		
	<b>Annexure - A</b>	Point wise compliance report of CRZ recommendations issued vide letter No ENV-1098-6477-PI dated October 28, 1999, and No. ENV-1099-2702-PI dated 27.12.99	53-62
	<b>Annexure - 1</b>	Adani Foundation – CSR Report for the FY 2023-24	64-155
	<b>Annexure - 2</b>	Half Yearly Environment Monitoring Summary Report	157-238
	<b>Annexure - 3</b>	Details on Mangroves afforestation & Green belt development	240-241
	<b>Annexure - 4</b>	The algal removal report	243
	<b>Annexure - 5</b>	Details of Regional Level Pollution Response exercise and Oil Spill mock drill report	245-257
	<b>Annexure - 6</b>	Safety mock drill report	259-271
	<b>Annexure - 7</b>	Environment Management Cell Organogram	273
	<b>Annexure - 8</b>	Budget spent for environmental protection expenditure	275
<b>Annexure - 9</b>	Copy of submitted action taken report w.r.t. , IRO-MoEF&CC Gandhinagar site visit on 18th to 20th December, 2023 for compliance verification	277-356	

 <p>adani Ports and Logistics</p>	<p><b>Adani Ports and Special Economic Zone Limited, Mundra.</b></p>	<p><b>From: Oct'23 To : Mar'24</b></p>
<p><b>Status of the conditions stipulated in Environment Clearance under CRZ notification</b></p>		

- Chronology of company name change from **M/s. Gujarat Adani Port Limited** to **M/s. Adani Ports and Special Economic Zone Ltd.** was submitted along with half yearly EC Compliance report for the period Oct'20 to Apr'21.

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

- **Half yearly Compliance report of Environment Clearance under CRZ notification for "Port expansion project including dry/break bulk cargo container terminal, railway link and related ancillary and back-up facilities at Mundra Port, Dist. Kutch in Gujarat vide letter no. J-16011/40/99-IA.III dated 20<sup>th</sup> September, 2000.'**

Sr. No.	Conditions	Compliance Status as on 31-03-2024																				
<b>A. Specific Condition</b>																						
i	All the conditions stipulated by the Gujarat Pollution Control Board vide their NOC No. PC/NOC/Kutch/391/184 24 dated 10.6.99 and No. PC/NOC/Kutch/222(2)16 880 dated 1.5.99 shall be strictly implemented.	<p>Complied.</p> <p>Consent to operate (CC&amp;A) has been renewed from GPCB vide consent no. AWH-117045 valid till 20<sup>th</sup> November 2026. The copy of CtO renewal was submitted along with last half yearly compliance report for the period Oct'21 to Mar'22.</p> <p>Consent to Establish (CtE) and Consent to Operate (CtO) are obtained from GPCB and renewed/amended from time to time as per the progress of the project activity. The present in-force CtE / CtO are mentioned below.</p> <table border="1"> <thead> <tr> <th>Sr. 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-117045</td> <td>20.11.2026</td> </tr> <tr> <td>2</td> <td>CtE – Amendment</td> <td>WFDP</td> <td>17739 / 15618</td> <td>18.05.2027</td> </tr> <tr> <td>3</td> <td>CC&amp;A Correction</td> <td>Mundra Port Terminal</td> <td>PC/CCA-KUTCH-39(8)/GPCB ID 17739/748148</td> <td>20.11.2026</td> </tr> </tbody> </table> <p>The permission mentioned above (Sr. No. 2) was submitted along with earlier compliance report submission. The copy of CtO renewal was submitted along with last half yearly compliance report for the period Oct'21 to Mar'22. The permission copy (Sr. No. 3) of CC&amp;A – Correction letter was submitted along with half yearly compliance report for the period of Apr'23 to Sept'23.</p>	Sr. No.	Permission	Project	Ref. No. / Order No.	Valid till	1	CtO – Renewal	Mundra Port Terminal	AWH-117045	20.11.2026	2	CtE – Amendment	WFDP	17739 / 15618	18.05.2027	3	CC&A Correction	Mundra Port Terminal	PC/CCA-KUTCH-39(8)/GPCB ID 17739/748148	20.11.2026
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ii	The conditions stipulated in the letter No ENV-1098-6477-PI dated October 28, 1999, and No. ENV-1099-2702-PI dated 27.12.99	<p>Complied.</p> <p>Point wise compliance report of CRZ recommendations issued vide letter No ENV-1098-6477-PI dated October 28, 1999, and No. ENV-1099-2702-PI dated 27.12.99 is enclosed as <b>Annexure- A</b>.</p>																				

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

	of shall be strictly implemented.	
iii	The turning circle should be increased from 550 m to 600 m.	Complied. Construction activities are completed and project is in operation phase.
iv	A girdle canal with settlement tanks shall be provided around the coal storage area.	Not applicable at present.  Coal handling is not practiced at project site.
v	All efforts shall be made for water conservation and rainwater harvesting. Arrangements shall be made for roof top rainwater harvesting from various structures.	Complied.  Under the Water Conservation and Optimization Drive at APSEZ, various initiatives were taken for conservation of water such as,  <ol style="list-style-type: none"> <li>1. 100% utilization of treated water for horticultural purpose.</li> <li>2. Water-free urinals are installed and in operation within APSEZ.</li> <li>3. Recirculation of water from fixed firefighting system to reservoir through flexible pipe during testing of firefighting system.</li> <li>4. Conservation of Condensate from Air Conditioner and use for gardening.</li> <li>5. Water flow reducers are provided in taps of Adani House, Tug Berth, CT2, CT3 &amp; CT4 buildings to reduce the water consumption and are in use.</li> <li>6. Attending leakages and damages of water lines at various locations of APSEZ.</li> <li>7. Process optimization</li> <li>8. Aware to people by display of poster/sticker/ slogan of water saving at wash basin/bathroom/toilets areas of APSEZ &amp; Residential colonies.</li> </ol> Above initiative have saved substantial amount of water consumption.  Groundwater recharge cannot be done at the project site since the entire project is in the intertidal / sub tidal areas. Rainwater within project area is managed through storm water drainage.  We have installed Rainwater 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

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

		<p>FY 2023-24 Approx. 4.58 ML of rainwater has been recharged to increase the ground water table.</p> <p>We have also connected roof top rainwater duct of operational building (Tug berth building within MPT) with u/g water tank for utilization of collected rainwater 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, Adani Foundation – CSR arm of Adani Group has carried out rainwater harvesting activities in the nearby villages for benefit of the locals.</p> <p>Water conservation Projects i.e., Roof Top Rainwater Harvesting, Desilting of Check dams, Bore Well Recharge and Pond deepening were taken up in past years, review and monitoring of all water harvesting structures had been taken up.</p> <p>To make connections between human actions and the level of biological diversity found within a habitat and/or ecosystem, this year Adani Foundation launch project "Sanrakshan" in coordination with GUIDE and Sahjeevan.</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 increased in coastal belt of Mundra as per Government Figures.</p> <p><b>Our water conservation work is as below.</b> <b>Water Conservation Projects –</b> Below tabulated Water Conservation Projects completed during Compliance period:</p> <p><b><u>Swajal Project:</u></b></p> <ul style="list-style-type: none"> <li>➤ <b>Aim:</b> The Foundation's Water Conservation program, SWAJAL, is aimed at addressing the alarming depletion of groundwater levels and reduction in water sources in various parts of Kutch district.</li> <li>➤ <b>Water Security Plan:</b> Due to arid climatic characters of the Kutch region, it is essential to plan for water security drinking and livelihood purposes. Considering weather condition, rainfall characters, geohydrological condition and water demand, water</li> </ul>
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**Status of the conditions stipulated in Environment Clearance under CRZ notification**

security plan has been prepared for the Seven villages.

Block Name	Water conservation structure	Total no. of Structure	Total Capacity Created (CUM)
Mundra	Check Dam	23	6,07,332.80
	Pond Deepening	66	1,89,121.08
	RRWHS	275	2750
	Recharge Borewell	209	-
	Percolation Well	24	-

Below tabulated Water Conservation Projects completed during previous Compliance period:

Sr. No.	Project	Unit	Outcome	Impact
1	Check dam Restrengthening-Nana Kapaya	1	Water Storage Capacity increased by 48000 Cum	60 + farmer's 120+Acre Area of Agri land can be Irrigated
2	Recharge Borewell	21	Reduce Salinity ingress, and preventing water run	150+ farmer's 260+ Acre Area of Agri land for Irrigated
3	Pipe Culvert at Checkdam at Bhujpur	1	prevent water runoff into seaside.	35 farmers' 120+Acre Area of Agri land can be Irrigated

**Earlier Completed Activities/Projects:**

- Large number of water harvesting structure (18 Nos. of check dams in coordination with salinity department) and Augmentation of 3 check dams.
- Ground recharge activities (pond deepening work for 61 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.
- New Pond Deepening Under Ajadi ka Amrut Mahotsav done in Goyarsama village Approx Deepening Capacity is 12000 Cum.
- Roof Top Rainwater Harvesting 145 Nos. (40 Nos. current FY 2022-23) which is having 10,000 litre storage which is sufficient for one year drinking water purpose for 5 people family.
- Recharge Borewell 208 Nos (19 Nos. current FY 2022-23) which is best ever option to direct recharge the soil.

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

		<ul style="list-style-type: none"> <li>• Drip Irrigation approx. 1505 Farmers benefitted in coordination with Gujrat Green Revolution Company till date.</li> <li>• Bund construction on way of Nagmati River could save more than 575 MCFT water quantity which recharged in ground due to which borewell depth decreased by 50-100 Ft in Zarpara, Bhujpur and Navinal Vadi Vistar.</li> <li>• Pond Pipeline work at Prasla Vistar Zarpara which increase recharge capacity more than 25% in 100 hector area.</li> <li>• Check dam gate valve construction at Bhujpur which controlled more than 350 MCFT water to go into sea and get recharged current year.</li> </ul> <p>With the objective of to preserve the rainwater 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>Please refer <b>Annexure - 1</b> for full details of CSR activities carried out by Adani Foundation in the Kutch region. Budget for CSR Activity for the FY 2023-24 is to the tune of INR 953.50 lakh. Out of which, Approx. INR 940.52 lakh is spent in FY 2023-24.</p>								
vi	To obviate the problem of coastal erosion due to dredging, the setback distance of at least 50 m from the Chart Datum line of Bocha island would be maintained.	<p>Complied.</p> <p>During Maintenance dredging in this area, it is ensured that at least 50 m distance is maintained.</p>								
vii	The dredged material shall be disposed of only in the identified locations outside the CRZ area. While dumping the dredged material, sufficient distance should be ensured from the existing mangroves so that there is no damage to the ecology. During dumping of dredged material the mitigative measures as suggested by NIO shall	<p>Complied.</p> <p>Capital dredging is completed and only maintenance dredging is being carried out, if required which is being ensured that there no damage of marine ecology.</p> <p>In order to ensure no damage to marine ecology Marine water &amp; sediment monitoring is being carried out once in a month by NABL and MoEF&amp;CC accredited agency namely M/s. Unistar Environment and Research Labs Pvt. Ltd., Vapi. Summary of the same for duration from Oct'23 to Mar'24 is mentioned below.</p> <p><b>Total Sampling Locations: 09 Nos.</b></p> <table border="1"> <thead> <tr> <th></th> <th>Unit</th> <th>Surface</th> <th>Bottom</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		Unit	Surface	Bottom				
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**Status of the conditions stipulated in Environment Clearance under CRZ notification**

	<p>be implemented. It shall be ensured that there is no dumping of dredged material in the CRZ.</p>	<table border="1"> <thead> <tr> <th>Parameter</th> <th></th> <th>Min</th> <th>Max</th> <th>Avg.</th> <th>Min</th> <th>Max</th> <th>Avg.</th> </tr> </thead> <tbody> <tr> <td>pH</td> <td>--</td> <td>7.99</td> <td>8.24</td> <td>8.17</td> <td>7.86</td> <td>8.12</td> <td>8.01</td> </tr> <tr> <td>BOD (3 Days @ 27 °C)</td> <td>mg/L</td> <td>98</td> <td>152</td> <td>126.91</td> <td>78</td> <td>128</td> <td>106.11</td> </tr> <tr> <td>TSS</td> <td>mg/L</td> <td>2.2</td> <td>3.5</td> <td>3.02</td> <td>BDL(M DL:1.0)</td> <td>BDL(M DL:1.0)</td> <td>BDL(M DL:1.0)</td> </tr> <tr> <td>DO</td> <td>mg/L</td> <td>5.88</td> <td>6.35</td> <td>6.09</td> <td>5.68</td> <td>6.25</td> <td>5.91</td> </tr> <tr> <td>Salinity</td> <td>ppt</td> <td>35.24</td> <td>38.88</td> <td>36.39</td> <td>36.15</td> <td>37.38</td> <td>37.06</td> </tr> <tr> <td>TDS</td> <td>mg/L</td> <td>35864</td> <td>36610</td> <td>36225</td> <td>34500</td> <td>37540</td> <td>37077</td> </tr> </tbody> </table> <p>*BDL – Below Detection Limit *MDL – Minimum Detection Limit</p> <p>Please refer <b>Annexure – 2</b> for detailed analysis reports. Approx. INR 13.37 Lakh is spent for all environmental monitoring activities during the FY 2023-24 for overall APSEZ, Mundra.</p>	Parameter		Min	Max	Avg.	Min	Max	Avg.	pH	--	7.99	8.24	8.17	7.86	8.12	8.01	BOD (3 Days @ 27 °C)	mg/L	98	152	126.91	78	128	106.11	TSS	mg/L	2.2	3.5	3.02	BDL(M DL:1.0)	BDL(M DL:1.0)	BDL(M DL:1.0)	DO	mg/L	5.88	6.35	6.09	5.68	6.25	5.91	Salinity	ppt	35.24	38.88	36.39	36.15	37.38	37.06	TDS	mg/L	35864	36610	36225	34500	37540	37077
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viii	<p>The mangrove afforestation shall be undertaken at the identified sites and the progress report in this regard shall be submitted to this Ministry regularly. All the recommendations suggested in the NIO report for restoration of the coastal habitat by mangrove afforestation at Navinal island shall be strictly implemented.</p>	<p>Complied.</p> <p>All construction activities are completed and project is in operation phase since long time. 24 hectare of mangrove afforestation was carried out at identified sites in consultation with Dr Maity, (Mangrove Consultant of India).</p> <p>Green belt was developed 72.67 ha. Total 149959 trees were planted with the density of 2060 trees per hectare within the port area. So, far APSEZ has developed 457.99 ha. area as greenbelt with plantation of more than 9.06 Lacs saplings within the APSEZ area.</p> <p>To enhance the marine biodiversity, till Mar'24 APSEZ has carried out total mangrove afforestation in 4140 ha. area across the coast of Gujarat. Total expenditure for the same till date is INR 1592.8 lakh.</p> <p>Details on Mangroves afforestation &amp; Green belt development carried out by APSEZ till date is annexed as <b>Annexure – 3</b>.</p> <p>Other than this Adani Foundation – CSR Arm of Adani Group at Mundra-Kutch has initiated multi-species plantation of mangroves in Luni village in association with M/s. GUIDE, Gujarat. During 2018-2019 (Phase-I) multi-species mangrove plantation was carried out in 10 ha, during Phase-II (2019-2020) it was 02 ha and during Phase III (2020-2021) it is 01 ha. During FY 2021-22, 03 ha area coastal stretches have been planted with species.</p>																																																								

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

		<p>During current FY 2022-23, 04 Hector plantation has been planted with various species. Total 20 Ha. multi-species mangrove plantation has been carried out till March-23 association with M/s. GUIDE, Gujarat.</p> <p>These plantations are diligently maintained and continually monitored. Notably, these forests have evolved into a thriving habitat for various marine and migratory bird species, enriching the local ecosystem.</p> <p>Please refer attached <b>Annexure – 1</b> for CSR activity report carried out by Adani Foundation.</p>
ix	No ground water shall be withdrawn for this project.	<p>Complied.</p> <p>Present source of water for various project activities is desalination plant of APSEZ and/or through Gujarat Water Infrastructure Limited (GWIL). Average water consumption for entire APSEZ area is 5.14 MLD during the compliance period i.e. Oct'23 to Mar'24.</p>
x	The project proponent shall ensure that the construction workers do not cut the Mangroves for fuel wood etc.	<p>Complied.</p> <p>All construction activities are completed and project is in operation phase since long time.</p>
xi	The project proponent shall ensure that no creeks are blocked and the natural drainage of the area is not affected due to project activities.	<p>Complied.</p> <p>Prominent creek system (main creeks and small branches of creeks) in the study region are: (1) Kotdi (2) Baradimata (3) Navinal (4) Bocha (5) Mundra (Oldest port (Juna Bandar) leading to Bhukhi river).</p> <p>All above creeks are in existence allowing free flow of water and there is no filling or reclamation of any creek area. APSEZ has so far constructed 19 culverts having total length of approx. 1100 m with total cost of INR 20 Crores. Apart from that three RCC Bridges have been constructed over Kotdi creek with total length of 230 m at the cost of INR 10 Crores. Photographs of the same were submitted as part of compliance report for the duration of Apr'17 to Sep'17.</p> <p>As per the bathymetry study carried out by NCSCM in 2017-18, it can be concluded that there are sufficient depths at the creek mouths and all creek mouths are open allowing flushing of water.</p>

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

<p>xii</p>	<p>The project proponent shall ensure that there will be no disposal of sludge and sewage generated from construction camps, surface run-off from construction sites, and oil and grease spillage from the construction equipment's in the creeks.</p>	<p>Complied.</p> <p>Project is in operation phase.</p> <p>Sewage generated from port is being treated in designated ETP 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. from Oct'23 to Mar'24)</th> <th>Type of ETP / STP</th> </tr> </thead> <tbody> <tr> <td>LT</td> <td>265 KLD</td> <td>93.62 KLD</td> <td>Activated Sludge</td> </tr> </tbody> </table> <p>Summary of ETP treated water analysis results during compliance period as mentioned below.</p> <p><b>Frequency of Analysis:</b> Once in a month</p> <table border="1"> <thead> <tr> <th>Parameter</th> <th>Unit</th> <th>Min</th> <th>Max</th> <th>Average</th> <th>Perm. Limit<sup>§</sup></th> </tr> </thead> <tbody> <tr> <td>pH</td> <td>--</td> <td>6.55</td> <td>7.42</td> <td>7.11</td> <td>6.5 – 8.5</td> </tr> <tr> <td>SS</td> <td>mg/L</td> <td>26</td> <td>48</td> <td>35</td> <td>100</td> </tr> <tr> <td>TDS</td> <td>mg/L</td> <td>970</td> <td>1184</td> <td>1096</td> <td>2100</td> </tr> <tr> <td>COD</td> <td>mg/L</td> <td>82</td> <td>89</td> <td>87.37</td> <td>100</td> </tr> <tr> <td>BOD</td> <td>mg/L</td> <td>24</td> <td>26</td> <td>24.92</td> <td>30</td> </tr> <tr> <td>Ammonical Nitrogen as NH<sub>3</sub>-N</td> <td>mg/L</td> <td>23.8</td> <td>28.4</td> <td>25.8</td> <td>50</td> </tr> </tbody> </table> <p style="text-align: right;">§ as per CC&amp;A granted by GPCB</p> <p>The quality of marine water, treated effluents, air emissions and noise levels are being regularly analyzed by NABL accredited and MoEF&amp;CC accredited agency namely M/s. Unistar Environment and Research Labs Pvt. Ltd., Vapi. Please refer <b>Annexure – 2</b>.</p> <p>Monitoring and analysis of ETP treated waste is also carried out regularly through in-house laboratory for the parameters such as pH, TDS, TSS, COD, Chlorides, and residual chlorine.</p> <p>For detailed analysis reports for the period Oct'23 to Mar'24. Approx. INR 13.37 Lakh is spent for all environmental monitoring activities during the FY 2023-24 for overall APSEZ.</p>	Location	Capacity	Quantity of Treated Water (Avg. from Oct'23 to Mar'24)	Type of ETP / STP	LT	265 KLD	93.62 KLD	Activated Sludge	Parameter	Unit	Min	Max	Average	Perm. Limit <sup>§</sup>	pH	--	6.55	7.42	7.11	6.5 – 8.5	SS	mg/L	26	48	35	100	TDS	mg/L	970	1184	1096	2100	COD	mg/L	82	89	87.37	100	BOD	mg/L	24	26	24.92	30	Ammonical Nitrogen as NH <sub>3</sub> -N	mg/L	23.8	28.4	25.8	50
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**Status of the conditions stipulated in Environment Clearance under CRZ notification**

		It is also noted that GPCB is doing regular site inspection along with wastewater sampling and analysis. The last GPCB sample analysis report was submitted as part of compliance report submission for the duration of Apr'21 to Sep'21 which shows all the parameters are well within the permissible limit.
xiii	The project proponent shall stick to the time bound program submitted to the Department of Environment, Government of Gujarat for the proposed activities including installation of desalination plant for meeting the entire water requirement. They shall coordinate their construction/operations schedule with the installation schedule of desalination plant.	Complied.  Desalination plant has already been installed as per time bound program for overall APSEZ area and is in use. Details regarding water consumption are mentioned in Sr. no. ix above.
xiv	The project proponent shall ensure that the commercial fisheries are not hampered due to presence of barges, vessels and other activities in the region. Necessary plan in this regard shall be prepared in consultation with the NIO and submitted within 3 months.	Complied. No commercial fisheries are prevailing in this area except Pagadia and fishermen with small boats. Unhindered access is provided to the fishing boats.  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, APSEZ has provided seven (7) access roads. Total length of all the approach roads is approx. 23 Kms and expenditure involved was Rs. 637 Lacs. There is no hindrance to the movement of fisherman boats. Details of the same were submitted along with EC Compliance report for the period Apr'18 to Sep'18.
xv	The project proponent shall bear the cost of the external agency that may be appointed by the Department of	Complied.  Construction activities are completed and project is in operation phase.

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

<p>Environment, Government of Gujarat for carrying out the supervision and/or the monitoring of the construction activities.</p>	<p>As part of the directions given by MoEF&amp;CC vides order dated 18<sup>th</sup> Sep, 2015, following studies were conducted.</p> <ol style="list-style-type: none"> <li>1. NCSCM (MoEF&amp;CC promoted Government Agency) study on comprehensive and integrated plan for preservation and conservation of mangroves and associated creeks in and around APSEZ in year 2016-17. The cost of said study was 3.15 Cr, which was incurred by APSEZ.</li> </ol> <p>As a part of mangrove conservation plan, APSEZ has done following activities.</p> <ol style="list-style-type: none"> <li>a. Monitoring of mangrove distribution in creeks in and around APSEZ and shoreline changes in Bocha island through NCSCM, Chennai. The cost of the said study was INR 23.56 Lacs incurred by APSEZ.</li> <li>b. Tidal observation in creeks in and around APSEZ – The cost of the said activity was INR 1.0 Lacs incurred by APSEZ.</li> <li>c. Algal &amp; Prosopis removal from Mangrove area - The cost of the said activity is Rs. 80,000 incurred by APSEZ during FY 2023-24. The details of algal &amp; prosopis removal is attached as <b>Annexure-4</b>.</li> <li>d. Awareness of mangroves importance in surrounding communities &amp; Fodder support - The expenditure for fodder supporting activities was approx. 305.55 Lacs during FY 2023-24, which was incurred by APSEZ. This activity is being done on continuous basis as a part of CSR activity.</li> </ol> <p>To comply with the GCZMA recommendations regarding mangrove monitoring at every 2 years, APSEZ earlier awarded work order to NCSCM, Chennai vide order no. 4802018994, dated 29/07/2022 with cost 23.77 Lacs for mangrove mapping in and around APSEZ, but due to some financial disputes and no proper response from NCSCM side regarding resolution, the work order has been revoked.</p> <p>After that as suggested by Joint Review Committee in its report that mangrove related studies may be undertaken by different agencies on a rotation basis for a better review of the mangroves, APSEZ issued work order to the Gujarat Institute of Desert Ecology (GUIDE), Bhuj vide</p>
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**Status of the conditions stipulated in Environment Clearance under CRZ notification**

order no. 4802027981, dated 10/04/2023 for mangrove mapping in and around APSEZ, Mundra. The cost of said work is 23.60 Lacs (Including Taxes), which was paid by APSEZ.

GUIDE has completed the study of Monitoring and Distribution of the Mangroves along the Creeks in and Around APSEZ, Mundra, Kutch, Gujarat for the duration of year March 2019 to March 2021. Copy of the report of Monitoring and Distribution of the Mangroves was submitted along with half yearly compliance report for the period of Oct'23 to Mar'24.

According to NCSCM Mangrove monitoring study report March 2021, distribution of mangroves in Kotdi, Baradimata, Navinal, Bocha and Khari creeks and also in Bocha island was studied using Google earth images (2017 March and 2019 Sep). The data obtained for 2017 i.e., 2398 ha was compared with data reported for 2016 (Dec) - 2017 (Jan & Feb) i.e., 2340 ha in the Conservation plan submitted earlier. The Google earth showed a marginal difference of + 58 ha (compared to earlier 2016-17 data) which shows 2.4% higher and the difference can be considered as insignificant. Further for both the start year (2017 March) and the end year (Sep.2019) Google earth image was used as a source and therefore, the results will be quite acceptable for assessment. With regard to overall health of mangroves in the creeks in and around APSEZ, it was found that there was an increase of mangrove cover between March 2017 and Sep 2019 to an extent of 256 ha which is about 10.7% increase in mangroves. Hence overall mangrove cover was considered as 2596 Ha in year 2019.

According to GUIDE Mangrove monitoring study report November 2023 the distribution of mangroves in Kotadi, Baradi mata, Navinal, Bocha and Khari creeks as well as in the Bocha island was studied using LISS IV satellite images for the duration of March 2019 to March 2021. The mangrove cover in the creeks in and around APSEZ showed a positive trend from March 2019 to March 2021, with an overall increase of 52.79 ha (1.9%) compared to the cover during the year 2019. The total mangrove cover during 2019 was 2670 ha which has increased to 2723 ha during the year 2021.

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

		<p><b>Hence, overall increase in mangrove cover area in creek system in and around APSEZ from 2011 (2094 Ha) to 2021 (2723 Ha) is 629 Ha (30%).</b></p> <p>2. A Regional Impact Assessment study through Chola MS, Chennai (NABET accredited consultant) to identify impacts of all the existing as well as proposed project activities in Mundra region inline to ToR issued by GCZMA. The cost of said study was 1.3 Cr, which was incurred by APSEZ.</p>
xvi	The project proponent shall carry out the post-project monitoring of various environmental parameters in consultation with the Department of Environment, Government of Gujarat and Gujarat Pollution Control Board.	<p>Complied.</p> <p>Monitoring of various environmental parameters for Ambient Air, Noise, Wastewater, ground water, marine water and sediments along with the parameters mentioned in the consent order issued by GPCB is being carried out by NABL and MoEF&amp;CC accredited agency namely M/s. Unistar Environment and Research Labs Pvt. Ltd., Vapi. Monitoring reports for the period from Oct'23 to Mar'24 is enclosed as <b>Annexure - 2</b>.</p>
xvii	The project proponent shall prepare the detailed traffic control management plan for the port and shall participate in the VTMS to be developed for the Gulf of Kachchh.	<p>Complied.</p> <p>APSEZ is practicing well defined traffic control procedure.</p> <p>A VTMS service for Gulf of Kutch is operated by Directorate General of Lighthouses and Lightships (DGLL), Govt. of India.</p> <p>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 Gulf of Kutch is provided to VTMS 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>.</p> <p>Mundra port has subscribed and taking VTMS feed from Kandla from link <a href="http://www.vts.gov.in">www.vts.gov.in</a>.</p>
xviii	Action plan shall be prepared by the project proponents to prevent damage to marine life and also to the coastline in case of any oil spillage	<p>Complied.</p> <p>Oil spill contingency response plan is being updated on regular basis and the same was last updated on 30.07.2022 is in place and implemented. The updated Oil spill contingency response plan was submitted along with</p>

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

	<p>and the same shall be strictly implemented. Regular mock drills shall be carried out to ensure fitness of the equipment in place.</p>	<p>EC Compliance report for the period Apr'22 to Sep'22.</p> <p>For responding to oil spill, the Indian Coast Guard has developed the National Oil Spill Disaster Contingency Plan NOSDCP which has the approval of the Committee of Secretaries and has been in operation since 1996. Oil Spill Contingency Response Plan (OSCRP) prepared by APSEZ is in accordance with the NOSDCP.</p> <p>Latest Regional Level Pollution Response exercise "SWACHCHH SAMUDRA-NW 2023" was carried out by Indian Coast Guard on 25<sup>th</sup> November, 2023 at Vadinar, Gujarat. All participants from various Oil Handling Agencies and Stakeholders (IOCL-Jamnagar, APSEZ-Mundra, Nayara Energy LTD VOTL- Vadinar, Reliance Industries LTD- Sikka Jamnagar, Essar Bulk Terminal-Salaya and Coast Guard) were participated in this exercise. Details of the same is attached <b>Annexure - 5</b></p> <p>Mock drills are conducted regularly by APSEZ. Last Oil Spill Mock drill was conducted on 19.01.2024. Oil Spill Mock Drill report is enclosed as <b>Annexure - 5</b>.</p>
<p>xix</p>	<p>The project proponents shall work out the maximum quantity of spilled material, which can find its way into the coastal waters, under different accident scenarios, and their impact on aquatic life shall be studied after clearly demarcating the impact zones. On the basis of such studies, the necessary action plan to mitigate the likely impacts shall be prepared before commencement of the operations. Action taken report in this regard shall be submitted to the Ministry.</p>	<p>Complied.</p> <p>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.</p> <p>Based on the oil spill modeling study, it has been observed that crude oil spill of 700 tons (Tier-I) will spread over an area having radius of around 400 m within 4hr. APSEZ already has facilities for combating a Tier-1 spill.</p> <p>Recommendations of Marine EIA by NIO with respect to pollution emergency contingency plan for Multipurpose Terminal, Container, Dry &amp; Break Bulk Terminal as well as associated facilities are addressed in Oil Spill Response Plan.</p> <p>This action plan prepared by APSEZ to combat the oil spill (LOS-DCP) is in accordance with the NOS DCP, International Petroleum Industry Environmental Conservation Association (IPIECA). Please refer Point No. xviii.</p>

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

**B. General Condition**

i	Construction of the proposed structures should be undertaken meticulously conforming to the existing Central / local rules and regulations. All the construction designs / drawings relating to the proposed construction activities must have approvals of the concerned State Government Departments / Agencies.	<p>Already complied. Not applicable at present.</p> <p>All construction activities are carried out confirming to the existing rules and regulation and as per the CRZ notification.</p> <p>Approval under the preview of GMB, PESO and Factories act were taken prior to start of construction.</p>																																																																	
ii	The proponent shall ensure that as a result of the proposed constructions ingress of the saline water into the ground water does not take place. Piezometers shall be installed for regular monitoring for this purpose at appropriate locations on the project site.	<p>Complied.</p> <p>To monitor the ground water quality, bore wells are provided at various location in the port and SEZ areas. Third party analysis of the ground water is being carried out twice a year by NABL and MoEF&amp;CC accredited agency namely M/s. Unistar Environment and Research Labs Pvt. Ltd., Vapi. Summary of the same for duration from Oct'23 to Mar'24 is mentioned below. Monitoring Reports are attached as <b>Annexure – 2</b> for the same.</p> <p><b>Number of Sampling Locations of port ground water: 5 Nos.</b></p> <table border="1"> <thead> <tr> <th>Parameters</th> <th>Unit</th> <th>Min</th> <th>Max</th> <th>Average</th> </tr> </thead> <tbody> <tr> <td>pH @ 25 ° C</td> <td>--</td> <td>7.45</td> <td>8.32</td> <td>7.97</td> </tr> <tr> <td>Salinity</td> <td>ppt</td> <td>0.99</td> <td>3.44</td> <td>2.05</td> </tr> <tr> <td>Oil &amp; Grease</td> <td>mg/L</td> <td>BDL(MDL:5.0)</td> <td>BDL(MDL:5.0)</td> <td>BDL(MDL:5.0)</td> </tr> <tr> <td>Hydrocarbon</td> <td>mg/L</td> <td>ND*</td> <td>ND*</td> <td>ND*</td> </tr> <tr> <td>Lead as Pb</td> <td>mg/L</td> <td>BDL(MDL:0.01)</td> <td>0.11</td> <td>0.03</td> </tr> <tr> <td>Arsenic as As</td> <td>mg/L</td> <td>BDL(MDL:0.01)</td> <td>BDL(MDL:0.01)</td> <td>BDL(MDL:0.01)</td> </tr> <tr> <td>Nickel as Ni</td> <td>mg/L</td> <td>BDL(MDL:0.02)</td> <td>BDL(MDL:0.02)</td> <td>BDL(MDL:0.02)</td> </tr> <tr> <td>Total Chromium as Cr</td> <td>mg/L</td> <td>BDL(MDL:0.05)</td> <td>BDL(MDL:0.05)</td> <td>BDL(MDL:0.05)</td> </tr> <tr> <td>Cadmium as Cd</td> <td>mg/L</td> <td>BDL(MDL:0.003)</td> <td>0.02</td> <td>0.005</td> </tr> <tr> <td>Mercury as Hg</td> <td>mg/L</td> <td>BDL(MDL:0.001)</td> <td>BDL(MDL:0.001)</td> <td>BDL(MDL:0.001)</td> </tr> <tr> <td>Zinc as Zn</td> <td>mg/L</td> <td>BDL(MDL:0.05)</td> <td>BDL(MDL:0.05)</td> <td>BDL(MDL:0.05)</td> </tr> <tr> <td>Copper as Cu</td> <td>mg/L</td> <td>BDL(MDL:0.05)</td> <td>BDL(MDL:0.05)</td> <td>BDL(MDL:0.05)</td> </tr> </tbody> </table>	Parameters	Unit	Min	Max	Average	pH @ 25 ° C	--	7.45	8.32	7.97	Salinity	ppt	0.99	3.44	2.05	Oil & Grease	mg/L	BDL(MDL:5.0)	BDL(MDL:5.0)	BDL(MDL:5.0)	Hydrocarbon	mg/L	ND*	ND*	ND*	Lead as Pb	mg/L	BDL(MDL:0.01)	0.11	0.03	Arsenic as As	mg/L	BDL(MDL:0.01)	BDL(MDL:0.01)	BDL(MDL:0.01)	Nickel as Ni	mg/L	BDL(MDL:0.02)	BDL(MDL:0.02)	BDL(MDL:0.02)	Total Chromium as Cr	mg/L	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	Cadmium as Cd	mg/L	BDL(MDL:0.003)	0.02	0.005	Mercury as Hg	mg/L	BDL(MDL:0.001)	BDL(MDL:0.001)	BDL(MDL:0.001)	Zinc as Zn	mg/L	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	Copper as Cu	mg/L	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)
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iii	<p>A comprehensive contingency plan in collaboration with the concerned authorities must be formulated to contain in case of any oil spills. Appropriate devices such as oil skimmer, oil monitor, oil water separator must be acquired for strengthening the contingency plan. All the service vessels that required for oil spill operations must be equipped with booms and dispersants. The personal onboard of these vessels must be properly trained in operation of these booms and dispersants.</p>	<p>Complied.</p> <p>Oil spill contingency response plan is being updated on regular basis and the same was last updated on 30.07.2022 is in place and implemented. The updated Oil spill contingency response plan was submitted along with EC Compliance report for the period Apr'22 to Sep'22.</p> <p>Shoreline Resources available with APSEZ, for deployment during shoreline cleanup/ emergent situation:</p> <table border="1"> <thead> <tr> <th>Item</th> <th>Quantity</th> </tr> </thead> <tbody> <tr> <td>Oil Spill Dispersants</td> <td>5000 ltr.</td> </tr> <tr> <td>Absorbent pads</td> <td>2000 Nos.</td> </tr> <tr> <td>Portable dispersant storage tank: 1000 ltr. Capacity</td> <td>1 no.</td> </tr> <tr> <td>Portable pumps</td> <td>2 nos.</td> </tr> <tr> <td>Oil Containment Boom-Length 2000 metres, Height -1500 mm, Draft-900mm, Free Board-600mm</td> <td>2000 m</td> </tr> <tr> <td>Skimmer-KOMARA 15 Duplex Skimmer System with floating IMP 6 Pump.</td> <td>4 Nos.</td> </tr> <tr> <td>12.5T Flexible Floating Storage Tank (PUA).</td> <td>3 Nos.</td> </tr> <tr> <td>Lamor Minimax 12 m<sup>3</sup> skimmer</td> <td>2 sets</td> </tr> <tr> <td>Lamor Side Collector system (Recovery Capacity 123 m<sup>3</sup>/ hr)</td> <td>2 Nos. 2 sets</td> </tr> <tr> <td>Canadyne Fence Boom (Reel model 7296/8496 with Power Pack, Towing bridles and Tow lines - 235 meter</td> <td>1 No.</td> </tr> </tbody> </table> <p>11 Dolphin tugs are fitted with Oil Spill Dispersant boom and proportionate pump to mix OSD and Sea water as required. The tugs are fitted with a fire curtain and remote-controlled fire monitors.</p>	Item	Quantity	Oil Spill Dispersants	5000 ltr.	Absorbent pads	2000 Nos.	Portable dispersant storage tank: 1000 ltr. Capacity	1 no.	Portable pumps	2 nos.	Oil Containment Boom-Length 2000 metres, Height -1500 mm, Draft-900mm, Free Board-600mm	2000 m	Skimmer-KOMARA 15 Duplex Skimmer System with floating IMP 6 Pump.	4 Nos.	12.5T Flexible Floating Storage Tank (PUA).	3 Nos.	Lamor Minimax 12 m <sup>3</sup> skimmer	2 sets	Lamor Side Collector system (Recovery Capacity 123 m <sup>3</sup> / hr)	2 Nos. 2 sets	Canadyne Fence Boom (Reel model 7296/8496 with Power Pack, Towing bridles and Tow lines - 235 meter	1 No.
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Oil Containment Boom-Length 2000 metres, Height -1500 mm, Draft-900mm, Free Board-600mm	2000 m																							
Skimmer-KOMARA 15 Duplex Skimmer System with floating IMP 6 Pump.	4 Nos.																							
12.5T Flexible Floating Storage Tank (PUA).	3 Nos.																							
Lamor Minimax 12 m <sup>3</sup> skimmer	2 sets																							
Lamor Side Collector system (Recovery Capacity 123 m <sup>3</sup> / hr)	2 Nos. 2 sets																							
Canadyne Fence Boom (Reel model 7296/8496 with Power Pack, Towing bridles and Tow lines - 235 meter	1 No.																							

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

		<p>IMO module course organized by Maritime Training Institute is conducted &amp; 24 personnel have achieved IMO level 1 &amp; 04 personnel have achieved IMO Level 2. Different training modules as Oil Spill, Oil Spill Equipment, Oil spill Management course, Notification exercise, Tabletop, Incident are conducted at different frequency.</p> <p>Detail of resource available at APSEZL provided Oil Spill Contingency Response Plan which was submitted along with EC Compliance report for the period Apr'22 to Sep'22.</p>																		
iv	<p>The operation plan for responding to an oil spill must include clear procedures for notification of a spill, response decision, cleanup operations, communications, and termination of cleanup operations, cleanup cost, oil pollution, damage control and disaster management plan.</p>	<p>Complied.</p> <p>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.</p> <p>Oil spill contingency response plan is being updated on regular basis and the same was last updated on 30.07.2022 is in place and implemented. The updated Oil spill contingency response plan was submitted along with EC Compliance report for the period Apr'22 to Sep'22.</p> <p>Oil Spill Contingency Plan includes procedures for notification of a spill as point no 7.1, response strategy as Point no. 3.0, cleanup operations, Clean-up cost and termination of cleanup in point no. 3.5, communications in point no. 6.0.</p>																		
v	<p>A well-equipped laboratory with suitable instruments to monitor the quality of air and water shall be set up so as to ensure that the quality of ambient air and water conforms to the prescribed standards. The laboratory will also be equipped with qualified manpower including a marine biologist so that the marine water quality is regularly monitored in order to ensure that the</p>	<p>Being complied</p> <p>Site is provided with environment monitoring equipment with sufficient &amp; competent staff of Third-Party laboratory accredited by NABL &amp; MoEF&amp;CC.</p> <p>Ambient Air Quality (twice in a week) and Noise (once in a month) monitoring are being carried out by NABL and MoEF&amp;CC accredited agency namely M/s. Unistar Environment and Research Labs Pvt. Ltd., Vapi. Summary of the same for duration from Oct'23 to Mar'24 is mentioned below.</p> <p><b>Total Ambient Air &amp; Noise Sampling Locations: 5 Nos.</b></p> <table border="1"> <thead> <tr> <th>Parameter</th> <th>Unit</th> <th>Min</th> <th>Max</th> <th>Average</th> <th>Perm. Limit<sup>s</sup></th> </tr> </thead> <tbody> <tr> <td colspan="6"><b>AAQM</b></td> </tr> <tr> <td>PM<sub>10</sub></td> <td>µg/m<sup>3</sup></td> <td>63.95</td> <td>87.13</td> <td>78.78</td> <td>100</td> </tr> </tbody> </table>	Parameter	Unit	Min	Max	Average	Perm. Limit <sup>s</sup>	<b>AAQM</b>						PM <sub>10</sub>	µg/m <sup>3</sup>	63.95	87.13	78.78	100
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**Status of the conditions stipulated in Environment Clearance under CRZ notification**

marine life is not adversely affected as a result of implementation of the said project. The quality of ambient air and water shall be monitored periodically in all the seasons and the results should be properly maintained for inspection of the concerned pollution Control agencies. The periodic monitoring reports at least once in 6 months must be sent to this Ministry as well as its Regional Office at Bhopal.

PM <sub>2.5</sub>	µg/m <sup>3</sup>	23.58	38.10	31.82	60
SO <sub>2</sub>	µg/m <sup>3</sup>	18.96	33.47	26.17	80
NO <sub>2</sub>	µg/m <sup>3</sup>	22.58	38.54	30.55	80
Noise	Unit	Leq Min	Leq Max	Leq Ave.	Leq Perm. Limit*
Day Time	dB(A)	58.7	69.8	64.91	75
Night Time	dB(A)	53.8	64.8	61.05	70

<sup>5</sup> as per NAAQ standards, 2009

\* as per CC&A granted by GPCB

Values recorded confirms to the stipulated standards.

Sewage generated from port is being treated in designated ETP / STPs and treated sewage is being used for horticulture purposes.

Please refer Specific Condition No. xii for further details.

**Marine Monitoring:**

Summary of the marine water monitoring for duration from Oct'23 to Mar'24 is provided above in point No. vii (specific conditions).

Adani group has appointed a marine biologist Mr. Dhiraj Narale to monitor marine water quality. Also, the third party monitoring of the Marine water is being carried out once in a month by NABL and MoEF&CC accredited agency namely M/s. Unistar Environment and Research Labs Pvt. Ltd., Vapi, who has marine biologist to ensure that the marine water quality do not adversely affects the marine life. Monitoring Reports are attached as **Annexure - 2** for the same.

Approx. INR 13.37 Lakh is spent for all environmental monitoring activities during the FY 2023-24 for overall APSEZ.

Compliance report of EC conditions is uploaded regularly. A soft copy of last compliance report including results of monitoring data for the period of Apr'23 to Sept'24 was submitted through e-mail to Regional Office of Integrated Regional Office (IRO) @ Gandhinagar, Zonal Office of CPCB @ Baroda, GPCB @ Gandhinagar & Gandhidham and Dept. of Forests & Env., Gandhinagar on dated 29.11.2023. Copy of the same is also available on our web site <https://www.adaniports.com /ports-downloads>. Please

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

		<p>refer below for the details regarding past six compliance submissions.</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>Oct'20 to Mar'21</td> <td>25.05.2021</td> </tr> <tr> <td>2</td> <td>Apr'21 to Sep'21</td> <td>30.11.2021</td> </tr> <tr> <td>3</td> <td>Oct'21 to Mar'22</td> <td>30.05.2022</td> </tr> <tr> <td>4</td> <td>Apr'22 to Sep'22</td> <td>30.11.2022</td> </tr> <tr> <td>5</td> <td>Oct'22 to Mar'23</td> <td>30.05.2023</td> </tr> <tr> <td>6</td> <td>Apr'23 to Sep'23</td> <td>29.11.2023</td> </tr> </tbody> </table>	Sr. No.	Compliance period	Date of submission	1	Oct'20 to Mar'21	25.05.2021	2	Apr'21 to Sep'21	30.11.2021	3	Oct'21 to Mar'22	30.05.2022	4	Apr'22 to Sep'22	30.11.2022	5	Oct'22 to Mar'23	30.05.2023	6	Apr'23 to Sep'23	29.11.2023
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vi	<p>Adequate provision for infrastructure facilities such as water supply, fuel for cooking, sanitation etc. must be provided for the laborers during the construction period in order to avoid damage to the environment. Colonies for the laborers should not be located in the CRZ area. It should also be ensured that the construction workers do not cut trees including mangroves for fuel wood purpose.</p>	<p>Already complied. Not Applicable at present.</p> <p>Construction Activity is already completed. Adequate infrastructure facilities as mentioned in the condition were provided during construction phase.</p> <p>The facility for drinking water, toilet and rest shelter are provided for the dignity of operation labors.</p> <p>Photographs of the same were provided along with the compliance submission for the duration of Oct'16 to Mar'17.</p>																					

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

vii	To prevent discharge of sewage and other liquid wastes into the water bodies, adequate system for collection and treatment of the wastes must be provided. No sewage and other liquid wastes without treatment should be allowed to enter into the water bodies. The quality of treated effluents, emissions, solid wastes and noise levels must confirm to the standards laid down by the competent authority including the Central/State Pollution Control Board.	<p>Complied.</p> <p>Adequate pipelines are provided to ensure the collection and treatment of effluent. Raw sewage is collected from different collection pits at APSEZ locations through dedicated browsers and is transferred to ETP for treatment.</p> <p>Sewage generated from port is being treated in designated ETP and treated sewage is used for horticulture purposes. No treated water is discharged into the water bodies. Please refer Specific Condition No. xii for further details.</p> <p>Third party analysis of the treated water, Flue Gas, Ambient Air and Noise is being carried out regularly by NABL and MoEF&amp;CC accredited agency namely M/s. Unistar Environment and Research Labs Pvt. Ltd., Vapi.</p> <p>Summary of six-monthly monitoring of Flue gas emission is provided below.</p> <p><b>Total Nos. of Stacks: 16 Nos.</b></p> <table border="1"> <thead> <tr> <th>Parameters</th> <th>Unit</th> <th>Min</th> <th>Max</th> <th>Average</th> <th>Permissible Limit<sup>5</sup></th> </tr> </thead> <tbody> <tr> <td>PM</td> <td>mg/Nm<sup>3</sup></td> <td>16.27</td> <td>27.23</td> <td>22.02</td> <td>150</td> </tr> <tr> <td>SO<sub>2</sub></td> <td>ppm</td> <td>6.13</td> <td>15.49</td> <td>9.12</td> <td>100</td> </tr> <tr> <td>NOx</td> <td>ppm</td> <td>16.92</td> <td>28.39</td> <td>23.07</td> <td>50</td> </tr> </tbody> </table> <p style="text-align: right;"><sup>5</sup> as per CC&amp;A granted by GPCB</p> <p>Six monthly reports of flue gas emissions for duration from Oct'23 to Mar'24 is attached as <b>Annexure – 2</b>.</p> <p>Summary of Ambient Air and Noise for duration from Oct'23 to Mar'24 is provided in general condition No. v above.</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>Non-Hazardous Solid Waste:</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</p>	Parameters	Unit	Min	Max	Average	Permissible Limit <sup>5</sup>	PM	mg/Nm <sup>3</sup>	16.27	27.23	22.02	150	SO <sub>2</sub>	ppm	6.13	15.49	9.12	100	NOx	ppm	16.92	28.39	23.07	50
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**Status of the conditions stipulated in Environment Clearance under CRZ notification**

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, and Glasses, etc. are then sent to respective recycling units, whereas remaining non-recyclable waste is bailed and sent to cement plant (M/s. Ambuja Cement Ltd., Kodinar) for Co-processing as RDF (Refused Derived Fuel).

APSEZ, Mundra is certified for Zero Waste to Landfill management system (ZWTL MS 2020) by TUV Rheinland India Pvt. Ltd. (valid up to 31.05.2024 Details of the same were submitted as part of compliance report submission for the duration of Apr'21 to Sep'21.

**Hazardous & Other Waste:**

- Bio medical waste generated from OHCs and Adani Hospital is being disposed at Common Bio Medical Waste Treatment Facility namely M/s. Distromed Kutch Services Pvt. Ltd., Bhuj.
- E – Waste is being sold to GPCB registered recyclers namely M/s. Galaxy Recycling, Rajkot.
- Used Batteries are being sold to GPCB registered recyclers namely Sabnam Enterprise, Kutch and S K Metal Industries, Rajkot.
- Solid Hazardous Waste is being disposed through co-processing / incineration through common facility i.e. M/s. Saurashtra Enviro Projects Pvt. Ltd., Bhachau and/or cement industries of Ambuja Cement Ltd., Kodinar.
- Used/Waste Oil is being sold to GPCB authorized recyclers / re-processors namely M/s. Western India Petro Chem Ind - Bhavnagar, Aviation Corporation - Kutch & Aroma Petrochem - Bhavnagar. It is also being reused within organization for lubrication purpose.
- Discarded drums / barrels are being sold to authorized decontamination facility i.e. M/s. Jawrawala Petroleum, Ahmedabad. It is also being reused within organization for filling hazardous waste.
- Solid hazardous waste i.e. Tank bottom sludge is being sold to authorized recycler namely M/s. Mundra Oil Pvt. Ltd., Mundra for recycling.

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

- Expired paint materials is being disposed by incineration through common facility i.e. M/s. Saurashtra Enviro Projects Pvt. Ltd., Bhachau.
- Downgrade chemicals generated from cleaning of storage tanks / pipelines are being sold to authorized solvent recovery facilities namely M/s. Acquire Chemicals, Ankleshwar.
- 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 Petro Chem Ind - Bhavnagar, Aviation Corporation - Kutch & Aroma Petrochem - Bhavnagar and water is sent to ETP for further treatment. However, during the compliance period, there was no received or disposal of Slope Oil.
- However, during the compliance period, there was no generation and disposal of Sludge & Filters contaminated with oil, Tank Bottom sludge, Asbestos Waste, Glass wool Waste (Thermal Insulation Material), Downgrade Chemicals, Waste Oil and Expired Paint Material.
- Horticulture waste is collected from various green belt areas and it is using for making of manure and manure is being utilizing in horticulture purpose within plant premises.

Details of permissions / agreements of hazardous waste authorized vendors were submitted along with pervious half yearly EC Compliance Reports. And there is no further change.

The following table summarizes the waste management practice (from Oct'23 to Mar'24) for different types of wastes at APSEZ:

Type of Waste	Name of Waste	Quantity (MT)	Disposal Method
<b>Hazardous Waste</b>	Used / Spent / Waste Oil	121.93	Sell to registered recycler
	Pig Waste	8.69	Co-processing at cement industries
	Oily Cotton Waste	68.67	Co-processing at cement industries
	ETP Sludge	5.68	Co-processing at cement industries

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

			Discarded Containers / Barrels	3.42	Sell to registered recycler
		<b>Non-Hazardous Waste</b>	Wet Waste (Food waste + Organic waste)	500.32	Converted to Manure for Horticulture use / Biogas for cooking purpose
			STP Sludge	3	Converted to Manure for Horticulture use
			Recyclables Dry Waste / Scrap	1211.94	After recovery sent for recycling / Reuse within premises
			RDF (Non Recyclable Waste)	197.74	Co-processing at cement industries
			Horticulture Waste	318.44	Used for making of manure and utilize for horticulture purpose
		<b>Other Waste</b>	E-Waste	11.6	Sell to registered recycler
			Bio Medical Waste	3.72	To approved CBWTF Site and registered recyclers
			Battery Waste	11.94	Sell to registered recycler
viii	Appropriate facility should be created for the collection of solid and liquid wastes generated by the barges/vessels and their safe treatment and disposal should be ensured to avoid possible contamination of the water bodies.	Complied.	<ul style="list-style-type: none"> <li>Ships berthing at Mundra Port comply with MARPOL / DG Shipping regulations.</li> <li>The port is registered with DG Shipping PAN India portal "Swatch Sagar" for providing reception facility. All vessels wish to deliver waste at Mundra Port, raises request in Swatch Sagar Portal. The Port arranges waste collection from vessels and uploads Waste Delivery Receipt in Swatch Sagar Portal against vessel's request. The waste disposal is being done as per regulation. The PRF is also annually audited by DG Shipping.</li> <li>The reception facility for all category of waste except Annex VI as per IMO and DG Shipping requirements is available in the port.</li> <li>From all the waste, waste categorized in Annex – V category is being collected and disposed by port itself i.e. APSEZL Mundra. Port collects Solid waste (i.e. Garbage) categorized in Annex – V from vessels and collected waste is being sent to Material Recovery Facility for segregation &amp; than segregated waste is being disposed in line with 5R principles.</li> <li>Waste categorized in Annex – 1 (Sludge Oil) category is directly collected and disposed by GPCB authorized</li> </ul>		

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

		<p>recyclers.</p> <ul style="list-style-type: none"> <li>No discharge such as bilge wastes, sewage or any other liquid wastewater is allowed into marine environment inside port limits.</li> <li>As a general practice APSEZ has been authorized under Hazardous Waste Rules – 2016 to provide facility for receiving waste / slop oil from vessels through hose connection with oil tankers. These tankers divert waste / slop oil to Oil water separator system where water and oil particles are separated. Separated oil is being sold to authorized recycler /re-processor. However, no waste / slope oil was received during the compliance period.</li> </ul>
ix	<p>Necessary navigational aids such as channel markers should be provided to prevent accidents. Internationally recognized safety standards shall be applied in case of barge /vessel movements.</p>	<p>Complied.</p> <p>Navigational aids such as buoys and leading lights have been provided. The rules and regulation of the port contributes to the safe, efficient and environmentally responsible handling of shipping traffic. The international rules of IMO, such as SOLAS convention and its amendments and national regulations are in force at APSEZ, Mundra.</p> <p><b>APPLICABLE REGULATION</b></p> <ul style="list-style-type: none"> <li>➤ Port Security Law (ISPS)</li> <li>➤ Indian Port Act</li> <li>➤ Gujrat Maritime Board Act 1981</li> <li>➤ Navigational Safety Port Committee (NSPC)</li> <li>➤ All relevant international rules and regulations on MARPOL, Load lines etc.</li> </ul>
x	<p>During operation phase proper precautions should be taken to avoid any oil spills and no oily wastes shall be discharged into the water bodies.</p>	<p>Complied.</p> <p>Proper precautions are taken to avoid any oil spills during operation such as pressure checks of oil transfer lines and manual watch during oil cargo transfer.</p> <p>Available mechanisms to avoid oil spills are identified as below.</p> <p><u>At liquid terminal:</u></p> <ul style="list-style-type: none"> <li>• Immediate shut off valve from vessel and shore.</li> <li>• Periodical testing of lines</li> <li>• Immediate suction of material by pump.</li> <li>• Emergency operation shut down.</li> </ul>

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

		<p><u>At Marine Operations:</u></p> <ul style="list-style-type: none"> <li>• Scupper plug, dip tray, absorbent pad, saw dust is provided to address confined spillage/leakage.</li> </ul> <p><u>At Container Terminals:</u></p> <ul style="list-style-type: none"> <li>• Leak cart is available for collect spilled chemical.</li> <li>• Spill control materials in place.</li> <li>• Oil drums are stored in covered shed where pellets are used. Tray provided to collection of spillage/leakage if occurred.</li> </ul> <p>No oily waste is discharged to water bodies. Oily waste or oil contaminated waste is being disposed as mentioned in General Condition no. vii above.</p>				
xi	<p>The project authorities should take appropriate community development and welfare measures for the villagers in the vicinity of the project site, including drinking water facilities. A separate fund should be allocated for this purpose.</p>	<p>Complied.</p> <p>APSEZ is actively working with local community around the project area and provides required support for their livelihood and other concerns through the CSR arm – Adani Foundation. Adani Foundation is working in main five persuasions as below.</p> <ul style="list-style-type: none"> <li>❖ Education</li> <li>❖ Community Health</li> <li>❖ Rural Infrastructure</li> <li>❖ Sustainability Livelihood</li> <li>❖ Skill Development</li> </ul> <p>Brief information about activities in the main five persuasions is mentioned below. 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>Community Health</td> <td> <ul style="list-style-type: none"> <li>• Mobile Health Care Units and Rural Clinics</li> <li>• 07 Rural Clinics</li> <li>• 05 villages of Mundra &amp; 02 village Mandvi block has benefited by rural clinic service.</li> <li>• Total Patients Benefitted FY 23-24 23327 (direct &amp; indirect) by Mobile van and rural clinic.</li> <li>• 2 financially challenged patients has been supported with Dialysis treatment at 124 Times which added day in their Life.</li> <li>• Provided 41,546 medical health services and conducted health awareness camps for 763 High school students.</li> <li>• <b>Cataract-Free Mundra:</b></li> </ul> </td> </tr> </tbody> </table>	Area	Activity	Community Health	<ul style="list-style-type: none"> <li>• Mobile Health Care Units and Rural Clinics</li> <li>• 07 Rural Clinics</li> <li>• 05 villages of Mundra &amp; 02 village Mandvi block has benefited by rural clinic service.</li> <li>• Total Patients Benefitted FY 23-24 23327 (direct &amp; indirect) by Mobile van and rural clinic.</li> <li>• 2 financially challenged patients has been supported with Dialysis treatment at 124 Times which added day in their Life.</li> <li>• Provided 41,546 medical health services and conducted health awareness camps for 763 High school students.</li> <li>• <b>Cataract-Free Mundra:</b></li> </ul>
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**Status of the conditions stipulated in Environment Clearance under CRZ notification**

			<p>The initiative is a dedicated effort to eradicate cataract-related vision impairments specially focused on Senior citizen through Meticulous planning as below.</p> <p><b>Lives Impacted: - 1131</b></p> <ul style="list-style-type: none"> <li>&gt; Comprehensive Eye Screenings at Village level</li> <li>&gt; Cataract Surgeries to GKGH ,Bhuj</li> <li>&gt; Post-Operative Care and Follow-up</li> <li>&gt; 5 successful Operation</li> </ul> <p><b>Health camp:</b></p> <ul style="list-style-type: none"> <li>• Specialty camps, Eye checkup camps, Blood donation camp, Anti-tobacco awareness camp, TB screening, and other are conducted in core villages as well as in labour colonies.</li> <li>• Specialty health (Gynec, ophthalmic, specialty health camp): - 5795 Patients Benefited.</li> <li>• General health camp: -1618 Patients benefited.</li> <li>• Blood Donation Camp: 1715 people have donated blood.</li> <li>• Conducted health programs for students, engaging 763 participants, and held sessions on Personal Health &amp; Hygiene Awareness, addressing critical health issues and promoting overall well-being.</li> <li>• Women's Health: Provided health services to more than 2610 women benefitted through Menstrual &amp; Mental Health Awareness Drive.</li> <li>• Dialysis Support: During this year, 2 patients were supported for regular dialysis with 124 Times which added day in their Life.</li> <li>• Medical Supports: 1 007 beneficiary in 35 village.</li> <li>•</li> <li>• <b>International year of Millets - 2023:</b> To promote millet culture and raise awareness about its benefits in Mundra, we organized a Millet Competition across nine villages. Over 715 women took part in the competition, while 2200 benefited from awareness sessions. Through this initiative, 300 indigenous millet recipes were showcased, highlighting the potential for sustainable and nutritious dishes in our daily diets.</li> <li>• <b>Ayushman card facilitation:</b> Ayushman card issued to 6865 for 25 village of 686.50 Cr. health insurance. Preventive health Campaign The Adani Foundation is focusing</li> </ul>
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**Status of the conditions stipulated in Environment Clearance under CRZ notification**

			<p>on providing preventive healthcare to women and adolescent girls, raising awareness of Physical and Mental health issues, promoting healthy behaviors, implementing Menstrual hygiene initiatives and Millet consumption for healthy body.</p> <ul style="list-style-type: none"> <li>• <b>Sample Survey Report 2023-24</b> <ul style="list-style-type: none"> <li>○ 55% Never heard about Menstrual hygiene</li> <li>○ 60% Are using cloths on regular basis</li> <li>○ 36% Had never used sanitary pads</li> <li>○ 68% Had no information about UTI</li> <li>○ 30% Never used millets in their diet</li> <li>○ 60% Never heard about millets or it's benefits</li> </ul> </li> <li>• 2222 –Economically Challenged patients have been supported for operation, OPD, IPD, Medicines and lab-test.</li> <li>• For Preventive health care General and multispecialty camps Pediatric camp, General Health camps in 7 villages and Super specialist camp which benefitted more than 4690 patients of Mundra &amp; Mandvi Taluka.</li> <li>• Cattle Health Camp: Adani Foundation and Animal Husbandry department Veterinary Jointly organizing cattle health Awareness and vaccination programs in 24 Villages of our periphery villages with total 18903 cattle benefitted and 18870 cattle vaccinated. Total 982 cattle owners benefited for Preventive Health Care &amp; Fodder Support Program</li> </ul>
	<p>Sustainable Livelihood – Fisher folk, Agriculture &amp; Women</p>		<p><b><u>Overall Persistent efforts for Fisherman development:</u></b></p> <ul style="list-style-type: none"> <li>• 598 Education Kit Support</li> <li>• 273 Fisherman Shelter Support</li> <li>• 1,247 Vehicle transportation support of Mundra and Mandvi taluka</li> <li>• 106 Cycle Support to high school going students</li> <li>• 613 Scholarship Support</li> <li>• 419 Youth Employment</li> <li>• 195 Linkages with Fisheries Scheme</li> <li>• 3,534 Ramatotsav Community Engagement</li> <li>• 56,523 Man days Mangroves Plantation</li> </ul> <p><b><u>Empowering Fisherfolk Communities through Education:</u></b></p> <ul style="list-style-type: none"> <li>• <b>Vehicle Transportation Facilities:</b> 146 Students supported Mundra Taluka and 58 Students supported at Mandvi Taluka during the compliance period</li> </ul>

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

- **Education Kits Support:** Education Kits including notebooks, guides, and bags, to fisherfolk students studying in 9th to 12th standard to enhance their learning experience (57 nos. students benefitted).
- **Educational Awareness Sessions:** Through targeted awareness sessions in Fisherfolk Vasahats, we promote the transformative power of education, with a particular focus on advancing girl-child education. (487 Students motivated for high school Education).
- **Scholarship Support:** Provide scholarship support to 31 deserving students, covering their higher secondary school fees. Emphasizing gender equality, we offer 100% fee support to female candidates and 80% to male candidates.
- **Cycle Support:** Overcoming transportation obstacles, our cycle support initiative enables six 9<sup>th</sup> standard fisherfolk students from Juna Bandar to continue their education with ease.
- **Assisting During Emergencies:** Fisherfolk Home were significantly damaged by the Biporjoy Cyclone. In response to that we provided 2696 cement sheets to 336 fisherfolk households of Juna Bandar, Luni, and Randh Bandar to support their recovery. (336 Fisherfolk house benefitted)
- **Fostering Youth Employment:** At APSEZ Mundra, our mission revolves around providing sustainable employment opportunities for the local fishing community. We serve as a bridge between industries and Fisherfolk youth, facilitating job placements to enhance livelihoods. This year, we have successfully engaged 115+ Fisherfolk youth, paving the way for a brighter future. (115+ Fisherfolk youth employed)
- **Strengthening Fisherfolk women:** Through comprehensive health and hygiene initiatives, we empower Fisherfolk women. Our programs include family planning resources, menstrual hygiene workshops, nutrition advocacy, and health awareness sessions covering vaccinations, clean water access, and mental health support. (449 Women benefitted)
- **Potable Water Distribution:** Providing potable water facilities to 9 Fisherfolk Vasahats daily, either through water tankers or by establishing linkages with the nearest Gram Panchayat. This initiative benefits over 5000 Fisherfolk, significantly improving their health

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

and productivity. (5000+ Population benefited).

**Sustainable Livelihood - Agriculture:**

During compliance period This year, the Adani Foundation continued its strong commitment to advancing natural farming in Mundra. Through various initiatives and partnerships, we provided crucial support to local farmers, empowering them with knowledge and resources to transition to sustainable practices.

- 2200+ Farmers educated in natural farming
- 800+ Farmers embracing natural farming methods
- 200 Farmers got financial assistance of Rs. 10,000
- 3 District level exposure visit
- ₹ 36.7 lakh Business done by our benefited Farmers

**Promoting Natural Farming:**

- **Training:** Conducted training for 1250 farmers in 16 villages, enlightening them about the harmful effects of chemical fertilizers. Demonstrated how to produce organic fertilizer using household products, emphasizing its benefits and cost-effectiveness. After adopting it, they witnessed its positive effects on their fields.
- **Kitchen Garden Kit:** We have supported vegetable kitchen garden kits to 500 farmers with the aim to enable them to grow fresh and nutritious, chemical-free vegetables. This will enhance their food security and promote self-reliance.
- **Empowering Farmers:** This year, amidst the aftermath of the cyclone, we stood by our farmers and held dedicated meetings with KVK, KCS, and DRC to restore the fallen date trees. Collaboratively, provided JCB, technical support, organic fertilizer etc. Successfully restored 615 trees. Each Date trees is projected to yield approximately Rs. 25,000, Total Yield in Next Season:- Rs.1.53 Cr.
- **Financial Assistance:** Extend financial support to 200 farmers, each receiving Rs. 10,000, a transaction gracefully facilitated by Mr. R. N. Parmar, virtually transferring funds to their bank accounts, funded by Adani Petrochemicals. This fund will help farmers in planting a total of 53,136 fruit-bearing plants.

**Raj Shakti Prakrutik Kheti Sahkari Mandali:**

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

- **Appreciation by Governor:** Governor of Gujarat, Shree Acharya Devvratji, encouraged 25 of our farmers practicing natural farming at the Krushi and Dairy Expo event in Bhuj.
- **Exposure Visits Certification by GOPCA:** Our farmers embarked on three eye-opening exposure visits to Gautech-2023,
- **Certification by GOPCA:** We have successfully certified 28 farmers under the Gujarat Organic Products and Certification Agency (GOPCA).

**Kutch Kalptaru FPO (KKPC) and Prakrutik Mandli**

- To promote horticulture, the Kutch Kalptaru FPO (KKPC) was established in 2020 by farmers from Mundra Block to address various challenges they faced. With an initial 350 shares held by 280 shareholders, the company is now expanding to include up to 5000 farmers and 537 registered shareholders. (800 Farmers benefited and ₹ 33.67 lacs Turn over)
- 19 nos. of Market Linkage for supporting to Green carnival at Samudra Township & Shantivan colony Now 302+ farmers are collaborated with Mandli. Total Green Carnivals 37, Total Sell 8,623 kg and Revenue generated ₹ 30184805. by connecting directly with consumers, they've seen a remarkable 35% increase in their income.
- Adani Foundation has also provided 14.38 lacs kg Dry Fodder and 45.85 lacs kg Green fodder in 31 villages of Mundra and Anjar Block to support the resource dependent villagers, to avoid their dependency on mangroves. The expenditure for fodder supporting activities was approx. 305.55 Lacs during FY 2023-24.
- Adani Foundation provides Good Quality dry and green fodder to 24 Villages. Project is covering total 15005 Cattels / 2070 farmers and hence enhancing cattle productivity during FY 2023-24.
- **Grass Land development:** AF converted 18 acres of denuded village common pastureland gauchar into fertile and productive grassland in Zarpara, Siracha, Gundal , Kukadsar village to transform into Fodder Sustain village during FY 2023-24.

**Women Empowerment:**

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

- **Self Help Groups (SHGs):** Established 82 self-help groups in various rural and urban areas to provide financial and social support to women We provided training and capacity building workshops to members of these SHGs to help them develop income generating activities and improve their livelihoods Through this initiative, we have empowered over 850 women to become self-reliant with Savings of more than Rs 35 Lacs.
- **Making SHG Self Reliant:**
  - 16 SHG are on pathways of self-reliance.
  - Various handicraft, dry and fresh food making, stitching, tie and die etc.
  - 175+ women - Monthly average income @ 7000 of each member over Month.
- **Job Sourcing – Govt:**
  - 11 Women supported for application and process of Gram Rakshak Dal, Bank Sakhi, Bima Sakhi and Professional Resouce Person.
  - Average income 4200 Per Month.
- **Job Sourcing – Private:**
  - Coordination for Job by Unnati Portal with Adani Group company companies, Britania, B Medical and Emphazer company.
  - 398 Women supported till date for job sourcing of more than 18 villages.
  - Average income 10200 Per Month.
- **Social Empowerment:**
  - 2 Livlihood Enhancement Training through RSETI.
  - Financial support for business set up.
  - Legal rights and domestic violence workshops.
  - Family counselling for Job sourcing.
- During FY2023-24 Approx. INR 122.32 lakh were spent for Fisherfolk Amenities work in different core areas.
- Till FY 2023-24 Adani Foundation has done total expenditure of INR 1460.50 lakh for Fisherfolk Amenities work in different core areas.
- Skill Development and Income Generation – Adani Foundation is working with 82 Self-help group and supporting to develop entrepreneur skills to become self-reliant, sourcing more than 850 women to absorb in various job.

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

		<p><b>Previous development activities:</b></p> <ul style="list-style-type: none"> <li>• <b>Cement Roof Sheet Support:</b> fisherfolk Home were significantly damaged by the <b>Bipor Cyclone</b>. In response to that we provided 2696 cement sheets to 336 fisherfolk households of Juna Bandar, Luni, and Randh Bandar to support their recovery."</li> <li>• <b>Potable water Distribution:</b> Providing access of potable Drinking water Facilities to Nine sherfolk vasahat on Daily bases, either By Water tanker or Linkage with Nearest Gram panchayat.</li> <li>• More than 5000 Fisherfolk Population are getting benefit which impact on their health and efficiency.</li> <li>• Water distribution to Luni &amp; Bavadi Bandar Fishfolk Vasahat: 35000 KL water for 936 people.</li> <li>• <b>Sagar Mitra Card:</b> Introduced the 'Sagar Mitra Card' to simplify access for Fisherfolk to specific fishing routes within APSEZ. This digital card is connected to a digital punching machine located at designated entry points. Initially, we have implemented this system for Navinal Fisherfolk, and so far, we have issued a total of 57 Sagar Mitra Cards."</li> <li>• Government scheme Awareness session was held in association with Fisheries department Bhuj to facilitate pagadiya fishermen by providing fishing kits to seven Fishermen. The coordination was made by Adani Foundation to process application.</li> <li>• <b>Organic Vegetable Shop Inauguration:</b> Adani Foundation is promoting natural farming in Mundra through the "Rajshakti Prakrutik Kheti Sahkari Mandali," a group of 32 farmers. They opened a shop on May 24th to sale their produce in the open market.</li> <li>• 257 Farmers have started to preparing Jiva Mrut &amp; Gaukrupa Amrutam Bio-fertilizer and using in agricrop. Series of Training is arranged by ATMA and Adani Foundation.</li> <li>• Supported 1500 farmers for barrel &amp; wormi compost.</li> </ul>		
	Education	<p><b>Initiatives Under Utthan Project:</b></p> <table border="1"> <tr> <td><b>Utthan Initiatives</b></td> <td><b>Benefited</b></td> </tr> </table>	<b>Utthan Initiatives</b>	<b>Benefited</b>
<b>Utthan Initiatives</b>	<b>Benefited</b>			

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

			Strengthening government Primary & High schools	31 Villages, 77 Schools, 12000+ Students, Efforts for Increase Gunotsav result & Board result.
			Appointing an Utthan sahayak	70+ Utthan sahayak works as catalyst. Students: Teacher ration decrease.
			Mainstreamed Progressive learner	Assessment: 6982, Progressive learners: 2541, Mainstreamed: 1278.
			Providing required resources and facilities	Sports Kit, Music Kit, TLM Kit, Science Kit provided in schools.
			Enabling joyful learning spaces	Smart Class with Navneet software+ Bala painting + Activity base learning.
			Adani Students Development Center (ASDC)	2 Adani Evening Education Center, 5 Adani Competitive Coaching Center, 5 Adani English Coaching Center
			Introducing English as a Third Language	Students: 5000+ Classes 1-4, Curriculum, Every Friday morning assembly in English Language
			Enhancing Reading Habits	Redding corner , 1000+ Oasis workshop , 162780 Books CICO, 100+ Schools partner from 10+ Country in International school library month(ISLM)
			IT on Wheels	2 dedicative van, 2 IT instructors, 55 laptops, 34 schools, Empowering 4170 students , 200+ High schools' students
			Promote sports	6 Students selected in District level sports school, Inspiring more 100 Students. Khel Maha Kumbh : 2000+
			Teachers' & Sahayak Capacity Building	3500+ Hours Capacity building program + Webinar + Diksha + 10 full days training.
			Formation of Eco Club	Plastic free village workshop : 1250+ Students, Environment Awareness program & Tree plantation in schools.
			Day Celebrations & Collaboration with GoG	Summer Camp : 6000+ Students Diwali Mela : 5500+ Students. 1400+ Parents participated.

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

Mothers as catalyst in transformation	Mothers meet : 700+ Mothers Joined: 15000+ this year. (Meetings + Home Visit)
Strengthening Stakeholders	Support in Taluka, District & state level various initiative with DIRT, BRC, Strengthening SMC Committee.

- **Utthan Marks 5-Year Milestone:** Celebrating the extraordinary five-year journey of Utthan in Mundra, we hosted a remarkable event graced by the presence of distinguished individuals. The event witnessed the convergence of more than 2000 students, 416 school principals and teachers, and 145 School Management Committee Members
- **Mother's Meet – Promoting Community Bond:** Mothers meet is special intervention of Utthan, This year, more than 15000+ Mothers Joined in 700+ Mothers meet.
- **Utthan other various initiatives & Achievements:**
  - Utthan won FOKIA Award under the category "Excellence in collaborative CSR Project.
  - Utthan created special syllabus of Maths, Science & English to achieve good result in board exam.
  - The Kutch University has conducted an impact assessment of IT on Wheels, which has been evaluated and certified by the DEO Office.
  - Career Counselling in Utthan High Schools same remedial classes during summer break.
  - Health awareness programs in schools, children of class 6 to 8 were made aware about health.
  - High school girls' students celebrated Rakshabandhan with Shoulder at Boarder.
  - 1000+ Students are preparing for competitive exam. Its more than double from last year.

**Adani Vidya Mandir, Bhadreshwar**

- **Empowering Communities through Free and Compulsory Education:** We are empowering economically disadvantaged families through free and quality education. In the academic year 2023-24, it proudly serves a

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

			<p>student population of 604, with 174 students hailing from fisher-folk communities. 24 dedicated teachers are there in school.</p> <ul style="list-style-type: none"> <li>• <b>Achievement in sports:</b> <ul style="list-style-type: none"> <li>➤ In August 2023, students of AVMB engaged in block-level sports competitions, excelling in Athletics, Kho-Kho, and Yoga. Team of AVMB: U14 &amp; U17 boys secured 1st place in Kho-Kho and progressed to the district level.</li> <li>➤ Notably, Abzal Reliva, a Class X student, clinched 1st position in Shot Put, and Hardev Jadeja from Class IX achieved 1st rank in Long Jump earning the opportunity to represent Mundra block at the district level</li> </ul> </li> <li>• <b>Achievement in Arts:</b> <ul style="list-style-type: none"> <li>➤ An Essay and Quiz Competition arranged by TATA BUILDING INDIA was organized on the theme of "Recycle". 81 students of AVMB participated.</li> <li>➤ 06 Students of Class VI to VIII appeared in PRARAMBHIK VISHARAD examination conducted by BRIHAD GUJARAT SANGIT SAMITI on 14/12/2023, School is waiting for the result.</li> <li>➤ 19 Students of Class V to IX wrote inspirational stories in Gujarati language all the stories were submitted to a published in "GULSHAN" magazine in 10th edition on 11/10/2023.</li> </ul> </li> <li>• <b>Training Skill Development:</b> Adani Skill Development Centre (ASDC) is dedicated to enhancing employability and entrepreneurship. This year, ASDC has trained 50,00 individuals across Kutch, resulting in 65% livelihood generation. ASDC's vision is to make everyone skilled and employable, meeting industry demands through trained manpower.</li> </ul>
		<p>Rural Infrastructure &amp; Environmental Sustainability</p>	<p>Adani foundation designed and build various structure and provide service in the Health, Education, agriculture and sustainable livelihood area.</p> <p><b><u>WORK COMPLETED</u></b> Below tabulated Water Conservation Projects completed during Compliance period:</p> <p><b><u>Water Conservation Projects:</u></b></p>

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

**Swajal Project:**

- **Aim:** The Foundation's Water Conservation program, SWAJAL, is aimed at addressing the alarming depletion of groundwater levels and reduction in water sources in various parts of Kutch district.
- **Water Security Plan:** Due to arid climatic characters of the Kutch region, it is essential to plan for water security drinking and livelihood purposes. Considering weather condition, rainfall characters, geohydrological condition and water demand, water security plan has been prepared for the Seven villages.

Block Name	Water conservation structure	Total no. of Structure	Total Capacity Created (CUM)
Mundra	Check Dam	23	6,07,332.80
	Pond Deepening	66	1,89,121.08
	RRWHS	275	2750
	Recharge Borewell	209	-
	Percolation Well	24	-

**Soil Conservation:**

- **1250 Farmers Awareness Sessions at Village Level:** Spreading awareness on natural farming benefits and address their concerns.
- **7 exposure of Hands-On Training & Exposures :** Arranged Workshop and training to emphasizing on real-world techniques.
- **857 Farmers link with Government Scheme:** facilitation of govt. Cow Nurturing scheme to promote eco- friendly farming practices.
- **258 Gobardhan Bio-gas Support:** Link with Gov Gobar Dhan Biogas Unit Nutrient-rich slurry serves as an essential organic fertilizer for natural farming.
- **35 Farmers Natural Farming Certification** Process to obtain natural farming certification through the GOPCA for the 35 Farmers who are Members of Raj shakti Sahakrai Mandali.
- **Rs.9.88 Lacs RG Marketing Assistance:** Provide platforms and resources ensuring fair prices and broader consumer reach.

**Earlier Completed Activities/Projects:**

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

Sr. No.	Project	Unit	Outcome	Impact
1	Check dam Restrengthening-Nana Kapaya	1	Water Storage Capacity increased by 48000 Cum	60 + farmer's 120+Acre Area of Agri land can be Irrigated
2	Recharge Borewell	21	Reduce Salinity ingress, and preventing water run	150+ farmer's 260+ Acre Area of Agri land for Irrigated
3	Pipe Culvert at Checkdam Bhujpur	1	prevent water runoff into seaside.	35 farmers' 120+Acre Area of Agri land can be Irrigated

- Large number of water harvesting structure (18 Nos. of check dams in coordination with salinity department) and Augmentation of 3 check dams.
- Ground recharge activities (pond deepening work for 61 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.
- New Pond Deepening Under Ajadi ka Amrut Mahotsav done in Goyarsama village Approx Deepening Capacity is 12000 Cum.
- Roof Top Rainwater Harvesting 145 Nos. (40 Nos. current FY 2022-23) which is having 10,000 litre storage which is sufficient for one year drinking water purpose for 5 people family.
- Recharge Borewell 208 Nos (19 Nos. current FY 2022-23) which is best ever option to direct recharge the soil.
- Drip Irrigation approx. 1505 Farmers benefitted in coordination with Gujrat Green Revolution Company till date.
- Bund construction on way of Nagmati River could save more than 575 MCFT water quantity which recharged in ground due to which borewell depth decreased by 50-100 Ft in Zarpara, Bhujpur and Navinal Vadi Vistar.
- Pond Pipeline work at Prasla Vistar Zarpara which increase recharge capacity more than 25% in 100 hector area.
- Check dam gate valve construction at Bhujpur which controlled more than 350

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

		<p>MCFT water to go into sea and get recharged current year.</p> <ul style="list-style-type: none"> <li>• 377 - AC Roof sheet support to Fisherfolk Vasaha 1700+ Benefited.</li> <li>• 2 Development of Common Gathering flooring work – 4000+ Benefited.</li> <li>• 195 Stall – Vegetable market– 900+ Benefited.</li> <li>• Solar Panel System at Mundra – 600+ Benefited.</li> <li>• Maintenance, Fencing &amp; Material Support - 30+ Benefited.</li> <li>• Renovation of Shed at Shekranpir Bhopavandh - 2000+ Benefited.</li> </ul> <ul style="list-style-type: none"> <li>• 40 RRWS structure have been completed.</li> <li>• Total 229 nos. Bore-well recharging activity is completed Percolation well Recharging work at Bhadiya &amp; Mota Kandgra village.</li> <li>• Sluice gate Construction to Control Flood during Flooding at Khoydivadi Vistar Bhujpur.</li> <li>• Pond Beatification and Bund Strengthening at Bhujpur village.</li> <li>• Check dam gate valve construction at Bhujpur which controlled more than 350 MCFT water to go into sea and get recharged current year.</li> <li>• commissioning of Community Training Centre at Shekhadiya.</li> <li>• Two Pond Deepening at Zarpara under Amrut Sarovar Yojna.</li> <li>• Ground recharge activities (pond deepening work for 61 ponds) individually and 26 ponds under Sujlam Suflam Jal Abhiyan.</li> <li>• Pond Pipeline work at Prasla Vistar Zarpara which increase recharge capacity more than 25% in 100 hector area.</li> <li>• JCB &amp; Hitachi Machine Support for Pre-Monsoon activities. Repairing and Maintenance work of Approach at Luni, Bavdi and Navinal Fishermen Bandar.</li> <li>• 3 Re-strengthening of Approach Road.</li> <li>• Renovate Blood storage Lab CHC Mundra Renovation Blood storage Lab CHC Mundra.</li> <li>• Constructed 2 nos. of CC Road of 700 mtr.</li> <li>• Constructed Community Training center Shekadiya.</li> <li>• Constructed 2 nos. Disable Widow Toilet Block</li> <li>• Installed R.O. Plant at Mokha with capacity 1000ltr /HR.</li> </ul>
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**Status of the conditions stipulated in Environment Clearance under CRZ notification**

- Constructed 4 nos. Common gathering Open Shed
- Constructed 03 nos. of Water Tank at Luni Bandar.
- Developed of Cricket Ground at Hatdi Village

**ENVIRONMENT SUSTAINABILITY  
PROJECTS till Compliance period:**

- **Dates Tree -Restoration:** Biparjoy cyclone has damaged huge number plants of Dates, Mango, Sapota. In coordination with Kutch Crop Services and Krishi Vigyan Kendra – more than 615 plants are restored till date and continue.
- **Miyawaki Forest Development, Nana Kapaya** - Native species plantation in the 2 acre area at Nana Kapaya village creating a flourishing mini-forest with 5,508 trees.
- **"Adani Van":** Barren spaces were transformed into lush green havens through our massive public plantation drives. One notable example is the Bhupur Visri Mata Temple, where 23,000 trees were planted. Second example Momai Mata temple, Desalpar 10,000 trees were planted. Third Example Matiyadada at Bhujpur 8000 trees were planted. Fourth example Rasha pir, Dhruv 2-acre 5000 tree planted. Thus, in PPP Model 4 Adani Van were developed where 46,000 trees were planted.
- **Prakruti Rath:** This initiative goes beyond just planting trees; it is about fostering a sense of responsibility towards our environment. Through 46,750 sapling distribution to individuals, we have empowered communities to take ownership of their surroundings, leading to a heightened consciousness about the environment's significance.
- Till the date Total 1.49 Lac tree plantation have been done that has enriched the local ecosystem and significantly contributed to carbon sequestration
- **Smruti Van** – Plantation more than 47,000 sapling with more than 115 species through Miyawaki methodology.
- **Ecosystem Restoration, Guneri** – Grassland ecosystem restoration and mangrove conservation in 40 Ha area over a period of 4 years. The site visit and soil samplings conducted by GES team. Regular bi

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

			<p>monthly meeting conducted to assess the annual phase wise growth of ongoing activities.</p> <ul style="list-style-type: none"> <li>• <b>Multi-Species Mangrove Park</b> - Adani Foundation at Mundra's initiated multi-species plantation of mangroves in Kutch association with GUIDE. During 2018-2019 (Phase-I) multi-species mangrove plantation was carried out in 10 ha, during Phase-II (2019-2020) it was 02 ha and during Phase III (2020-2021) it is 01 ha. During FY 2021-22, 03 ha area coastal stretches have been planted with species. During current FY 2022-23, 04 Hector plantation has been planted with various species. Total 20 Ha. multi-species mangrove plantation has been carried out till March-23 association with M/s. GUIDE,</li> <li>• Mangroves Biodiversity Park within one year</li> <li>• <b>Home biogas</b> - Under Gram Utthan Project, Adani Foundation is supporting home biogas to farmers to Uthhan Villages phase wise. Total 583 farmers are supported with Biogas as sustainable environment protection</li> </ul>
		Skill Development	<p>Over the previous few years, Adani Skill Development Center has assessed various aspects of the technical, leadership and soft skills gaps that organizations, in general, face and accordingly focuses on imparting required training in those areas in partnership with various colleges and institutes.</p> <p><b>ASDC Mundra Center Activities &amp; Achievements:</b></p> <ul style="list-style-type: none"> <li>• <b>Women Empowerment through Skill Training:</b> Provided Mud work training to 180 women in Mundra taluka villages supported by MPL.</li> <li>• <b>RTG Crane Operator Training:</b> Collaborated with APSEZ HR Team to train 79 students.</li> <li>• <b>Dori Work and Hand Embroidery Training:</b> Benefited 90 women in various Mundra villages supported by MPL.</li> <li>• <b>Health Awareness and Career Sessions:</b> 108 Ambulance Department enlightened GDA trainees at Adani Institute of Medical Sciences. Guest session on career advancement led by Mr. Kapil Goswami.</li> <li>• <b>Exposure Visit for Women:</b> Women trained in Mud Work, Dori Work, and Hand Embroidery showcased their skills during a visit by foreign delegates to the Solar Plant.</li> <li>• <b>Women's Related Training Seminar:</b> Held at Matravadana College, Bidada, Mandvi.</li> </ul>

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

		<p><b>ASDC Bhuj Center Activities &amp; Achievements:</b></p> <ul style="list-style-type: none"> <li>• <b>Commendation from Shree Jeet Adani:</b> Received appreciation for supporting the Divyang job fair.</li> <li>• <b>Employee Development Initiatives:</b> Conducted Advanced Excel training for 18 Sumitomo India Ltd employees</li> <li>• <b>Entrepreneurship Development Program:</b> Organized a comprehensive 12- day program with 60 diverse candidates.</li> <li>• <b>New Trainee Orientation:</b> Conducted sessions about SAKSHAM center and LMS registration at the Bhuj Centre.</li> <li>• <b>Civil Defense Training (5 days):</b> Covered essential topics including Disaster Management, First Aid, 181 Mahila Helpline, 108 Emergency Services, and Fire Safety.</li> <li>• <b>F&amp;B &amp; Housekeeping Batch Inauguration:</b> 92 students trained to enhance employability.</li> <li>• <b>Indo-Euro Project Seminar:</b> Arranged at various Nursing Colleges in Kutch District. Focused on German Language training and job placements.</li> <li>• <b>Crucial Meeting with ISAR &amp; UNICEF:</b> Discussed future skill development challenges and transgender equality on 9th December 2023.</li> </ul> <p>Total 734 nos. in ASDC Mundra Center and 405 nos. in ASDC Bhuj Center male &amp; female trained in various skill development programme.</p> <p>Please refer <b>Annexure - 1</b> for full details of CSR activities carried out by Adani Foundation in the Mundra region. Budget for CSR Activity for the FY 2023-24 is to the tune of INR 953.50 lakh. Out of which, Approx. INR 940.52 lakh is spent during the FY 2023-24.</p>
xii	<p>The quarrying material required for the construction purpose shall be obtained only from the approved quarries / borrow areas. Adequate safeguard measures shall be taken to ensure that the overburden and rocks at the quarry site does not find their way into water bodies.</p>	<p>Not applicable at present.</p> <p>Construction activities are completed. No such activity is carried out during the compliance period of Oct'23 to Mar'24.</p>

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

<p>xiii</p>	<p>The dredging operations, if any, to be undertaken with the prior approval of this Ministry, shall be executed with appropriate safeguard measures to prevent turbidity conditions in consultation with the expert agencies such as CWPRS / NIO.</p>	<p>Complied</p> <p>Capital dredging is completed and only maintenance dredging is being carried out, if required.</p>
<p>xiv</p>	<p>For employing unskilled, semi-skilled and skilled workers for the project, preference shall be given to local people.</p>	<ul style="list-style-type: none"> <li>• Complied</li> <li>• Adani Foundation – CSR Arm of Adani Group is doing following activities as a part of Skill Development in surrounding communities in Kutch area.</li> <li>• Adani Skill Development Center (ASDC), Mundra &amp; Bhuj is providing skill development training to the locals for Soft Skill, Technical Training and Career Guidance &amp; knowledge-based training.</li> <li>• Adani Skill Development Centre (ASDC) is playing a pivotal role in implementing sustainable development in the state. ASDC is envisioned to be playing a major role in elevating the socio-economic status of the people belonging to the lowest strata of the society by empowering them with various skill development training for employability and livelihood.</li> <li>• Over the previous few years, ASDC has assessed various aspects of the technical, leadership and soft skills gaps that organizations, in general, face and accordingly focuses on imparting required training in those areas in partnership with various colleges and institutes.</li> <li>• ASDC imparted various soft skilled and technical training to make Atma Nirbhar India.</li> <li>• Adani Skill Development Centre (ASDC) is dedicated to enhancing employability and entrepreneurship. This year, ASDC has trained 50,000 individuals across Kutch, resulting in 65% livelihood generation. ASDC's vision is to make everyone skilled and employable, meeting industry demands through trained manpower.</li> <li>• Preference is given to local people for employment based on their qualification and experience.</li> <li>• All Mangrove plantations are done in consultation with GUIDE and Local forest dept.</li> </ul>

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

		<ul style="list-style-type: none"> <li>• 24 hectare of mangrove afforestation at Mundra was done through active participation of local fishermen at the cost of INR 25.0 Lac.</li> <li>• 25 hectare of mangrove plantation with a cost of 10 Lakh is already completed near railway yard in consultation with Dr. Maity, Mangrove consultant of India.</li> <li>• 56,523 Man-days Fisherman person days employed in Mangroves Plantation during the FY 2023-24. The Foundation has also supported Pagadiya fishermen as painting laborers by providing them with employment and job in various field.</li> <li>• Details on skill development training imparted during FY 2023-2024 by Adani Foundation are available in CSR report enclosed as <b>Annexure – 1</b>.</li> </ul>
xv	To meet any emergency situation, appropriate firefighting system and water pipelines should be installed. Appropriate arrangements for uninterrupted power supply to the environment protection equipment and continuous water supply for the firefighting system should be made.	<p>Complied.</p> <p>Tug (Dolphin-11) has firefighting system of 1200 m<sup>3</sup>/hr. along with 20 ton lifting "A" frame and diving support facility for support at offshore.</p> <p>With respect to onshore facilities valve station, pumping station and transportation pipeline, foam base fire tender, fire water network is available. Fire-fighting system has been installed and maintained to meet emergency situations. Additionally for emergency, emergency DG Set is provided for fire water pumps to ensure continuous water supply for firefighting purpose. Detail information on firefighting facility available at APSEZ was submitted as a part of compliance report for the duration of Apr'17 to Sep'17.</p>
xvi	Regular drills should be conducted to check the effectiveness of the on-site Disaster Management Plan.	Complied.

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

Sr. No.	Location	Month	Scenario
1.	ACMTPL CT-04, Charging Station	Mar'24	Assuming battery got ignited of e-ITV 011 which was standing at charging station, the driver rushes towards the cabin for a fire extinguisher to extinguish the fire while the e-ITV supervisor evacuates all the e-ITVs from the charging station and informed the shift superintend. Recognising the urgency, shift superintend declared the emergency and simultaneously informed to POC, OHC, Fire, Safety & Security.
2.	STS-02, AMCT	Oct'23	Scenario was one grinder fall from STS-02 while maintenance work. Supervisor immediate informed to engineering shift in charge (Incident Controller) via VHF, Incident controller informed Fire services, OHC, Safety, Security, ERT, Terminal head, Engineering head, admin department regarding emergency.
3.	Liquid Terminal (Storage Tank 38 (enclosure-02)	Nov'23	At tank T-38 during leak arrest (after naphtha pigging activity) spark induce due to use of non-sparking tools and fire catch on cargo inside the tank. Immediately two workers run outside for escape, at that time tank roof top flow up (uprooted) and one worker (dummy) fell outside of the tank. Another worker Mr. Raja Palli ran away from Encloser - 02 and informed to job supervisor Mr Mehul Goyal. Immediately Mr. Mehul was reached at location and broke the MCP (MCP No-52) and informed to the Incident controller. Incident controller Mr. Keyur Brahmhatt reached at the location and declared emergency.
4.	Barge berth, near TT-06 and T-1	Mar'24	During bunkering activity progress on berth-01, FO (furnace Oil) leakage from 12"

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

				<p>bunker line observed by Mr. Imtiyaz (job supervisor of M/s: MHS Engg) who supervised a hot work job at TT-06. Immediately Mr. Imtiyaz was informed to the Jetty In charge Mr. Gopal Raviya who was gone to T-1 for routine site visit. he reached at location and rechecked what exactly happen, after observing the leakage he informed to the Shift in charge in controller room and declared emergency. Immediately POC, OHC and fire were informed, and subsequently intimated the same through message/ call to concern departments.</p>
5.	MLTPL	Oct'23	<p>During regular operation CCR operator come to know about electricity failure in LPG terminal, CCR contacted substation to check the facts &amp; take EDG online, during inspection of EDG it has been observed that EDG fails to start in Auto/ in Manual mode due to breakdown of EDG relay.</p>	
6.	MLTPL	Mar'24	<p>While loading operation of LPG in LPG tanker truck no-RJ13 GB5435 of BPCL. TLF Operator found some abnormality in LPG loading arm, while checking abnormality sudden leak occurs from loading arm and operator comes in contact with LPG vapors.</p>	
7.	AD 1C Stringer No. # 20 (Behind the Sub Station 2) (Westbasin)	Nov'23	<p>Right hand of housekeeping worker got caught between return conveyor &amp; roller while doing routine housekeeping work.</p>	
<p>Regular drills are being conducted for effectiveness of the system. There were 7 drills conducted for various scenarios during compliance period (Oct'23 to Mar'24) as mentioned below.</p> <p>Safety Mock drill report (latest report) conducted during</p>				

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

		the compliance period is enclosed as <b>Annexure – 6.</b>								
xvii	The recommendations made in the Environmental Plan and Disaster Management Plan, as contained in the EIA and Risk Analysis Reports of the project, shall be effectively implemented.	<p>Complied All the recommendations are being implemented.</p> <p><b>Few Marine EIA recommendations:</b></p> <table border="1"> <tr> <td>Operational protocols and safety procedure should be printed and freely available to concerned staff. The employees must be adequately trained to inculcate a high level of competence not only in day to day operations but also during emergency situations. Periodic refresher courses must also be organized to maintain the level of their competence.</td> <td>The company has written the operational protocols and safety procedures as a part of ISO 14001:2015, ISO 45001:2018 and ISO 9001:2015 certifications. APSEZ has established training department to impart training to its employees.  IMO module course organized by Maritime Training Institute is conducted &amp; 24 personnel have achieved IMO level 1 &amp; 3 personnel have achieved IMO Level 2. Different training modules as Oil Spill, Oil Spill Equipment, Notification exercise, Incident are conducted at different frequency.</td> </tr> <tr> <td>Periodic monitoring should be undertaken at the designated sites after the terminals become operational and the results of each monitoring should be carefully evaluated to identify changes if any and to take corrective measures, if warranted.</td> <td>Monitoring of various environmental parameters for Ambient Air, Noise, Wastewater, ground water, marine water and sediments is being carried out by NABL and MoEF&amp;CC accredited agency namely M/s. Unistar Environment and Research Labs Pvt. Ltd., Vapi. Monitoring reports for the period from Oct'23 to Mar'24 is enclosed as <b>Annexure – 2.</b></td> </tr> <tr> <td>Adequate vigilance is required to adherence of ships to MARPOL protocol and related regulations.</td> <td>During the vessel declaration compliances with respect to Air Pollution and Oil are monitored by the Port Authority. The ships are certified with international certification bodies only after complying with the MARPOLI protocol.</td> </tr> <tr> <td>Manual Listing Procedure for conducting ship movement operations in the port area must be available to the concerned staff.</td> <td>Berthing Policy &amp; Tariff Structure is made available for conducting ship movement to the concerned staff and made available on web link <a href="http://www.adaniports.com/pdfs/PIB_06122013.pdf">www.adaniports.com/pdfs/PIB_06122013.pdf</a> Port Information Booklet is also made available on web link <a href="http://www.adaniports.com/Port_Operations_Port_Tariffs.aspx">www.adaniports.com/Port_Operations_Port_Tariffs.aspx</a></td> </tr> </table>	Operational protocols and safety procedure should be printed and freely available to concerned staff. The employees must be adequately trained to inculcate a high level of competence not only in day to day operations but also during emergency situations. 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**Status of the conditions stipulated in Environment Clearance under CRZ notification**

		<b>Few Risk Assessment Recommendations of EIA of Multipurpose Terminal carried out in 1995:</b>	
		There should be a provision for activating a fire alarm at the fire control room from various strategic/hazard prone areas in the factory. In areas where there is high level of Noise, It may be necessary to install more than one audible alarm transmitter or flashing lights.	Provision of activating a fire alarm is available at Control Room. Employees are provided with communication system with which they can communicate about any emergency to Control Room. Emergency alarm systems are installed which is audible from any port location. Alarm testing is carried out at a frequency of once in a month.
		Wind sleeves with adequate lightings around them should be provided at various places to guide personnel to escape in a direction perpendicular to the prevailing wind direction.	Wind sleeves with adequate various lighting system around them are available at various places of Port locations to guide personnel to escape in a direction perpendicular to the prevailing wind direction.
		Succession or second line Coordinators should be named for assuming responsibilities in case disaster occurs in the absence of principal coordinators.	Disaster Management Plan for APSEZ is in place and that includes second line coordinators to assume responsibilities in absence of principal coordinators.
xviii	A separate Environment Management Cell with suitably qualified staff to carry out various environment related functions should be set up under the charge of a Senior Executive who will report directly to the Chief Executive of the company.	Complied.  APSEZL has a well-structured Environment Management Cell, staffed with qualified manpower for implementation of the Environment Management Plan at site. Site environment team direct report to site Chief Executive Officer (CEO) and the CEO directly reports to the top management. Updated Environment Management Cell Organogram is attached as <b>Annexure-7</b> .	
xix	The project affected people, if any, should be properly compensated and rehabilitated.	Not applicable.  The project was conceptualized in such a way that there are no impacts on the local settlements due to the project proposal. However, the project is already implemented and is in operation phase.	
xx	The funds earmarked for environment protection measures should be maintained in a separate account and there should be no diversion of	Complied  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. No separate	

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

	<p>these funds for any other purpose. A year wise expenditure on environmental safeguards should be reported to this Ministry.</p>	<p>bank account is maintained for the same however, all the expenses are recorded in advanced accounting system of the organization.</p> <p>Budget for environmental management measures (including horticulture) for the FY 2023-24 is to the tune of INR 1536.48 lakh. Out of which, Approx. INR 1366.78 lakh are spent during the year FY 2023-24. Detailed breakup of the expenditures for the past 3 years is attached as <b>Annexure - 8</b>.</p>
xxi	<p>Full support should 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>APSEZL is always extending full support to the regulatory authorities during their visit to the project site.</p> <p>Last visit of Regional Office, GPCB was done on 07.03.2022 for Main port and compliance of the same has been submitted vide our letter dated 11.03.2022. Details of the same were submitted as part of compliance report submission for the duration of Oct'21 to Mar'22.</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 non-compliance observed.</p> <p>Inline to the compliance certification process of Consent to Operates of existing facilities developed under Waterfront Development Plan, RO, GPCB, Gandhidham had visited the site on 17<sup>th</sup> March, 2021 for compliance verification. APSEZ provided all requisite information and documents required by the Regional Officer GPCB). During the said compliance verification visit and as per the compliance certification received, there was no non-compliance observed.</p> <p>Inline to the compliance of MoEF&amp;CC Order dated 18<sup>th</sup> September 2015, Joint Review Committee (JRC) comprising officials from various competent authorities visited the APSEZ, Mundra from 1<sup>st</sup> to 3<sup>rd</sup> September, 2021</p>

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

		<p>to monitor the progress of implementation of the conditions stipulated in the order. APSEZ provided all requisite information and documents required by the JRC. As per the report received by MoEF&amp;CC vide dated 01.12.2021, there was no non-compliance observed.</p> <p>Inline to the compliance certification process for getting Environment Clearance of Waterfront Development Plan, IRO- MoEF&amp;CC Gandhinagar has lastly visited the site on 18<sup>th</sup> to 20<sup>th</sup> December, 2023 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 non-compliance observed. Copy of submitted action taken report w.r.t. certified compliance is attached as <b>Annexure-9</b>.</p>
xxii	In case of deviation or alteration in the project including the implementing agency, a fresh reference should be made to this Ministry for modification in the clearance conditions or imposition of new ones for ensuring environmental protection. The project proponents should be responsible for implementing the suggested safeguard measures.	Point Noted.
xxiii	This 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.
xxiv	This Ministry or any other competent authority may stipulate any other additional	Point Noted.

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

	conditions subsequently, if deemed necessary, for environmental protection, which shall be complied with.	
xxv	A copy of the clearance letter will be marked to concerned Panchayat / local NGO. If any, from whom any suggestion / representation has been received while processing the proposal.	Not applicable at present
xxvi	State Pollution Control Board should display a copy of the clearance letter at the Regional Office, District Industries center and Collector's Office/Tehsildar's Office for 30 days	Applicable for State Pollution Control Board.
xxvi i	The project proponent should advertise at least in two 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 Website of the Ministry of Environment and Forests at <a href="http://www.envfor.nic.in/">http://www.envfor.nic.in/</a> .	Already Complied.

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

xxvi ii	The Project Proponents should inform the Regional Office as well as the Ministry the date of financial closure and final approval of the project by the concerned authorities and the date of start of Land Development Work.	Already Complied.
xxix	The Project Proponent should make specific arrangements for rainwater harvesting in the project design and the rainwater so harvested should be optimally utilized.	<p>Complied</p> <p>Groundwater recharge cannot be done at the project site since the entire project is in the intertidal / sub tidal areas. Rainwater within project area is managed through storm water drainage.</p> <p>Please refer specific condition no. v for further details upon ground water recharging and rainwater harvesting is being done by Adani Foundation as a part of CSR activity.</p>

# **ANNEXURE – A**

## **Half yearly Compliance report of CRZ recommendation**

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

**Half yearly Compliance report of CRZ recommendation for "Port expansion project including dry/break bulk cargo container terminal, railway link and related ancillary and back-up facilities at Mundra Port, Dist. Kutch in Gujarat vide DoEF, GOG letter no. ENV-1098-6477-p1 dated 28<sup>th</sup> October 1999.**

Sr. No.	Conditions	Status as on 31-03-2024
Specific Condition		
1	The company shall submit comprehensive Environmental Impact Assessment Report and Risk Assessment Report containing worst case scenario and detailed oil spill control management plan before carrying out the construction activities and shall implement all the mitigative measures/suggestions/recommendations given in the report of NIO and Tata AIG Risk Management Services.	<p>Already Complied. Not applicable at present</p> <p>Environmental Clearance was granted based on the submission of said documents. Rapid EIA was submitted on Feb 29, 2000 &amp; Risk Assessment Report containing worst case scenario and detailed oil spill control management plan was submitted on Dec 28, 1999.</p> <p>For more details, please refer to general condition no xvii of the compliance of EC and CRZ clearance.</p>
2	The company in no case tap ground water.	<p>Complied.</p> <p>Please refer to Specific Condition no. ix of the compliance of EC and CRZ clearance above for details.</p>
3	The company shall not cut mangroves for the project activities except for stray mangrove seeding required for the railway line only after detailed assessment through NIO and 25 acre of land shall be planted with mangroves in consultation with NIO.	<p>Already Complied. Not applicable at present</p> <p>The company has not cut any mangroves. APSEZ has carried out 24 hectare of mangrove plantation near Navinal creek.</p> <p>To enhance the marine biodiversity, till date APSEZ has carried out mangrove afforestation in 4140 ha. area across the coast of Gujarat. Total expenditure for the same till date is INR 1592.8 lakh.</p>
4	The company shall carry out the mangroves plantation programme in	APSEZ has awarded work for FY 2023-24 (to enhance the marine biodiversity) to the agency namely M/s. Shreeji Enterprise, Rajula-Amreli for carrying out 250 ha.

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

Sr. No.	Conditions	Status as on 31-03-2024
	<p>addition to 25-acre mangrove plantation to be done with the help of the NIO, in consultation with the forest department.</p>	<p>mangrove afforestation at Kukadsar village coastal area (Mundra region) vide P.O. No. 4802037814 dated 18.10.2023. The cost of said study is INR 1.60 Cr.</p> <p>Green belt was developed 72.67 ha. Total 149959 trees were planted with the density of 2060 trees per hectare within the port area. So, far APSEZ has developed 457.99 ha. area as greenbelt with plantation of more than 9.06 Lacs saplings within the APSEZ area. Details on Mangroves afforestation &amp; Green belt development carried out by APSEZ till date is annexed as <b>Annexure - 3</b>.</p> <p>Other than this Adani Foundation – CSR Arm of Adani Group at Mundra-Kutch has initiated multi-species plantation of mangroves in Luni village in association with GUIDE, Gujarat. During 2018-2019 (Phase-I) multi-species mangrove plantation was carried out in 10 ha, during Phase-II (2019-2020) it was 02 ha and during Phase III (2020-2021) it is 01 ha. During FY 2021-22, 03 ha area coastal stretches have been planted with species. During current FY 2022-23, 04 Hecter plantation has been planted with various species. Total 20 Ha. multi-species mangrove plantation has been carried out till March-23 association with M/s. GUIDE, Gujarat.</p> <p>These plantations are diligently maintained and continually monitored. Notably, these forests have evolved into a thriving habitat for various marine and migratory bird species, enriching the local ecosystem.</p> <p>Please refer attached <b>Annexure - 1</b> for CSR activity report carried out by Adani Foundation.</p> <p>EIA report was prepared by NIO in which all impacts on mangroves and coastal ecology of the region for the proposed design were studied in detail.</p> <p>Please refer to Specific Condition no. viii of the compliance of EC and CRZ clearance above for details.</p> <p><b>Conservation of mangroves:</b></p>

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

Sr. No.	Conditions	Status as on 31-03-2024
		<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> </ul> <p>As per MoEF&amp;CC directive, APSEZ entrusted NCSCM to demarcate mangroves in and around APSEZ area. As per their study, mangrove cover in and around APSEZ was over 2340 ha. The analysis of the comparison between 2011 and 2016-17 has shown an overall growth of 246 ha. Recently study was carried out in the year 2019 and based on that there is an increase of mangrove cover between <b>March 2017 (Total 2340) and September 2019</b> with an extent of <b>256 Ha (Total 2596 Ha Area)</b> which is about <b>10.94%</b> rise in growth rate, also It reveals that the mangrove and the tidal system in the creeks remained undisturbed over this period. Hence, there is an overall growth of mangroves in creeks in and around APSEZ, Mundra is <b>502 Ha</b> between 2011 and 2019.</p> <p>NCSCM final report on comprehensive and integrated plan for preservation and conservation of mangroves and associated creeks in and around was submitted along with half yearly EC Compliance report for the period Apr'19 to Sep'19. The same was further submitted to GCZMA and MoEF&amp;CC for their examination and recommendation vide (with a copy to MoEF&amp;CC vide letter dated 04.06.2018 &amp; reminder letter vide dated 4<sup>th</sup> Jan, 2019). Presentation on the findings of the report was made to GCZMA committee on 4<sup>th</sup> October 2019 and the recommendation for the same has been received vide email dtd 22<sup>nd</sup> Sept, 2020 with conditions. Details of the same were submitted as a part of previous</p>

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

Sr. No.	Conditions	Status as on 31-03-2024										
		<p>half yearly EC compliance report for the period Oct'20 to Mar'21.</p> <p>As a part of GCZMA recommendations and NCSCM mangrove conservation action plan, APSEZ has undertaken following activities.</p> <table border="1"> <thead> <tr> <th>Sr. No.</th> <th>Recommendations</th> <th colspan="2">Compliance</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Mangrove mapping and monitoring in and around APSEZ</td> <td colspan="2"> <ul style="list-style-type: none"> <li>• APSEZ entrusted NCSCM, Chennai to carry out Monitoring of mangrove distribution in creeks in and around APSEZ and shoreline changes in Bocha island.</li> <li>• As a part of this study, overall growth of mangroves in the creeks in and around APSEZ was assessed comparing Google earth images of 2017 &amp; 2019 and it is observed that there was increase in mangrove cover between March 2017 and September 2019 to the extent of 256 Ha, which is about 10.94%.</li> <li>• This suggests that the mangroves and the tidal system in the creeks remain undisturbed over this period. Analysis of data between categories indicated that there was an increase in dense mangroves and also conversion of scattered to sparse which also shows that the growth of mangroves in a progressive direction.</li> <li>• Hence, there is an overall growth of mangroves in creeks in and around APSEZ, Mundra is 502 Ha between 2011 and 2019.</li> <li>• The cost of the said study was INR 23.56 Lacs incurred by APSEZ.</li> <li>• According to GUIDE Mangrove monitoring study report November 2023 (was submitted along with half yearly compliance report for the period of Apr'23 to Sep'23.), the distribution of mangroves in Kotadi, Baradi mata, Navinal, Bocha and Khari creeks as well as in the Bocha island was studied using LISS IV satellite images for the duration of March 2019 to</li> </ul> </td> </tr> </tbody> </table>			Sr. No.	Recommendations	Compliance		1.	Mangrove mapping and monitoring in and around APSEZ	<ul style="list-style-type: none"> <li>• APSEZ entrusted NCSCM, Chennai to carry out Monitoring of mangrove distribution in creeks in and around APSEZ and shoreline changes in Bocha island.</li> <li>• As a part of this study, overall growth of mangroves in the creeks in and around APSEZ was assessed comparing Google earth images of 2017 &amp; 2019 and it is observed that there was increase in mangrove cover between March 2017 and September 2019 to the extent of 256 Ha, which is about 10.94%.</li> <li>• This suggests that the mangroves and the tidal system in the creeks remain undisturbed over this period. Analysis of data between categories indicated that there was an increase in dense mangroves and also conversion of scattered to sparse which also shows that the growth of mangroves in a progressive direction.</li> <li>• Hence, there is an overall growth of mangroves in creeks in and around APSEZ, Mundra is 502 Ha between 2011 and 2019.</li> <li>• The cost of the said study was INR 23.56 Lacs incurred by APSEZ.</li> <li>• According to GUIDE Mangrove monitoring study report November 2023 (was submitted along with half yearly compliance report for the period of Apr'23 to Sep'23.), the distribution of mangroves in Kotadi, Baradi mata, Navinal, Bocha and Khari creeks as well as in the Bocha island was studied using LISS IV satellite images for the duration of March 2019 to</li> </ul>	
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**Status of the conditions stipulated in Environment Clearance under CRZ notification**

Sr. No.	Conditions	Status as on 31-03-2024																											
			<p>March 2021. The mangrove cover in the creeks in and around APSEZ showed a positive trend from March 2019 to March 2021, with an overall increase of 52.79 ha (1.9%) compared to the cover during the year 2019. The total mangrove cover during 2019 was 2670 ha which has increased to 2723 ha during the year 2021.</p> <ul style="list-style-type: none"> <li>Hence, overall increase in mangrove cover area in creek system in and around APSEZ from 2011 (2094 Ha) to 2021 (2723 Ha) is 629 Ha (30%).</li> <li>The cost of the said study was INR 23.60 Lacs incurred by APSEZ.</li> </ul> <p><b>Summary of Mangrove mapping and monitoring (from 2011 to 2021):</b></p> <table border="1"> <thead> <tr> <th rowspan="2">Mangrove mapping Year</th> <th rowspan="2">Mangrove cover total Area (Ha.)</th> <th colspan="2">Mangrove cover area increased</th> </tr> <tr> <th>Hac.</th> <th>Hac.</th> </tr> </thead> <tbody> <tr> <td>2011</td> <td>2094</td> <td>-</td> <td>-</td> </tr> <tr> <td>2011 to 2016-17</td> <td>2340</td> <td>246</td> <td>11.75%</td> </tr> <tr> <td>2017 to 2019 till March</td> <td>2596</td> <td>256</td> <td>10.94 %</td> </tr> <tr> <td>2019 to 2021 till March</td> <td>2723</td> <td>127</td> <td>4.89</td> </tr> <tr> <td><b>Total</b></td> <td><b>2723</b></td> <td><b>629</b></td> <td><b>--</b></td> </tr> </tbody> </table> <p>Further, APSEZ is in process to carry out the further Monitoring of mangrove distribution in creeks in and around APSEZ from 2021 to 2023.</p>	Mangrove mapping Year	Mangrove cover total Area (Ha.)	Mangrove cover area increased		Hac.	Hac.	2011	2094	-	-	2011 to 2016-17	2340	246	11.75%	2017 to 2019 till March	2596	256	10.94 %	2019 to 2021 till March	2723	127	4.89	<b>Total</b>	<b>2723</b>	<b>629</b>	<b>--</b>
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	2. Tidal observation in creeks in and around APSEZ		<ul style="list-style-type: none"> <li>APSEZ carried out the tidal observations at locations similar to 2017 in Kotdi, Baradimata, Navinal, Bocha and Khari creeks under the guidance of NCSCM.</li> <li>The observed tidal ranges indicate that the creeks experience normal tidal ranges, adequate for the growth of mangroves.</li> <li>The cost of the said activity was INR 1.0 Lacs.</li> </ul>																										
	3. Removal of Algal and Prosopis		<ul style="list-style-type: none"> <li>Algal and Prosopis growth monitoring was done in and around mangrove area and algal</li> </ul>																										

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

Sr. No.	Conditions	Status as on 31-03-2024	
			<p>growth from mangrove areas</p> <p>encrustation was found in some of the mangrove areas, which has been removed manually.</p> <ul style="list-style-type: none"> <li>The cost of the said activity was Rs. 80000 during the FY 2023-24. The algal removal report is attached as <b>Annexure - 4</b>.</li> </ul>
		4.	<p>Awareness of mangroves importance in surrounding communities</p> <ul style="list-style-type: none"> <li>Adani Foundation – CSR Arm of Adani group has done awareness camps/activities created in the community regarding importance of mangroves. Adani Foundation provides Good Quality dry and green fodder to 29 Villages. Project is covering total 16000 Cattels / 3008 farmers and hence enhancing cattle productivity. Dry Fodder 731230 Kg Green – 2359204 Kg.</li> <li>Awareness of mangroves importance in surrounding communities &amp; Fodder support - The expenditure for fodder supporting activities was approx. 305.55 Lacs during FY 2023-24, which was incurred by APSEZ.</li> <li><b>Grass Land development:</b> 213 acres of gauchar land has been cleaned and allocated for Grass land development with strong Community Contribution and Mobilization.</li> <li>Other than this dedicated security guard with gate system deployed by APSEZ across the coastal area and no any unauthorized persons allowed within coastal as well as mangrove areas.</li> <li>APSEZ has celebrated the International Day for the Conservation of the Mangrove Ecosystem on July 26th 2023 and World Nature Conservation Day on 28th July 2023 to raise awareness of the importance of mangrove ecosystems as "a unique, special and vulnerable ecosystem". The report of day celebration was submitted along with half yearly compliance report for the period of Apr'23 to Sep'23.</li> </ul>

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

Sr. No.	Conditions	Status as on 31-03-2024	
			<ul style="list-style-type: none"> <li>• Since PhD scholars and students frequently visit this area for study, we plan to establish it as a Center of Excellence, serving as a hub to create awareness among students and facilitating research activities for scientist.</li> <li>• Refer CSR report attached as <b>Annexure - 1.</b></li> </ul>
<p>Details of activities done as a part of GCZMA recommendations and NCSCM mangrove conservation action plan were submitted as a part of previous half yearly EC compliance report for the period Oct'20 to Mar'21.</p> <p>To comply with the GCZMA recommendations regarding mangrove monitoring at every 2 years, APSEZ earlier awarded work order to NCSCM, Chennai vide order no. 4802018994, dated 29/07/2022 with cost 23.77 Lacs for mangrove mapping in and around APSEZ, but due to some financial disputes and no proper response from NCSCM side regarding resolution, the work order has been revoked.</p> <p>After that as suggested by Joint Review Committee in its report that mangrove related studies may be undertaken by different agencies on a rotation basis for a better review of the mangroves, APSEZ issued work order to the Gujarat Institute of Desert Ecology (GUIDE), Bhuj vide order no. 4802027981, dated 10/04/2023 for mangrove mapping in and around APSEZ, Mundra. The cost of said work is 23.60 Lacs (Including Taxes), which was will be paid by APSEZ.</p> <p>GUIDE has completed the study of Monitoring and Distribution of the Mangroves along the Creeks in and Around APSEZ, Mundra, Kutch, Gujarat for the duration of year March 2019 to March 2021. Copy of the report of Monitoring and Distribution of the Mangroves was submitted along with half yearly compliance report for the period of Apr'23 to Sep'23.</p> <p>According to NCSCM Mangrove monitoring study report March 2021, distribution of mangroves in Kotdi,</p>			

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

Sr. No.	Conditions	Status as on 31-03-2024
		<p>Baradimata, Navinal, Bocha and Khari creeks and also in Bocha island was studied using Google earth images (2017 March and 2019 Sep). The data obtained for 2017 i.e., 2398 ha was compared with data reported for 2016 (Dec) - 2017 (Jan &amp; Feb) i.e., 2340 ha in the Conservation plan submitted earlier. The Google earth showed a marginal difference of + 58 ha (compared to earlier 2016-17 data) which shows 2.4% higher and the difference can be considered as insignificant. Further for both the start year (2017 March) and the end year (Sep.2019) Google earth image was used as a source and therefore, the results will be quite acceptable for assessment. With regard to overall health of mangroves in the creeks in and around APSEZ, it was found that there was an increase of mangrove cover between March 2017 and Sep 2019 to an extent of 256 ha which is about 10.7% increase in mangroves. Hence overall mangrove cover was considered as 2596 Ha in year 2019.</p> <p>According to GUIDE Mangrove monitoring study report November 2023 the distribution of mangroves in Kotadi, Baradi mata, Navinal, Bocha and Khari creeks as well as in the Bocha island was studied using LISS IV satellite images for the duration of March 2019 to March 2021. The mangrove cover in the creeks in and around APSEZ showed a positive trend from March 2019 to March 2021, with an overall increase of 52.79 ha (1.9%) compared to the cover during the year 2019. The total mangrove cover during 2019 was 2670 ha which has increased to 2723 ha during the year 2021.</p> <p><b>Hence, overall increase in mangrove cover area in creek system in and around APSEZ from 2011 (2094 Ha) to 2021 (2723 Ha) is 629 Ha (30%).</b></p>
5	The company shall ensure that the construction labors do not cut mangroves for fuel, etc.	<p>Already Complied. Not applicable at present Construction activity is already completed.</p> <p>Most of the construction labours were residing 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. were</p>

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

Sr. No.	Conditions	Status as on 31-03-2024
		provided by APSEZ.
6	The company shall ensure that no creek are blocked due to the project activities,	Complied.  Please refer to Specific Condition no. xi of the compliance of EC and CRZ clearance above for details.
7	The company shall ensure that there will be no disposal of sullage and sewage generated from construction camps, surface run-off from construction sites, and oil and grease spillage from construction equipment in the creeks.	Already complied. Not applicable at present.  Please refer condition no. xii of EC Compliance report. Project is in operation phase.  Sewage and effluent generated from port is being treated in designated ETP and treated water is used for horticulture purposes.  Third party analysis of the treated water is being carried out twice in a month by NABL and MoEF&CC accredited agency namely M/s. Unistar Environment and Research Labs Pvt. Ltd., Vapi. The results of the same are attached as <b>Annexure – 2</b> .  Monitoring and analysis of ETP treated waste is also carried out regularly through in-house laboratory for the parameters such as pH, TDS, TSS, COD, Chlorides, and residual chlorine.
8	The company shall stick to the time bound programme submitted to this department for the proposed activities including installation of desalination plant for meeting the entire water requirement.	Already complied. Not applicable at present.  Construction work was completed on time and project is in operation phase. Desalination plant with the capacity of 47 MLD is installed to meet the water requirement for overall APSEZ, Mundra.  For detail on present source of water and quantity of water consumption, Please refer to Specific Condition no. ix of the compliance of EC and CRZ clearance above.
9	The company shall ensure that the commercial fisheries are not hampered due to the presence of barges, vessels and other activities in the region. Necessary plan in this regards shall be prepared	Complied.  Communication mechanisms have been developed for the smooth movement of fishing boats vis-à-vis shipping activities.  Please refer to Specific Condition no. xiv of the compliance of EC and CRZ clearance above for details.

**Status of the conditions stipulated in Environment Clearance under CRZ notification**

<b>Sr. No.</b>	<b>Conditions</b>	<b>Status as on 31-03-2024</b>
	in consultation with the NIO.	
10	The company shall bear the cost of the external agency that may appointed by this department for carrying out the supervision and/or the monitoring of the construction activities.	Complied.  Construction activities are completed and project is in operation phase. If at all any study is suggested by Govt. of Gujarat, we will give full co-operation.  Please refer to Specific Condition no. xv of the compliance of EC and CRZ clearance above for details.
11	The company shall carry out the post project monitoring of various environmental parameters in consultation with this department and Gujarat Pollution Control Board.	Being complied.  Post project monitoring of various environmental parameters is being carried out regularly.  Please refer to Specific Condition no. xvi of the compliance of EC and CRZ clearance above for details.
12	The company shall prepare the detailed traffic control management plan for the port and shall participate in the VTMS to be developed for the Gulf of Kachchh.	Complied.  APSEZ has participated in VTMS. Please refer to Specific Condition no. xvii of the compliance of EC and CRZ clearance above for details.
13	In order the eliminate adverse impact on the mangroves of Bocha Island and coastal ecology of the region, the company shall carry out construction activities only after the construction design and methodology is approved by NIO.	Already complied. Not applicable at present.  Construction activity is already completed.  EIA report was prepared by NIO in which all impacts on mangroves and coastal ecology of the region for the proposed design were studied in detail.
14	Any other conditions may be stipulated by this department from time to time.	Point noted.

# **Annexure – 1**

# CSR Gujarat

Kutch – Hazira – Dahej

**adani**  
Foundation

pond deepening

A N N U A L R E P O R T 2 0 2 3 - 2 4



## Our Journey by Mr. Rakshit Shah, Executive Director APSEZ



From Pledge to Progress Further,

I am happy to share that Adani Foundation continued to make significant strides to elevate the sustainability of our CSR operations. This year We prioritize capacity building and awareness on ESG, as evidenced in 8 employees completing training modules that raise awareness about best practices in ESG. We raised the bar through our environmental initiatives, Water Conservation, Terrestrial and Coastal Biodiversity. We are also spreading awareness for reducing paper usage, Reducing emissions through firewood cooking, diesel free village drive at Surat district and increasing the green cover by planting trees. We enhanced the impact of our social initiatives by empowering women through Enhancing skill and Livelihood, increasing gender diversity and improving inclusivity. We are working for socio economic upliftment marginalized community i.e. Primitive Tribes at Bharuch and Surat district and fisherman at Kutchh district.

Our commitment to sustainable CSR operations has earned the trust of our stakeholders and contributed to our success. It has also helped us build a more resilient, sustainable and profitable business. I thank our Adani Foundation Team for their continued support and dedication to our commitment to sustainable CSR practices, as we remain focused on driving long-term value for our stakeholders, and the communities in which we operate.

With best wishes,

Rakshit Shah

# Contents

## 4 CSR Kutch

Demographic Detail	5
Mundra Site	
Environment Sustainability	6
Education	22
Sustainable Livelihood Development	37
Community Health	53
Community Infrastructure Development	60
Community Resource Centre	63
Adani Skill Development Centre	70
AKBPTL Tuna	74
AGEL Khavda	75
AGEL Dayapar & Mandvi	79
Adani Cement Sanghi	83

NDTV	87
Shree Renuka Sugar Ltd.	88
AESL – Mandvi & Rapar	89
CER – APSEZ	90
Biporjoy Cyclone Relief Work	91
Events	94
Awards & recognition	97
VVIP & VIP Visits	99
Case Study	103
Beneficiaries list	108

## 109 CSR Hazira

Education	110
Community Health	113
Sustainable Livelihood Development	115

Community Infrastructure Development	117
Project Udaan	118
Mega Event – Day Celebration	119
Appreciation Letter	120
Case Study	121

## 123 CSR Dahej

Education: Utthan	124
Community Health	125
Sustainable Livelihood Development	126
Community Infrastructure Development	130
Case Study	131
Budget utilization	132
Media coverage	133

# CSR KUTCH

The Adani group plans to invest over two lakh crore rupees in Kutch over the next five years, creating around 100,000 jobs. The investment is expected to contribute to a Vikshit Gujarat, with the group constructing a world-largest green energy park in Khavda, Kutch, and expanding its green supply chain. Kutch Copper Ltd, a subsidiary of Adani Enterprises Ltd (AEL), the world's largest single-location copper manufacturing plant at Mundra in Gujarat, will start operations of the first phase by March-end and full-scale 1 million tonnes capacity by FY29. Mundra Port, Adani Power Plant, Adani Wilmar and Mundra Solar is reached to remarkable development ! Adani Foundation is instrumental in Mundra from 25 years but for last 3 years, started CSR at Khavda, Nakhtranana, Lakhpat and Abdasa Taluka in Community health care, Women Empowerment and Water conservation core.



# Demographic Details

Block	Villages	No. of HHs	Population
Mundra	61 Villages	35192	153179
Anjar	6 Villages	5350	28500
Nakhtrana	22 Villages	14093	36373
Lakhpat	20 Villages	8092	18976
Khavda	22 Villages	8450	35200
Rapar	3 Villages	345	12450
Mandvi	8 Villages	2780	14560
Abdasa	12 Villages	2415	9660

1. Adani Ports and SEZ Limited
2. Adani Power Mundra Limited
3. Adani Wilmar Limited
4. Adani Wilmar – Caster Limited
5. Kutchh Copper Limited
6. Mundra Solar PV Ltd
7. Mundra Petrochem Ltd
8. Adani Kandla Bulk Terminal Private Limited
9. Adani Solar Limited – Bitta, Abdasa
10. Adani Green Energy Limited – Nakhtrana
11. Adani Green Energy Limited - Khavda
12. Adani Energy Solution Limited – Rapar

# Environment Sustainability



Water Conservation 

Soil Conservation 

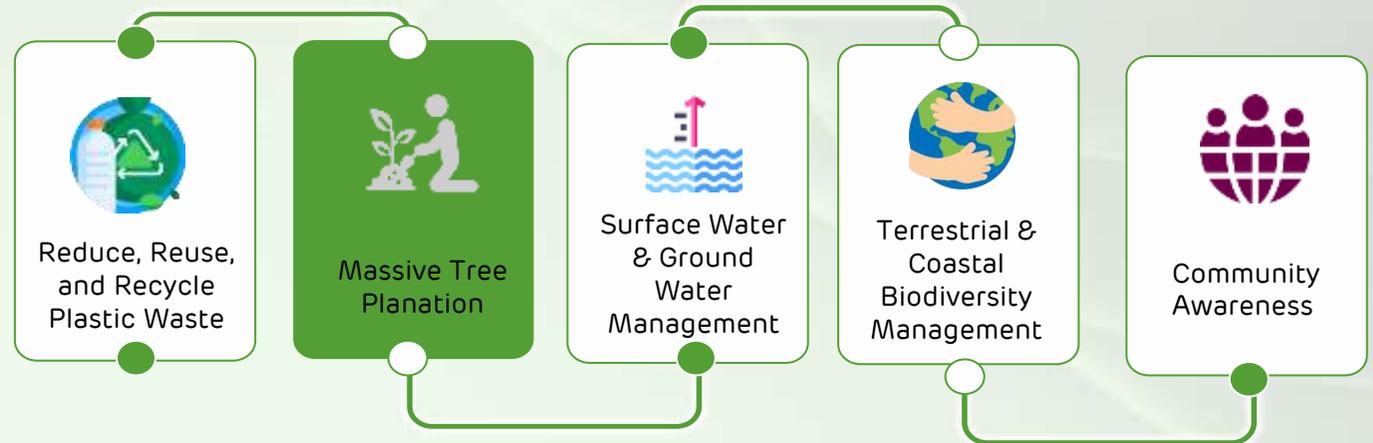
Terrestrial Biodiversity 

Coastal Biodiversity 

Plastic Free Drive 

# Environment Sustainability

As per UN Sustainable Development Goal. 13 - The environment and biodiversity serve as the lifeblood of our planet, playing a crucial role in maintaining ecological balance and sustaining life in all its diverse forms. Preserving them is more than a necessity; it is a shared responsibility to secure the health and well-being of both present and future generations. Adani Foundation embodies this commitment through its varied environmental projects. These range from extensive tree plantation and mangrove restoration to innovative biogas provision, drip irrigation, Plastic Free Drive, groundwater recharging, and water conservation.



Action to environment Sustainability



# Swajal Project



## AIM:

The Foundation's Water Conservation program, SWAJAL, is aimed at addressing the alarming depletion of groundwater levels and reduction in water sources in various parts of Kutch district.

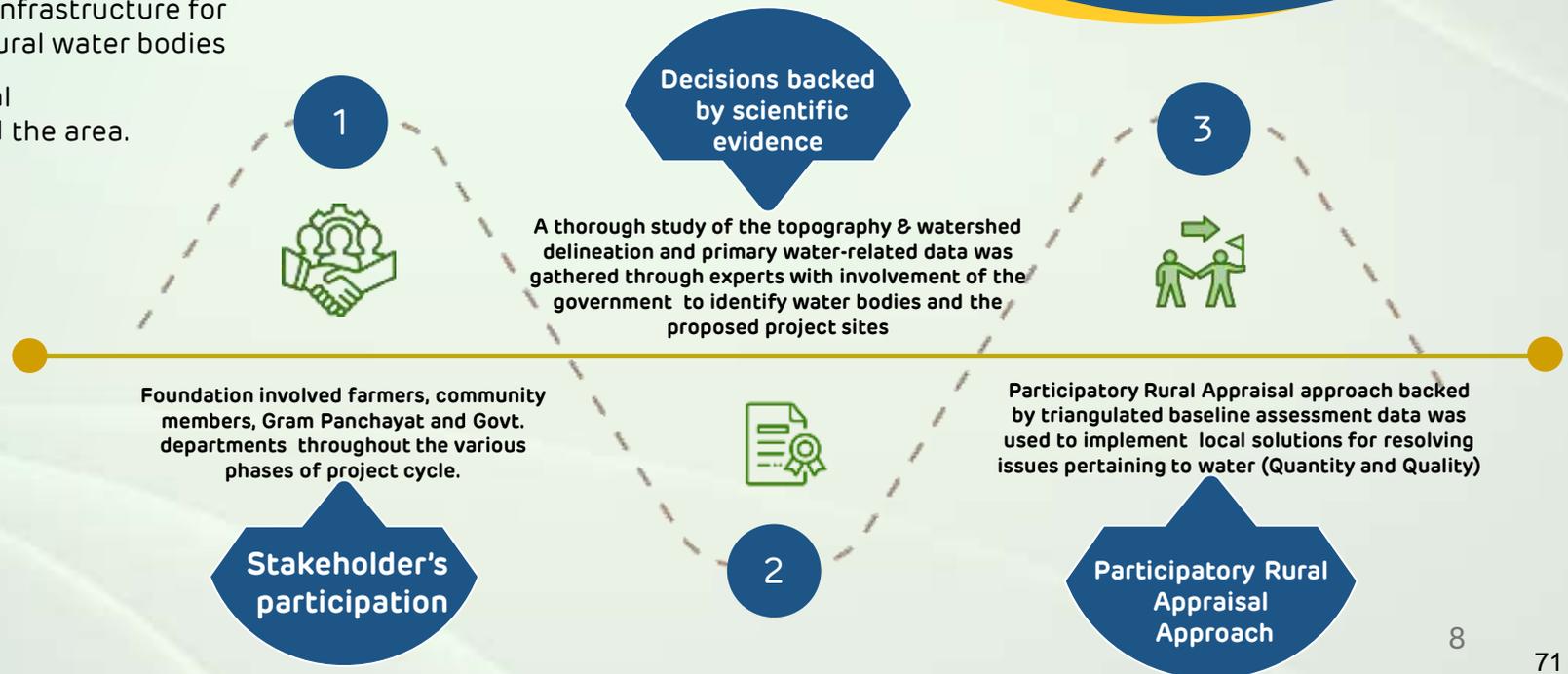


## Vision:

Devising eco-friendly and cost-efficient methods of water body rejuvenation, the project works

1. To revive existing water resources,
2. Plan sustainable infrastructure for protection of natural water bodies
3. Improve ecological conditions around the area.

## Process:





## Water Security Plan

Due to arid climatic characters of the Kutch region, it is essential to plan for water security drinking and livelihood purposes. Considering weather condition, rainfall characters, geohydrological condition and water demand, water security plan has been prepared for all the Seven villages.

To prepare water security plan following method has been adopted:

1. Overview of the Project villages through primary field visit and reference of prestudied and reports.
2. Survey of existing surface water resources to assess the potential and further scope of development.
3. Groundwater monitoring in term of storage and quality assessment.
4. Water balance calculation considering water supply and demand estimation.
5. Integrated water resource development and management plan for each village.

## Swajal in Kutch – Block wise:

Sr. No.	Block Name	Water conservation structure	Total no. of Structure	Total Capacity Created (CUM)
1	Mundra	Check Dam	23	6,07,332.80
		Pond Deepening	66	1,89,121.08
		RRWHS	275	2750
		Percolation Well	24	-
		Bore & Well Recharge	209	-
2	Dayapar	Pond Deepening	2	9,200
		Check Dam	1	18,000.00
3	Khavda	Pond Deepening	1	2,000
		Check Dam	1	16,000.00
4	Abdasa	Pond Deepening	1	22,000
5	Lakhpat	Check Dam	1	21,237.64

## Swajal - Impact:



**28,000**  
farmers Benefited



**7.2%**  
Increase Revenue



**17% TDS reduced**



**Rs. 1150**  
Reduce in health expenses/month



**Total Water capacity increased**

**8,87,641 Cum**  
**= 31.35 MCFT**

# Water Conservation Structure:



# Soil Conservation

<p><b>1250 Farmers</b></p>	<p><b>07 exposure</b></p>	<p><b>857 Farmers</b></p>	<p><b>258 Gobardhan</b></p>	<p><b>35 Farmers</b></p>	<p><b>Rs.9.88 Lacs RG</b></p>
<p>•<b>Awareness Sessions at Village Level:</b> Spreading awareness on natural farming benefits and address their concerns.</p>	<p>•<b>Hands-On Training &amp; Exposures :</b> Arranged Workshop and training to emphasizing on real-world techniques.</p>	<p>•<b>Link with Government Scheme:</b> facilitation of govt. Cow Nurturing scheme to promote eco-friendly farming practices.</p>	<p>•<b>Bio-gas Support:</b> Link with Gov Gobar Dhan Biogas Unit Nutrient-rich slurry serves as an essential organic fertilizer for natural farming</p>	<p>•<b>Natural Farming Certification Process</b> to obtain natural farming certification through the GOPCA for the 35 Farmers who are Members of Raj shakti Sahakrai Mandali.</p>	<p>•<b>Marketing Assistance:</b> Provide platforms and resources ensuring fair prices and broader consumer reach.</p>

## Natural Farming

Natural farming is an urgent need of the hour, We have initiated a comprehensive approach to promote natural farming practices through a variety of activities aiming to minimize pesticides and chemicals uses ,lead to produce , nutritious, chemical-free produce which is benefitting both farmers and consumers by providing healthier and more sustainable food options as well as plays significant role to flourishing environment and balanced ecosystem.



\* Funded by -Mundra Petro chem Limited

# Home Biogas

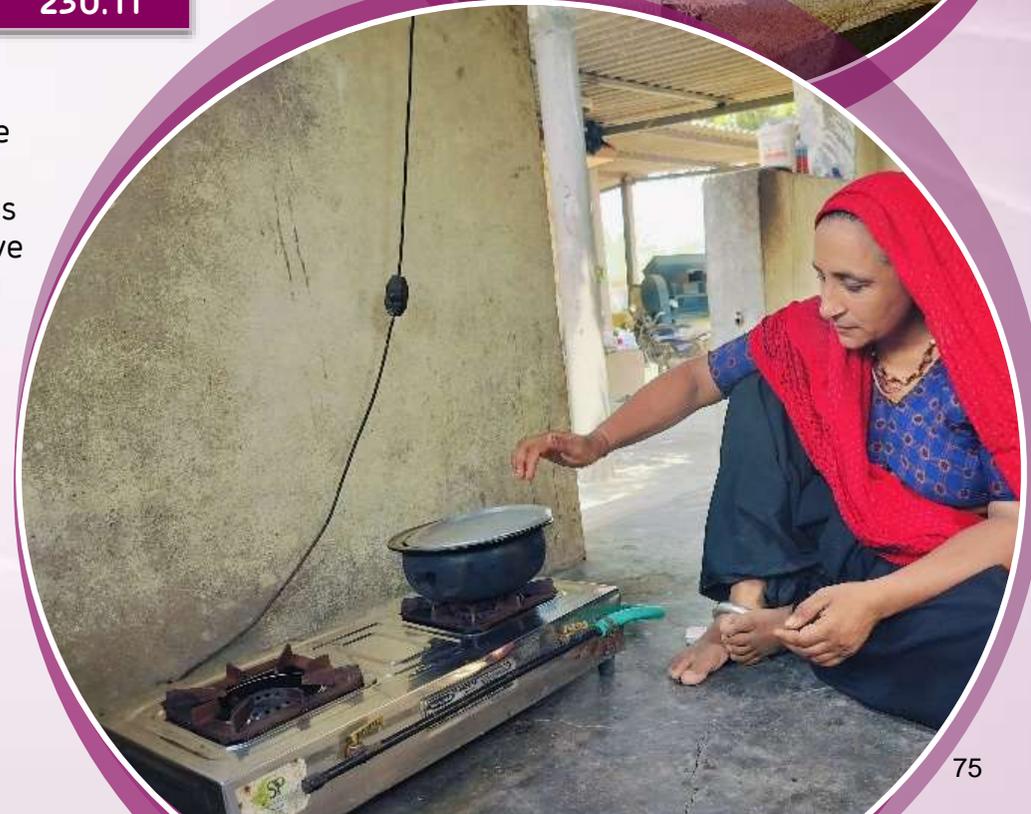
Phase	unit	Unit Cost In Rs.	AF in Lac	Support Beneficiaries Contribution in Lac	Gov. Convergence in Lac	Total in Lac
Phase -1	125	23200	29	3.75	0	32.75
Phase -2	100	42000	42.0	5.0	0	47
Phase -3	100	42000	0	5.0	37	42
Phase -4	258	42000	6.45	6.45	95.46	108.36
<b>Total</b>	<b>583</b>	<b>149200</b>	<b>77.45</b>	<b>20.2</b>	<b>132.46</b>	<b>230.11</b>



Home biogas systems, adept at converting organic waste into renewable energy, present a sustainable and eco-friendly solution for cooking. We have started this project in 2020, with farmers contributing 10% towards the cost, that persisted till 2022. Since then, we have scaled our initiative by aligning with government home biogas schemes to amplify the reach and adoption of this eco-friendly technology in wider rural regions.

The deployment of home biogas has been particularly transformative for women, offering a healthier, smoke-free cooking environment reducing greenhouse gas emissions.

Current year we process to facilitate 258 Gobardhan unit through Gov.



# Natural farming Workshop with Governor of Gujarat

- To promote natural farming, the Adani Foundation and Shri Rajshakti Natural Farming Cooperative Society Ltd. are making numerous efforts in kutch. In our endeavor to motivate and raise awareness among farmers, we recently organized a significant event inviting the Governor of Gujarat, Shri Acharya Devrath, Mr. V.S. Gadhavi, Executive Director of the Adani Foundation, and other distinguished guests. Addressing a gathering of 2000 farmers, Shri Acharya Devvrat aimed to inspire and enlighten them about the benefits and importance of adopting natural farming practices.
- "The foundation of people's well-being and health lies in the health of the land. Natural farming is the only way for this," said Acharya Devvratji, emphasizing that microscopic organisms in the soil nourish crops with essential elements, providing healthy and nutritious food. Devvratji highlighted the harmful effects of chemical fertilizers and pesticides on the land and urged farmers to adopt natural farming practices.

\* Funded by -Mundra Petro chem Limited





# Revival of Date Palm destroyed by **BIPORJOY** Cyclone



## **Dates Tree -Restoration**

Biparjoy cyclone has damaged huge number plants of Dates, Mango, Sapota. In coordination with Kutch Crop Services and Krishi Vigyan Kendra – more than 615 plants are restored till date and continue. This initiative has created trust and credibility in farmers of Mundra. As for one date tree Average revenue is 25000 INR – this initiative revenue generation will be 1.53 Cr per year which is remarkable.



# Go Green – Horticulture Saplings Distribution to Farmers



## Objective :

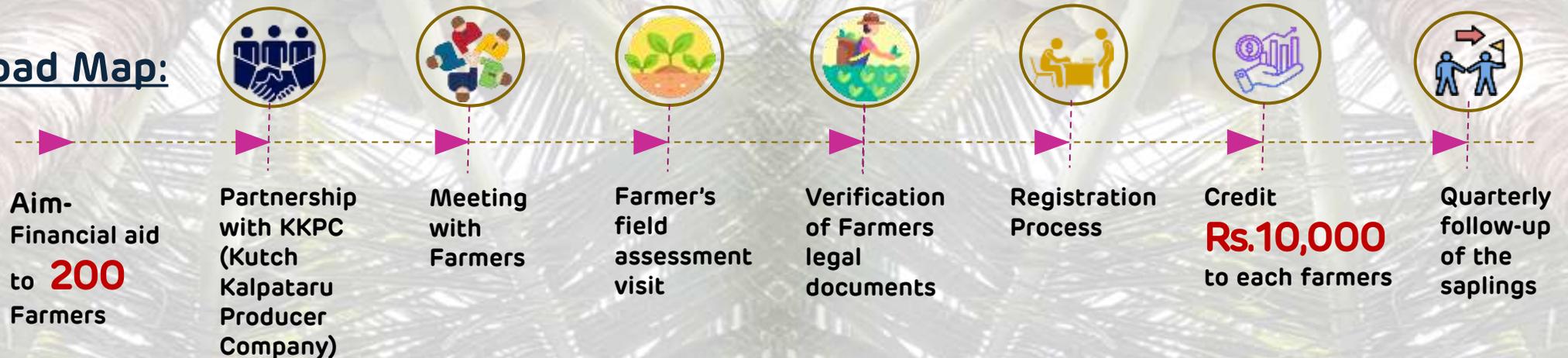
In alignment with a vision for sustainable agriculture and environmental stewardship, MPL aims to empower local farmers and contribute to larger environmental goals. The initiative focuses on providing financial assistance to 200 farmers for cultivating horticultural saplings.



## Impacts :

- Environmental sustainability
- Carbon sequestration
- Soil conservation
- Combat climate change
- A healthier ecosystem
- Contributing to a cleaner atmosphere

## Road Map:



# Go Green – Horticulture Saplings Distribution to Farmers



## Carbon sequestration Value :

Supported the plantation of 53,136 fruit bearing trees.

These plants will sequester 1,465.00 MT of CO2 after 5 years as per calculation in Mundra Petrochem villages

Name of Fruit bearing Tree	Co2 Sequ Kg	No of Plants	Total Co2 Seq - Kg
Mango	41.47	33,780	1,400,856.6
Custard Apple	4	1,300	5,200
Dates	12.8	15,856	2,02,956.8
Coconut	26.87	2,200	59,114
<b>Total</b>		<b>53,136</b>	<b>1,465,170.6</b>



# Event: Horticulture Sapling Distribution and No Plastic Drive

Noteworthy event unfolded at the serene Sonal Mata Ji Temple in Vakrai - Moti Bhujpur, organized by Adani Foundation and Adani Petrochemicals. The focus of this gathering was giving away horticulture saplings through financial assistance, a symbolic step towards fostering a cleaner and sustainable environment.

Our esteemed guests for this event include R N Parmar, RO GPCB; Javed Sindhi, Mamlatdar Mundra; Vinay Kumar Singh, Head ESG MPL; Bhagwat Swaroop Sharma, Head Environment; Panktiben Shah, Head CSR Gujarat; Vishnu Patidar, ESG expert; and Laxmiben Ninjan, Sarpanch Bhujpur.

Mr. R.N. Parmar addressed the imperative need for cultivating a green and healthy environment for current and future generations. Additionally, he praised the efforts of Adani Petrochemicals and Adani Foundation, emphasizing the importance of sustainable practices.

**The primary objective of the event was to extend financial support to 200 farmers, each receiving Rs. 10,000, a transaction gracefully facilitated by Mr. R. N. Parmar, virtually transferring funds to their bank accounts, funded by Adani Petrochemicals. Presently, MPL is aiding over 300 farmers in planting a total of 53,136 fruit-bearing plants.**

The event further shone a spotlight on past beneficiaries of drip irrigation and tissue dates distribution, who took the stage to share their experiences and express gratitude for the transformative support received. Adding a touch of artistry, small Utthan students staged a captivating environment protection act.

As the event wrapped up, a strong commitment was made to keep supporting and assessing efforts for a greener environment, contributing to carbon sequestration.



# Terrestrial Biodiversity

## Vruksh Se Vikas – Massive Drive

Since 2014, we have embarked on a transformative journey to execute a wide range of tree plantation drives in collaboration with local communities and forestry departments.

**1. Miyawaki Forest Development:** Native species plantation in the 2-acre area at Nana Kapaya village creating a flourishing mini-forest with 5,508 trees.

**2. "Adani Van":** Barren spaces were transformed into lush green havens through our massive public plantation drives. One notable example is the Bhupur Visri Mata Temple, where 23,000 trees were planted. Second example Momai Mata temple, Desalpar 10,000 trees were planted. Third Example Matiyadada at Bhujpur 8000 trees were planted. Fourth example Rasha pir, Dhruv 2-acre 5000 trees planted. Thus, in PPP Model 4 Adani Van were developed where 46,000 trees were planted.

**Prakruti Rath:** This initiative goes beyond just planting trees; it is about fostering a sense of responsibility towards our environment. Through 46,750 sapling distribution to individuals, we have empowered communities to take ownership of their surroundings, leading to a heightened consciousness about the environment's significance.

Till the date Total 1.49 Lac tree plantation have been done that has enriched the local ecosystem and significantly contributed to carbon sequestration

Completed the plantation of 1,49,889 trees. These plants will sequester 3180.00 MT of CO<sub>2</sub> after 5 years as per calculation in Mundra Petrochem villages

1.49  
Lac tree  
plantation





# Coastal Biodiversity

Mangrove Biodiversity



In 2010, we initiated a mangrove plantation project at Luni coastal belt, ultimately leading to 162 hectares of dense mangrove forests. Subsequently, we expanded our efforts by planning and implementing a multi-species mangrove plantation across an additional 20 hectares. These plantations are diligently maintained and continually monitored. Notably, these forests have evolved into a thriving habitat for various marine and

migratory bird species, enriching the local ecosystem.. Since PhD scholars and students frequently visit this area for study, we plan to establish it as a Center of Excellence, serving as a hub to create awareness among students and facilitating research activities for scientist

Mangrove Plantation Work Detail				
Sr. No	Year	Number	Person days	Remarks
1	2011-12	50000	3000	
2	2012-13	125000	6943	
3	2013-14	60000	1480	
4	2014-15	125000	6501	
5	2015-16	65000	3533	
6	2016-17	20000	3125	
7	2017-18	100000	3666	
8	2018-19		7539	Algal Removal work
9	2019-20		6261	Algal Removal work
10	2020-21		4830	Algal Removal work
11	2021-22	97000	5200	
12	2022-23	100000	4445	
<b>Total</b>		<b>742000</b>	<b>56523</b>	

4+

Spices of Mangroves

60+

Coastal Spices as habitat preservation

160+

Hector Avicennia marine plantation

20+

Hector Biodiversity park

\* Funded by -Mundra Petro chem Limited

# Plastic Free Drive

## Objective:

The central aim of the Plastic-Free Drive is to empower and enlighten students as key agents of change, enabling them to disseminate awareness and instill the practice of reducing single-use plastics within their community.

**1. Educate:** Spread awareness about the harmful effects of plastic on the environment, marine life, soil health, and human well-being.

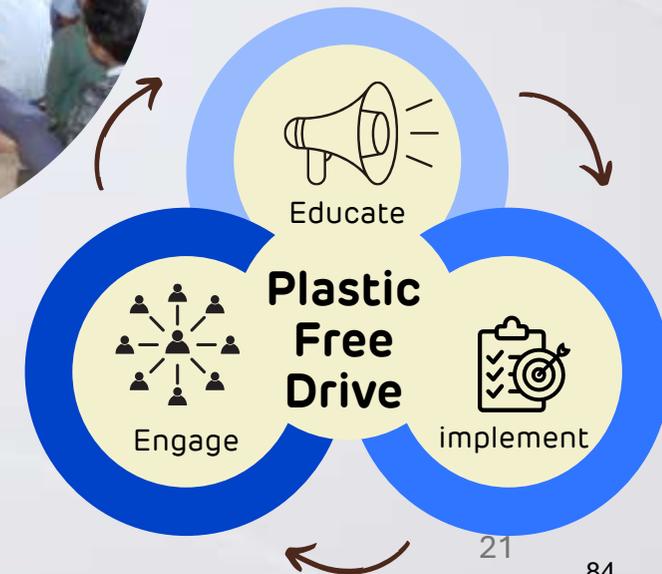
**2. Engage:** Mobilize community members, especially the youth and family members to actively participate in plastic waste reduction activities.

**3. Implement:** Introduce sustainable alternatives to ensure proper disposal and recycling. As of now we supply plastic to one NGO to prepare Garden benches. .

## Outreach :-

12000 Students of Primary Schools.

990 Students of Secondary Schools of Mundra Block.





5 Years

उत्थाव

2018-2023

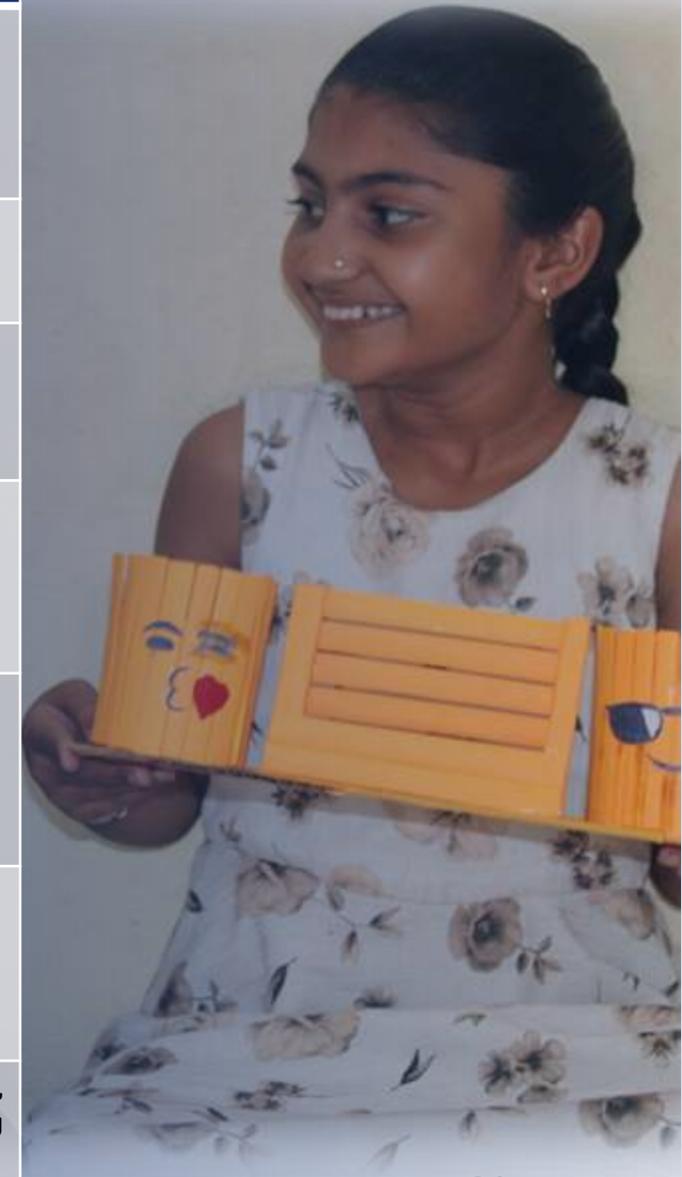
adani  
Foundation

# Education: Utthan

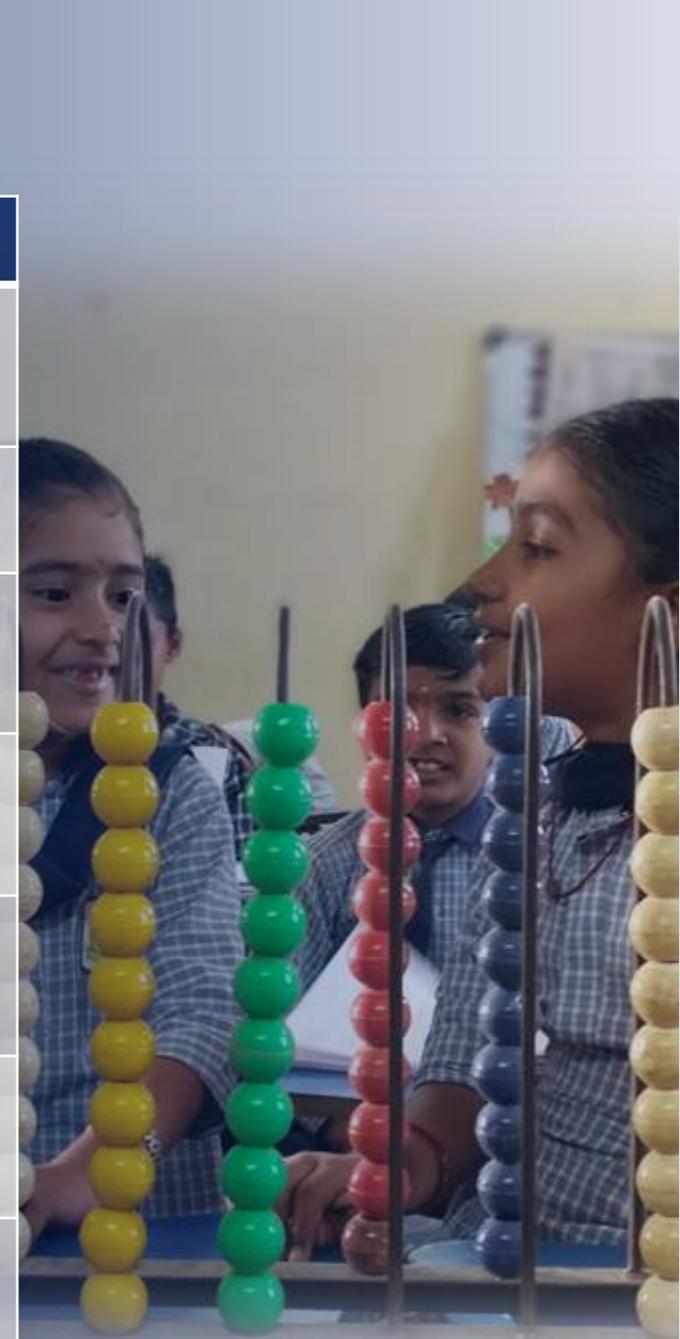
Project Utthan, an innovative initiative by the Adani Foundation by Mou with DEO, which aligns seamlessly with both the National Education Policy 2020 and the Sustainable Development Goal. By adopting government primary schools, Utthan fostering community engagement, it aims to create model schools that empower students and elevate education quality. By providing dedicated teachers and essential facilities, Utthan strive to enhance the Gunotsav results of primary schools and improve the Board results of 10th standard students. Project Utthan takes the lead in initiating various co-curricular activities to ensure the holistic development of students. Through capacity-building programs and collaborative efforts, we envision a future where every child receives holistic and empowering education, paving the way for a brighter tomorrow.



Utthan Initiative	SDG 4	NEP 2020	Benefited
Strengthening government Primary & High schools	Target 4.1.0 suggest to contributes to providing quality education for all.	4.1 and 4.2 - improving primary education.	31 Villages, 77 Schools, 12000+ Students, Efforts for Increase Gunotsav result & Board result.
Appointing an Utthan sahayak	Target 4.1.1 suggest to support students.	5.2 - focus on capacity building and support systems	70+ Utthan sahayak works as catalyst. Students: Teacher ration decrease.
Mainstreamed Progressive learner	Target 4.6.1 suggest fixed level of proficiency in functional	2.1 and 2.2 Mainstream students from progressive learners	Assessment : 6982, Progressive learners : 2541 Mainstreamed : 1278.
Providing required resources and facilities	Target 4.2.1 Suggest the necessary resources for effective learning.	7.4 and 7.5 emphasis on infrastructure development and resource availability.	Sports Kit, Music Kit, TLM Kit, Science Kit provided in schools.
Enabling joyful learning spaces	Target 5.1.2 Suggest positive and engaging learning environments	5.9 & vision of NEP suggest experiential learning to encourages creativity.	Smart Class with Navneet software+ Bala painting + Activity base learning.
Adani Students Development Center (ASDC)	Target 6.1.2 Suggest preparing students for future opportunities.	20.1 and 20.2 NEP's It resonates with the NEP's focus on holistic development and skill-building.	2 Adani Evening Education Center, 5 Adani Competitive Coaching Center, 5 Adani English Coaching Center
Introducing English as a Third Language	Target 5.1.2 Suggest other language learning.	4.13 emphasizes multilingualism and language learning.	Students: 5000+ Classes 1-4, Curriculum, Every Friday morning assembly in English



Utthan Initiative	SDG 4	NEP 2020	Benefited
Enhancing Reading Habits	Target 7.1.2 Promote literacy and a love for reading.	2.8 Supports the NEP's goal of enhancing reading & comprehension skills.	Redding corner , 1000+ Oasis workshop , 162780 Books CICO, 100+ Schools partner from 10+ Country in International school library month(ISLM)
IT on Wheels	Target 4.2.3 Promotes Digital literacy.	5.9 focuses on integrating technology in education.	2 dedicative van, 2 IT instructors, 55 laptops, 34 schools, Empowering 4170 students , 200+ High schools' students
Promote sports	Target 6.1.2 Suggest preparing students for future opportunities	4.8 promoting physical fitness and sports.	6 Students selected in District level sports school, Inspiring more 100 Students. Khel Maha Kumbh : 2000+
Teachers' & Sahayak Capacity Building	Target 4 C Suggest to qualified teachers by cooperation	2.6 emphasizing teacher training and professional development.	3500+ Hours Capacity building program + Webinar + Diksha + 10 full days training.
Formation of Eco Club	Target 5.1.2 Suggest to increase awareness of Environment.	4.44 Promoting environmental awareness.	Plastic free village workshop : 1250+ Students, Environment Awareness program & Tree plantation in schools.
Day Celebrations & Collaboration with GoG	Target 4.2.1 Suggest to inspire Holistic development of students	7.1 children of all ages should learn about arts, sports and careers.	Summer Camp : 6000+ Students Diwali Mela : 5500+ Students. 1400+ Parents participated.
Mothers as catalyst in transformation	Target 4.1.1 Suggest to inspire parents in growth of students	Aligned with NEP's Principles. Page No.6	Mothers meet : 700+ Mothers Joined: 15000+ this year. (Meetings + Home Visit)
Strengthening Stakeholders	Target 4.1.0 suggest to work	Aligned with NEP's Preface, Page No. 4	Support in Taluka, District & state level various initiative with DIRT, BRC, Strengthening SMC Committee.



# Utthan Marks 5-Year Milestone

Celebrating the extraordinary five-year journey of Utthan in Mundra, we hosted a remarkable event graced by the presence of distinguished individuals. Among them, the Director of Primary Education, Gujarat, Mr. M. I. Joshi, brought with him not only wisdom but also a sense of grace that elevated the occasion. Standing alongside were the District Development Officer, Mr. Prajapati, and the District Primary Education Officer, Mr. Sanjay Parmar.

Yet, beyond the notable dignitaries, the event witnessed the convergence of more than 2000 students, 416 school principals and teachers, and 145 School Management Committee Members. Their collective presence bore witness to a significant milestone in the enduring journey of Utthan, leaving an indelible mark on our hearts and memories.

In this gracious event, we commend the outstanding contributions of the Principal, Utthan Sahayak, and students who have excelled over the past five years.

During the event, the children showcased their incredible talents. They enthralled the audience with mesmerizing performances, including folk songs, classical dances, and vibrant folk Garba dance. The young talents also graced the stage with captivating dramas and much more.

The event was a true celebration of their skills and abilities, and it was executed with utmost dedication and excellence.





## Mother's Meet – Promoting Community Bond

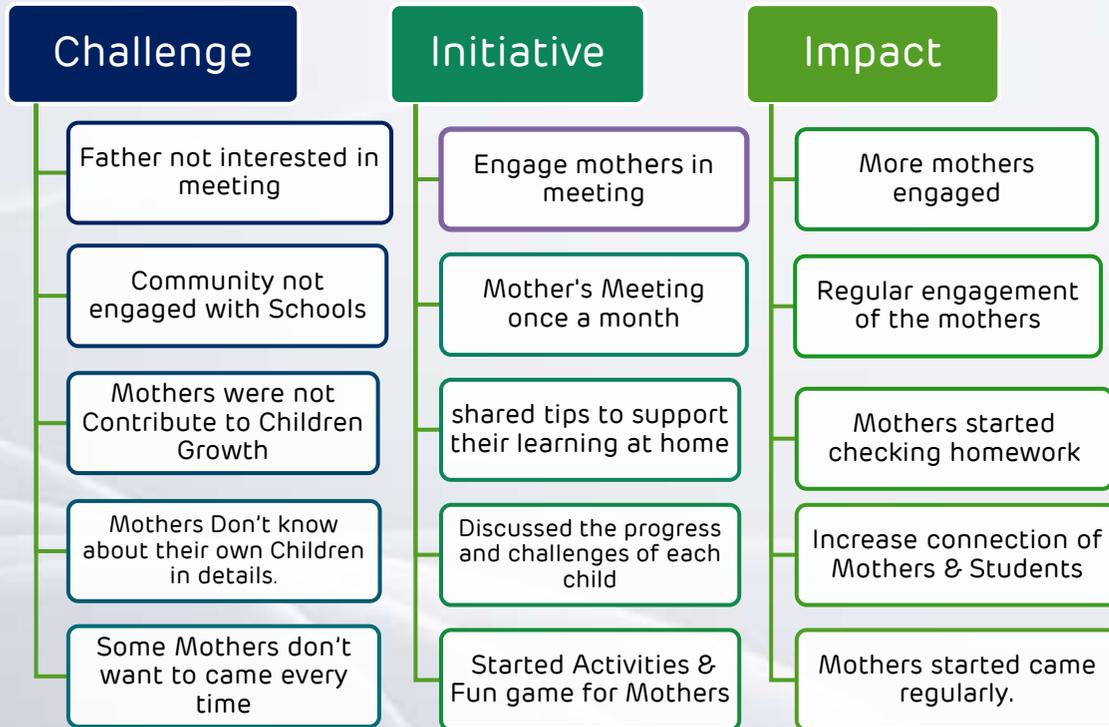
Mothers meet is special intervention of Utthan, This year, more than 15000+ Mothe's Joined in 700+ Mothers meet. Some of the challenges and impact of this initiative through out the year is as bellow:



**700+**  
Mother's meet



**15,000+**  
mother participated



## Mainstreaming Progressive learners

Utthan, through its assessment, has identified over 2541 Progressive students out of 6459 from 3<sup>rd</sup> to 7<sup>th</sup> standard . Among them, 1278 students have been successfully mainstreamed. The key role played by Utthan Sahayak has been instrumental in achieving this success. Utthan's approach includes a customized syllabus, activity-based learning, and teaching at the right level. Additionally, Utthan actively involves mothers and members of the School Management Committee (SMC) in strengthening progressive learners. Below is the yearly outcome of our hard work:

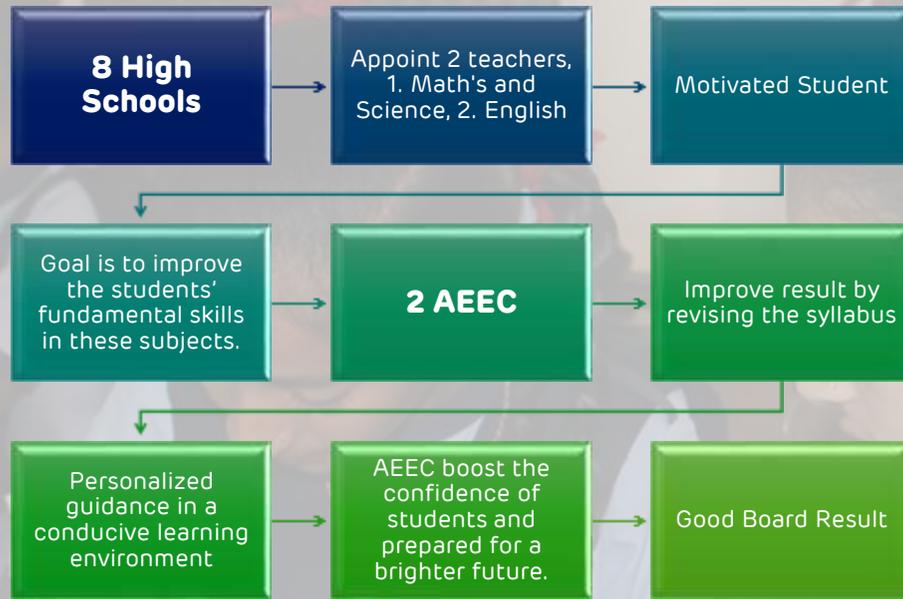


**1278 students**  
mainstreamed

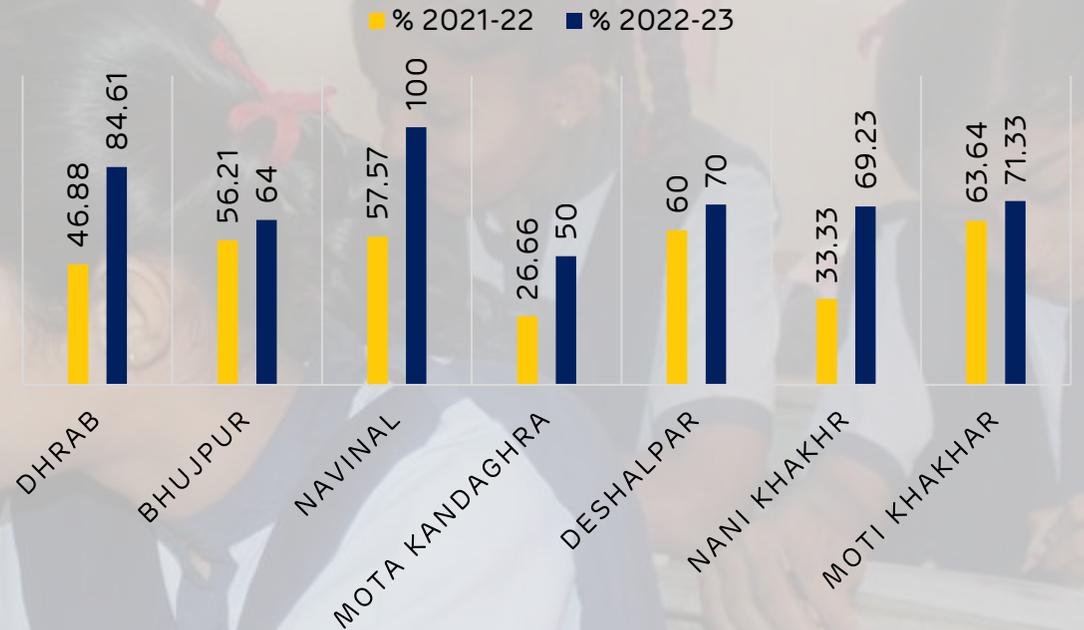




## Utthan in High Schools



## UTTHAN HIGH SCHOOL RESULT COMPARISON



## Utthan other various initiatives & Achievements

- ✓ Utthan won FOKIA Award under the category "Excellence in collaborative CSR Project.
- ✓ Utthan created special syllabus of Maths, Science & English to achieve good result in board exam.
- ✓ The Kutch University has conducted an impact assessment of IT on Wheels, which has been evaluated and certified by the DEO Office.
- ✓ Career Counselling in Utthan High Schools same remedial classes during summer break.
- ✓ Health awareness programs in schools, children of class 6 to 8 were made aware about health.
- ✓ High school girls' students celebrated Rakshabandhan with Shoulder at Boarder.
- ✓ 1000+ Students are preparing for competitive exam. Its more than double from last year.

# Adani Vidya Mandir, Bhadreshwar

## Empowering Communities through Free and Compulsory Education

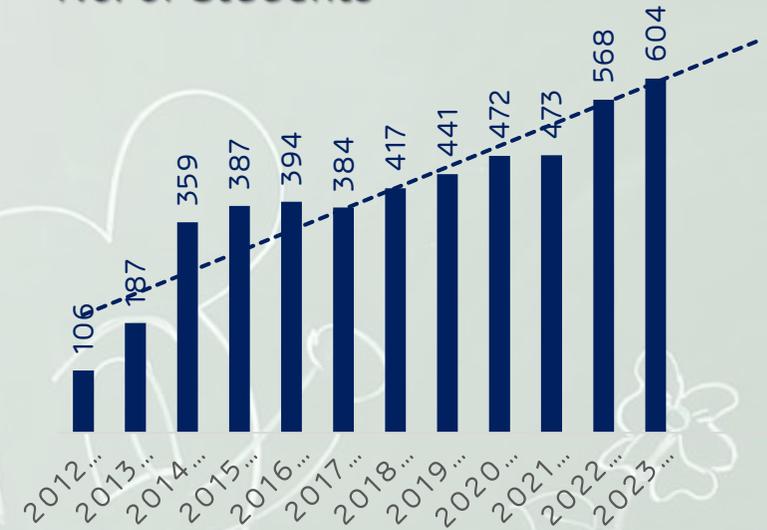
- Established in June 2012, school is a Gujarati Medium, Co-educational institution that adheres to the Gujarat State Board curriculum. It is a school for the students of KG to Class X. Starting its journey in a rented house in Bhadreshwar village, the school commenced operations with 80 students in class-I. Guided by a committed team of six teachers. In the academic year 2023-24, it proudly serves a student population of 604, with 174 students hailing from fisher-folk communities. 24 dedicated teachers are there in school. Committed to providing comprehensive and quality education, the school operates with a unique approach – offering education at no cost. Furthermore, the school extends support by providing complimentary uniforms, books, and stationery. It's noteworthy that all the students belong to the Economically Weaker Sections (EWS), emphasizing dedication to inclusivity and accessible education.
- School stands as a trailblazer, being the first state board school in Gujarat to receive accreditation from NABET under the Quality Council of India.



# Adani Vidya Mandir, Bhadreshwar

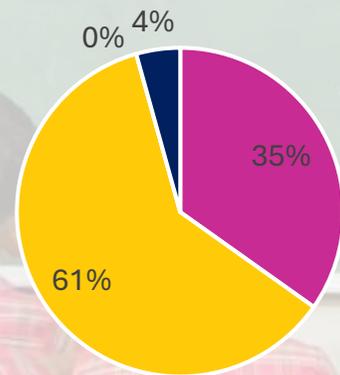


No. of Students



## Achievement in sports

- In August 2023, students of AVMB engaged in block-level sports competitions, excelling in Athletics, Kho-Kho, and Yoga. Team of AVMB: U14 & U17 boys secured 1st place in Kho-Kho and progressed to the district level.
- Notably, Abzal Reliva, a Class X student, clinched 1st position in Shot Put, and Hardev Jadeja from Class IX achieved 1st rank in Long Jump earning the opportunity to represent Mundra block at the district level.



■ Districion    ■ First Class  
■ Second Class    ■ Pass Class

AVMB STD 10 – SSC Board Result (2022-23)		
Sr. No.	Grade	Student
1	Above 80%	8
2	Above 70%	8
3	Above 60%	6
4	Above 50%	0
5	Above 40%	1
Total Students		23

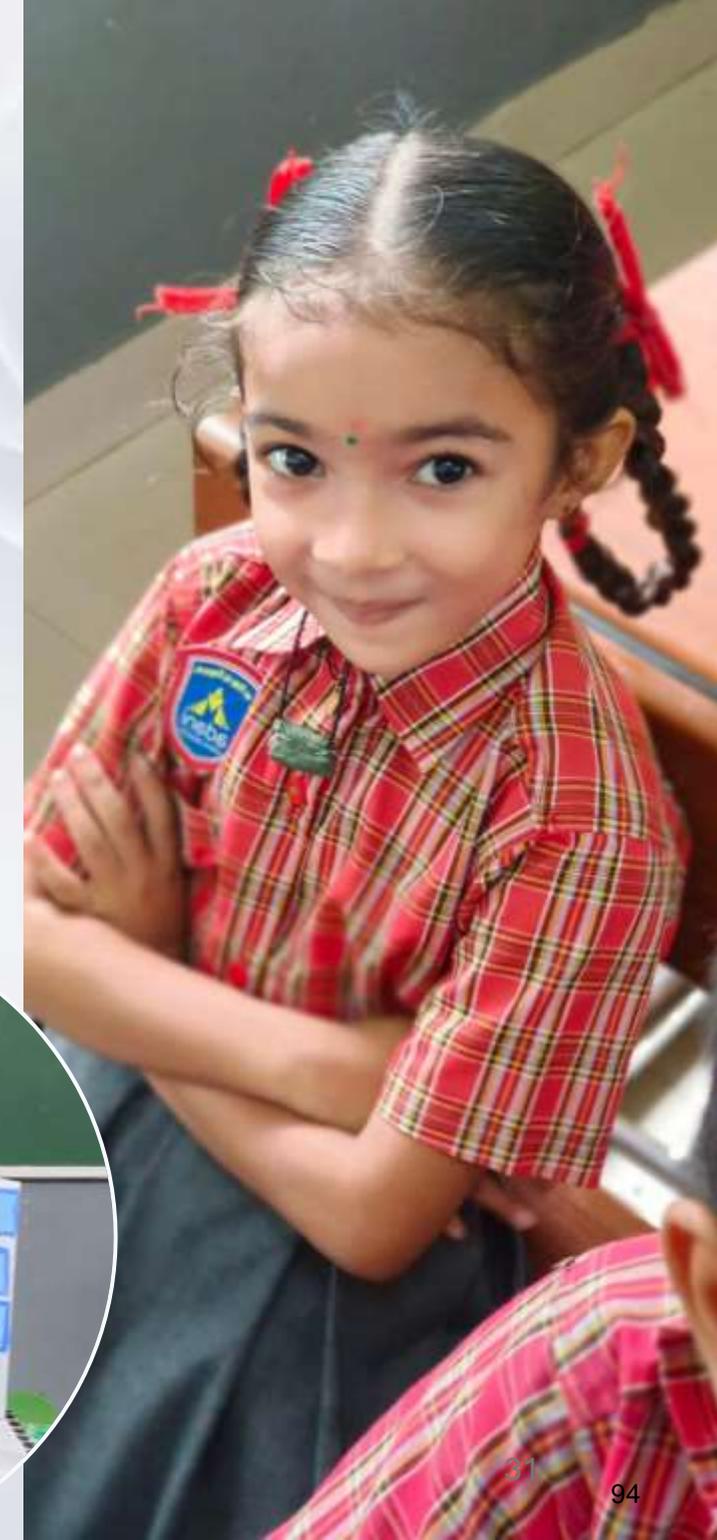


**100%**

**Success in Gujarat Board  
Standard 10th Examination.**

## Achievement in Arts:

- An Essay and Quiz Competition arranged by TATA BUILDING INDIA was organized on the theme of "Recycle". 81 students of AVMB participated. Winners were recognized and rewarded by Tata Group, Rajkot. Winner students received medals.
- School orchestrated a special moment. Parents were invited to the school where they had the honor of presenting medals and certificates to the winning students. Notably, Ms. Manjaliya Najirhussain Hasam hails from the fisherman community.
- 06 Students of Class VI to VIII appeared in PRARAMBHIK VISHARAD examination conducted by BRIHAD GUJARAT SANGIT SAMITI on 14/12/2023, School is waiting for the result.
- 19 Students of Class V to IX wrote inspirational stories in Gujarati language all the stories were submitted to a publisher name: Jagdish Jepu, among them 01 story of Maheshwari Raj of Class IX title: Importance of Every individual" published in "GULSHAN" magazine in 10th edition on 11/10/2023.



# Annual Function in AVMB

- On 5 March 2024, the school celebrated its 12th annual day with a pledge to plant over 25000+ saplings over 3 years in the school premises and in the surroundings, including mangroves in the coastline. The annual day named Utkarsh was aptly linked with the United Nation's Sustainable Development Goals, especially highlighting environmental consciousness.
- Utkarsh gave these students a platform to celebrate the ethos of environmental conservation with a lot of take aways in terms of showcasing learning through models based on SDGs and working models on environment and water conservation. The students presented various sustainability goals through skits, songs, and poetry narration in an enthralling event in AVMB.
- The highlight of Utkarsh 2024 was a pledge that students have taken to plant 25000+ saplings towards greening the region. The fishermen community also came forward to support the children in achieving this pledge. AVMB is committed towards contributing to a secure world. At the event, all 17 SDGs were presented in two sections – 1) Exhibition – through models, charts, and painting and 2) Drama, dance, and songs. The carefully curated event by the teachers under the guidance of the Adani Foundation sensitized the guests on the seriousness of causes, especially the importance of preserving the coastal biodiversity.
- Mr. Jugeshinder ('Robbie') Singh, CFO of Adani Group, chaired the program. He was impressed by the state-of-the-art facilities of the school and especially by the knowledge showcased by the children on the topics which are generally taken up and discussed in higher academics, policy roundtables and corporate chambers. He said, "I am humbled to be here and seeing fantastic knowledge and models presented by these young children. I am sure each of them will make great progress in their lives, become financially independent and help their families, communities and our great nation."







### Natural Farming (Cow based Farming):

Adopting sustainable practices i.e., organic pesticides/bio enzymes, Jivamrut, Vermi compost, and bacterial culture to enhance Agri yield.

- First and Second phase Training given to 2200+ Farmers to motivate for Natural Farming
- 2500+ Farmers supported by 25000+ Fruit bearing Saplings. Natural Farming Training will result in 15-20% increase in income after 3 years.



# Udaan GET INSPIRED Inspiring Minds



## About Project

Udaan is a special project inspired by the life-changing story of Mr. Gautam Adani. As a child, he had visited the Kandla port in Gujarat, and after looking at the expanse of the port, he dreamt of having his own port one day. The rest is history. Under this project, exposure tours are organized wherein school, college students, faculties, employees from corporates are given a chance to visit the Adani Group facilities. Under this project, services are absolutely-free of cost for government schools.

### Vision

To create a pool of inspired young minds for nation building at a global scale.

### Mission

To motivate young students to dream big by exposing them to world-class industrial facilities.



Total no. of visits

**7019**

Total no. of participants

**447541**





**Project Site**

**Mundra, Gujarat**

(Site commenced on Dec 2010)

**Adani Ports and Special Economic Zone Limited (APSEZ)**

India's largest port operator and SEZ

**Adani Power Mundra Limited (APMuL)**

India's largest single location coal based private power plant

**Adani Wilmar Limited (AWL)**

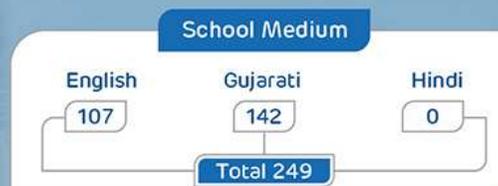
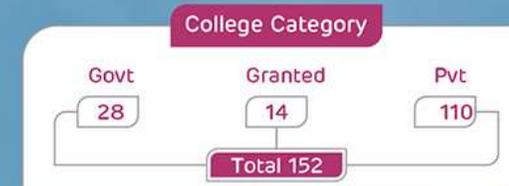
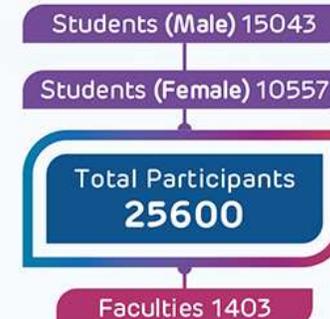
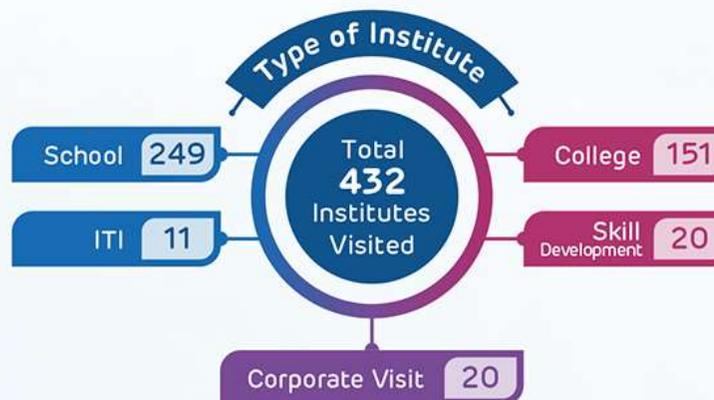
Asia's largest single location edible oil refinery

**MSPVL - Adani Mundra Solar PhotoVoltaic Limited**

India's first and largest vertically integrated solar company

**Mundra Windtech Ltd**

A wind turbine taller than the world's tallest Statue of Unity.





# Sustainable Livelihood Projects

# Sustainable Livelihood - Animal Husbandry

In the face of dwindling rainfall and increasing salinity in groundwater, agriculture is under threat. Recognizing this challenge, the Adani Foundation has initiated various interventions to foster the holistic development of agriculture and animal husbandry.

## Pashudhan initiative:

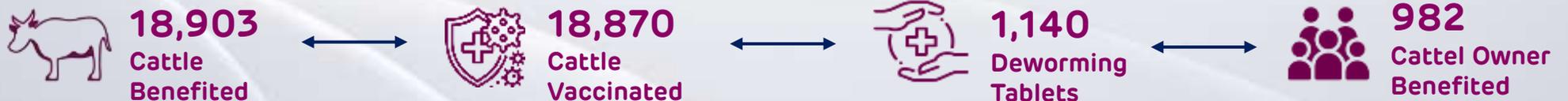
Two vital pillars of this initiative:

Preventive Health Care & Fodder Support Program

### Preventive Health Care: Cattle Health camp

The Adani Foundation, in collaboration with the Animal Husbandry department, organizes cattle health awareness and vaccination programs in 24 villages surrounding our area. These camps bring together government veterinary doctors who conduct check-ups and administer treatments for common ailments. The remaining medicines and vaccines are provided by the Adani Foundation.

These programs are highly effective in maintaining the optimal health of livestock and safeguarding them against deadly diseases like Foot-and-Mouth Disease (FMD) and Clostridial infections. The vaccines used are specifically designed to offer long-lasting immunity against specific diseases, ensuring the continued health of the animals even in harsh environmental conditions.



\* Funded by - Kutch Copper Limited

## Fodder Support:

Our Fodder Support Program is dedicated to assisting our neighboring villages during the challenging seasons of summer, drought, and crop failures. Through this program, we have provided a significant amount of Green and dry Fodder to ensure the well-being of both the communities.

**Adani Foundation provides good quality dry and green fodder to 24 villages in our vicinity, covering 15,005 cattle of 2070 Cattel owners.**

## Grass Land development:

AF converted 18 acres of denuded village common pastureland (Gauchar) into fertile and productive grassland in Zarpara and siracha village to transform into Fodder Sustain village with Community participation and responsibility for maintain and Monitoring.

Among that 18 Acre of Gauchar land is fenced and sowed with Multispecies Green Fodder with Having Good nutritive value. More than 1500 Cattle will sustain with Improving quality and quantity of milk.

1500 cattle get benefitted by green fodder for 30 days – which increase 0.5-liter milk quantity of 50% cattle.

(750 cattle x 0.5-liter milk quantity Increase x 40 INR per liter=Rs.15,000/day).

**This Intervention could benefit ₹ 4,50,000.**

14,38,163 Kg Dry Fodder Support  
45,85,278 Kg Green Fodder Support  
24 Beneficiary Villages  
15005 Cattle Benefitted  
2070 Cattle Owner Benefitted

**“It would be highlighted as best Demonstration and replicate in the other villages as sustainable fodder development project”**

\*Funded by - Kutch Copper Limited



# Sustainable Livelihood - Fisherfolk Community

Persistent efforts for Fisherman development:

**598** Education Kit Support

**273** Fisherman Shelter Support

**1,247** Vehicle transportation  
support

**106** Cycle Support to high school  
going students

**613** Scholarship Support

**419** Youth Employment

**195** Linkages with Fisheries Scheme

**3,534** Ramatotsav Community  
Engagement

**56,523** Man days Mangroves  
Plantation



# Empowering Fisherfolk Communities through Education



## Vehicle Transportation Facilities:

Ensure seamless access to education for school-going children from Luni, Randh and Juna Bandar Fisherfolk Students in reaching the nearest School, eliminating barriers to regular attendance.

**146** Students supported Mundra Taluka  
**58** Students supported at Mandvi Taluka



## Educational Awareness Sessions:

Through targeted awareness sessions in Fisherfolk Vasahats, we promote the transformative power of education, with a particular focus on advancing girl-child education.

**487** Students motivated for high school Education



## Cycle Support:

Overcoming transportation obstacles, our cycle support initiative enables six 9th standard fisherfolk students from Juna Bandar to continue their education with ease.



## Scholarship Support:

Provide scholarship support to 31 deserving students, covering their higher secondary school fees. Emphasizing gender equality, we offer 100% fee support to female candidates and 80% to male candidates.



## Education Kits Support:

Equipping fisherfolk students in grades 9 to 12 with essential tools for academic success, including notebooks, guides, and study bags, we empower them to pursue their educational aspirations with confidence.

**15** Students supported at Mundra  
**42** Students supported by Mandvi



### Assisting During Emergencies:

Fisherfolk Home were significantly damaged by the Biporjoy Cyclone. In response to that we provided 2696 cement sheets to 336 fisherfolk households of Juna Bandar, Luni, and Randh Bandar to support their recovery.

**336** Fisherfolk house benefited



### Fostering Youth Employment:

At APSEZ Mundra, our mission revolves around providing sustainable employment opportunities for the local fishing community. We serve as a bridge between industries and Fisherfolk youth, facilitating job placements to enhance livelihoods. This year, we have successfully engaged 115+ Fisherfolk youth, paving the way for a brighter future.

**115+** Fisherfolk youth employed



### Strengthening Fisherfolk women:

Through comprehensive health and hygiene initiatives, we empower Fisherfolk women. Our programs include family planning resources, menstrual hygiene workshops, nutrition advocacy, and health awareness sessions covering vaccinations, clean water access, and mental health support.

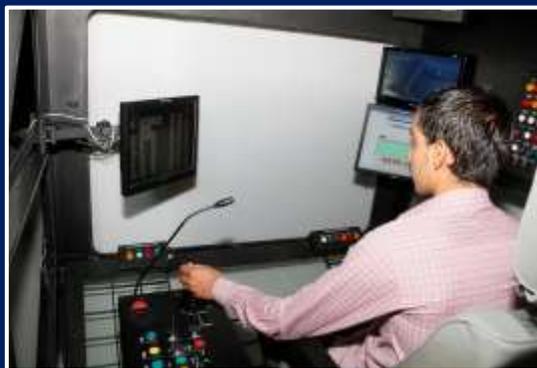
**449** Women benefited



### Potable Water Distribution:

Providing potable water facilities to 9 Fisherfolk Vasahats daily, either through water tankers or by establishing linkages with the nearest Gram Panchayat. This initiative benefits over 5000 Fisherfolk, significantly improving their health and productivity.

**5000+** Population benefited





# Sustainable Livelihood - Agriculture

Sustainable agriculture is a powerful force for good, safeguarding our environment, public health, communities, and the welfare of animals.

Through practices like soil enrichment, diverse crop patterns, eco-friendly cover crops, natural farming methods, orchard development, tissue culture, and water harvesting, sustainable agriculture ensures the well-being of our ecosystem while replacing harmful chemicals with healthier alternatives.

This year, the Adani Foundation continued its strong commitment to advancing natural farming in Mundra. Through various initiatives and partnerships, we provided crucial support to local farmers, empowering them with knowledge and resources to transition to sustainable practices.



**2200+**

Farmers educated in natural farming

**800+**

Farmers embracing natural farming methods

**200**

Farmers got financial assistance of Rs. 10,000

**3**

District level exposure visit

**₹ 36.7 lakh**

Business done by our benefited Farmers

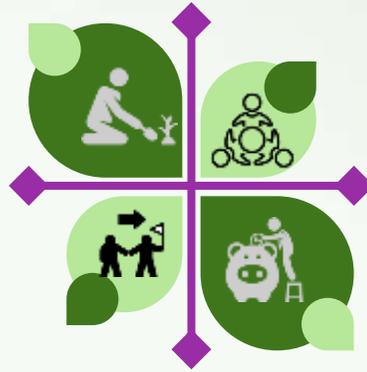
*It's more than just a farming practice; it's a commitment to nurturing our planet and enhancing lives.*

# Promoting Natural Farming

The Adani Foundation is dedicated to advancing natural farming through a cow-based farming initiative. Our interconnected techniques aim to boost farmer yields, with a primary focus on enhancing soil quality. We conduct pre-testing and post-testing to manage soil carbon content effectively. These are our endeavor for promoting natural farming this year:

## Training

Conducted training for **1250 farmers in 16 villages**, enlightening them about the harmful effects of chemical fertilizers. Demonstrated how to produce organic fertilizer using household products, emphasizing its benefits and cost-effectiveness. After adopting it, they witnessed its positive effects on their fields.



## Kitchen Garden Kit

We have supported vegetable kitchen garden kits to 500 farmers with the aim to enable them to grow fresh and nutritious, chemical-free vegetables. This will enhance their food security and promote self-reliance.



## Empowering Farmers

This year, amidst the aftermath of the cyclone, we stood by our farmers and held dedicated meetings with KVK, KCS, and DRC to restore the fallen date trees. Collaboratively, provided JCB, technical support, organic fertilizer etc. Successfully restored **615 trees**. **Each Date trees is projected to yield approximately Rs. 25,000, Total Yield in Next Season:- Rs.1.53 Cr.**

## Financial Assistance

Extend financial support to 200 farmers, each receiving Rs. 10,000, a transaction gracefully facilitated by Mr. R. N. Parmar, virtually transferring funds to their bank accounts, funded by Adani Petrochemicals. This fund will help farmers in planting a total of **53,136 fruit-bearing plants**.

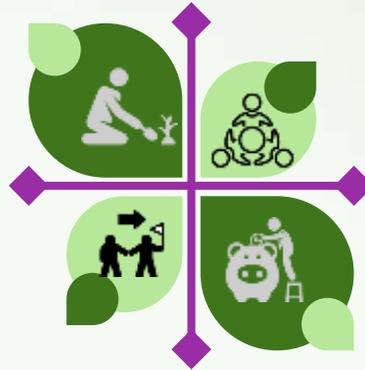


# Raj Shakti Prakrutik Kheti Sahkari Mandali

The Adani Foundation has taken a proactive step by organizing awakening and awareness sessions to promote natural farming practices in Mundra block Villages. These efforts led to the formation of the "Raj Shakti Prakrutik Kheti Sahkari Mandali," comprised of 35 dedicated farmers who are deeply committed to natural farming. These are the activities done assisting the Mandali this year:

## Interaction with Governor

Rajshakti Prakrut sahakari Mandali had Opportunity to meeting with honorable Governor of Gujarat Achrya devvrat at Gandhinagar. They got the valuable knowledge by the him on Natural Farming and gave their farm's vegetables to sir.



## Appreciation by Governor

Governor of Gujarat, Shree Acharya Devvratji, encouraged 25 of our farmers practicing natural farming at the Krushi and Dairy Expo event in Bhuj. He motivating them to continue their commendable work for our mother earth.



## Exposure Visits

Our farmers embarked on three eye-opening exposure visits to Gautech-2023, Bansi Gir Gaushala, and Narayan Dev Dwisatabdi Mahotsav, where they learned about new agricultural tools, various seeds, organic products, and making of Gau Krupa Amrutam organic fertilizer

## Certification by GOPCA

We have successfully **certified 28 farmers** under the Gujarat Organic Products and Certification Agency (GOPCA). Now, they have authentic validation as organic farmers, ensuring they receive the best prices for their farm products.



# Kutch Kalptaru FPO (KKPC) and Prakrutik Mandli

To promote horticulture, the Kutch Kalptaru FPO (KKPC) was established in 2020 by farmers from Mundra Block to address various challenges they faced. With an initial 350 shares held by 280 shareholders, the company is now expanding to include up to 5000 farmers and 537 registered share holders.

In the current year, KKPC began selling 10kg capacity packaging boxes at a minimal profit margin of Rs. 29 per box, resulting in a turnover of Rs. 10.5 lakh and a profit of Rs. 75 thousand. This initiative has indirectly supported over 800 farmers.

Regular director board meetings and capacity-building training sessions have been arranged to ensure effective management and growth. Total Turn over is Rs. 33.67 Lacs current year which is four times higher than last year which shows remarkable progress of FPO.



**800**  
**Farmers**  
**benefited**

**₹ 33.67 lacs**  
**Turn over**



# Green Carnival

Today, finding truly natural, chemical-free food has become a challenge. Our fruits and vegetables are often processed with chemicals, stripping them of their nutritional value. But there's hope. For years, the Adani Foundation has been supporting farmers practicing natural farming methods. However, these farmers lacked a platform to sell their produce. That's why AF has launched the Green Carnival. At Shantivan, Samudra colonies in Mundra, and KCL's Mandvi colony, we've provided a marketplace for these farmers to showcase and sell their agricultural bounty. The response has been overwhelming.

Encouraged by the positive feedback, these farmers have even established an organic produce shop in Mundra, setting an example for sustainable agriculture. Today, over **302 farmers** are part of this initiative.

Previously, these farmers sold their harvest in bulk to vendors. Now, by connecting directly with consumers, they've seen a remarkable **35% increase in their income**.

The communities of both colonies are delighted and eagerly anticipate the Green Carnival every Sunday. Together, we're not just changing food habits, but also supporting the livelihoods of those who cultivate our food, and nurturing a healthier, more sustainable future.

**Total Green Carnivals = 37**

**Total Sell = 8,623 kg**

**Revenue = ₹ 3,01,805**





## Sustainable Livelihood - Women Empowerment

Women's empowerment holds a significant place within the Adani Foundation. Since its inception, the foundation has been dedicated to strengthening women by providing training, essential materials, and creating platforms for them to sell their products. Additionally, the foundation collaborates with the government to establish Self-Help Group (SHG) initiatives, enabling women to conduct their

businesses more effectively and encouraging savings. Through various training programs, the Adani Foundation empowers women, fostering their growth and self-reliance. Moreover, the foundation is acutely aware of hygiene and health, actively involving women in initiatives related to these crucial aspects. The holistic development of women is at the core of the foundation's approach and strategy.

**We dedicated to empowering women both financially and socially. To that end, a comprehensive training program that has reached 850 women across 82+ Self Help Groups with 35+ Lacks saving Corpus, out of which 5 groups have outstanding revenue generation.**

# About - Project Saheli



## Self Help Groups

- ✓ 82 Self Help Groups in coordination with National Rural Livelihood Mission.
- ✓ 850+ Members
- ✓ Over Rs.35 Lacs Saving Amount Corpus



## Job Sourcing - Govt

- ✓ 11 Women supported for application and process of Gram Rakshak Dal, Bank Sakhi , Bima Sakhi and Professional Resouce Person.
- ✓ Average income Rs.4200 Per Month



## Making SHG Self Reliant

- ✓ 16 SHG are making strides towards self-reliance.
- ✓ Various handicraft, dry and fresh food making, stitching, tie and die etc.
- ✓ 175+ women - Monthly average income @ Rs.7000 of each member/Month



## Social Empowerment

- ✓ 2 Livelihood Enhancement Training through RSETI
- ✓ Financial support for business set up
- ✓ Legal rights and domestic violence workshops
- ✓ Family counselling for Job sourcing



## Job Sourcing - Private

- ✓ Coordination for Job by Unnati Portal with Adani Group company companies, Britania, B Medical and Emphazer company
- ✓ 398 Women supported till date for job sourcing.
- ✓ Average income Rs.10200 Per Month

## Revenue of each SHG in the FY 2023-24

Name of IG activity of SHG's/JLG/FPC's	Income 2023-24 (INR)	Cumulative income (INR)
Sonal Saheli	480250	3027450
Jay Adhar Saheli	26,500	252,066
Tejasvi Saheli	325000	3,390,150
Umang Saheli	76500	225800
Vishvas Saheli	26300	511400
Jay Momay Saheli	21000	151500
Meghadhanush Saheli	116950	597450
Sanitary Pad Group	71300	746300
Radhe Saheli	31000	870418
Shrddha Saheli	486580	1107580
Chamunda Saheli	21900	1726400
Jay shakti Saheli	2500	605500
Food Sister Sahlei	898250	898250
Jyot Saheli	40800	40800
Pantjanpir gau Saheli	412000	412000
<b>Total</b>	<b>3036830</b>	<b>14563064</b>

# Highlights of the Work done by our SHG!



## Australia 29th PM visit: Exhibition in Adani Solar

The 29<sup>th</sup> PM of Australia, Mr. Malcolm Bligh Turnbull and his wife Lucinda Mary Turnbull visited Adani, Mundra. At Adani Solar, they saw our 20+ SHG exhibition stall and interacted with over 180 working women from SHGs. Mr. Turnbull was genuinely thrilled to see women stepping out of their homes, crafting beautiful pieces, and supporting their families. Mr. Malcolm Bligh Turnbull – “It’s empowering to witness women taking charge of their livelihoods and making a difference.”



## Sathwara Mela 2023-24

The event unfolded with the captivating theme of 'Powering Art Empowering Women,' setting the stage for an extraordinary celebration. Held at the prestigious Adani Corporate House in Ahmedabad, the inauguration was graced by the esteemed presence of the Honorable Chairperson of AF, Dr. Preeti G Adani, Mrs. Shilin R Adani, and Shri V.S. Gadhvi. We were delighted to welcome over 500 enthusiastic visitors to our stall, contributing to the resounding success of the event. **Notably, SHG Groups earned a remarkable income of over Rs. 75,000.**



## Switzerland delegate visits SHG

Switzerland delegates made a memorable visit to Adani Solar to witness the exceptional craftsmanship showcased by our SHG exhibition. Captivated by the intricate artwork, they engaged with the women, gaining a profound understanding of their skills and purchasing a significant quantity of goods. **Overwhelmed by the quality of workmanship, they graciously extended their support by sponsoring \$100 (90,000 INR) towards our SHG.** This monumental gesture marks a historic milestone for our group.



### Handicraft Day Celebration

After 3-day training from Shrujan, hosted an exhibition showcasing handmade crafts by women, alongside interactive workshops on handicraft techniques.



### Workshop on Women Health

Aware the women connected to our SHG about mental and menstrual health care, benefited over 130 women, especially those neglecting personal well-being during menstruation.



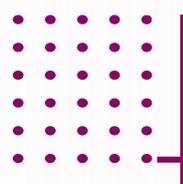
### Gauchar Cleaning Abhiyan

At Bujpur, 31 women initiated the 'Gauchar Cleaning Abhiyan,' with support from AF's Loader Machine. This collaboration aims to enhance environmental preservation and community development.



### Women's Day celebration

Celebrated Women's Day with entrepreneur training and mental peace awareness sessions, attracting over 100 participants.



# Community Health



Ensuring good health is not just a priority; it's the cornerstone of a thriving community. At the heart of Kutch, the Adani Foundation is dedicated to nurturing well-being and facilitating access to expert medical care. Collaborating closely with G.K General Hospital in Bhuj and Adani Hospital in Mundra, we tirelessly strive to enhance community health standards.

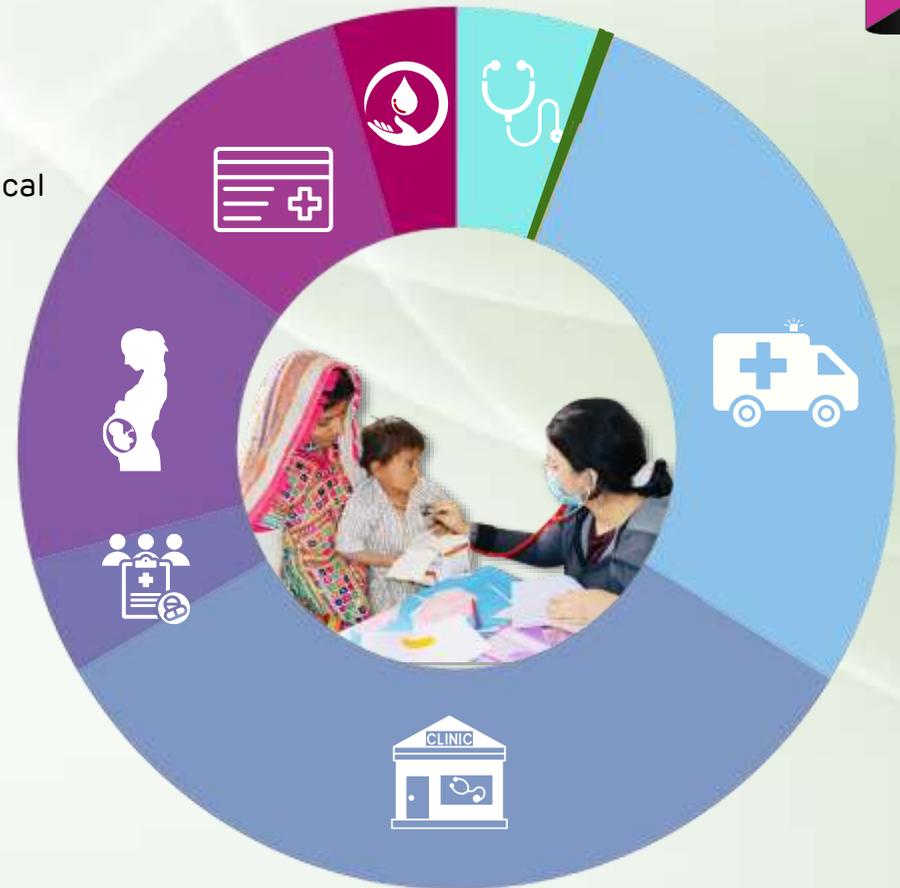
For over a decade, our commitment to community care has been unwavering, manifested through our Mobile Health Care Units, Rural Clinics, and Ayushman Cards linkages with the beneficiaries and THO. In recent years, a concerning trend of Viral, kidney and ortho related diseases has emerged due to salinity ingress. In response, we have orchestrated a series of specialized health camps to address these issues, offering essential treatment support while fostering awareness about preventive measures.

We firmly believe that both preventive and curative healthcare are fundamental pillars for sustaining community well-being and fostering economic prosperity. Our aim is to strike a harmonious balance, paving the way for a journey of longevity, vitality, and fulfilment for all those under the care of the Adani Foundation.

# Summary of Healthcare Initiatives for the Year

This year, we provided **41,546** medical health services and conducted health awareness camps for **763 High school students**. Our annual medical facilities have made a significant impact in improving healthcare access and awareness. Here are the direct beneficiaries of our endeavor:

-  **2,108** Medical Support to needy patients
-  **118** Dialysis Support
-  **10,477** Mobile Van
-  **12,850** Rural Clinic
-  **1,618** Health Camp
-  **5,795** Specialty Health Camp
-  **6,865** Ayushman Card till date
-  **1,715** Blood Donation Camp



-  Medical Support – 5.5%
-  Health Camp – 4.3%
-  Dialysis Support – 0.3%
-  Specialty Health Camp – 15%
-  Mobile Van – 27.2%
-  Ayushman Card – 10.02%
-  Rural Clinic – 33.3%
-  Blood Donation Camp – 4.5%



## Rural Clinic & Mobile Health Care Unit

Health stands as the cornerstone for community development, and to revolutionize rural healthcare, the Adani Foundation has launched the 'Mobile Health Care' and 'Rural Clinic Service'. These initiatives aim to offer primary, preventive, and curative healthcare services accessible in remote and inaccessible areas, a commitment upheld for over a decade.

### Rural Clinic



Rural clinics extend their services to 5 villages in Mundra and 2 villages of Mandavi Block. The services of both MHCU and Rural Clinics are accessible to patients at token charges of Rs. 20 per visit.



### Mobile Healthcare Unit

MHU is equipped with a range of integrated medical devices enabling staff to conduct preliminary check-ups. With over 90 types of essential lifesaving medicines available, the Mobile Health Care Unit covers 29 villages with 7 fishermen settlements. Services provided include blood pressure checking, sugar testing, and ECG assessments.



# Ayushman card facilitation

In a world where medical costs are overwhelming, the Ayushman Card offers hope by providing affordable access to quality healthcare. The Adani Foundation bridges the gap between the government and those in need ensuring that 3865 people received this vital resource. Ayushman Bharat PM-JAY provides Rs. 10 lakhs per card owner for secondary and tertiary care, Adani Foundation is aiming to achieve 100% coverage in Mundra's villages.

**25** Village

**6,865**

**Ayushman cards Issued**

**686.50 Cr**

**Health insurance**

*\* Funded by - Kutch Copper Limited*



# Supporting Individuals



The Adani Foundation extends financial assistance to the most economically challenged patients facing life-threatening diseases such as those related to the heart, liver, kidney, and cancer. This support comes with minimum participation requirements, ensuring access to crucial medical care.

In the current year, a total of 2,108 patients from Mundra, Mandavi, and Anjar Block have received support at Adani Hospital, Mundra. This assistance underscores our commitment to providing essential healthcare services to those in need, regardless of economic status. The medical staff of GKGH stood with us in these endeavors.

# Dialysis Support



In the arid region of Kutch, particularly in Mundra where saline drinking water is prevalent, cases of urinary stones and kidney failure are significant. To address this issue, a dialysis support project has been initiated to provide essential dialysis treatment to the most vulnerable patients, enabling them to lead healthier lives.

This year, a total of 2 patients have been supported with regular dialysis sessions, twice a week. Regular dialysis sessions have notably improved the patients' conditions, extended their life expectancy and enhanced their quality of life.

# Special Camp

## Cataract-Free Mundra



The initiative is a dedicated effort to eradicate cataract-related vision impairments specially focused on Senior citizen through Meticulous planning as below.

**Lives Impacted :- 1131**

- Comprehensive Eye Screenings at Village level
  - Cataract Surgeries to GKGH ,Bhuj
  - Post-Operative Care and Follow-up
    - 5 successful Operation



This year Adani Foundation organized numerous special health camps, such as blood donation camps where 1715 donors contributed, helping save countless lives.



Conducted health programs for students, engaging 763 participants, and held sessions on Personal Health & Hygiene Awareness, addressing critical health issues and promoting overall well-being.



Our camps for pregnant women provided essential prenatal care, ensuring healthier pregnancies and safer deliveries. It benefited 809 pregnant women.



Conducted a pediatric health camp, nurturing the health of 628 children and ensuring their well-being.

GKGH medical staff support in all camps.

# Preventive health Campaign

The Adani Foundation is focusing on providing preventive healthcare to women and adolescent girls, raising awareness of Physical and Mental health issues, promoting healthy behaviors, implementing Menstrual hygiene initiatives and Millet consumption for healthy body.

## Sample Survey Report 2023-24

- 55%** Never heard about Menstrual hygiene
- 60%** Are using cloths on regular basis
- 36%** Had never used sanitary pads
- 68%** Had no information about UTI
- 30%** Never used millets in their diet
- 60%** Never heard about millets or it's benefits.



## Menstrual & Mental Health Awareness Drive:



We organized impactful awareness camps in various villages, empowering women and adolescent girls with knowledge about menstrual hygiene, ensuring both physical and mental fitness.

### Impact:

- 36%** Growing usage of sanitary napkins
- 22%** reduction in UTI
- 2610** women & girls benefited

## International year of Millets – 2023



To promote millet culture and raise awareness about its benefits in Mundra, we organized a Millet Competition across nine villages. **Over 715 women took part in the competition, while 2200 benefited from awareness sessions. Through this initiative, 300 indigenous millet recipes were showcased**, highlighting the potential for sustainable and nutritious dishes in our daily diets.

### Impact:

- 65%** of women are using millet in their regular diet.
- 17%** Women grappling with obesity and diabetes are experiencing positive transformations in their health, evident in significant weight loss.

# Millets Food Festival

In the wake of the "International Year of Millet" in 2023, KCL took decisive steps to promote the nutritional and empower women from remote area of Mundra Taluka.

Across the villages of Mundra Taluka, KCL organized a series of millet awareness camps and a thrilling millet food competition. The response was nothing short of remarkable, with 715 women actively participating and sharing 300 indigenous millet recipes. To commemorate this achievement, we hosted a grand millet festival at Adani House, in which 120 women showcased a diverse array of millet dishes, each one bursting with flavor and nutritional value.

But the significance of the event extended beyond mere culinary delight. Women spoke of how millets had become integral to their lives, aiding them in combating long-term ailments. They are very much grateful for these awareness camps and look forward to such health-promoting events.

At this event, we had the privilege of welcoming esteemed guests, including Mr. Sujal Shah (CEO, APSEZ), Mrs. Rachna Joshi (President, Mundra Nagar Palika), Mr. Pandya (Program officer, ICDS), Mr. Saurabh Shah (Head Corporate Affairs, APSEZ), and Mrs. Nehalben (Nutrition expert). Their presence added immense value to our gathering.



# Community Infrastructure Development

Adani Foundation is dedicated to enhancing the quality of life of communities under the Community Infrastructure Development Initiative. It acknowledges the government's role in providing fundamental infrastructure facilities and strives to bridge gaps, ensuring its activities are tailored to meet specific needs and responsive to grassroots requirements.

Some of the initiatives include constructing check dams, deepening ponds to augment water storage capacity, infrastructure support to fisherfolk communities, developing secure education premises and facilitating access to clean drinking water for villagers.



# CID endeavor of FY 2023-24



Renovation Check dam and CC road work at Nani Khakhar – 200+ benefited



Renovation of High School at Zaarapa – 2200+ Benefited



Construction of Pipe Culvert – 400+ Benefited



Construction of chain-link fencing at Mangra village – 300 people benefited



Gaushala Shed at Zarapara village – 400 cattle benefited



195 Stall – Vegetable market– 900+ Vegetable vendor benefited



Renovation of approach road, Zarapara – benefiting 400 villagers



Renovation of Civil and Electrical Work at ITI, Mundra - 500 students benefited

# CID endeavor of FY 2023-24



Construction of 21 Borewell Recharge in Nagmati River - 150+ farmer benefited



Check dam Desilting and restoration at Nana Bhadiya – 100+ farmers benefited



Renovation of Check dam at Pavadiyara village - 300 people benefited



Renovation of Balwadi at Juna bandar & Luni bandar



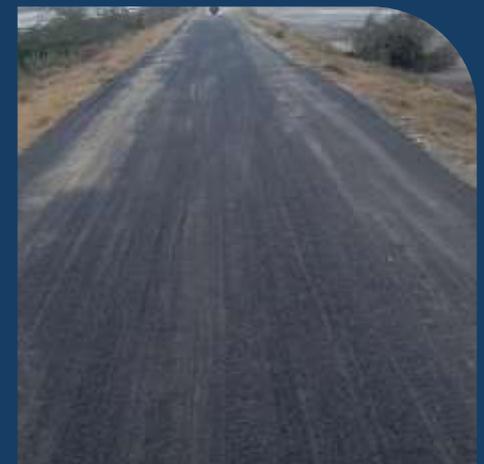
185 RRWHS construction is ongoing in various villages - will benefit 1300+ residents



Supply & installation of Solar pannel (3.25 KV) at CGP, Mundra – benefiting 1200 people



Development of Model Farm in Zarpara, Siracha & Mangra – Benefiting 300 people



Renovation of approach road at various fisherfolk vasahat

# Community Resource Centre



Government Scheme Facilitation				
Sr. No	Scheme Detail	Gov. Support Rs/Month.	Total Beneficiaries	Total Amount per Month (INR)
1	Widow Pension	1250	674	28323150
2	Bal seva Ayog	2000	49	3430000
3	Divyang pension	1000	27	586000
5	Niradhar Pension	1000	126	5178000
6	Palak Mata Pita	3000	5	696000
<b>Total</b>			<b>1439</b>	<b>38213150</b>



Community resource Centre is the bridge between Government Schemes and real Beneficiaries. It is situated at Adani Field Office, Baroi with the motive to be Single window point solution (Online Application & Documentation) to Facilitate Government Schemes leveraged to needy and Eligible people.

**Till Date 1439 beneficiaries are getting aid of Widow Pension scheme, Senior Citizen and Divyang pension scheme and Palak Mata Pita Scheme 3.81 Crore Monthly by procedure support of AF.**

# Key Achievements of Community Resource Center

One time

Sr.No	Gove Scheme one Time	Gov. Support	Total Beneficiaries	Total Amount/Year
1	Covid Support One Time	50000	12	600000
2	Vahali Dikri @ 18 Year	110000	113	12430000
3	Divayang Sadhan Sahay one time	5000	176	880000
4	Manrega (NB21)	22000	32	704000
5	Pagadiya Sadhan Sahay Yojana	9000	9	81000
6	Gau Dattak Yojana	10800	857	9255600
7	Gobardhan Yojana	42000	100	4200000
8	Fishermen Shram Yogi Yojna		163	
			<b>1487</b>	<b>28150600</b>





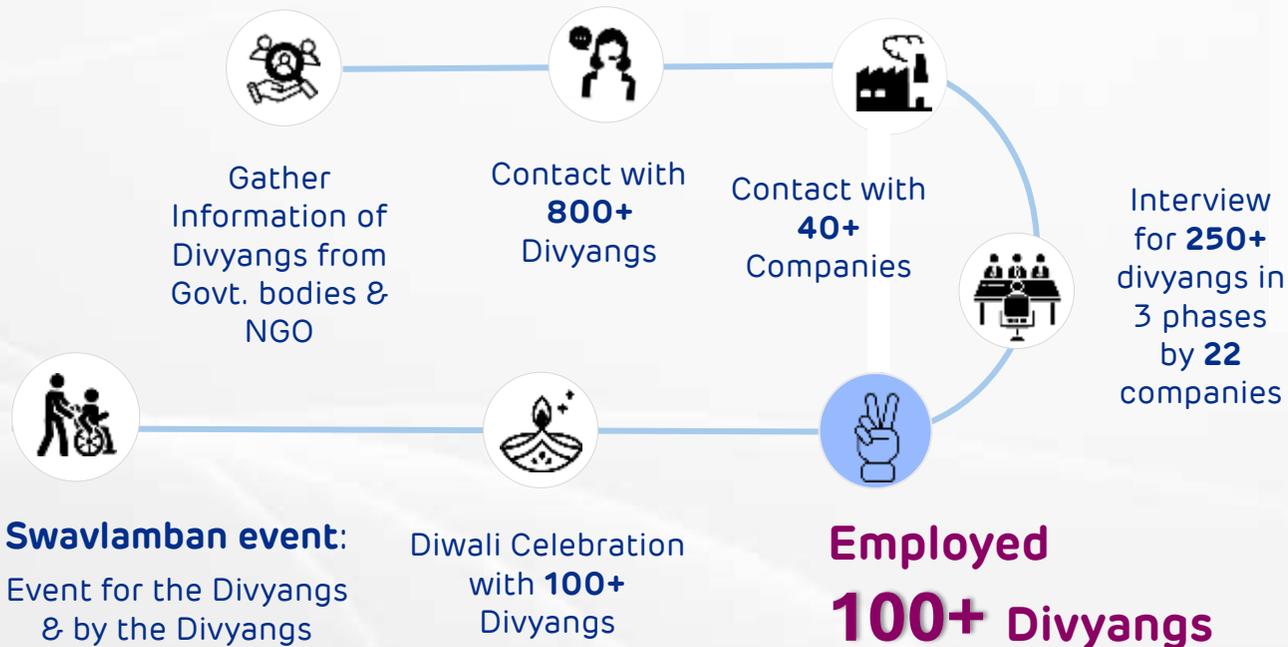
# Swavlamban - Project for Divyangs

Adani Foundation's vision extends beyond Aid, focusing on dignity and sustainability through meaningful employment. While equipment support offers mobility, employment bestows the dignity to stand tall in society.

With noble intentions in mind, this year, we organized a mega employment drive. Our goal is to provide job opportunities to over 100 disabled individuals.

We've conducted interviews in three phases, for 250+ divyang candidates engaging 22 companies from Adani Groups and other reputed firms in Mundra.

➤ Roadmap of this incredible vision:



# Diwali Celebration

After the successful completion of the 1st phase of the Divyang Employment Fair on November 8th, we gathered to share the joy of Diwali with over 100 remarkable divyangs.

In the spirit of uplifting divyangs, we have also invited advocates dedicated to the well-being of disabled people. Mrs. Anni Rakshit Shah and Mrs. Rupa Kapoor graced us with their presence as chief guests. Our invitation also extended to the HR representatives of Adani Group and SEZL companies.

On this auspicious occasion, we **equipped 32 divyangs with essential tools such as wheelchairs, tricycles, harmoniums, and facilitated 10 divyangs through government schemes.**

To express our gratitude to those who have dedicated their lives to improving the lives of disabled individuals, we honored them with certificates and mementos.

Just as we light up our homes with glowing diyas during Diwali, the smiling faces of these divyang individuals illuminated our Adani House during this event. It was a celebration that went beyond the ordinary, leaving a lasting impression of compassion and unity.



# Swavlamban Event

In the spirit of hard work and dedication, the Adani Foundation concluded its Divyang Employment Fair, marking a significant milestone in transforming lives. Through three phases of dedicated effort, the Foundation successfully secured over 100 employments, providing a newfound sense of self-reliance to individuals with disabilities.

Notably, 35 divyangs were equipped with essential employment tools, fostering self-sufficiency. To commemorate this achievement and honour the divyangs, companies, and advocates of inclusivity, the Foundation organized the Swavlamban event on December 5th at GAIMS, Bhuj.

The event garnered the presence of esteemed personalities, including Jeet Adani, Director of Adani Group, V.J. Rajput, Commissioner for Persons with Disabilities, and Nimesh Pandya, Ed. of Kutch collector, among others.

This celebration was a testament to the Foundation's commitment to redefining the narrative around disability and employment.

As the Adani Foundation rejoices in this achievement, it reaffirms its commitment to ongoing efforts that positively impact the lives of differently-abled individuals, embodying a vision of a more inclusive and empowered society.



# Our Pride from Divyang Employment Fair !



**Bhimaji Maheswari**  
DEO, Mundra Windtech Ltd



**Patani Govind Babu**  
Document Officer, KCL, Mundra



**Arjan Gadhavi**  
DEO, Adani Solar, Mundra



**Govind Maheswari**  
DEO, Mundra Windtech Ltd



**Devangh Gadhavi**  
DEO, Adani Solar, Mundra



**Jadeja Natubha Gangji**  
KCRC NGO, Bhuj



**Arti Nilesh Jethva**  
Trainer, ASDC, Mundra



**Bharat Makwana**  
CMR, Admin, Adani house

# Adani Skill Development

Adani Skill Development Centre (ASDC) is dedicated to enhancing employability and entrepreneurship. This year, ASDC has trained 50,00 individuals across Kutch, resulting in 65% livelihood generation. Their innovative courses cover diverse sectors, and they have played a significant role in empowering marginalized communities in places like Mundra and Bhuj, Gujarat. ASDC's vision is to make everyone skilled and employable, meeting industry demands through trained manpower.



## ASDC Mundra Center

Course Name	Gender Category		Total
	Female	Male	
Digital Literacy	04	03	07
Mud Work	180	00	180
JOC (RTG Crane Operator)	00	79	79
Hydrography	00	03	03
Advance Excel	00	18	18
Domestic data entry operator	23	30	53
Tally with GST	02	00	02
Hand Embroidery	170	00	170
Dori/ Macramé Work	90	00	90
Food & Beverage	20	12	32
General Housekeeper	60	00	60
Beauty Therapist	40	00	40
<b>Total</b>	<b>589</b>	<b>145</b>	<b>734</b>

## ASDC Bhuj Center

Course Name	Gender Category		Total
	Female	Male	
General duty Assistant	84	20	104
Digital literacy	46	16	62
Hydrography	9	0	09
Industrial Safety	1	0	01
5S	1	0	01
Entrepreneurship Development program	60	0	60
Domestic data entry operator	25	0	25
Financial Literacy	64	0	64
Diet and Nutrition	50	0	50
First aid	18	0	18
Interview skills	11	0	11
<b>Total</b>	<b>369</b>	<b>36</b>	<b>405</b>

# ASDC Mundra Center

At Mundra Center ASDC, our mission is to equip young individuals with the skills necessary for success. In the current year, a remarkable 734 youth have undergone comprehensive skill training. Our unwavering commitment extends to ensuring that every aspiring professional receives an opportunity for growth and development. Almost 99% of our fees are tied up with various companies, allowing students to access high-quality training without financial barriers.

## Other Activities & Achievements

- i. Women Empowerment through Skill Training: Provided Mud work training to 180 women in Mundra taluka villages supported by MPL.
- ii. RTG Crane Operator Training: Collaborated with APSEZ HR Team to train 79 students.
- iii. Dori Work and Hand Embroidery Training: Benefited 90 women in various Mundra villages supported by MPL.
- iv. Health Awareness and Career Sessions: 108 Ambulance Department enlightened GDA trainees at Adani Institute of Medical Sciences. Guest session on career advancement led by Mr. Kapil Goswami.
- v. Exposure Visit for Women: Women trained in Mud Work, Dori Work, and Hand Embroidery showcased their skills during a visit by foreign delegates to the Solar Plant.
- vi. Women's Related Training Seminar: Held at Matr Vandana College, Bidada, Mandvi.



# ASDC Bhuj Center

ASDC Bhuj, established following successful skill development initiatives, is a beacon for aspiring professionals. Driven by youth demand, this center plays a pivotal role in providing crucial training for self-development and enhancing personality traits.

Our mission is clear: to equip young individuals with essential skills that position them for success in the job market. With almost 58% of fees tied up by ASDC through strategic partnerships and 42% of fees contributed by students, we ensure that financial barriers do not hinder skill acquisition.

## Other Activities & Achievements

- i. Commendation from Shree Jeet Adani: Received appreciation for supporting the Divyang job fair.
- ii. Employee Development Initiatives: Conducted Advanced Excel training for 18 Sumitomo India Ltd employees
- iii. Entrepreneurship Development Program: Organized a comprehensive 12-day program with 60 diverse candidates.
- iv. New Trainee Orientation: Conducted sessions about SAKSHAM center and LMS registration at the Bhuj Centre.
- v. Civil Defense Training (5 days): Covered essential topics including Disaster Management, First Aid, 181 Mahila Helpline, 108 Emergency Services, and Fire Safety.
- vi. F&B & Housekeeping Batch Inauguration: 92 students trained to enhance employability.
- vii. Indo-Euro Project Seminar: Arranged at various Nursing Colleges in Kutch District. Focused on German Language training and job placements.
- viii. Crucial Meeting with ISAR & UNICEF: Discussed future skill development challenges and transgender equality on 9th December 2023.



# AKBPTL - TUNA



## CID:

The paver block work at Vandi and Tuna Common Gathering which enhances their usability and convenience for the community. Community hall Room construction at Rampar is completed. It will benefit 1010 fishermen.



## Potable Water Distribution:

Potable water (17.5 KL per Day) Distribution to Vandi, Vira and Dhavar varo Bandar on regular base through Water tanker Regularly through **AKBTPL and GWIL**. This initiative **benefited 2230 Fishermen**.



## Prakrut Rath -Tree Plantation:

Total 3000 Tree sapling were distributed to individual, And 500 tree have planted at Common place and school with ensure their responsibility for watering and caring.



## Fodder Support:

Support of Dry & Green Fodder to Tuna and Rampar Village and Gaushala during Scarcity. That impacted on Cattle health and Milk Productivity.

**7410 kg** Dry fodder

**4,47,473 kg** Green fodder

**1228** Cattle Benefited



**3000**  
Tree  
plantation



**193** Benefited by  
Mobile Van

**56** Benefited by  
Medical support

# AGEL – Khavda

Adani Green Energy Ltd. Khavda renewable solar plant is a hybrid power project that will use both solar and wind energy to generate electricity. It will be built in the Khavda desert along the Indo-Pak border in Kutch district of Gujarat, having a total capacity of 20,000 megawatts (MW), making it the world's largest hybrid renewable energy park and will be cover an area of 72,600 hectares of waste land. It is expected to play a major role in fulfilling India's vision of generating 450 gigawatts (GW) of renewable power by 2030.

## Our Vision for Khavda:



**Empowering through Education:** Elevate overall academic results, champion girl child education, and ignite a passion for technical streams. We aspire to pave the way for stable employment, fostering a prosperous livelihood for the youth.



**Empowering Khavda's Women:** Empower 1000+ women socially, economically, and financially through the establishment of a strong federation "Sarhadi Mahila Vikas Sangathan"



**Elevating Healthcare:** Provide quality healthcare services in 22 villages of Khavda, with a primary focus on enhancing women and child health.



**Water Positive Villages:** Achieve water positivity in 8 villages of Khavda through our dedicated water conservation structures. We aim to create sustainable solutions for water availability, ensuring a secure and flourishing future for these communities.



## Transforming lives in Khavda!

Nestled deep within the remote borderlands of Kutchh, Khavda grapples with the harsh reality of limited access to fundamental necessities: education, healthcare, clean water, and crucial preventive care for women. In response to these pressing challenges, the Adani Foundation has embarked on a transformative journey, launching four visionary projects aimed at illuminating hope and progress across Khavda and its surrounding villages.

Recently, luminaries including Mr. Amit Arora, the Collector of Kutchh, Mr. Verma, Plant Head of AGEL, and Mr. Sanjay Avinash, BSF Head Bt.72, convened with local leaders from 26 villages to honor the Foundation's unwavering commitment.

Amidst accolades and appreciation, Mr. Amit Arora lauded the Foundation's healthcare initiatives and advocated for further support, proposing the launch of an "Arogya Van" to bridge the gap in access.

Echoing this sentiment, Mr. Sanjay Avinash championed the pursuit of higher education, heralding a beacon of hope for the community. As the event culminated with the felicitation of five specialist doctors by the District Collector, it underscored the profound impact of the Adani Foundation's endeavors, igniting a flame of optimism that illuminates the path towards a brighter tomorrow.



# Endeavor In Core Areas:



## Education – Project Utthan:

Through our Utthan project, we've embraced 8 high schools.

**Our mission: Elevate 10th board results, boost attendance, slash dropout rates, promote girls' education, and uplift education quality in Khavda.**

At this high schools, we've enlisted 8 dedicated Utthan Sahayaks, equipped with specialized training. They're laser-focused on bolstering core subjects such as Math, Science, and English. Additionally, we've brought on board 2 community mobilizers, tasked with persuading parents to prioritize their children's education, particularly for girls.

Fostering ambition & motivation by facilitating with Industrial visit & notebook distribution



**Empowering 364 Students**



## Health Care:

The community struggles with limited healthcare resources, including just one CHC with a single general doctor, no specialized care for women and children, and insufficient diagnostic equipment. Financial constraints further hinder access to medical services.

**To improve healthcare, we're tackling diseases in two ways: through health camps and Adani Arogya Karyakram Khavda CHC for treatment, and dedicated awareness camps for prevention.**

### Curative Health Camp:

#### Adani Arogya Karyakram Khavda CHC:

Gynec	Pedia	Physi	Ortho	Optho
555	640	283	206	197

#### Health Camp:

Gynec	Pedia	Physi	Ortho	Optho
278	455	579	61	139



**42 Villages benefited**



**3433 patients benefited**

### Preventive Health Camp:

Actively promoting preventive health awareness through family planning education, menstrual hygiene workshops, nutrition advocacy, mental health awareness sessions. Conducted 49 training in 38 villages.



**1453 Women Benefited**



**1300 Pad Distributed**

# Endeavor In Core Areas:



## CID – Water Conservation

In Khavda, water scarcity is critical: supply is weekly, groundwater levels are low, and villagers and animals share a single pond. Students drink unfiltered water at school, and rainwater flows away, unused.

1. Kuran village – Pond deepening & Filter well
2. Tuga village - Check dam maintenance



**15 lakh cum**



**3600+ villagers benefited**

## Other CID work

1. Roof Shed in khavda High school
2. RO plant in 5 High school

**350+ students benefited**



## Farmer welfare:

In Khavda, agriculture struggles due to limited knowledge and challenges like water scarcity and soil fertility issues, despite 80% of the population being engaged in dairy farming.

To educate farmers we organized an awareness camp for **275 farmers**, encouraging them to join the **ATMA Government Sanstha**. This initiative aims to provide guidance on conventional agriculture techniques and exposure to modern farming methods and tools.



## Women Empowerment:

Women empowerment initiatives are underway, emphasizing financial independence and self-reliance.

Conducting awareness camps across 38 villages, we're educating women about the importance of having Saving Accounts, Through awareness camps, established Saving Account Groups, forming 7 SHG with 150 women.



**15 SHG formed**



**150+ Women Economically Empowered**

# Green Energy



# AGEL – Dayapar & Mandvi



Dayapar Adani Wind Energy project is a large-scale wind power project located in the Kutch district of Gujarat, India. It is one of the biggest wind farms in the country, with a total capacity of 575 MW. The project was developed by Adani Group and Inox Wind, its project was commissioned in April 2019 and supplies clean energy to various states in India through power purchase agreements with Maharashtra State Electricity Distribution, NTPC and PTC India.

## Our Vision for Dayapar & Mandavi:



**Water Positive Villages:** Achieve water positivity in 42 villages of Dayapar through our dedicated water conservation structures. We aim to stablish sustainable solutions ensuring reliable water availability.



**Improve Animal Husbandry:** Focus on the health of cattle by providing vaccinations, medical treatment, and highly nutritious food to cattle. Helping Cattle owners to generate good revenue and sustain their livelihoods.



**Enhance Education:** Enhance the school's infrastructure and financially support students for educational equipment, providing them with a modern classroom environment equipped with the modern technology.



**Health Services:** Provide medical services to 3500 people of Dyapar and connect them with government medical schemes.



# Endeavor In Core Areas:



## CID – Water Conservation

Kutch suffers from a water shortage, particularly in the Dayarpar region, which receives the least amount of rainfall and has high TDS groundwater. To conserve as much water as possible in the AGEL Dayarpar region, the Adani Foundation has initiated various pond deepening and check dam restoration projects.

### Sustainable Water Management projects:

1. Pond deepening in 8 Villages
2. Check Dam renovation & deepening in 2 villages
3. Over Head Portable Water Tank in 1 village

**10.4 lakh cum**  
Water capacity

**985 acers**  
Water rich land

**1500+**  
Farmers Benefited

**50,000/Ltr**  
Capacity of Over head water tank



## SLD - Kamdhenu:

The Dayapar people rely largely on animal husbandry as their second most important income source, after agriculture. But villagers lack in sufficient knowledge on the dietary needs and vaccinations for cattle.

To educate them we are organizing cattle treatment and vaccination program, workshop on Animal Husbandry, and participating in Krushi Mela providing cattle owners mineral mixers to improve animal health and milk production.



**455**  
cattle owners  
provided Mixture  
Mineral

**1500**  
cattle Vaccination

# Endeavor In Core Areas:



## CID - Education:

Committed to improving educational infrastructure to ensure every student in Dayapar has access to safe and quality education environment. Through smart classes and material support, we're easing financial burdens and creating engaging learning environments. For good health of students ensuring portable water facility and tree plantation drive in schools.

Support	School
LED TV for smart class	3
Morden Education tools	2
Education kit support	2
Portable water facility	3
Eco club	1
School renovation	2



## Health Care:

In AGEL Dayapar region, the health condition is concerning with major diseases like kidney stones and arthritis are prevalent in the villages. To battle this situation we are conducting health camps and organized Ayushman Bharat card camps. During these events, we distributed medicine free of cost to patients and provided recommendations for optimal treatment to those in need.

**AGEL/ Adani foundation have supported 20 different equipment like Cardiac Machine, Semi auto analyzer, and other medical tools at CHC Dayapar which is going to facilitate 56 villages benefiting 62,500+ population.**



**618** Health camp Beneficiaries

**86** Ayushman card Beneficiaries

**₹8.6** Cr. Medical Coverage



**13**  
Schools  
Benefited



**1500+**  
Students  
Empowered

# Adani Cement - Sanghi



Adani Cement Plant, prominently located near Moti Ber Village in the Abdasa block of Kutch, Gujarat, stands as a distinguished entity in the cement industry. Our facility is not just a cornerstone of the local economy, but also a pivotal contributor to the community's development. With a robust and integrated manufacturing infrastructure, we boast:

- A 6.6 MMTPA (Million Metric Tones Per Annum) capacity Clinker Plant
- A 6.1 MMTPA capacity Cement Plant
- Power generation facilities with a capacity of 143 MW.

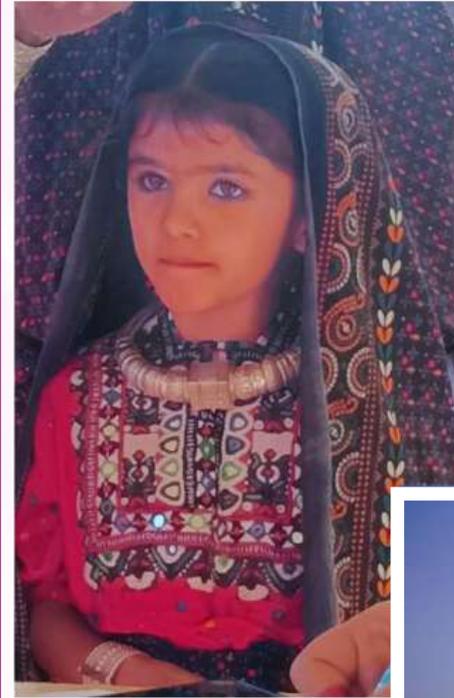
## About Abdasa:

Abdasa is a region of Gujarat's Kutch district, defined by its diverse geography and rich cultural tapestry, influenced by different communities, agriculture crops and livestock rearing, particularly cattle and camel husbandry, is integral to the region's livelihoods.

The coastal areas support fishing communities, despite progress in infrastructure and development, Abdasa faces challenges related to water scarcity, education, and healthcare, while its diverse culture and unique landscapes continue to define its identity.

## Our vision:

**To foster and create a sustainable future for all by providing affordable and accessible facilities at the core of health, education, livelihood, and infrastructure.**



# Endeavor In Core Areas:



## Joyful Beginnings:

Our CSR journey in Sanghi commenced with a joyous Christmas celebration at Adani Cement Abdasa on December 24th. The event, attended by over 500 students and parents, featured cultural performances and dance competitions, spreading festive cheer. Esteemed guests, including Mr. Vivek Misra, Head of Adani Cement Plant, Sanghipuram, Mr. Pushkar Chaudhry, HR Head, and Mrs. Pankti Shah, Gujarat CSR Head, graced the occasion.



## Health:



Addressing the pressing healthcare needs of residents near Adani Cement Sanghipuram, a series of specialty health camps were launched. These camps, featuring Pediatric, Gynecological, Ophthalmic, and General medical services, aimed to bridge the gap in access to specialized healthcare. Previously, locals had to travel long distances to Naliya or Bhuj for medical care. By bringing essential health services directly to the communities, these camps have made a significant impact, offering health check-ups, consultations, and treatment for various illnesses and conditions, ensuring better healthcare accessibility for all.



**1200** patients benefited



**11** Villages benefited

# Endeavor In Core Areas:



## Road Superheroes:

Introducing the "Road Superheroes" Health Care Program, tailored specifically for the drivers of

**Adani Cement Abdasa, dedicated to promoting health awareness and preventive care within our driving community.**

This holistic initiative comprises five vital stages:

1. Health Screening
2. Telehealth Services
3. De-addiction Awareness
4. Stress Management & Yoga
5. Regular Health Tracking

A two-day health screening camp held at Adani Cement, offered comprehensive health assessments, including vision tests, blood pressure measurements, ECG, diabetes screenings, and BMI evaluations, alongside expert consultations.

**150**  
**Drivers Benefited**  
**& Receive Health Card**



## Tree Plantation Initiative:

Adani Cement Campus hosted a remarkable tree planting drive as part of our employee volunteer program. More than 50 enthusiastic employees joined forces to plant trees, showcasing our dedication to a greener future. This collective effort exemplifies our commitment to environmental conservation and responsible corporate citizenship.





adani  
Cement

NDTV

adani  
Foundation

અદાણી ફાઉન્ડેશન દ્વારા  
અબડાસા વિસ્તારમાં સામાજિક ઉત્તરદાયિત્વના ભાગરૂપે  
શૈક્ષણિક કાર્યનો શુભારંભ

adani  
Foundation

અદાણી ફાઉન્ડેશન  
આપનું હાર્દિક સ્વાગત કરે છે.



NDTV, or New Delhi Television Limited, stands as one of India's premier news networks, renowned for its steadfast commitment to journalistic integrity and comprehensive coverage. Founded in 1988 by Radhika Roy and Prannoy Roy, NDTV has emerged as a trusted source of news and analysis, shaping public discourse on critical issues both within India and around the world.

At the heart of NDTV's ethos lies an unwavering dedication to delivering unbiased, credible, and impactful journalism



## Empowerment through Education:

In Abdasa Block, the AF, partnering with NDTV, is revolutionizing education through CSR initiatives. Faced with low literacy rates and infrastructure challenges, the Foundation conducted a thorough needs analysis. This led to targeted interventions, including:

- 1. Smart Classes: Implemented in 10 primary schools for interactive learning.**
- 2. School Building & Bala Painting: Creating vibrant learning spaces.**
- 3. Educational Kits Distribution: Providing 1,150 students in 15 schools with essential learning materials.**

A momentous **Handing Over Ceremony** unfolded in Moti Ber Village, Abdasa, marking the debut of Smart Classes and vibrant Bala Painting in 15 primary schools.

A notable announcement by Mr. Vivek Mishra, Plant head, Adani cement, Sanghipuram unveiled plans for a forthcoming hospital within Sangji premises, promising enhanced community healthcare access.

In this overwhelming event **1,150 students facilitated with essential education kits** and teachers were honored with memento.



# Shree Renuka Sugar Ltd.

Shree Renuka Sugars Limited stands as a globally recognized agribusiness and bio-energy corporation, covering the entire sugar value chain.

As one of India's largest producers of sugar and green energy, Renuka is at the forefront of sugar manufacturing. With eight cutting-edge sugar mills, many equipped with ethanol and power co-generation capabilities, Renuka leads the industry. Additionally, Renuka operates two of India's largest port-based refineries.



## Education:

Committed to improving educational infrastructure to ensure every student has access to safe and quality education environment; we are committed to do following work:

- Renovation of 15 Anganwadi in Kidana, Bharapar, Tuna, Rapar and Wandi village benefiting **600+ students**. Also, supporting primary schools with smart class education equipment.
- Bala Panting and construction of stage in Primary school, Rapar.



## Water Conservation Project

To support the community with secure and safe water we are dedicated in implementing water project.

### Sustainable Water Management projects:

1. **Pond deepening work in Kidana, Bharapar and Tuna Villages. It will benefit 600+ villagers and will have 24,000 CUM water holding capacity.**
2. **Construction of RO plant room with installation of 1000 ltr./ hr RO System.**



# AESL



Adani Energy Solutions Ltd, formerly known as Adani Transmission Ltd, is an electric power transmission company.

**ATL is the country's largest private transmission company, with a presence across 16 states of India and a cumulative transmission network of 19,800 ckm and 53,000 MVA transformation capacity.**

In its distribution business, AESL serves more than 12 million consumers in metropolitan Mumbai and the industrial hub of Mundra SEZ. AESL is ramping up its smart metering business and is on course to become India's leading smart metering integrator.

## Course of Action in ATL's Villages:

Upon receiving the CSR responsibility for villages under ATL, the Adani Foundation embarked on a mission to address community challenges. Recognizing the pressing issue of increased salinity affecting water availability for daily needs and agriculture, we initiated work on water conservation structures as a sustainable solution to alleviate the villagers' hardships.

- **Initiated Pond deepening and Check dam restrengthening work in 5 villages of Rapar and Mandvi Taluka.**
- **Additionally, started working for Cattle Health Camp and tree plantation drive.**



**27,200 cum**  
Water Capacity



**17,000+** villagers  
benefited



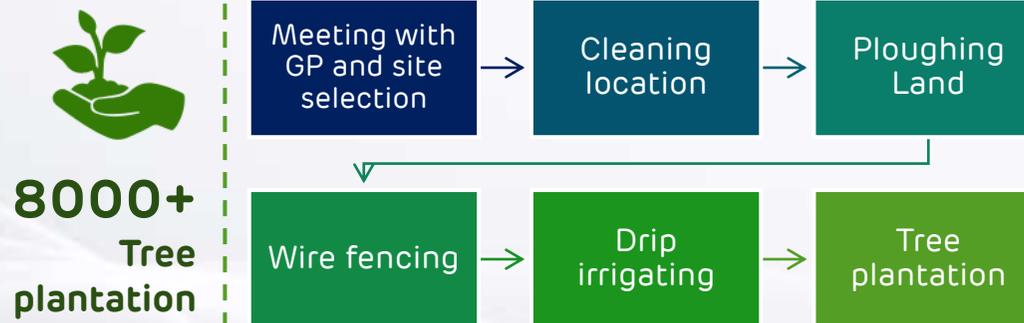
# CER – APSEZ



Adani Ports and Special Economic Zone Limited, a subsidiary of Adani Group, is India's largest private port Operator, operating 12 ports and terminals, including India's first deep water Transshipment Port Vizhinjam International Seaport Thiruvananthapuram and India's first port-based SEZ at Mundra.

## Course of Action:

Taking on the CER responsibility from APSEZ, the Adani Foundation has undertaken a massive tree plantation drive in Moti Bhujpar. To ensure its success, we have devised a comprehensive six-step plan.



**Our initiative represents a sustainable approach to addressing environmental challenges and reducing carbon emissions.**



**Ploughing of land & Wire fencing done!**





## Work done during Biparjoy Cyclone

Cyclone Biparjoy caused huge losses in Mundra and nearby villages. Adani Foundation's worked for relief and recovery with Panchayat & Government body. More than 17,000 people benefited from various efforts.

Adani foundation consider this as ethical responsibility and a source of satisfaction. Stakeholders and government bodies also appreciated the efforts.

Meetings with Taluka & District government officials to facilitate assistance and coordination with local authorities.



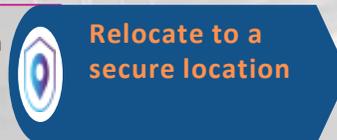
Health teams and ambulances on standby in case of emergency.



Reached to more than 10000 people by Awaz de to aware all, specially for fisherfolk settlement.



4500+ Workforce migration with basic amenities.



100+ Team member distributed for each taluka/Villages as per requirement



**Monitoring**

Tracking the cyclone's progress by AF team member.



**Connect**

Team members in directly touch with 10 Temporary housing & 60 Villages.



**Government**

Co-ordinating with Government organizations from Talati to Collector.



**Panchayat**

Co-ordinate with Gram panchayat in case they need any emergency support.

**Pre-cyclone preparation**



- Team distribution
- Workforce migration
- Basic amenities
- Awareness efforts.
- Meetings with government.

**During cyclone**



- Food and shelter provision
- Fodder support
- Awareness messages
- Vehicle support.
- Coordination with Panchayat

**Post-cyclone relief**



- Temporary housing
- Food packets
- Excavator support
- Transfer of affected individuals.
- Provision of fodder

# **Annexure – 2**



# “Half Yearly Environmental Monitoring Reports “

**For,**  
**adani**  
Ports and  
Logistics

**M/S.ADANI PORTS & SPECIAL ECONOMIC ZONE LTD.**

PLOT NO. 169/P, AT - NAVINAL ISLAND, TAL. - MUNDRA, DIST. - KUTCH - 370421.

**Monitoring Period: October - 2023 to March - 2024**

**Submitted By**



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

White House, Near GIDC Office, Char Rasta, Vapi, Gujarat, India – 396195



### 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	Oct-23		Nov-23		Dec-23		Jan-24		Feb-24		Mar-24		TEST METHOD
			SURFACE	BOTTOM											
1.	pH	--	8.11	7.94	8.21	8.06	8.18	8.12	8.17	8.05	8.12	7.98	8.14	8.02	IS 3025 (Part11)1983
2.	Temperature	°C	29.8	29.7	29.7	29.6	29.6	29.5	29.5	29.4	29.6	29.5	29.7	26.6	IS 3025 (Part 9)1984
3.	Total Suspended Solids	mg/L	132	94	144	116	132	108	124	112	132	112	142	124	APHA 23 <sup>rd</sup> Ed.,2017,2540- D
4.	BOD (3 Days @ 27°C)	mg/L	2.6	BDL	2.5	BDL	2.3	BDL	2.4	BDL	2.9	BDL	3.1	BDL	IS 3025(Part 44)1993Amd.01
5.	Dissolved Oxygen	mg/L	6.08	5.78	6.08	5.88	6.22	5.92	6.17	5.97	6.12	5.92	6.25	6.05	APHA 23 <sup>rd</sup> Ed.,2017,4500-O, B
6.	Salinity	ppt	35.84	36.15	36.12	36.38	36.34	36.88	36.32	37.14	36.12	37.18	36.19	37.24	By Calculation
7.	Oil & Grease	mg/L	BDL	BDL	IS 3025(Part39) 1991, Amd. 2										
8.	Nitrate as NO <sub>3</sub>	µmol/L	3.23	3.06	3.39	3.23	3.06	2.9	2.42	2.26	2.24	2	3.23	2.9	APHA 23 <sup>rd</sup> Ed., 2017,4500 NO3-B
9.	Nitrite as NO <sub>2</sub>	µmol/L	0.348	0.326	0.304	0.261	0.348	0.326	0.261	0.217	0.543	0.5	0.522	0.5	APHA 23 <sup>rd</sup> Ed.,2017,4500NO <sub>2</sub> B
10.	Ammonical Nitrogen as NH <sub>3</sub>	µmol/L	3.74	3.59	4.22	4.11	4.16	4.11	4.06	3.95	3.95	3.8	4.11	4.06	APHA 23 <sup>rd</sup> Ed., 2017,4500- NH3 B
11.	Phosphates as PO <sub>4</sub>	µmol/L	1.47	1.26	1.37	1.16	1.16	1.05	1.26	1.05	2.32	2.11	1.58	1.47	APHA 23 <sup>rd</sup> Ed.,2017,4500-P, D
12.	Total Nitrogen	µmol/L	7.318	6.976	7.914	7.601	7.568	7.336	6.741	6.427	6.733	6.3	7.862	7.46	APHA 23 <sup>rd</sup> Ed., 2017,4500 NH3 - B
13.	Petroleum Hydrocarbon	µg/L	N.D.	N.D.	APHA 23 <sup>rd</sup> ED,2017,5520 F										
14.	Total Dissolved Solids	mg/L	35864	36890	36110	36910	36180	37120	35980	37060	36120	36980	36328	37118	APHA 23 <sup>rd</sup> Ed.,2017, 2540- C
15.	COD	mg/L	32	12	24.29	8.1	28.25	12.11	20.38	4.08	24.1	8	28.03	12.01	APHA 23 <sup>rd</sup> Ed.,2017, 5220-B

Continue...

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

SR. NO	TEST PARAMETERS	UNIT	Oct-23		Nov-23		Dec-23		Jan-24		Feb-24		Mar-24		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
A			Phytoplankton												
1.	Chlorophyll	mg/m <sup>3</sup>	3.05	2.65	2.36	2.15	2.41	2.36	3.01	2.44	2.66	2.44	3.05	3.25	APHA (23rd Ed. 2017)10200 H
2.	Phaeophytin	mg/m <sup>3</sup>	2.1	0.96	1.4	0.86	1.61	1.25	1.79	2	1.79	1.66	2	1.56	APHA (23rd Ed. 2017)10200 H
3.	Cell Count	No. x 10 <sup>3</sup> /L	125	142	111	98	124	100	106	96	120	84	109	90	APHA (23rd Ed. 2017)10200 F
4	Name of Group Number and name of group species of each group	--	<i>Coscinodiscus</i>	<i>Odontella</i>	<i>Nitzschia</i>	<i>Biddulphia</i>	<i>Nitzschia</i>	<i>Biddulphia</i>	<i>Thalassiothrix</i>	<i>Dinophysis</i>	<i>Thalassiothrix</i>	<i>Dinophysis</i>	<i>Thalassiothrix</i>	<i>Dinophysis</i>	APHA (23rd Ed. 2017)10200 F
			<i>Diploneis</i>	<i>Rhizosolenia</i>	<i>Diploneis</i>	<i>Rhizosolenia</i>	<i>Pinnularia</i>	<i>Rhizosolenia</i>	<i>Surirella</i>	<i>Pinnularia</i>	<i>Surirella</i>	<i>Pinnularia</i>	<i>Biddulphia</i>	<i>Pinnularia</i>	
			<i>Rhizosolenia</i>	<i>Coscinodiscus</i>	<i>Rhizosolenia</i>	<i>Coscinodiscus</i>	<i>Rhizosolenia</i>	<i>Coscinodiscus</i>	<i>Navicula</i>	<i>Thalassiothrix</i>	<i>Navicula</i>	<i>Thalassiothrix</i>	<i>Navicula</i>	<i>Thalassiothrix</i>	
			<i>Dinophysis</i>	<i>Grammatophora</i>	<i>Dinophysis</i>	<i>Grammatophora</i>	<i>Dinophysis</i>	<i>Grammatophora</i>	<i>Thalassiosira</i>	<i>Grammatophora</i>	<i>Nitzschia</i>	<i>Grammatophora</i>	<i>Nitzschia</i>	<i>Grammatophora</i>	
			<i>Thalassionema</i>	<i>Thalassiosira</i>	<i>Biddulphia</i>	<i>Navicula</i>	<i>Biddulphia</i>	<i>Navicula</i>	<i>Skeletonema</i>	<i>Ceratium</i>	<i>Skeletonema</i>	<i>Ceratium</i>	<i>Skeletonema</i>	<i>Ceratium</i>	
B			Zooplankton												
1	Abundance(Population)	noX103/ 100 m <sup>3</sup>	52		50		46		50		41		55		APHA (23rd Ed. 2017)10200 G
2	Name of Group Number and name of group species of each group		<i>Crustacean Larvae</i>		<i>Oikoplura</i>		<i>Oikoplura</i>		<i>Egg(Fish and Shrimps)</i>		<i>Egg(Fish and Shrimps)</i>		<i>Egg(Fish and Shrimps)</i>		
			<i>Egg(Fish and Shrimps)</i>		<i>Pinnularia</i>		<i>Pinnularia</i>		<i>Oikoplura</i>		<i>Oikoplura</i>		<i>Oikoplura</i>		
			<i>Copepods</i>		<i>Copepods</i>		<i>Copepods</i>		<i>Copepods nauplii</i>		<i>Copepods nauplii</i>		<i>Copepods nauplii</i>		
			<i>Crustacean</i>		<i>Copepods nauplii</i>		<i>Copepods nauplii</i>		<i>Crustacean</i>		<i>Crustacean</i>		<i>Crustacean</i>		
			<i>Bivalve Larvae</i>		<i>Thalassionema</i>		<i>Thalassionema</i>		<i>Bivalve Larvae</i>		<i>Bivalve Larvae</i>		<i>Bivalve Larvae</i>		
3	Total Biomass	ml/100 m <sup>3</sup>	15.63		14.25		15.44		15.26		14.78		13.69		

Continue...

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

SR. NO.	TEST PARAMETERS	UNIT	Oct-23		Nov-23		Dec-23		Jan-24		Feb-24		Mar-24		TEST METHOD
			SURFACE	BOTTOM											
C	Microbiological														
1	Total Bacterial Count	CFU/ml	244		214		230		242		96		102		APHA 23 <sup>rd</sup> Ed.2017,9215-C
2	Total Coliform	/100ml	56		44		41		39		10		14		APHA 23 <sup>rd</sup> Ed.2017,9222-B
3	Ecoli	/100ml	32		30		22		19		8		10		IS :15185:2016
4	Enterococcus	/100ml	19		22		14		12		Absent		Absent		IS:15186:2002
5	Salmonella	/100ml	Absent		IS:15187:2016										
6	Shigella	/100ml	Absent		APHA 23 <sup>rd</sup> Ed.2017,9260-E										
7	Vibrio	/100ml	Absent		IS: 5887 (Part V):1976										



Mr. Nilesh Patel  
Sr. Chemist




Mr. Nitin Tandel  
Technical Manager

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

SR. NO.	TEST PARAMETERS	UNIT	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	TEST METHOD
			SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	
1.	Organic Matter	%	0.53	0.46	0.42	0.48	0.44	0.41	IS: 2720 (Part 22):1972 RA.2015, Amds.1
2.	Phosphorus as P	µg/g	494.2	510.3	514.8	532.2	542.2	549.3	IS: 10158 :1982, RA.2009 Method B
3.	Texture	--	Sandy	Sandy	Sandy	Sandy	Sandy	Sandy	Lab SOP No. UERL/CHM/LTM/108
4.	Petroleum Hydrocarbon	µg/g	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	APHA 23rd ED,2017,5520 F
5.0	Heavy Metals								
5.1	Aluminum as Al	%	4.02	3.92	3.96	3.98	4.02	4.06	IS3025(Part 55)2003
5.2	Total Chromium as Cr+3	µg/g	124.9	110.3	115.4	121.2	124.4	130.8	EPA 3050B/7190 (Extraction &Analytical Method): 1986
5.3	Manganese as Mn	µg/g	627.3	644.8	622.5	618.2	612.4	618.3	EPA 3050B/7460 (Extraction &Analytical Method): 1986
5.4	Iron as Fe	%	3.97	4.06	4.09	4.11	4.15	4.08	EPA 3050B/7380 (Extraction &Analytical Method): 1986
5.5	Nickel as Ni	µg/g	38.62	42.28	42.44	41.08	42.02	41.88	EPA 3050B/7520 (Extraction &Analytical Method): 1986
5.6	Copper as Cu	µg/g	37.19	40.25	40.86	41.12	42.11	42.32	EPA 3050B /7210 (Extraction &Analytical Method):1986
5.7	Zinc as Zn	µg/g	132.2	124.3	119.2	116.34	112.5	118.2	EPA 3050B/7950 (Extraction &Analytical Method): 1986
5.8	Lead as Pb	µg/g	2.44	2.49	2.44	2.38	2.32	2.36	EPA 3050B /7420 (Extraction &Analytical Method):1986
5.9	Mercury as Hg	µg/g	BDL	BDL	BDL	BDL	BDL	BDL	EPA 7471B (Extraction &Analytical Method) :2007

Continue...

MoEF&CC (GOI) Recognized Environmental Laboratory under the EPA-1986 (31.03.2023 to 22.09.2024)

QCI-NABET Accredited EIA & GW Consultant Organization

GPCB Recognized Environmental Auditor (Schedule-II)

ISO 9001 : 2015 Certified Company

ISO 45001 : 2018 Certified Company

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

SR. NO.	TEST PARAMETERS	UNIT	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	TEST METHOD
			SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	
D	Benthic Organisms								
1	Macrobenthos	--	<i>Isopods</i>	<i>Isopods</i>	<i>Isopods</i>	<i>Foraminiferan</i>	<i>Foraminiferan</i>	<i>Foraminiferan</i>	APHA (23rd Ed. 2017)10500 C
			<i>Polychates</i>	<i>Polychates</i>	<i>Polychates</i>	<i>Decapods Larvae</i>	<i>Decapods Larvae</i>	<i>Decapods Larvae</i>	
			<i>Sipunculids</i>	<i>Sipunculids</i>	<i>Sipunculids</i>	<i>Amphipods</i>	<i>Gastropods</i>	<i>Gastropods</i>	
			<i>Amphipods</i>	<i>Foraminiferan</i>	<i>Foraminiferan</i>	<i>Polychates</i>	<i>Polychates</i>	<i>Polychates</i>	
2	MeioBenthos	--	<i>Herpectacoids</i>	<i>Gastropods</i>	<i>Herpectacoids</i>	<i>Turbellarians</i>	<i>Turbellarians</i>	<i>Turbellarians</i>	
			<i>Decapods Larvae</i>	<i>Decapods Larvae</i>	<i>Decapods Larvae</i>	<i>Foraminiferan</i>	<i>Foraminiferan</i>	<i>Foraminiferan</i>	
3	Population	no/m <sup>2</sup>	318	303	347	356	289	368	



Mr. Nilesh Patel  
Sr. Chemist




Mr. Nitin Tandel  
Technical Manager

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

SR. NO.	TEST PARAMETERS	UNIT	Oct-23		Nov-23		Dec-23		Jan-24		Feb-24		Mar-24		TEST METHOD
			SURFACE	BOTTOM											
1.	pH	--	8.17	7.94	8.14	7.89	8.16	7.94	8.21	8.08	8.18	8.06	8.15	8.02	IS 3025 (Part11)1983
2.	Temperature	°C	29.7	29.6	29.6	29.5	29.5	29.4	29.4	29.3	29.5	29.4	29.6	29.5	IS 3025 (Part 9)1984
3.	Total Suspended Solids	mg/L	136	114	122	108	128	114	134	112	142	118	136	120	APHA 23 <sup>rd</sup> Ed.,2017,2540- D
4.	BOD (3 Days @ 27°C)	mg/L	2.9	BDL	2.8	BDL	2.5	BDL	2.2	BDL	2.6	BDL	2.8	BDL	IS 3025(Part 44)1993Amd.01
5.	Dissolved Oxygen	mg/L	5.88	5.68	5.98	5.78	6.12	5.82	6.17	5.87	6.12	5.82	6.25	5.95	APHA 23 <sup>rd</sup> Ed.,2017,4500-O, B
6.	Salinity	ppt	35.24	36.41	35.62	36.55	35.98	36.84	36.22	37.15	36.25	37.18	36.32	37.24	By Calculation
7.	Oil & Grease	mg/L	BDL	BDL	IS 3025(Part39) 1991, Amd. 2										
8.	Nitrate as NO <sub>3</sub>	µmol/L	2.9	2.58	3.06	2.74	3.39	3.23	2.74	2.58	2.9	2.58	3.55	3.23	APHA 23 <sup>rd</sup> Ed., 2017,4500 NO3-B
9.	Nitrite as NO <sub>2</sub>	µmol/L	0.413	0.391	0.37	0.348	0.348	0.304	0.326	0.304	0.478	0.435	0.522	0.478	APHA 23 <sup>rd</sup> Ed.,2017,4500NO <sub>2</sub> B
10.	Ammonical Nitrogen as NH <sub>3</sub>	µmol/L	3.59	3.48	3.95	3.8	3.9	3.85	3.85	3.74	3.9	3.74	4.16	4.11	APHA 23 <sup>rd</sup> Ed., 2017,4500- NH3 B
11.	Phosphates as PO <sub>4</sub>	µmol/L	1.68	1.58	1.47	1.37	1.37	1.26	1.47	1.37	2.32	2.21	1.9	1.68	APHA 23 <sup>rd</sup> Ed.,2017,4500-P, D
12.	Total Nitrogen	µmol/L	6.903	6.451	7.38	6.888	7.638	7.384	6.916	6.624	7.278	6.755	8.232	7.818	APHA 23 <sup>rd</sup> Ed., 2017,4500 NH3 - B
13.	Petroleum Hydrocarbon	µg/L	N.D.	N.D.	APHA 23 <sup>rd</sup> ED,2017,5520 F										
14.	Total Dissolved Solids	mg/L	36124	36960	36206	36988	36220	37110	36124	37104	36150	37110	36222	37180	APHA 23 <sup>rd</sup> Ed.,2017, 2540- C
15.	COD	mg/L	36	16	32.38	4.05	32.29	16.14	16.3	4.08	20.1	4.1	24.02	12.01	APHA 23 <sup>rd</sup> Ed.,2017, 5220-B

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

SR. NO.	TEST PARAMETERS	UNIT	Oct-23		Nov-23		Dec-23		Jan-24		Feb-24		Mar-24		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
<b>Phytoplankton</b>															
1.	Chlorophyll	mg/m <sup>3</sup>	3.15	3.56	3.02	2.88	3.12	3.04	3	2.56	3.21	3.11	2.98	2.69	APHA (23rd Ed. 2017)10200 H
2.	Phaeophytin	mg/m <sup>3</sup>	2.31	2.47	2.63	1.96	2.41	2.33	2.22	2.09	2.01	2.44	2.09	2.06	APHA (23rd Ed. 2017)10200 H
3.	Cell Count	No. x 10 <sup>3</sup> /L	108	127	142	102	125	127	120	132	100	125	95	147	APHA (23rd Ed. 2017)10200 F
4	Name of Group Number and name of group species of each group	--	<i>Thalassiothrix</i>	<i>Pinnularia</i>	<i>Thalassiothrix</i>	<i>Pinnularia</i>	<i>Dinophysis</i>	<i>Pinnularia</i>	<i>Navicula</i>	<i>Thalassiothrix</i>	<i>Surirella</i>	<i>Thalassiothrix</i>	<i>Surirella</i>	<i>Thalassiothrix</i>	APHA (23rd Ed. 2017)10200 F
			<i>Surirella</i>	<i>Biddulphia</i>	<i>Surirella</i>	<i>Biddulphia</i>	<i>Surirella</i>	<i>Biddulphia</i>	<i>Skeletonema</i>	<i>Surirella</i>	<i>Pinnularia</i>	<i>Surirella</i>	<i>Pinnularia</i>	<i>Surirella</i>	
			<i>Navicula</i>	<i>Navicula</i>	<i>Navicula</i>	<i>Navicula</i>	<i>Nitzschia</i>	<i>Navicula</i>	<i>Rhizosolenia</i>	<i>Navicula</i>	<i>Rhizosolenia</i>	<i>Navicula</i>	<i>Melosira</i>	<i>Navicula</i>	
			<i>Thalassiosira</i>	<i>Rhizosolenia</i>	<i>Cyclotella</i>	<i>Rhizosolenia</i>	<i>Cyclotella</i>	<i>Rhizosolenia</i>	<i>Dinophysis</i>	<i>Thalassiosira</i>	<i>Dinophysis</i>	<i>Thalassiosira</i>	<i>Dinophysis</i>	<i>Thalassiosira</i>	
			<i>Skeletonema</i>	<i>Skeletonema</i>	<i>Skeletonema</i>	<i>Thalassiosira</i>	<i>Skeletonema</i>	<i>Thalassiosira</i>	<i>Thalassionema</i>	<i>Skeletonema</i>	<i>Thalassionema</i>	<i>Skeletonema</i>	<i>Thalassionema</i>	<i>Skeletonema</i>	

<b>Zooplankton</b>															
1	Abundance (Population)	noX10 <sup>3</sup> / 100 m <sup>3</sup>	44		57		38		41		52		47		APHA (23rd Ed. 2017)10200 G
2	Name of Group Number and name of group species of each group		<i>Egg(Fish and Shrimps)</i>		<i>Egg(Fish and Shrimps)</i>		<i>Egg(Fish and Shrimps)</i>		<i>Crustacean Larvae</i>		<i>Crustacean Larvae</i>		<i>Crustacean Larvae</i>		
			<i>Copepods</i>		<i>Oikoplura</i>		<i>Nitzschia</i>		<i>Egg(Fish and Shrimps)</i>		<i>Egg(Fish and Shrimps)</i>		<i>Egg(Fish and Shrimps)</i>		
			<i>Copepods nauplii</i>		<i>Copepods nauplii</i>		<i>Copepods nauplii</i>		<i>Copepods</i>		<i>Copepods</i>		<i>Copepods</i>		
			<i>Crustacean</i>		<i>Crustacean</i>		<i>Pinnularia</i>		<i>Crustacean</i>		<i>Crustacean</i>		<i>Copepods nauplii</i>		
3	Total Biomass	ml/100 m <sup>3</sup>	17.36		15.36		13.25		14.13		14.39		15.78		
			<i>Bivalve Larvae</i>		<i>Bivalve Larvae</i>		<i>Bivalve Larvae</i>		<i>Bivalve Larvae</i>		<i>Bivalve Larvae</i>		<i>Bivalve Larvae</i>		

Continue...

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

SR. NO.	TEST PARAMETERS	UNIT	Oct-23		Nov-23		Dec-23		Jan-24		Feb-24		Mar-24		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
C			Microbiological												
1	Total Bacterial Count	CFU/ml	200		188		200		222		144		120		APHA 23 <sup>rd</sup> Ed.2017,9215-C
2	Total Coliform	/100ml	42		30		36		40		36		30		APHA 23 <sup>rd</sup> Ed.2017,9222-B
3	E.coli	/100ml	20		24		21		22		18		12		IS :15185:2016
4	Enterococcus	/100ml	18		10		18		15		Absent		Absent		IS:15186:2002
5	Salmonella	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		IS:15187:2016
6	Shigella	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		APHA 23 <sup>rd</sup> Ed.2017,9260-E
7	Vibrio	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		IS: 5887 (Part V):1976



Mr. Nilesh Patel  
Sr. Chemist




Mr. Nitin Tandel  
Technical Manager

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

SR. NO.	TEST PARAMETERS	UNIT	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	TEST METHOD
			SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	
1.	Organic Matter	%	0.46	0.43	0.48	0.46	0.42	0.44	IS: 2720 (Part 22):1972 RA.2015, Amds.1
2.	Phosphorus as P	µg/g	582.2	588.4	546.2	538.4	550.2	561.4	IS: 10158 :1982, RA.2009 Method B
3.	Texture	--	Sandy	Sandy	Sandy	Sandy	Sandy	Sandy	Lab SOP No. UERL/CHM/LTM/108
4.	Petroleum Hydrocarbon	µg/g	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	APHA 23rd ED,2017,5520 F
5.0	<b>Heavy Metals</b>								
5.1	Aluminum as Al	%	4.07	4.16	4.09	4.02	4.11	4.03	IS3025(Part 55)2003
5.2	Total Chromium as Cr+3	µg/g	162.4	156.8	148.2	142.2	134.5	142.2	EPA 3050B/7190 (Extraction &Analytical Method): 1986
5.3	Manganese as Mn	µg/g	684.4	702.2	686.5	644.4	652.2	644.5	EPA 3050B/7460 (Extraction &Analytical Method): 1986
5.4	Iron as Fe	%	4.02	4.11	4.08	4.03	4.09	4.02	EPA 3050B/7380 (Extraction &Analytical Method): 1986
5.5	Nickel as Ni	µg/g	40.39	40.88	41.05	42.12	42.84	42.52	EPA 3050B/7520 (Extraction &Analytical Method): 1986
5.6	Copper as Cu	µg/g	40.28	40.62	41.12	42.35	42.66	42.15	EPA 3050B /7210 (Extraction &Analytical Method):1986
5.7	Zinc as Zn	µg/g	144.8	148.9	152.24	148.6	150.24	149.62	EPA 3050B/7950 (Extraction &Analytical Method): 1986
5.8	Lead as Pb	µg/g	2.18	2.24	2.18	2.24	2.33	2.28	EPA 3050B /7420 (Extraction &Analytical Method):1986
5.9	Mercury as Hg	µg/g	BDL	BDL	BDL	BDL	BDL	BDL	EPA 7471B (Extraction &Analytical Method) :2007

Continue...

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

SR. NO.	TEST PARAMETERS	UNIT	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	TEST METHOD
			SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	
D			Benthic Organisms						
1	Macrobenthos	--	Decapods Larvae	Polychates	Polychates	Foraminiferan	Foraminiferan	Foraminiferan	APHA (23rd Ed. 2017)10500 C
			Isopods	Isopods	Isopods	Gastropods	Gastropods	Gastropods	
			Amphipods	Amphipods	Gastropods	Isopods	Isopods	Isopods	
			Sipunculids	Sipunculids	Sipunculids	Sipunculids	Amphipods	Amphipods	
2	MeioBenthos	--	Foraminiferan	Foraminiferan	Decapods Larvae	Herpectacoids	Sipunculids	Sipunculids	
			Herpectacoids	Herpectacoids	Herpectacoids	Polychates	Polychates	Polychates	
3	Population	no/m <sup>2</sup>	256	350	321	308	254	307	



Mr. Nilesh Patel  
Sr. Chemist




Mr. Nitin Tandel  
Technical Manager

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

SR. NO.	TEST PARAMETERS	UNIT	Oct-23		Nov-23		Dec-23		Jan-24		Feb-24		Mar-24		TEST METHOD
			SURFACE	BOTTOM											
1.	pH	--	8.12	8.02	8.18	8.04	8.24	8.11	8.16	7.98	8.12	7.89	8.16	7.99	IS 3025 (Part11)1983
2.	Temperature	°C	29.7	29.6	29.6	29.5	29.5	29.4	29.3	29.2	29.4	29.3	29.5	29.4	IS 3025 (Part 9)1984
3.	Total Suspended Solids	mg/L	111	84	118	92	126	98	130	104	136	110	144	120	APHA 23 <sup>rd</sup> Ed.,2017,2540- D
4.	BOD (3 Days @ 27°C)	mg/L	3.2	BDL	3.1	BDL	2.9	BDL	3.1	BDL	3.3	BDL	3.1	BDL	IS 3025(Part 44)1993Amd.01
5.	Dissolved Oxygen	mg/L	6.18	6.08	5.98	5.88	5.92	5.72	5.97	5.77	5.92	5.72	6.05	5.85	APHA 23 <sup>rd</sup> Ed.,2017,4500-O, B
6.	Salinity	ppt	35.78	36.35	36.24	36.68	36.68	37.16	36.74	37.22	36.77	37.28	36.84	37.32	By Calculation
7.	Oil & Grease	mg/L	BDL	BDL	IS 3025(Part39) 1991, Amd. 2										
8.	Nitrate as NO <sub>3</sub>	µmol/L	3.06	2.74	3.55	3.39	3.23	2.9	3.06	2.9	2.74	2.42	3.06	2.9	APHA 23 <sup>rd</sup> Ed., 2017,4500 NO3-B
9.	Nitrite as NO <sub>2</sub>	µmol/L	0.435	0.391	0.456	0.413	0.391	0.348	0.326	0.304	0.348	0.326	0.391	0.37	APHA 23 <sup>rd</sup> Ed.,2017,4500NO <sub>2</sub> B
10.	Ammonical Nitrogen as NH <sub>3</sub>	µmol/L	3.69	3.48	4.01	3.9	3.74	3.69	3.69	3.59	3.74	3.59	4.06	4.01	APHA 23 <sup>rd</sup> Ed., 2017,4500- NH3 B
11.	Phosphates as PO <sub>4</sub>	µmol/L	1.79	1.68	1.58	1.47	1.37	1.26	1.58	1.37	1.47	1.26	1.58	1.37	APHA 23 <sup>rd</sup> Ed.,2017,4500-P, D
12.	Total Nitrogen	µmol/L	7.185	6.611	8.016	7.703	7.361	6.938	7.076	6.794	6.828	6.336	7.511	7.28	APHA 23 <sup>rd</sup> Ed., 2017,4500 NH3 - B
13.	Petroleum Hydrocarbon	µg/L	N.D.	N.D.	APHA 23 <sup>rd</sup> ED,2017,5520 F										
14.	Total Dissolved Solids	mg/L	35880	36744	35970	36790	36130	36860	36080	36780	36210	37050	36320	37180	APHA 23 <sup>rd</sup> Ed.,2017, 2540- C
15.	COD	mg/L	32	8	28.34	16.19	28.25	16.14	12.03	4.08	16.1	8	20.02	12.01	APHA 23 <sup>rd</sup> Ed.,2017, 5220-B

Continue...

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

SR. NO.	TEST PARAMETERS	UNIT	Oct-23		Nov-23		Dec-23		Jan-24		Feb-24		Mar-24		TEST METHOD
			SURFACE	BOTTOM											
<b>Phytoplankton</b>															
1.	Chlorophyll	mg/m <sup>3</sup>	3.11	2.83	3.11	3.04	2.98	3.26	2.45	3.08	2.74	2.56	2.47	2.47	APHA (23rd Ed. 2017)10200 H
2.	Phaeophytin	mg/m <sup>3</sup>	1.65	1.52	1.65	2.01	2.01	2.18	2.06	2.41	1.87	1.45	1.66	1.47	APHA (23rd Ed. 2017)10200 H
3.	Cell Count	No. x 10 <sup>3</sup> /L	147	109	147	110	148	135	132	125	154	88	140	98	APHA (23rd Ed. 2017)10200 F
4	Name of Group Number and name of group species of each group	--	<i>Pinnularia</i>	<i>Coscinodiscus</i>	<i>Pinnularia</i>	<i>Coscinodiscus</i>	<i>Pinnularia</i>	<i>Coscinodiscus</i>	<i>Melosira</i>	<i>Cyclotella</i>	<i>Melosira</i>	<i>Cyclotella</i>	<i>Melosira</i>	<i>Cyclotella</i>	APHA (23rd Ed. 2017)10200 F
			<i>Biddulphia</i>	<i>Pinnularia</i>	<i>Biddulphia</i>	<i>Pinnularia</i>	<i>Biddulphia</i>	<i>Pinnularia</i>							
			<i>Navicula</i>	<i>Rhizosolenia</i>	<i>Navicula</i>	<i>Rhizosolenia</i>	<i>Navicula</i>	<i>Rhizosolenia</i>	<i>Skeletonema</i>	<i>Skeletonema</i>	<i>Rhizosolenia</i>	<i>Skeletonema</i>	<i>Rhizosolenia</i>	<i>Skeletonema</i>	
			<i>Thalassiosira</i>	<i>Dinophysis</i>	<i>Thalassiosira</i>	<i>Dinophysis</i>	<i>Thalassiosira</i>	<i>Dinophysis</i>	<i>Thalassiosira</i>	<i>Thalassiosira</i>	<i>Thalassiosira</i>	<i>Thalassiosira</i>	<i>Thalassiosira</i>	<i>Thalassiosira</i>	
			<i>Skeletonema</i>	<i>Thalassionema</i>	<i>Skeletonema</i>	<i>Thalassionema</i>	<i>Skeletonema</i>	<i>Thalassionema</i>							

<b>Zooplankton</b>															
1	Abundance (Population)	noX10 <sup>3</sup> / 100 m <sup>3</sup>	63		55		50		38		30		65		APHA (23rd Ed. 2017)10200 G
2	Name of Group Number and name of group species of each group		<i>Copepods</i>		<i>Copepods</i>		<i>Rhizosolenia</i>		<i>Crustacean</i>		<i>Crustacean</i>		<i>Crustacean</i>		
			<i>Copepods nauplii</i>		<i>Copepods nauplii</i>		<i>Crustacean Larvae</i>		<i>Copepods nauplii</i>		<i>Copepods nauplii</i>		<i>Copepods nauplii</i>		
			<i>Egg(Fish and Shrimps)</i>		<i>Egg(Fish and Shrimps)</i>		<i>Egg(Fish and Shrimps)</i>		<i>Crustacean Larvae</i>		<i>Crustacean Larvae</i>		<i>Crustacean Larvae</i>		
			<i>Crustacean</i>		<i>Pinnularia</i>		<i>Oikoplura</i>		<i>Crustacean</i>		<i>Crustacean</i>		<i>Egg(Fish and Shrimps)</i>		
3	Total Biomass	ml/100 m <sup>3</sup>	<i>Bivalve Larvae</i>		<i>Bivalve Larvae</i>		<i>Thalassionema</i>		<i>Bivalve Larvae</i>		<i>Bivalve Larvae</i>		<i>Bivalve Larvae</i>		
			15.69		16.35		14.23		17.12		15.47		15.47		

Continue...

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

SR. NO.	TEST PARAMETERS	UNIT	Oct-23		Nov-23		Dec-23		Jan-24		Feb-24		Mar-24		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
C			Microbiological												
1	Total Bacterial Count	CFU/ml	178		164		188		198		132		128		APHA 23 <sup>rd</sup> Ed.2017,9215-C
2	Total Coliform	/100ml	33		28		30		42		24		26		APHA 23 <sup>rd</sup> Ed.2017,9222-B
3	E.coli	/100ml	23		20		24		20		10		20		IS :15185:2016
4	Enterococcus	/100ml	17		12		20		19		Absent		Absent		IS:15186:2002
5	Salmonella	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		IS:15187:2016
6	Shigella	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		APHA 23 <sup>rd</sup> Ed.2017,9260-E
7	Vibrio	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		IS: 5887 (Part V):1976



Mr. Nilesh Patel  
Sr. Chemist




Mr. Nitin Tandel  
Technical Manager

**RESULTS OF SEDIMENT ANALYSIS [M3 EAST OF BOCHAISLANOT DETECTED - N 22°46'530" E 069°41'690"]**

SR. NO.	TEST PARAMETERS	UNIT	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	TEST METHOD
			SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	
1.	Organic Matter	%	0.43	0.47	0.46	0.41	0.44	0.45	IS: 2720 (Part 22):1972 RA.2015, Amds.1
2.	Phosphorus as P	µg/g	564.2	570.3	580.4	584.6	602.2	612.4	IS: 10158 :1982, RA.2009 Method B
3.	Texture	--	Sandy	Sandy	Sandy	Sandy	Sandy	Sandy	Lab SOP No. UERL/CHM/LTM/108
4.	Petroleum Hydrocarbon	µg/g	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	APHA 23rd ED,2017,5520 F
5.0	<b>Heavy Metals</b>								
5.1	Aluminum as Al	%	4.08	4.14	4.09	4.13	4.15	4.09	IS3025(Part 55)2003
5.2	Total Chromium as Cr+3	µg/g	124.6	121.2	125.4	132.2	142.2	138.6	EPA 3050B/7190 (Extraction &Analytical Method): 1986
5.3	Manganese as Mn	µg/g	624.2	633.4	621.2	614.4	618.2	622.5	EPA 3050B/7460 (Extraction &Analytical Method): 1986
5.4	Iron as Fe	%	4.12	4.15	4.08	4.01	4.06	4.12	EPA 3050B/7380 (Extraction &Analytical Method): 1986
5.5	Nickel as Ni	µg/g	44.28	48.2	46.4	44.8	42.9	42.5	EPA 3050B/7520 (Extraction &Analytical Method): 1986
5.6	Copper as Cu	µg/g	38.2	40.3	38.5	38.95	40.12	41.08	EPA 3050B /7210 (Extraction &Analytical Method):1986
5.7	Zinc as Zn	µg/g	117.4	120.2	118.4	120.2	124.5	132.1	EPA 3050B/7950 (Extraction &Analytical Method): 1986
5.8	Lead as Pb	µg/g	2.44	2.51	2.46	2.38	2.44	2.38	EPA 3050B /7420 (Extraction &Analytical Method):1986
5.9	Mercury as Hg	µg/g	BDL	BDL	BDL	BDL	BDL	BDL	EPA 7471B (Extraction &Analytical Method) :2007

Continue...

**RESULTS OF SEDIMENT ANALYSIS [M3 EAST OF BOCHAISLANOT DETECTED - N 22°46'530" E 069°41'690"]**

SR. NO.	TEST PARAMETERS	UNIT	Oct-23 SEDIMENT	Nov-23 SEDIMENT	Dec-23 SEDIMENT	Jan-24 SEDIMENT	Feb-24 SEDIMENT	Mar-24 SEDIMENT	TEST METHOD
D	Benthic Organisms								
1	Macrobenthos	--	Polychates	<i>Polychates</i>	<i>Amphipods</i>	<i>Gastropods</i>	<i>Gastropods</i>	<i>Decapods Larvae</i>	APHA (23rd Ed. 2017)10500 C
			<i>Gastropods</i>	<i>Gastropods</i>	<i>Gastropods</i>	<i>Isopods</i>	<i>Isopods</i>	<i>Isopods</i>	
			<i>Isopods</i>	<i>Isopods</i>	<i>Isopods</i>	<i>Amphipods</i>	<i>Amphipods</i>	<i>Amphipods</i>	
			<i>Sipunculids</i>	<i>Sipunculids</i>	<i>Sipunculids</i>	<i>Sipunculids</i>	<i>Sipunculids</i>	<i>Sipunculids</i>	
2	MeioBenthos	--	<i>Herpectacoids</i>	<i>Herpectacoids</i>	<i>Herpectacoids</i>	<i>Polychates</i>	<i>Polychates</i>	<i>Foraminiferan</i>	
			<i>Polychates</i>	<i>Polychates</i>	<i>Polychates</i>	<i>Herpectacoids</i>	<i>Herpectacoids</i>	<i>Herpectacoids</i>	
3	Population	no/m <sup>2</sup>	284	303	247	268	287	296	



Mr. Nilesh Patel  
Sr. Chemist




Mr. Nitin Tandel  
Technical Manager

**RESULTS OF MARINE WATER [M4 JUNA BANOT DETECTEDAR N 22°47'577" E 069°43'620"]**

SR. NO.	TEST PARAMETERS	UNIT	Oct-23		Nov-23		Dec-23		Jan-24		Feb-24		Mar-24		TEST METHOD
			SURFACE	BOTTOM											
1.	pH	--	8.19	8.06	8.24	8.09	8.17	8.12	8.22	8.09	8.19	8.04	8.24	8.05	IS 3025 (Part11)1983
2.	Temperature	°C	29.7	29.6	29.7	29.6	29.5	29.4	29.4	29.3	29.5	29.4	29.6	29.5	IS 3025 (Part 9)1984
3.	Total Suspended Solids	mg/L	146	118	134	112	128	110	142	118	136	122	152	128	APHA 23 <sup>rd</sup> Ed.,2017,2540- D
4.	BOD (3 Days @ 27°C)	mg/L	3.4	BDL	3.2	BDL	3.1	BDL	3	BDL	3.4	BDL	3.2	BDL	IS 3025(Part 4)1993Amd.01
5.	Dissolved Oxygen	mg/L	6.18	5.98	5.88	5.68	6.22	6.12	6.27	6.18	6.22	6.12	6.35	6.25	APHA 23 <sup>rd</sup> Ed.,2017,4500-O, B
6.	Salinity	ppt	36.27	36.83	36.54	37.02	36.74	37.19	36.66	37.34	36.84	37.32	38.88	37.34	By Calculation
7.	Oil & Grease	mg/L	BDL	BDL	IS 3025(Part39) 1991, Amd.2										
8.	Nitrate as NO <sub>3</sub>	µmol/L	2.74	2.42	2.9	2.74	2.74	2.58	3.06	2.9	3.23	3.06	3.06	2.9	APHA 23 <sup>rd</sup> Ed., 2017,4500 NO3-B
9.	Nitrite as NO <sub>2</sub>	µmol/L	0.478	0.435	0.5	0.478	0.478	0.435	0.391	0.37	0.522	0.478	0.478	0.456	APHA 23 <sup>rd</sup> Ed.,2017,4500NO <sub>2</sub> B
10.	Ammonical Nitrogen as NH <sub>3</sub>	µmol/L	3.9	3.74	3.85	3.69	3.8	3.74	4.16	4.11	3.85	3.64	4.01	3.9	APHA 23 <sup>rd</sup> Ed., 2017,4500- NH3 B
11.	Phosphates as PO <sub>4</sub>	µmol/L	2.32	2.21	1.79	1.68	1.47	1.37	1.37	1.16	2.53	2.42	2.32	2.11	APHA 23 <sup>rd</sup> Ed.,2017,4500-P, D
12.	Total Nitrogen	µmol/L	7.118	6.595	7.25	6.908	7.018	6.755	7.611	7.38	7.602	7.178	7.548	7.256	APHA 23 <sup>rd</sup> Ed., 2017,4500 NH3 - B
13.	Petroleum Hydrocarbon	µg/L	N.D.	N.D.	APHA 23 <sup>rd</sup> ED,2017,5520 F										
14.	Total Dissolved Solids	mg/L	36220	37120	36290	37140	36330	37210	36228	37120	36340	37150	36460	37240	APHA 23 <sup>rd</sup> Ed.,2017, 2540- C
15.	COD	mg/L	32	20	12.14	4.05	32.29	20.18	20.38	4.08	24.1	8	28.03	12.01	APHA 23 <sup>rd</sup> Ed.,2017, 5220-B

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

SR. NO.	TEST PARAMETERS	UNIT	Oct-23		Nov-23		Dec-23		Jan-24		Feb-24		Mar-24		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
<b>Phytoplankton</b>															
1.	Chlorophyll	mg/m <sup>3</sup>	3.42	3.55	3.22	2.86	3.08	2.56	2.88	3.04	2.9	3.14	2.36	3.14	APHA (23rd Ed. 2017)10200 H
2.	Phaeophytin	mg/m <sup>3</sup>	1.36	1.35	1.58	1.87	2.33	1.88	1.98	1.56	2.03	1.65	2.69	2	APHA (23rd Ed. 2017)10200 H
3.	Cell Count	No. x 10 <sup>3</sup> /L	109	188	110	142	125	139	99	126	108	145	154	88	APHA (23rd Ed. 2017)10200 F
4	Name of Group Number and name of group species of each group	--	<i>Coscinodiscus</i>	<i>Surirella</i>	<i>Surirella</i>	<i>Surirella</i>	<i>Coscinodiscus</i>	<i>Surirella</i>	<i>Thallassiosira</i>	<i>Coscinodiscus</i>	<i>Thallassiosira</i>	<i>Coscinodiscus</i>	<i>Thallassiosira</i>	<i>Coscinodiscus</i>	APHA (23rd Ed. 2017)10200 F
			<i>Diploneis</i>	<i>Biddulphia</i>	<i>Diploneis</i>	<i>Biddulphia</i>	<i>Diploneis</i>	<i>Biddulphia</i>	<i>Melosira</i>	<i>Diploneis</i>	<i>Melosira</i>	<i>Diploneis</i>	<i>Melosira</i>	<i>Diploneis</i>	
			<i>Rhizosolenia</i>	<i>Navicula</i>	<i>Thallassiothrix</i>	<i>Coscinodiscus</i>	<i>Skeletonema</i>	<i>Coscinodiscus</i>	<i>Nitzschia</i>	<i>Rhizosolenia</i>	<i>Nitzschia</i>	<i>Rhizosolenia</i>	<i>Nitzschia</i>	<i>Rhizosolenia</i>	
			<i>Dinophysis</i>	<i>Thallassiosira</i>	<i>Navicula</i>	<i>Thallassiosira</i>	<i>Navicula</i>	<i>Thallassiosira</i>	<i>Rhizosolenia</i>	<i>Dinophysis</i>	<i>Rhizosolenia</i>	<i>Dinophysis</i>	<i>Rhizosolenia</i>	<i>Dinophysis</i>	
			<i>Thallassionema</i>	<i>Skeletonema</i>	<i>Thallassionema</i>	<i>Skeletonema</i>	<i>Thallassionema</i>	<i>Skeletonema</i>	<i>Pleurosigma</i>	<i>Thallassionema</i>	<i>Pleurosigma</i>	<i>Thallassionema</i>	<i>Pleurosigma</i>	<i>Thallassionema</i>	

<b>Zooplankton</b>																
1	Abundance (Population)	noX10 <sup>3</sup> / 100 m <sup>3</sup>	48	63	49	50	36	40								APHA (23rd Ed. 2017)10200 G
2	Name of Group Number and name of group species of each group		<i>Oikoplura</i>	<i>Oikoplura</i>	<i>Copepods nauplii</i>	<i>Copepods nauplii</i>	<i>Copepods nauplii</i>	<i>Copepods nauplii</i>								
			<i>Copepods nauplii</i>	<i>Rhizosolenia</i>	<i>Rhizosolenia</i>	<i>Crustacean Larvae</i>	<i>Crustacean Larvae</i>	<i>Egg(Fish and Shrimps)</i>								
			<i>Crustacean Larvae</i>	<i>Crustacean Larvae</i>	<i>Egg(Fish and Shrimps)</i>	<i>Oikoplura</i>	<i>Oikoplura</i>	<i>Oikoplura</i>								
			<i>Crustacean Bivalve Larvae</i>	<i>Crustacean Bivalve Larvae</i>	<i>Crustacean Bivalve Larvae</i>	<i>Bivalve Larvae</i>	<i>Bivalve Larvae</i>	<i>Copepods nauplii</i>								
3	Total Biomass	ml/100 m <sup>3</sup>	17.58	16.55	16.25	15.26	14.25	14.23								

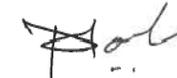
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**RESULTS OF MARINE WATER [M4 JUNA BANOT DETECTEDAR N 22°47'577" E 069°43'620"]**

SR. NO.	TEST PARAMETERS	UNIT	Oct-23		Nov-23		Dec-23		Jan-24		Feb-24		Mar-24		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
C			Microbiological												
1	Total Bacterial Count	CFU/ml	258		248		280		258		90		88		APHA 23 <sup>rd</sup> Ed.2017,9215-C
2	Total Coliform	/100ml	44		46		62		56		30		42		APHA 23 <sup>rd</sup> Ed.2017,9222-B
3	E.coli	/100ml	24		32		35		29		14		18		IS :15185:2016
4	Enterococcus	/100ml	14		21		23		15		Absent		Absent		IS:15186:2002
5	Salmonella	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		IS:15187:2016
6	Shigella	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		APHA 23 <sup>rd</sup> Ed.2017,9260-E
7	Vibrio	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		IS: 5887 (Part V):1976



Mr. Nilesh Patel  
Sr. Chemist

Mr. Nitin Tandel  
Technical Manager

**RESULTS OF SEDIMENT ANALYSIS [M4 JUNA BANOT DETECTEDAR N 22°47'577" E 069°43'620"]**

SR. NO.	TEST PARAMETERS	UNIT	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	TEST METHOD
			SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	
1.	Organic Matter	%	0.52	0.49	0.44	0.48	0.52	0.49	IS: 2720 (Part 22):1972 RA.2015, Amds.1
2.	Phosphorus as P	µg/g	648.1	640.2	610.5	612.2	625.4	611.1	IS: 10158 :1982, RA.2009 Method B
3.	Texture	--	Sandy	Sandy	Sandy	Sandy	Sandy	Sandy	Lab SOP No. UERL/CHM/LTM/108
4.	Petroleum Hydrocarbon	µg/g	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	APHA 23rd ED,2017,5520 F
5.0	<b>Heavy Metals</b>								
5.1	Aluminum as Al	%	4.01	4.08	4.11	4.08	4.12	4.09	IS3025(Part 55)2003
5.2	Total Chromium as Cr+3	µg/g	142.7	146.4	138.5	132.5	135.2	141.3	EPA 3050B/7190 (Extraction &Analytical Method): 1986
5.3	Manganese as Mn	µg/g	604.5	610.2	594.5	580.5	594.2	602.4	EPA 3050B/7460 (Extraction &Analytical Method): 1986
5.4	Iron as Fe	%	4.06	4.12	4.15	4.1	4.12	4.05	EPA 3050B/7380 (Extraction &Analytical Method): 1986
5.5	Nickel as Ni	µg/g	52.37	54.36	55.08	49.38	50.12	49.54	EPA 3050B/7520 (Extraction &Analytical Method): 1986
5.6	Copper as Cu	µg/g	42.24	44.28	44.62	42.33	44.25	44.63	EPA 3050B /7210 (Extraction &Analytical Method):1986
5.7	Zinc as Zn	µg/g	122.3	126.4	124.2	122.4	136.4	130.1	EPA 3050B/7950 (Extraction &Analytical Method): 1986
5.8	Lead as Pb	µg/g	2.64	2.71	2.64	2.58	2.45	2.36	EPA 3050B /7420 (Extraction &Analytical Method):1986
5.9	Mercury as Hg	µg/g	BDL	BDL	BDL	BDL	BDL	BDL	EPA 7471B (Extraction &Analytical Method) :2007

Continue...

**RESULTS OF SEDIMENT ANALYSIS [M4 JUNA BANOT DETECTEDAR N 22°47'577" E 069°43'620"]**

SR. NO.	TEST PARAMETERS	UNIT	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	TEST METHOD
			SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	
<b>Benthic Organisms</b>									
1	Macrobenthos	--	<i>Foraminiferan</i>	<i>Amphipods</i>	<i>Amphipods</i>	<i>Sipunculids</i>	<i>Sipunculids</i>	<i>Sipunculids</i>	APHA (23rd Ed. 2017)10500 C
			<i>Gastropods</i>	<i>Gastropods</i>	<i>Gastropods</i>	<i>Decapods Larvae</i>	<i>Decapods Larvae</i>	<i>Decapods Larvae</i>	
			<i>Isopods</i>	<i>Isopods</i>	<i>Isopods</i>	<i>Polychates</i>	<i>Polychates</i>	<i>Polychates</i>	
			<i>Sipunculids</i>	<i>Sipunculids</i>	<i>Turbellarians</i>	<i>Isopods</i>	<i>Isopods</i>	<i>Foraminiferan</i>	
2	MeioBenthos	--	<i>Herpectacoids</i>	<i>Herpectacoids</i>	<i>Herpectacoids</i>	<i>Turbellarians</i>	<i>Gastropods</i>	<i>Gastropods</i>	
			<i>Polychates</i>	<i>Turbellarians</i>	<i>Decapods Larvae</i>	<i>Herpectacoids</i>	<i>Herpectacoids</i>	<i>Herpectacoids</i>	
3	Population	no/m <sup>2</sup>	322	341	288	304	308	300	



Mr. Nilesh Patel  
Sr. Chemist




Mr. Nitin Tandel  
Technical Manager

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

SR. NO.	TEST PARAMETERS	UNIT	Oct-23		Nov-23		Dec-23		Jan-24		Feb-24		Mar-24		TEST METHOD
			SURFACE	BOTTOM											
1.	pH	--	8.15	8.01	8.12	8.05	8.18	8.08	8.18	8.01	8.24	8.06	8.15	8.01	IS 3025 (Part11)1983
2.	Temperature	°C	29.7	29.6	29.6	29.5	29.5	29.4	29.3	29.2	29.4	29.3	29.5	29.4	IS 3025 (Part 9)1984
3.	Total Suspended Solids	mg/L	104	82	124	98	142	122	134	108	138	112	126	108	APHA 23 <sup>rd</sup> Ed.,2017,2540- D
4.	BOD (3 Days @ 27°C)	mg/L	2.8	BDL	3.1	BDL	3.5	BDL	3.4	BDL	3.2	BDL	2.9	BDL	IS 3025(Part 44)1993Amd.01
5.	Dissolved Oxygen	mg/L	6.08	5.88	6.18	5.78	6.22	6.02	6.27	6.07	6.22	6.02	6.35	6.15	APHA 23 <sup>rd</sup> Ed.,2017,4500-O, B
6.	Salinity	ppt	36.18	36.71	36.46	37.12	36.65	37.33	36.84	37.28	36.74	37.25	36.79	37.31	By Calculation
7.	Oil & Grease	mg/L	BDL	BDL	IS 3025(Part39)1991, Amd.2										
8.	Nitrate as NO <sub>3</sub>	µmol/L	2.58	2.42	3.23	3.06	3.06	2.74	2.9	2.74	3.39	3.23	3.71	3.55	APHA 23 <sup>rd</sup> Ed., 2017,4500 NO3-B
9.	Nitrite as NO <sub>2</sub>	µmol/L	0.348	0.326	0.37	0.348	0.413	0.37	0.391	0.37	0.348	0.326	0.391	0.37	APHA 23 <sup>rd</sup> Ed.,2017,4500NO <sub>2</sub> B
10.	Ammonical Nitrogen as NH <sub>3</sub>	µmol/L	3.48	3.32	3.9	3.8	4.01	3.95	4.32	4.22	3.74	3.59	4.06	3.85	APHA 23 <sup>rd</sup> Ed., 2017,4500- NH3 B
11.	Phosphates as PO <sub>4</sub>	µmol/L	1.9	1.68	1.79	1.58	1.68	1.58	1.79	1.68	1.47	1.26	1.68	1.47	APHA 23 <sup>rd</sup> Ed.,2017,4500-P, D
12.	Total Nitrogen	µmol/L	6.408	6.066	7.5	7.208	7.483	7.06	7.611	7.33	7.478	7.146	8.161	7.77	APHA 23 <sup>rd</sup> Ed., 2017,4500 NH3 - B
13.	Petroleum Hydrocarbon	µg/L	N.D.	N.D.	APHA 23 <sup>rd</sup> ED,2017,5520 F										
14.	Total Dissolved Solids	mg/L	36233	37080	36274	37112	36320	37140	36120	37060	36140	37100	36186	37260	APHA 23 <sup>rd</sup> Ed.,2017, 2540- C
15.	COD	mg/L	40	28	20.24	8.1	24.22	20.18	20.38	8.15	24.1	12.1	28.03	16.02	APHA 23 <sup>rd</sup> Ed.,2017, 5220-B

Continue...

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

SR. NO.	TEST PARAMETERS	UNIT	Oct-23		Nov-23		Dec-23		Jan-24		Feb-24		Mar-24		TEST METHOD	
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM		
A			Phytoplankton													
1.	Chlorophyll	mg/m <sup>3</sup>	3.47	2.96	3.45	2.68	2.36	2.76	3.05	3.14	3.14	3.1	3.14	3.09	APHA (23rd Ed. 2017)10200 H	
2.	Phaeophytin	mg/m <sup>3</sup>	1.63	1.75	2.14	2.07	1.23	1.66	1.68	2.03	2.11	2.66	2.45	1.22	APHA (23rd Ed. 2017)10200 H	
3.	Cell Count	No. x 10 <sup>3</sup> /L	100	109	152	132	110	157	105	106	1422	141	110	109	APHA (23rd Ed. 2017)10200 F	
4	Name of Group Number and name of group species of each group	--	<i>Diploneis</i>	<i>Navicula</i>	<i>Diploneis</i>	<i>Navicula</i>	<i>Navicula</i>	<i>Navicula</i>	<i>Navicula</i>	<i>Navicula</i>	<i>Pinnularia</i>	<i>Navicula</i>	<i>Pinnularia</i>	<i>Navicula</i>	<i>Pinnularia</i>	APHA (23rd Ed. 2017)10200 F
			<i>Rhizosolenia</i>	<i>Skeletonema</i>	<i>Rhizosolenia</i>	<i>Skeletonema</i>	<i>Biddulphia</i>	<i>Skeletonema</i>	<i>Biddulphia</i>	<i>Biddulphia</i>	<i>Biddulphia</i>	<i>Biddulphia</i>	<i>Biddulphia</i>	<i>Biddulphia</i>	<i>Rhizosolenia</i>	
			<i>Nitzschia</i>	<i>Rhizosolenia</i>	<i>Nitzschia</i>	<i>Rhizosolenia</i>	<i>Nitzschia</i>	<i>Rhizosolenia</i>	<i>Nitzschia</i>	<i>Navicula</i>	<i>Nitzschia</i>	<i>Navicula</i>	<i>Odontella</i>	<i>Dinophysis</i>		
			<i>Cyclotella</i>	<i>Dinophysis</i>	<i>Cyclotella</i>	<i>Biddulphia</i>	<i>Cyclotella</i>	<i>Biddulphia</i>	<i>Cyclotella</i>	<i>Thalassiosira</i>	<i>Cyclotella</i>	<i>Thalassiosira</i>	<i>Cyclotella</i>	<i>Coscinodiscus</i>		
			<i>Pleurosigma</i>	<i>Thalassionema</i>	<i>Pleurosigma</i>	<i>Thalassionema</i>	<i>Pleurosigma</i>	<i>Thalassionema</i>	<i>Pleurosigma</i>	<i>Skeletonema</i>	<i>Pleurosigma</i>	<i>Skeletonema</i>	<i>Pleurosigma</i>	<i>Skeletonema</i>		

B			Zooplankton												
1	Abundance (Population)	noX10 <sup>3</sup> / 100 m <sup>3</sup>	52	44	36	44	48	41							APHA (23rd Ed. 2017)10200 G
2	Name of Group Number and name of group species of each group		<i>Copepods nauplii</i>	<i>Nitzschia</i>	<i>Nitzschia</i>	<i>Crustacean Larvae</i>	<i>Crustacean Larvae</i>	<i>Crustacean Larvae</i>							
			<i>Crustacean Larvae</i>	<i>Crustacean Larvae</i>	<i>Crustacean Larvae</i>	<i>Egg(Fish and Shrimps)</i>	<i>Egg(Fish and Shrimps)</i>	<i>Egg(Fish and Shrimps)</i>							
			<i>Oikoplura</i>	<i>Oikoplura</i>	<i>Oikoplura</i>	<i>Copepods</i>	<i>Copepods</i>	<i>Copepods nauplii</i>							
			<i>Bivalve Larvae</i>	<i>Bivalve Larvae</i>	<i>Bivalve Larvae</i>	<i>Crustacean</i>	<i>Crustacean</i>	<i>Crustacean</i>							
			<i>Oikoplura</i>	<i>Oikoplura</i>	<i>Oikoplura</i>	<i>Bivalve Larvae</i>	<i>Bivalve Larvae</i>	<i>Bivalve Larvae</i>							
3	Total Biomass	ml/100 m <sup>3</sup>	14.6	13.52	14.23	14.52	15.36	14.68							

Continue...

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

SR. NO.	TEST PARAMETERS	UNIT	Oct-23		Nov-23		Dec-23		Jan-24		Feb-24		Mar-24		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
C			Microbiological												
1	Total Bacterial Count	CFU/ml	286		256		242		244		140		140		APHA 23 <sup>rd</sup> Ed.2017,9215-C
2	Total Coliform	/100ml	50		38		33		42		28		28		APHA 23 <sup>rd</sup> Ed.2017,9222-B
3	E.coli	/100ml	28		25		26		31		15		16		IS :15185:2016
4	Enterococcus	/100ml	14		14		21		25		4		Absent		IS:15186:2002
5	Salmonella	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		IS:15187:2016
6	Shigella	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		APHA 23 <sup>rd</sup> Ed.2017,9260-E
7	Vibrio	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		IS: 5887 (Part V):1976



Mr. Nilesh Patel  
Sr. Chemist




Mr. Nitin Tandel  
Technical Manager

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

SR. NO.	TEST PARAMETERS	UNIT	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	TEST METHOD
			SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	
1.	Organic Matter	%	0.57	0.53	0.48	0.45	0.48	0.52	IS: 2720 (Part 22):1972 RA.2015, Amds.1
2.	Phosphorus as P	µg/g	562.4	570.5	765.2	738.6	744.1	721.4	IS: 10158 :1982, RA.2009 Method B
3.	Texture	--	Sandy	Sandy	Sandy	Sandy	Sandy	Sandy	Lab SOP No. UERL/CHM/LTM/108
4.	Petroleum Hydrocarbon	µg/g	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	APHA 23rd ED,2017,5520 F
5.0	<b>Heavy Metals</b>								
5.1	Aluminum as Al	%	4.04	4.13	4.11	4.04	4.08	4.11	IS3025(Part 55)2003
5.2	Total Chromium as Cr+3	µg/g	138.2	136.2	130.5	134.6	142.2	136.5	EPA 3050B/7190 (Extraction &Analytical Method): 1986
5.3	Manganese as Mn	µg/g	627.8	633.2	624.4	621.5	626.4	618.2	EPA 3050B/7460 (Extraction &Analytical Method): 1986
5.4	Iron as Fe	%	4.09	4.12	4.08	3.98	4.12	3.96	EPA 3050B/7380 (Extraction &Analytical Method): 1986
5.5	Nickel as Ni	µg/g	46.97	48.23	46.85	46.12	45.98	45.36	EPA 3050B/7520 (Extraction &Analytical Method): 1986
5.6	Copper as Cu	µg/g	42.38	44.28	45.21	45.58	45.96	45.82	EPA 3050B /7210 (Extraction &Analytical Method):1986
5.7	Zinc as Zn	µg/g	118.2	123.4	119.6	119	124.1	118.2	EPA 3050B/7950 (Extraction &Analytical Method): 1986
5.8	Lead as Pb	µg/g	2.41	2.46	2.35	2.27	2.24	2.11	EPA 3050B /7420 (Extraction &Analytical Method):1986
5.9	Mercury as Hg	µg/g	BDL	BDL	BDL	BDL	BDL	BDL	EPA 7471B (Extraction &Analytical Method) :2007

Continue...

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

SR. NO.	TEST PARAMETERS	UNIT	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	TEST METHOD
			SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	
D			Benthic Organisms						
1	Macrobenthos	--	<i>Amphipods</i>	<i>Amphipods</i>	<i>Amphipods</i>	<i>Isopods</i>	<i>Isopods</i>	<i>Isopods</i>	APHA (23rd Ed. 2017)10500 C
			<i>Polychates</i>	<i>Sipunculids</i>	<i>Polychates</i>	<i>Polychates</i>	<i>Polychates</i>	<i>Gastropods</i>	
			<i>Isopods</i>	<i>Isopods</i>	<i>Isopods</i>	<i>Sipunculids</i>	<i>Sipunculids</i>	<i>Sipunculids</i>	
			<i>Gastropods</i>	<i>Gastropods</i>	<i>Gastropods</i>	<i>Amphipods</i>	<i>Amphipods</i>	<i>Amphipods</i>	
2	MeioBenthos	--	Decapods Larvae	Decapods Larvae	Foraminiferan	Polychates	Herpectacoids	<i>Herpectacoids</i>	
			<i>Herpectacoids</i>	<i>Gastropods</i>	<i>Herpectacoids</i>	<i>Foraminiferan</i>	<i>Foraminiferan</i>	<i>Polychates</i>	
3	Population	no/m <sup>2</sup>	336	247	256	264	298	302	



Mr. Nilesh Patel  
Sr. Chemist




Mr. Nitin Tandel  
Technical Manager

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

SR. NO.	TEST PARAMETERS	UNIT	Oct-23		Nov-23		Dec-23		Jan-24		Feb-24		Mar-24		TEST METHOD
			SURFACE	BOTTOM											
1.	pH	--	8.17	7.99	8.21	7.96	8.24	8.12	8.19	8.02	8.14	7.88	8.09	7.91	IS 3025 (Part11)1983
2.	Temperature	°C	29.7	29.6	29.6	29.5	29.5	29.4	29.3	29.2	29.4	29.3	29.5	29.4	IS 3025 (Part 9)1984
3.	Total Suspended Solids	mg/L	112	88	128	104	110	94	124	110	130	114	124	98	APHA 23 <sup>rd</sup> Ed.,2017,2540- D
4.	BOD (3 Days @ 27°C)	mg/L	3.3	BDL	3.5	BDL	3.4	BDL	3.2	BDL	3.1	BDL	3.3	BDL	IS 3025(Part 44)1993Amd.01
5.	Dissolved Oxygen	mg/L	5.98	5.78	6.08	5.78	6.12	5.92	6.07	5.97	6.02	5.92	6.15	6.05	APHA 23 <sup>rd</sup> Ed.,2017,4500-O, B
6.	Salinity	ppt	36.29	36.64	36.41	36.98	36.52	37.17	36.44	37.25	36.35	37.18	36.41	37.22	By Calculation
7.	Oil & Grease	mg/L	BDL	BDL	IS 3025(Part39)1991, Amd. 2										
8.	Nitrate as NO <sub>3</sub>	µmol/L	2.9	2.74	3.06	2.58	3.55	3.23	3.39	3.06	3.23	2.9	3.39	3.06	APHA 23 <sup>rd</sup> Ed., 2017,4500 NO3-B
9.	Nitrite as NO <sub>2</sub>	µmol/L	0.522	0.478	0.435	0.413	0.456	0.435	0.435	0.413	0.435	0.391	0.478	0.435	APHA 23 <sup>rd</sup> Ed.,2017,4500NO <sub>2</sub> B
10.	Ammonical Nitrogen as NH <sub>3</sub>	µmol/L	3.85	3.64	4.11	3.95	4.06	3.95	3.95	3.85	3.69	3.48	3.95	3.85	APHA 23 <sup>rd</sup> Ed., 2017,4500- NH3 B
11.	Phosphates as PO <sub>4</sub>	µmol/L	2.53	2.42	2.11	2	1.9	1.79	1.58	1.47	1.79	1.68	2.11	1.9	APHA 23 <sup>rd</sup> Ed.,2017,4500-P, D
12.	Total Nitrogen	µmol/L	7.272	6.858	7.605	6.943	8.066	7.615	7.775	7.323	7.355	6.771	7.818	7.345	APHA 23 <sup>rd</sup> Ed., 2017,4500 NH3 - B
13.	Petroleum Hydrocarbon	µg/L	N.D.	N.D.	APHA 23 <sup>rd</sup> ED,2017,5520 F										
14.	Total Dissolved Solids	mg/L	36122	37148	36180	37180	36240	37210	36124	37180	36220	37090	36340	37230	APHA 23 <sup>rd</sup> Ed.,2017, 2540- C
15.	COD	mg/L	28	8	36.43	16.19	36.32	24.22	16.3	4.08	20.1	8	24.02	12.01	APHA 23 <sup>rd</sup> Ed.,2017, 5220-B

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

SR. NO.	TEST PARAMETERS	UNIT	Oct-23		Nov-23		Dec-23		Jan-24		Feb-24		Mar-24		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
<b>Phytoplankton</b>															
1.	Chlorophyll	mg/m <sup>3</sup>	2.98	3.35	3.08	3.35	3.25	3.65	3.12	2.88	2.96	3	3.09	2.49	APHA (23rd Ed. 2017)10200 H
2.	Phaeophytin	mg/m <sup>3</sup>	1.36	2.47	2	1.78	2.44	2.44	2.14	2.04	2.14	1.25	2.19	1.78	APHA (23rd Ed. 2017)10200 H
3.	Cell Count	No. x 10 <sup>3</sup> /L	106	160	108	158	156	137	128	100	120	96	87	121	APHA (23rd Ed. 2017)10200 F
4	Name of Group Number and name of group species of each group	--	<i>Nitzschia</i>	<i>Thalassiothrix</i>	<i>Nitzschia</i>	<i>Rhizosolenia</i>	<i>Nitzschia</i>	<i>Rhizosolenia</i>	<i>Diploneis</i>	<i>Coscinodiscus</i>	<i>Diploneis</i>	<i>Coscinodiscus</i>	<i>Diploneis</i>	<i>Coscinodiscus</i>	APHA (23rd Ed. 2017)10200 F
			<i>Pinnularia</i>	<i>Surirella</i>	<i>Pinnularia</i>	<i>Surirella</i>	<i>Odontella</i>	<i>Surirella</i>	<i>Rhizosolenia</i>	<i>Diploneis</i>	<i>Rhizosolenia</i>	<i>Diploneis</i>	<i>Rhizosolenia</i>	<i>Diploneis</i>	
			<i>Odontella</i>	<i>Navicula</i>	<i>Dinophysis</i>	<i>Navicula</i>	<i>Dinophysis</i>	<i>Navicula</i>	<i>Nitzschia</i>	<i>Rhizosolenia</i>	<i>Nitzschia</i>	<i>Rhizosolenia</i>	<i>Nitzschia</i>	<i>Rhizosolenia</i>	
			<i>Dinophysis</i>	<i>Thalassiosira</i>	<i>Pleurosigma</i>	<i>Thalassionema</i>	<i>Pleurosigma</i>	<i>Thalassionema</i>	<i>Thalassiothrix</i>	<i>Dinophysis</i>	<i>Thalassiothrix</i>	<i>Dinophysis</i>	<i>Thalassiothrix</i>	<i>Dinophysis</i>	
			<i>Surirella</i>	<i>Skeletonema</i>	<i>Surirella</i>	<i>Skeletonema</i>	<i>Cyclotella</i>	<i>Skeletonema</i>	<i>Pleurosigma</i>	<i>Thalassionema</i>	<i>Pleurosigma</i>	<i>Thalassionema</i>	<i>Cyclotella</i>	<i>Thalassionema</i>	

<b>Zooplankton</b>															
1	Abundance (Population)	noX10 <sup>3</sup> / 100 m <sup>3</sup>	50		48		53		41		25		38		APHA (23rd Ed. 2017)10200 G
2	Name of Group Number and name of group species of each group		<i>Nitzschia</i>		<i>Nitzschia</i>		<i>Egg(Fish and Shrimps)</i>								
			<i>Pinnularia</i>		<i>Pinnularia</i>		<i>Coscinodiscus</i>		<i>Oikoplura</i>		<i>Oikoplura</i>		<i>Oikoplura</i>		
			<i>Odontella</i>		<i>Odontella</i>		<i>Odontella</i>		<i>Copepods nauplii</i>		<i>Copepods nauplii</i>		<i>Copepods nauplii</i>		
			<i>Dinophysis</i>		<i>Dinophysis</i>		<i>Dinophysis</i>		<i>Crustacean</i>		<i>Crustacean</i>		<i>Crustacean</i>		
3	Total Biomass	ml/100 m <sup>3</sup>	16.33		16.25		17.35		16.23		13.56		16.58		
			<i>Surirella</i>		<i>Surirella</i>		<i>Bivalve Larvae</i>		<i>Bivalve Larvae</i>		<i>Bivalve Larvae</i>		<i>Bivalve Larvae</i>		

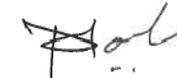
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**RESULTS OF MARINE WATER [M7 EAST PORT N 22°47'120" E 069°47'110"]**

SR. NO.	TEST PARAMETERS	UNIT	Oct-23		Nov-23		Dec-23		Jan-24		Feb-24		Mar-24		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
C			Microbiological												
1	Total Bacterial Count	CFU/ml	186		200		202		260		86		96		APHA 23 <sup>rd</sup> Ed.2017,9215-C
2	Total Coliform	/100ml	33		41		36		46		12		27		APHA 23 <sup>rd</sup> Ed.2017,9222-B
3	E.coli	/100ml	30		31		24		36		5		14		IS :15185:2016
4	Enterococcus	/100ml	21		19		22		23		Absent		Absent		IS:15186:2002
5	Salmonella	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		IS:15187:2016
6	Shigella	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		APHA 23 <sup>rd</sup> Ed.2017,9260-E
7	Vibrio	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		IS: 5887 (Part V):1976



Mr. Nilesh Patel  
Sr. Chemist

Mr. Nitin Tandel  
Technical Manager

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

SR. NO.	TEST PARAMETERS	UNIT	Oct-23		Nov-23		Dec-23		Jan-24		Feb-24		Mar-24		TEST METHOD
			SURFACE	BOTTOM											
1.	pH	--	8.21	8.04	8.18	8.08	8.16	8.06	8.09	7.96	7.99	7.86	8.06	7.88	IS 3025 (Part11)1983
2.	Temperature	°C	29.7	29.6	29.6	29.5	29.5	29.4	29.4	29.3	29.5	29.4	29.6	29.5	IS 3025 (Part 9)1984
3.	Total Suspended Solids	mg/L	102	78	112	84	98	84	106	88	112	90	122	98	APHA 23 <sup>rd</sup> Ed.,2017,2540- D
4.	BOD (3 Days @ 27°C)	mg/L	3.4	BDL	3.1	BDL	3.4	BDL	3.1	BDL	3.3	BDL	2.8	BDL	IS 3025(Part 44)1993Amd.01
5.	Dissolved Oxygen	mg/L	5.98	5.88	5.88	5.68	6.02	5.82	6.07	5.87	6.02	5.82	6.15	5.95	APHA 23 <sup>rd</sup> Ed.,2017,4500-O, B
6.	Salinity	ppt	36.02	36.76	36.27	36.88	36.44	37.09	36.38	37.24	36.22	37.14	36.38	37.09	By Calculation
7.	Oil & Grease	mg/L	BDL	BDL	IS 3025(Part39) 1991, Amd. 2										
8.	Nitrate as NO <sub>3</sub>	µmol/L	3.23	2.9	3.39	3.06	3.71	3.39	3.55	3.23	3.23	3.06	3.55	3.06	APHA 23 <sup>rd</sup> Ed., 2017,4500 NO3-B
9.	Nitrite as NO <sub>2</sub>	µmol/L	0.543	0.5	0.522	0.478	0.478	0.456	0.456	0.435	0.435	0.391	0.543	0.478	APHA 23 <sup>rd</sup> Ed.,2017,4500NO <sub>2</sub> B
10.	Ammonical Nitrogen as NH <sub>3</sub>	µmol/L	3.95	3.8	4.16	4.01	4.11	4.06	3.74	3.64	3.85	3.64	4.06	3.95	APHA 23 <sup>rd</sup> Ed., 2017,4500- NH3 B
11.	Phosphates as PO <sub>4</sub>	µmol/L	2.32	2.11	2.21	2	2.11	1.9	2.21	2	2.53	2.32	2.32	2.21	APHA 23 <sup>rd</sup> Ed.,2017,4500-P, D
12.	Total Nitrogen	µmol/L	7.723	7.2	8.072	7.548	8.298	7.906	7.746	7.305	7.515	7.091	8.153	7.488	APHA 23 <sup>rd</sup> Ed., 2017,4500 NH3 - B
13.	Petroleum Hydrocarbon	µg/L	N.D.	N.D.	APHA 23 <sup>rd</sup> ED,2017,5520 F										
14.	Total Dissolved Solids	mg/L	36268	37350	36302	37410	36380	34500	36410	37320	36540	37410	36610	37540	APHA 23 <sup>rd</sup> Ed.,2017, 2540- C
15.	COD	mg/L	24	12	28.34	8.1	32.29	28.25	20.38	12.23	24.1	16.1	28.03	20.02	APHA 23 <sup>rd</sup> Ed.,2017, 5220-B

Continue...

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

SR. NO.	TEST PARAMETERS	UNIT	Oct-23		Nov-23		Dec-23		Jan-24		Feb-24		Mar-24		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
<b>Phytoplankton</b>															
1.	Chlorophyll	mg/m <sup>3</sup>	2.68	2.47	2.36	2.85	2.3	2.88	2.95	3.04	2.36	3.01	3	3.01	APHA (23rd Ed. 2017)10200 H
2.	Phaeophytin	mg/m <sup>3</sup>	0.99	2.03	1.06	1.88	2.03	1.78	2.36	1.55	1.88	1.63	1.88	1.36	APHA (23rd Ed. 2017)10200 H
3.	Cell Count	No. x 10 <sup>3</sup> /L	78	156	86	145	97	148	100	85	123	96	106	106	APHA (23rd Ed. 2017)10200 F
4	Name of Group Number and name of group species of each group	--	<i>Odontella</i>	<i>Cyclotella</i>	<i>Odontella</i>	<i>Cyclotella</i>	<i>Odontella</i>	<i>Cyclotella</i>	<i>Nitzschia</i>	<i>Diploneis</i>	<i>Nitzschia</i>	<i>Diploneis</i>	<i>Nitzschia</i>	<i>Diploneis</i>	APHA (23rd Ed. 2017)10200 F
			<i>Rhizosolenia</i>	<i>Pinnularia</i>	<i>Rhizosolenia</i>	<i>Pinnularia</i>	<i>Rhizosolenia</i>	<i>Pinnularia</i>	<i>Grammatophora</i>	<i>Rhizosolenia</i>	<i>Grammatophora</i>	<i>Rhizosolenia</i>	<i>Grammatophora</i>	<i>Rhizosolenia</i>	
			<i>Coscinodiscus</i>	<i>Skeletonema</i>	<i>Coscinodiscus</i>	<i>Skeletonema</i>	<i>Coscinodiscus</i>	<i>Skeletonema</i>	<i>Diploneis</i>	<i>Nitzschia</i>	<i>Diploneis</i>	<i>Nitzschia</i>	<i>Diploneis</i>	<i>Nitzschia</i>	
			<i>Grammatophora</i>	<i>Thalassiosira</i>	<i>Grammatophora</i>	<i>Thalassiosira</i>	<i>Grammatophora</i>	<i>Thalassiosira</i>	<i>Thalassiothrix</i>	<i>Cyclotella</i>	<i>Thalassiothrix</i>	<i>Cyclotella</i>	<i>Thalassiothrix</i>	<i>Grammatophora</i>	
			<i>Thalassiosira</i>	<i>Thalassionema</i>	<i>Thalassiosira</i>	<i>Thalassionema</i>	<i>Thalassiosira</i>	<i>Thalassionema</i>	<i>Pleurosigma</i>	<i>Pleurosigma</i>	<i>Pleurosigma</i>	<i>Pleurosigma</i>	<i>Pleurosigma</i>	<i>Pleurosigma</i>	

<b>B Zooplankton</b>															
1	Abundance (Population)	noX10 <sup>3</sup> / 100 m <sup>3</sup>	41	52	60	49	49	49							APHA (23rd Ed. 2017)10200 G
2	Name of Group Number and name of group species of each group		<i>Coscinodiscus</i>	<i>Coscinodiscus</i>	<i>Odontella</i>	<i>Oikoplura</i>	<i>Oikoplura</i>	<i>Oikoplura</i>							
			<i>Diploneis</i>	<i>Egg(Fish and Shrimps)</i>	<i>Egg(Fish and Shrimps)</i>	<i>Copepods nauplii</i>	<i>Copepods nauplii</i>	<i>Egg(Fish and Shrimps)</i>							
			<i>Rhizosolenia</i>	<i>Rhizosolenia</i>	<i>Rhizosolenia</i>	<i>Crustacean Larvae</i>	<i>Crustacean Larvae</i>	<i>Crustacean Larvae</i>							
			<i>Dinophysis</i>	<i>Bivalve Larvae</i>	<i>Bivalve Larvae</i>	<i>Crustacean</i>	<i>Crustacean</i>	<i>Crustacean</i>							
3	Total Biomass	ml/100 m <sup>3</sup>	<i>Thalassionema</i>	<i>Thalassionema</i>	<i>Thalassionema</i>	<i>Bivalve Larvae</i>	<i>Bivalve Larvae</i>	<i>Bivalve Larvae</i>							
			16.45	15.44	17.68	15.44	15.44	14.78							

Continue...

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

SR. NO.	TEST PARAMETERS	UNIT	Oct-23		Nov-23		Dec-23		Jan-24		Feb-24		Mar-24	TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM		
C			Microbiological											
1	Total Bacterial Count	CFU/ml	202		274		250		266		98		98	APHA 23 <sup>rd</sup> Ed.2017,9215-C
2	Total Coliform	/100ml	30		39		35		32		20		14	APHA 23 <sup>rd</sup> Ed.2017,9222-B
3	E.coli	/100ml	22		30		26		27		14		10	IS :15185:2016
4	Enterococcus	/100ml	17		18		20		16		10		8	IS:15186:2002
5	Salmonella	/100ml	Absent		Absent		Absent		Absent		Absent		Absent	IS:15187:2016
6	Shigella	/100ml	Absent		Absent		Absent		Absent		Absent		Absent	APHA 23 <sup>rd</sup> Ed.2017,9260-E
7	Vibrio	/100ml	Absent		Absent		Absent		Absent		Absent		Absent	IS: 5887 (Part V):1976



Mr. Nilesh Patel  
Sr. Chemist




Mr. Nitin Tandel  
Technical Manager

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

SR. NO.	TEST PARAMETERS	UNIT	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	TEST METHOD
			SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	
1.	Organic Matter	%	0.43	0.42	0.46	0.41	0.42	0.43	IS: 2720 (Part 22):1972 RA.2015, Amds.1
2.	Phosphorus as P	µg/g	580.4	594.2	580.3	582.8	580.5	574.2	IS: 10158 :1982, RA.2009 Method B
3.	Texture	--	Sandy	Sandy	Sandy	Sandy	Sandy	Sandy	Lab SOP No. UERL/CHM/LTM/108
4.	Petroleum Hydrocarbon	µg/g	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	APHA 23rd ED,2017,5520 F
5.0	<b>Heavy Metals</b>								
5.1	Aluminum as Al	%	4.11	4.16	4.11	4.15	4.16	4.12	IS3025(Part 55)2003
5.2	Total Chromium as Cr+3	µg/g	134.1	128.5	122.6	121.2	120.4	116.2	EPA 3050B/7190 (Extraction &Analytical Method): 1986
5.3	Manganese as Mn	µg/g	621.2	630.4	624.2	618.4	620.5	624.2	EPA 3050B/7460 (Extraction &Analytical Method): 1986
5.4	Iron as Fe	%	4.14	4.12	4.08	4.02	4.11	4.02	EPA 3050B/7380 (Extraction &Analytical Method): 1986
5.5	Nickel as Ni	µg/g	46.92	42.85	42.22	41.23	42.35	41.86	EPA 3050B/7520 (Extraction &Analytical Method): 1986
5.6	Copper as Cu	µg/g	47.79	46.57	45.88	45.27	45.39	45.21	EPA 3050B /7210 (Extraction &Analytical Method):1986
5.7	Zinc as Zn	µg/g	122.2	114.2	119.4	112.2	114.5	110.6	EPA 3050B/7950 (Extraction &Analytical Method): 1986
5.8	Lead as Pb	µg/g	2.41	2.32	2.18	2.1	2.3	2.41	EPA 3050B /7420 (Extraction &Analytical Method):1986
5.9	Mercury as Hg	µg/g	BDL	BDL	BDL	BDL	BDL	BDL	EPA 7471B (Extraction &Analytical Method) :2007

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QCI-NABET Accredited EIA & GW Consultant Organization

GPCB Recognized Environmental Auditor (Schedule-II)

ISO 9001 : 2015 Certified Company

ISO 45001 : 2018 Certified Company

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

SR. NO.	TEST PARAMETERS	UNIT	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	TEST METHOD
			SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	
D			Benthic Organisms						
1	Macrobenthos	--	<i>Polychates</i>	<i>Gastropods</i>	<i>Gastropods</i>	<i>Polychates</i>	<i>Polychates</i>	<i>Polychates</i>	APHA (23rd Ed. 2017)10500 C
			<i>Decapods Larvae</i>	<i>Decapods Larvae</i>	<i>Decapods Larvae</i>	<i>Amphipods</i>	<i>Amphipods</i>	<i>Amphipods</i>	
			<i>Isopods</i>	<i>Isopods</i>	<i>Isopods</i>	<i>Isopods</i>	<i>Isopods</i>	<i>Sipunculids</i>	
			<i>Sipunculids</i>	<i>Sipunculids</i>	<i>Sipunculids</i>	<i>Sipunculids</i>	<i>Herpectacoids</i>	<i>Herpectacoids</i>	
2	MeioBenthos	--	<i>Herpectacoids</i>	<i>Herpectacoids</i>	<i>Herpectacoids</i>	<i>Foraminiferan</i>	<i>Foraminiferan</i>	<i>Foraminiferan</i>	
			<i>Turbellarians</i>	<i>Turbellarians</i>	<i>Turbellarians</i>	<i>Turbellarians</i>	<i>Turbellarians</i>	<i>Turbellarians</i>	
3	Population	no/m <sup>2</sup>	240	307	335	333	300	366	



Mr. Nilesh Patel  
Sr. Chemist




Mr. Nitin Tandel  
Technical Manager

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

SR. NO.	TEST PARAMETERS	UNIT	Oct-23		Nov-23		Dec-23		Jan-24		Feb-24		Mar-24		TEST METHOD
			SURFACE	BOTTOM											
1.	pH	--	8.16	8.02	8.19	8.06	8.22	8.1	8.14	7.99	8.12	7.86	8.18	8.02	IS 3025 (Part11)1983
2.	Temperature	°C	29.7	29.6	29.7	29.6	29.6	29.5	29.3	29.2	29.4	29.3	29.5	29.4	IS 3025 (Part 9)1984
3.	Total Suspended Solids	mg/L	134	106	126	114	122	110	118	106	124	108	138	112	APHA 23 <sup>rd</sup> Ed.,2017,2540- D
4.	BOD (3 Days @ 27°C)	mg/L	3.2	BDL	2.9	BDL	2.6	BDL	2.8	BDL	2.9	BDL	2.8	BDL	IS 3025(Part 44)1993Amd.01
5.	Dissolved Oxygen	mg/L	5.88	5.68	6.18	6.08	6.02	5.92	6.07	5.97	6.02	5.92	6.15	6.05	APHA 23 <sup>rd</sup> Ed.,2017,4500-O, B
6.	Salinity	ppt	35.89	37.06	36.21	37.14	36.39	37.31	36.44	37.38	36.33	37.32	36.31	37.18	By Calculation
7.	Oil & Grease	mg/L	BDL	BDL	IS 3025(Part39) 1991, Amd. 2										
8.	Nitrate as NO <sub>3</sub>	µmol/L	3.39	3.23	3.55	3.23	3.39	3.06	3.55	3.23	2.74	2.42	2.9	2.58	APHA 23 <sup>rd</sup> Ed., 2017,4500 NO3-B
9.	Nitrite as NO <sub>2</sub>	µmol/L	0.435	0.391	0.413	0.391	0.5	0.478	0.522	0.478	0.609	0.543	0.609	0.522	APHA 23 <sup>rd</sup> Ed.,2017,4500NO <sub>2</sub> B
10.	Ammonical Nitrogen as NH <sub>3</sub>	µmol/L	3.85	3.64	4.22	4.06	4.27	4.22	4.43	4.32	3.74	3.53	4.27	4.16	APHA 23 <sup>rd</sup> Ed., 2017,4500- NH3 B
11.	Phosphates as PO <sub>4</sub>	µmol/L	2.53	2.32	2.32	2.21	2.21	2.11	2	1.79	2.11	1.9	2.32	2.11	APHA 23 <sup>rd</sup> Ed.,2017,4500-P, D
12.	Total Nitrogen	µmol/L	7.675	7.261	8.183	7.681	8.16	7.758	8.502	8.028	7.089	6.493	7.779	7.262	APHA 23 <sup>rd</sup> Ed., 2017,4500 NH3 - B
13.	Petroleum Hydrocarbon	µg/L	N.D.	N.D.	APHA 23 <sup>rd</sup> ED,2017,5520 F										
14.	Total Dissolved Solids	mg/L	36210	37132	36340	37150	36400	37210	36104	36940	36220	37124	36310	37220	APHA 23 <sup>rd</sup> Ed.,2017, 2540- C
15.	COD	mg/L	28	8	20.24	8.1	28.25	24.22	16.3	8.15	20.1	12.1	24.02	16.02	APHA 23 <sup>rd</sup> Ed.,2017, 5220-B

Continue...

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

SR. NO.	TEST PARAMETERS	UNIT	Oct-23		Nov-23		Dec-23		Jan-24		Feb-24		Mar-24		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
A			Phytoplankton												
1.	Chlorophyll	mg/m <sup>3</sup>	3.05	3.07	2.36	2.85	3.68	3.54	3.06	3.11	3.09	2.63	2.98	2.5	APHA (23rd Ed. 2017)10200 H
2.	Phaeophytin	mg/m <sup>3</sup>	1.11	1.88	1.06	1.88	2.57	2.67	2.47	2.44	2.55	1.45	1.55	1.87	APHA (23rd Ed. 2017)10200 H
3.	Cell Count	No. x 10 <sup>3</sup> /L	109	134	86	145	187	174	148	64	122	117	122	114	APHA (23rd Ed. 2017)10200 F
4	Name of Group Number and name of group species of each group	--	<i>Dinophysis</i>	<i>Navicula</i>	<i>Odontella</i>	<i>Cyclotella</i>	<i>Cyclotella</i>	<i>Surirella</i>	<i>Odontella</i>	<i>Nitzschia</i>	<i>Odontella</i>	<i>Nitzschia</i>	<i>Odontella</i>	<i>Nitzschia</i>	APHA (23rd Ed. 2017)10200 F
			<i>Pinnularia</i>	<i>Skeletonema</i>	<i>Rhizosolenia</i>	<i>Pinnularia</i>	<i>Pinnularia</i>	<i>Skeletonema</i>	<i>Rhizosolenia</i>	<i>Pinnularia</i>	<i>Rhizosolenia</i>	<i>Pinnularia</i>	<i>Rhizosolenia</i>	<i>Pinnularia</i>	
			<i>Thalassiothrix</i>	<i>Rhizosolenia</i>	<i>Coscinodiscus</i>	<i>Skeletonema</i>	<i>Thalassiothrix</i>	<i>Rhizosolenia</i>	<i>Coscinodiscus</i>	<i>Odontella</i>	<i>Coscinodiscus</i>	<i>Odontella</i>	<i>Coscinodiscus</i>	<i>Odontella</i>	
			<i>Grammatophora</i>	<i>Dinophysis</i>	<i>Grammatophora</i>	<i>Thalassiosira</i>	<i>Rhizosolenia</i>	<i>Cyclotella</i>	<i>Grammatophora</i>	<i>Dinophysis</i>	<i>Grammatophora</i>	<i>Dinophysis</i>	<i>Pleurosigma</i>	<i>Dinophysis</i>	
			<i>Ceratium</i>	<i>Thalassionema</i>	<i>Thalassiosira</i>	<i>Thalassionema</i>	<i>Ceratium</i>	<i>Thalassionema</i>	<i>Thalassiosira</i>	<i>Surirella</i>	<i>Thalassiosira</i>	<i>Surirella</i>	<i>Thalassiosira</i>	<i>Surirella</i>	

B			Zooplankton											TEST METHOD
SR. NO.	TEST PARAMETERS	UNIT	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24	Jul-24	Aug-24	
1	Abundance (Population)	noX10 <sup>3</sup> / 100 m <sup>3</sup>	40	60	42	51	51	43						APHA (23rd Ed. 2017)10200 G
2	Name of Group Number and name of group species of each group		<i>Diploneis</i>	<i>Diploneis</i>	<i>Diploneis</i>	<i>Decapoda</i>	<i>Decapoda</i>	<i>Decapoda</i>						
			<i>Rhizosolenia</i>	<i>Rhizosolenia</i>	<i>Rhizosolenia</i>	<i>Copepods</i>	<i>Copepods</i>	<i>Oikoplura</i>						
			<i>Nitzschia</i>	<i>Nitzschia</i>	<i>Nitzschia</i>	<i>Crustacean Larvae</i>	<i>Crustacean Larvae</i>	<i>Crustacean Larvae</i>						
			<i>Thalassiothrix</i>	<i>Coscinodiscus</i>	<i>Coscinodiscus</i>	<i>Crustacean</i>	<i>Crustacean</i>	<i>Bivalve Larvae</i>						
			<i>Pleurosigma</i>	<i>Pleurosigma</i>	<i>Pleurosigma</i>	<i>Oikoplura</i>	<i>Oikoplura</i>	<i>Oikoplura</i>						
3	Total Biomass	ml/100 m <sup>3</sup>	15.47	17.45	15.24	16.02	16.02	15.23						

Continue...

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

SR. NO.	TEST PARAMETERS	UNIT	Oct-23		Nov-23		Dec-23		Jan-24		Feb-24		Mar-24		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
C			Microbiological												
1	Total Bacterial Count	CFU/ml	222		221		222		212		212		222		APHA 23 <sup>rd</sup> Ed.2017,9215-C
2	Total Coliform	/100ml	40		39		28		33		33		40		APHA 23 <sup>rd</sup> Ed.2017,9222-B
3	E.coli	/100ml	33		30		26		28		28		30		IS :15185:2016
4	Enterococcus	/100ml	24		16		14		21		21		18		IS:15186:2002
5	Salmonella	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		IS:15187:2016
6	Shigella	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		APHA 23 <sup>rd</sup> Ed.2017,9260-E
7	Vibrio	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		IS: 5887 (Part V):1976



Mr. Nilesh Patel  
Sr. Chemist




Mr. Nitin Tandel  
Technical Manager

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

SR. NO.	TEST PARAMETERS	UNIT	Oct-23		Nov-23		Dec-23		Jan-24		Feb-24		Mar-24		TEST METHOD
			SURFACE	BOTTOM											
1.	pH	--	8.16	7.94	8.12	7.88	8.19	7.98	8.24	8.08	8.19	8.04	8.14	7.98	IS 3025 (Part11)1983
2.	Temperature	°C	29.8	29.7	29.7	29.6	29.6	29.5	29.4	29.2	29.5	29.3	29.6	29.4	IS 3025 (Part 9)1984
3.	Total Suspended Solids	mg/L	118	98	132	110	124	108	116	102	112	108	134	120	APHA 23 <sup>rd</sup> Ed.,2017,2540- D
4.	BOD (3 Days @ 27°C)	mg/L	2.7	BDL	3.4	BDL	2.8	BDL	3.1	BDL	3.4	BDL	3.1	BDL	IS 3025(Part 44)1993Amd.01
5.	Dissolved Oxygen	mg/L	6.18	5.78	6.18	5.98	5.92	5.82	5.97	5.87	5.92	5.82	6.05	5.95	APHA 23 <sup>rd</sup> Ed.,2017,4500-O, B
6.	Salinity	ppt	36.08	36.74	36.22	36.97	36.34	37.11	36.48	37.38	36.44	37.32	36.48	37.35	By Calculation
7.	Oil & Grease	mg/L	BDL	BDL	IS 3025(Part39) 1991, Amd. 2										
8.	Nitrate as NO <sub>3</sub>	µmol/L	3.23	2.9	3.39	3.06	3.23	3.06	3.39	3.06	2.9	2.74	3.23	2.9	APHA 23 <sup>rd</sup> Ed., 2017,4500 NO3-B
9.	Nitrite as NO <sub>2</sub>	µmol/L	0.609	0.543	0.565	0.522	0.522	0.5	0.5	0.456	0.522	0.478	0.565	0.543	APHA 23 <sup>rd</sup> Ed.,2017,4500NO <sub>2</sub> B
10.	Ammonical Nitrogen as NH <sub>3</sub>	µmol/L	3.74	3.53	4.27	4.16	4.01	3.95	4.22	4.06	3.85	3.64	4.32	4.22	APHA 23 <sup>rd</sup> Ed., 2017,4500- NH3 B
11.	Phosphates as PO <sub>4</sub>	µmol/L	2.11	1.9	2	1.79	2.32	2.21	1.68	1.58	2.53	2.42	2.32	2.11	APHA 23 <sup>rd</sup> Ed.,2017,4500-P, D
12.	Total Nitrogen	µmol/L	7.579	6.973	8.225	7.742	7.762	7.51	8.11	7.576	7.272	6.858	8.115	7.663	APHA 23 <sup>rd</sup> Ed., 2017,4500 NH3 - B
13.	Petroleum Hydrocarbon	µg/L	N.D.	N.D.	APHA 23 <sup>rd</sup> ED,2017,5520 F										
14.	Total Dissolved Solids	mg/L	36138	37122	36210	37140	36270	37180	36120	37090	36324	37210	36410	37390	APHA 23 <sup>rd</sup> Ed.,2017, 2540- C
15.	COD	mg/L	24	12	36.43	16.19	24.22	20.18	8.15	4.08	12.1	8	16.02	12.01	APHA 23 <sup>rd</sup> Ed.,2017, 5220-B

Continue...

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

SR. NO.	TEST PARAMETERS	UNIT	Oct-23		Nov-23		Dec-23		Jan-24		Feb-24		Mar-24		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM									
A			Phytoplankton												
1.	Chlorophyll	mg/m <sup>3</sup>	2.22	3.26	2.35	3	2.58	2.98	2.58	3.07	2.64	3.07	2.58	2.87	APHA (23rd Ed. 2017)10200 H
2.	Phaeophytin	mg/m <sup>3</sup>	0.85	1.63	1.05	1.77	1.44	2.06	2	2.63	1.74	2.4	1.09	1.44	APHA (23rd Ed. 2017)10200 H
3.	Cell Count	No. x 10 <sup>3</sup> /L	90	145	101	123	129	152	162	111	135	102	74	124	APHA (23rd Ed. 2017)10200 F
4	Name of Group Number and name of group species of each group	--	<i>Ceratium</i>	<i>Melosira</i>	<i>Ceratium</i>	<i>Rhizosolenia</i>	<i>Surirella</i>	<i>Rhizosolenia</i>	<i>Skeletonema</i>	<i>Odontella</i>	<i>Skeletonema</i>	<i>Odontella</i>	<i>Skeletonema</i>	<i>Odontella</i>	APHA (23rd Ed. 2017)10200 F
			<i>Pinnularia</i>	<i>Dinophysis</i>	<i>Pinnularia</i>	<i>Dinophysis</i>	<i>Pinnularia</i>	<i>Dinophysis</i>	<i>Grammatophora</i>	<i>Rhizosolenia</i>	<i>Grammatophora</i>	<i>Rhizosolenia</i>	<i>Grammatophora</i>	<i>Rhizosolenia</i>	
			<i>Odontella</i>	<i>Skeletonema</i>	<i>Odontella</i>	<i>Skeletonema</i>	<i>Grammatophora</i>	<i>Skeletonema</i>	<i>Nitzschia</i>	<i>Coscinodiscus</i>	<i>Nitzschia</i>	<i>Coscinodiscus</i>	<i>Nitzschia</i>	<i>Coscinodiscus</i>	
			<i>Thalassiothrix</i>	<i>Thalassiosira</i>	<i>Thalassiothrix</i>	<i>Thalassiosira</i>	<i>Thalassiothrix</i>	<i>Thalassiosira</i>	<i>Thalassiothrix</i>	<i>Grammatophora</i>	<i>Thalassiothrix</i>	<i>Grammatophora</i>	<i>Coscinodiscus</i>	<i>Pinnularia</i>	
			<i>Thalassiosira</i>	<i>Thalassionema</i>	<i>Thalassiosira</i>	<i>Melosira</i>	<i>Rhizosolenia</i>	<i>Melosira</i>	<i>Pleurosigma</i>	<i>Thalassiosira</i>	<i>Pleurosigma</i>	<i>Thalassiosira</i>	<i>Pleurosigma</i>	<i>Thalassiosira</i>	

B			Zooplankton												
1	Abundance (Population)	noX10 <sup>3</sup> / 100 m <sup>3</sup>	39		41		55		49		49		32		APHA (23rd Ed. 2017)10200 G
2	Name of Group Number and name of group species of each group		<i>Nitzschia</i>		<i>Nitzschia</i>		<i>Nitzschia</i>		<i>Copepods</i>		<i>Copepods</i>		<i>Copepods</i>		
			<i>Grammatophora</i>		<i>Grammatophora</i>		<i>Grammatophora</i>		<i>Oikoplura</i>		<i>Oikoplura</i>		<i>Oikoplura</i>		
			<i>Diploneis</i>		<i>Diploneis</i>		<i>Egg(Fish and Shrimps)</i>		<i>Crustacean Larvae</i>		<i>Crustacean Larvae</i>		<i>Crustacean Larvae</i>		
			<i>Thalassiothrix</i>		<i>Thalassiothrix</i>		<i>Thalassiothrix</i>		<i>Crustacean</i>		<i>Crustacean</i>		<i>Crustacean</i>		
3	Total Biomass	ml/100 m <sup>3</sup>	<i>Pleurosigma</i>		<i>Pleurosigma</i>		<i>Pleurosigma</i>		<i>Bivalve Larvae</i>		<i>Bivalve Larvae</i>		<i>Egg(Fish and Shrimps)</i>		
			14.56		15.15		16.23		15.23		15.23		14.56		

Continue...

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

SR. NO.	TEST PARAMETERS	UNIT	Oct-23		Nov-23		Dec-23		Jan-24		Feb-24		Mar-24		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM			
C			Microbiological												
1	Total Bacterial Count	CFU/ml	202		240		256		288		288		248		APHA 23 <sup>rd</sup> Ed.2017,9215-C
2	Total Coliform	/100ml	50		50		44		43		43		52		APHA 23 <sup>rd</sup> Ed.2017,9222-B
3	E.coli	/100ml	42		33		32		36		36		41		IS :15185:2016
4	Enterococcus	/100ml	19		21		17		26		26		31		IS:15186:2002
5	Salmonella	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		IS:15187:2016
6	Shigella	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		APHA 23 <sup>rd</sup> Ed.2017,9260-E
7	Vibrio	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		IS: 5887 (Part V):1976



Mr. Nilesh Patel  
Sr. Chemist




Mr. Nitin Tandel  
Technical Manager

### RESULTS OF ETP OUTLET WATER

SR.NO.	TEST PARAMETERS	UNIT	LIQUID TERMINAL						GPCB Limit	TEST METHOD
			Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24		
			21-04-2023	29-05-2023	29-06-2023	25-07-2023	25-08-2023	14-09-2023		
1.	Colour	Pt. Co. Scale	50	40	50	40	50	50	100	IS 3025(Part 4)
2.	pH @ 27 ° C	--	7.41	6.74	7.26	7.36	7.44	7.52	6.5 to 8.5	APHA 23 <sup>rd</sup> Ed.,2017,4500-H <sup>+</sup> B
3.	Temperature	°C	30	31	30.5	30	30	30	40	IS 3025(Part 9)1984
4.	Total Suspended Solid	mg/L	22	24	26	24	18	32	100	APHA 23 <sup>rd</sup> Ed.,2017,2540 –D
5.	Total Dissolved Solids	mg/L	1106	732	804	810	822	840	2100	APHA 23 <sup>rd</sup> Ed.,2017,2540- C
6.	COD	mg/L	72.6	76.2	74.3	89.4	80.9	83.6	100	IS 3025(Part 58)2006
7.	BOD (3 days at 27 °C)	mg/L	20	23	25	27	24	23	30	IS 3025(Part 44)1993Amd.01
8.	Chloride (as Cl) -	mg/L	480.9	332.5	420.1	411.5	391	337.3	600	IS 3025(PART 32) 1988
9.	Oil & Grease	mg/L	BDL	BDL	BDL	BDL	BDL	BDL	10	IS 3025(Part39)1991, Amd. 2
10.	Sulphate (as SO <sub>4</sub> )	mg/L	102	43.3	40.2	36.6	42.2	46.4	1000	IS 3025(Part 24)1986
11.	Ammonical Nitrogen	mg/L	22.2	28.4	24.2	22.8	20.6	28.8	50	IS 3025(Part 34)1988,
12.	Phenolic Compound	mg/L	BDL(MDL:0.1)	BDL(MDL:0.1)	BDL(MDL:0.1)	BDL(MDL:0.1)	BDL(MDL:0.1)	BDL(MDL:0.1)	1	IS 3025(Part 43)1992, Amd.2
13.	Copper as Cu	mg/L	BDL	BDL	BDL	BDL	BDL	BDL	3	IS 3025(Part 42)1992amd.01,
14.	Lead as Pb	mg/L	BDL(MDL:0.01)	BDL(MDL:0.01)	BDL(MDL:0.01)	BDL(MDL:0.01)	BDL(MDL:0.01)	BDL(MDL:0.01)	0.1	APHA 23 <sup>rd</sup> Ed.,2017,3111-B

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QCI-NABET Accredited EIA & GW Consultant Organization

GPCB Recognized Environmental Auditor (Schedule-II)

ISO 9001 : 2015 Certified Company

ISO 45001 : 2018 Certified Company

SR.NO.	TEST PARAMETERS	UNIT	LIQUID TERMINAL						GPCB Limit	TEST METHOD
			Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24		
			21-04-2023	29-05-2023	29-06-2023	25-07-2023	25-08-2023	14-09-2023		
15.	Sulphide as S	mg/L	0.62	BDL	BDL	BDL	BDL	BDL	2	APHA 23 <sup>rd</sup> Ed.,2017,4500 S <sup>-2</sup> F
16.	Cadmium as Cd	mg/L	BDL(MDL:0.003)	BDL(MDL:0.003)	BDL(MDL:0.003)	BDL(MDL:0.003)	BDL(MDL:0.003)	BDL(MDL:0.003)	2	APHA 23 <sup>rd</sup> Ed.,2017,3111-B
17.	Fluoride as F	mg/L	1.03	0.82	0.94	0.86	0.74	0.66	2	APHA 23 <sup>rd</sup> Ed.,2017,4500 F, D
18.	Residual Chlorine	mg/L	0.74	0.88	0.78	0.64	0.94	0.82	0.5 Min.	APHA 23 <sup>rd</sup> Ed.,2017,4500-Cl-B
19.	Percent Sodium	%	48.51	48.05	46.74	45.72	46.93	46.94	60	By Calculation
20.	Sodium Absorption ratio	--	3.51	3.09	2.67	2.86	2.64	2.61	26	By Calculation



Mr. Nilesh Patel  
Sr. Chemist




Mr. Nitin Tandel  
Technical Manager

### Results of Ambient Air Quality Monitoring

Name of Location		CT3 RMU-2						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	HC µg/m <sup>3</sup>	Benzene µg/m <sup>3</sup>
1.	02-10-2023	84.39	36.85	28.57	32.39	0.92	--	NOT DETECTED
2.	05-10-2023	80.25	35.79	31.12	34.85	1.06	4.74	NOT DETECTED
3.	09-10-2023	85.20	37.85	32.02	35.76	0.97	4.29	NOT DETECTED
4.	12-10-2023	79.36	35.13	29.41	33.64	1.00	4.57	NOT DETECTED
5.	16-10-2023	83.56	38.10	31.54	36.83	1.05	4.87	NOT DETECTED
6.	19-10-2023	84.84	34.37	28.59	32.16	0.95	4.74	NOT DETECTED
7.	23-10-2023	80.93	36.73	30.16	35.74	1.00	4.98	NOT DETECTED
8.	26-10-2023	83.79	33.91	26.84	31.83	0.94	4.52	NOT DETECTED
9.	30-10-2023	85.47	36.94	27.89	31.25	1.00	4.23	NOT DETECTED
10.	02-11-2023	80.12	34.23	26.96	31.28	1.00	5.13	NOT DETECTED
11.	06-11-2023	83.51	36.58	28.42	33.88	1.05	5.25	NOT DETECTED
12.	09-11-2023	81.33	35.05	26.13	30.97	1.02	4.86	NOT DETECTED
13.	13-11-2023	78.49	33.64	24.85	29.60	0.97	4.53	NOT DETECTED
14.	16-11-2023	80.94	35.26	26.62	31.78	1.00	4.76	NOT DETECTED
15.	20-11-2023	84.63	37.89	28.76	33.52	1.04	5.29	NOT DETECTED

Continue...

Name of Location		CT3 RMU-2						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	HC µg/m <sup>3</sup>	Benzene µg/m <sup>3</sup>
16.	23-11-2023	81.76	35.25	27.10	31.49	1.00	4.88	NOT DETECTED
17.	27-11-2023	74.68	32.09	24.95	29.18	0.95	4.49	NOT DETECTED
18.	30-11-2023	76.29	34.41	26.37	32.51	0.98	4.64	NOT DETECTED
19.	02-12-2023	78.36	32.19	25.75	30.21	1.11	5.10	NOT DETECTED
20.	06-12-2023	80.96	34.52	27.13	31.98	1.14	5.26	NOT DETECTED
21.	09-12-2023	83.56	36.91	30.6	34.69	1.16	5.59	NOT DETECTED
22.	13-12-2023	81.10	34.31	28.74	32.58	1.13	5.42	NOT DETECTED
23.	16-12-2023	83.92	36.42	29.59	32.05	1.15	5.79	NOT DETECTED
24.	20-12-2023	80.46	33.87	26.43	30.91	1.12	5.62	NOT DETECTED
25.	23-12-2023	82.63	35.29	27.55	32.4	1.14	5.92	NOT DETECTED
26.	27-12-2023	84.10	37.33	29.15	34.62	1.16	6.12	NOT DETECTED
27.	01-01-2024	80.74	37.29	30.74	35.62	1.17	--	NOT DETECTED
28.	04-01-2024	83.15	35.61	27.42	31.81	1.14	5.35	NOT DETECTED
29.	08-01-2024	81.49	32.27	26.12	30.11	1.12	5.2	NOT DETECTED
30.	11-01-2024	84.56	34.2	28.62	32.54	1.15	5.26	NOT DETECTED
31.	15-01-2024	80.77	31.63	25.91	30.73	1.12	4.97	NOT DETECTED

Continue...

Name of Location		CT3 RMU-2						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	HC µg/m <sup>3</sup>	Benzene µg/m <sup>3</sup>
32.	18-01-2024	84.26	35.27	30.46	35.67	1.18	5.42	NOT DETECTED
33.	22-01-2024	82.52	32.84	28.71	33.41	1.16	5.36	NOT DETECTED
34.	25-01-2024	83.79	36.41	31.11	36.07	1.20	5.74	NOT DETECTED
35.	29-01-2024	84.57	34.62	29.88	34.28	1.17	5.52	NOT DETECTED
36.	01-02-2024	83.55	35.07	32.23	36.14	1.20	5.94	NOT DETECTED
37.	05-02-2024	80.49	33.84	29.87	34.52	1.16	5.62	NOT DETECTED
38.	08-02-2024	82.62	31.29	31.41	35.86	1.15	5.77	NOT DETECTED
39.	12-02-2024	77.21	29.74	28.95	32.72	1.12	5.41	NOT DETECTED
40.	15-02-2024	80.73	31.82	29.38	33.64	1.16	5.59	NOT DETECTED
41.	19-02-2024	84.65	34.83	31.26	36.10	1.22	5.88	NOT DETECTED
42.	22-02-2024	79.19	32.5	27.89	32.76	1.19	5.34	NOT DETECTED
43.	26-02-2024	76.53	30.48	27.15	32.91	1.13	5.13	NOT DETECTED
44.	29-02-2024	81.92	33.46	29.21	33.89	1.17	5.47	NOT DETECTED
45.	04-03-2024	83.38	33.56	29.13	34.82	1.16	5.27	NOT DETECTED
46.	07-03-2024	80.63	29.86	27.67	31.90	1.15	4.96	NOT DETECTED
47.	11-03-2024	73.85	28.76	24.91	29.74	1.12	4.83	NOT DETECTED

Continue...

Name of Location		CT3 RMU-2						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	HC µg/m <sup>3</sup>	Benzene µg/m <sup>3</sup>
48.	14-03-2024	83.47	32.25	28.83	32.38	1.17	5.31	NOT DETECTED
49.	18-03-2024	76.58	30.13	26.48	30.65	1.14	5.10	NOT DETECTED
50.	21-03-2024	79.62	33.78	28.85	33.27	1.11	5.25	NOT DETECTED
51.	25-03-2024	74.38	29.42	25.56	30.17	1.10	4.89	NOT DETECTED
52.	28-03-2024	77.81	32.39	28.12	31.84	1.15	5.13	NOT DETECTED
Permissible Value as per NAAQMS		100.0	60.0	80.0	80.0	2.0	---	5.0
Test Method		IS - 5182, Part-23	UERL/AIR/SOP/11	IS - 5182, Part - 2	IS - 5182, Part - 6	IS - 5182, Part - 10	Gas analyzer	IS - 5182, Part - 11



**Nikunj D. Patel**  
(Chemist)




**Jaivik S. Tandel**  
(Manager - Operations)

### Results of Ambient Air Quality Monitoring

Name of Location		Near Fire Station						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	HC µg/m <sup>3</sup>	Benzene µg/m <sup>3</sup>
1.	02-10-2023	79.31	32.15	27.81	30.99	0.91	--	NOT DETECTED
2.	05-10-2023	83.28	33.51	26.94	32.54	0.87	3.46	NOT DETECTED
3.	09-10-2023	85.10	32.56	30.12	35.47	0.95	3.25	NOT DETECTED
4.	12-10-2023	78.14	35.73	28.15	33.37	1.00	3.34	NOT DETECTED
5.	16-10-2023	75.84	37.47	30.23	34.92	1.00	3.16	NOT DETECTED
6.	19-10-2023	79.62	34.59	28.53	32.57	1.04	3.47	NOT DETECTED
7.	23-10-2023	74.22	36.64	26.99	35.98	1.05	3.48	NOT DETECTED
8.	26-10-2023	81.26	33.38	28.85	33.47	0.93	3.26	NOT DETECTED
9.	30-10-2023	84.79	31.72	26.43	31.85	0.90	3.10	NOT DETECTED
10.	02-11-2023	80.53	34.36	26.58	33.63	0.95	3.58	NOT DETECTED
11.	06-11-2023	84.92	37.26	28.92	35.26	1.00	3.70	NOT DETECTED
12.	09-11-2023	83.46	36.52	27.86	34.10	0.97	3.64	NOT DETECTED
13.	13-11-2023	81.82	34.40	26.31	32.55	0.95	3.42	NOT DETECTED
14.	16-11-2023	78.63	33.16	25.47	30.41	0.90	3.30	NOT DETECTED
15.	20-11-2023	75.41	31.73	24.75	29.99	0.86	3.26	NOT DETECTED

Continue...

Name of Location		Near Fire Station						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	HC µg/m <sup>3</sup>	Benzene µg/m <sup>3</sup>
16.	23-11-2023	77.35	34.62	27.32	32.76	0.92	3.49	NOT DETECTED
17.	27-11-2023	72.86	30.91	24.59	29.74	0.85	3.15	NOT DETECTED
18.	30-11-2023	75.63	32.5	26.35	30.52	0.91	3.37	NOT DETECTED
19.	02-12-2023	75.36	30.59	25.12	30.94	0.84	3.51	NOT DETECTED
20.	06-12-2023	73.69	29.46	24.62	28.65	0.80	3.28	NOT DETECTED
21.	09-12-2023	78.25	31.62	26.35	31.26	0.88	3.60	NOT DETECTED
22.	13-12-2023	80.42	33.56	28.64	32.49	0.91	3.64	NOT DETECTED
23.	16-12-2023	84.30	34.89	29.44	34.71	0.94	3.70	NOT DETECTED
24.	20-12-2023	83.02	34.81	29.02	33.86	0.89	3.66	NOT DETECTED
25.	23-12-2023	80.15	32.41	27.52	32.48	0.80	3.47	NOT DETECTED
26.	27-12-2023	78.63	30.96	25.48	30.26	0.78	3.30	NOT DETECTED
27.	01-01-2024	76.51	29.18	25.69	29.37	0.81	--	NOT DETECTED
28.	04-01-2024	79.62	31.43	27.50	31.86	0.86	3.76	NOT DETECTED
29.	08-01-2024	81.59	33.52	28.97	32.06	0.89	3.89	NOT DETECTED
30.	11-01-2024	75.92	28.45	25.26	28.42	0.76	3.52	NOT DETECTED
31.	15-01-2024	77.57	30.91	26.48	30.29	0.78	3.67	NOT DETECTED

Continue...

Name of Location		Near Fire Station						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	HC µg/m <sup>3</sup>	Benzene µg/m <sup>3</sup>
32.	18-01-2024	79.65	32.46	28.54	32.11	0.85	3.76	NOT DETECTED
33.	22-01-2024	82.73	33.47	29.26	33.56	0.90	3.85	NOT DETECTED
34.	25-01-2024	78.26	30.55	26.42	30.64	0.82	3.71	NOT DETECTED
35.	29-01-2024	75.37	29.93	24.35	28.63	0.77	3.39	NOT DETECTED
36.	01-02-2024	78.32	28.61	26.35	28.94	0.75	3.53	NOT DETECTED
37.	05-02-2024	81.56	32.11	29.54	32.29	0.83	3.86	NOT DETECTED
38.	08-02-2024	79.48	30.26	28.09	31.74	0.78	3.47	NOT DETECTED
39.	12-02-2024	75.73	28.91	26.62	30.11	0.74	3.38	NOT DETECTED
40.	15-02-2024	72.58	27.73	25.42	29.59	0.7	3.24	NOT DETECTED
41.	19-02-2024	75.16	29.1	26.85	29.13	0.76	3.40	NOT DETECTED
42.	22-02-2024	80.29	32.46	30.13	33.40	0.81	3.81	NOT DETECTED
43.	26-02-2024	73.84	28.38	26.91	31.42	0.72	3.42	NOT DETECTED
44.	29-02-2024	76.52	30.21	28.79	32.47	0.79	3.68	NOT DETECTED
45.	04-03-2024	71.94	27.79	25.37	29.52	0.69	3.07	NOT DETECTED
46.	07-03-2024	74.35	29.84	28.12	32.57	0.73	3.15	NOT DETECTED
47.	11-03-2024	70.54	27.27	25.94	28.77	0.67	3.24	NOT DETECTED

Continue...

Name of Location		Near Fire Station						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	HC µg/m <sup>3</sup>	Benzene µg/m <sup>3</sup>
48.	14-03-2024	72.95	30.71	27.47	32.81	0.70	3.42	NOT DETECTED
49.	18-03-2024	79.13	32.47	24.81	28.67	0.75	3.68	NOT DETECTED
50.	21-03-2024	75.46	30.68	28.45	33.13	0.78	3.52	NOT DETECTED
51.	25-03-2024	77.93	32.57	25.89	29.93	0.72	3.40	NOT DETECTED
52.	28-03-2024	81.24	27.83	27.64	32.28	0.79	3.57	NOT DETECTED
Permissible Value as per NAAQMS		100.0	60.0	80.0	80.0	2.0	---	5.0
Test Method		IS - 5182, Part-23	UERL/AIR/SOP/11	IS - 5182, Part - 2	IS - 5182, Part - 6	IS - 5182, Part - 10	Gas analyzer	IS - 5182, Part - 11



**Nikunj D. Patel**  
(Chemist)




**Jaivik S. Tandel**  
(Manager - Operations)

### Results of Ambient Air Quality Monitoring

Name of Location		ADANI PORT – TUG Berth 600 KL Pupm House						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	HC µg/m <sup>3</sup>	Benzene µg/m <sup>3</sup>
1.	02-10-2023	84.63	34.59	26.58	30.15	1.00	--	NOT DETECTED
2.	05-10-2023	82.39	32.65	25.97	29.76	0.97	3.86	NOT DETECTED
3.	09-10-2023	80.98	36.74	28.47	31.83	1.00	4.37	NOT DETECTED
4.	12-10-2023	76.84	34.10	30.26	33.94	1.05	4.50	NOT DETECTED
5.	16-10-2023	78.63	34.90	28.57	32.69	1.09	4.56	NOT DETECTED
6.	19-10-2023	85.70	36.85	29.98	32.46	1.10	4.10	NOT DETECTED
7.	23-10-2023	80.25	34.75	27.68	30.05	1.07	4.63	NOT DETECTED
8.	26-10-2023	84.64	32.39	26.14	29.65	1.03	4.21	NOT DETECTED
9.	30-10-2023	85.36	34.52	25.45	27.86	1.00	3.86	NOT DETECTED
10.	02-11-2023	82.26	35.65	28.27	32.18	0.99	4.13	NOT DETECTED
11.	06-11-2023	79.65	33.42	26.19	30.48	0.95	3.89	NOT DETECTED
12.	09-11-2023	83.16	36.48	29.62	33.55	1.02	4.35	NOT DETECTED
13.	13-11-2023	80.75	32.10	25.47	29.73	1.00	3.76	NOT DETECTED
14.	16-11-2023	82.92	36.83	28.24	31.92	1.05	4.50	NOT DETECTED
15.	20-11-2023	78.85	31.93	26.82	30.13	0.98	4.19	NOT DETECTED

Continue...

Name of Location		ADANI PORT – TUG Berth 600 KL Pupm House						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	HC µg/m <sup>3</sup>	Benzene µg/m <sup>3</sup>
16.	23-11-2023	80.20	33.52	28.76	33.38	1.00	4.36	NOT DETECTED
17.	27-11-2023	73.86	31.49	24.84	28.40	0.92	3.76	NOT DETECTED
18.	30-11-2023	78.58	32.73	26.13	29.62	0.95	3.97	NOT DETECTED
19.	02-12-2023	76.35	31.84	25.13	30.58	0.95	3.95	NOT DETECTED
20.	06-12-2023	81.63	33.29	27.86	31.96	1.00	4.32	NOT DETECTED
21.	09-12-2023	78.91	32.10	25.32	31.42	0.98	4.12	NOT DETECTED
22.	13-12-2023	80.53	33.75	27.43	31.77	1.00	4.36	NOT DETECTED
23.	16-12-2023	83.62	35.46	29.31	33.72	1.03	4.59	NOT DETECTED
24.	20-12-2023	81.96	32.79	28.16	32.63	1.00	4.37	NOT DETECTED
25.	23-12-2023	83.67	34.99	29.92	34.59	1.06	4.46	NOT DETECTED
26.	27-12-2023	80.49	31.26	27.51	31.25	1.00	4.25	NOT DETECTED
27.	01-01-2024	82.22	34.59	29.14	34.49	1.08	--	NOT DETECTED
28.	04-01-2024	79.62	32.18	26.54	31.52	1.05	3.87	NOT DETECTED
29.	08-01-2024	84.61	35.62	30.43	34.72	1.10	4.06	NOT DETECTED
30.	11-01-2024	80.74	32.14	28.69	32.87	1.06	3.91	NOT DETECTED
31.	15-01-2024	82.90	34.82	29.31	34.09	1.09	3.98	NOT DETECTED

Continue...

Name of Location		ADANI PORT – TUG Berth 600 KL Pupm House						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	HC µg/m <sup>3</sup>	Benzene µg/m <sup>3</sup>
32.	18-01-2024	77.29	31.71	26.84	31.27	1.00	3.74	NOT DETECTED
33.	22-01-2024	80.25	33.06	28.42	33.72	1.05	3.87	NOT DETECTED
34.	25-01-2024	84.36	35.13	30.21	34.43	1.11	4.26	NOT DETECTED
35.	29-01-2024	81.73	33.59	28.94	34.67	1.08	4.12	NOT DETECTED
36.	01-02-2024	80.96	33.31	28.42	33.21	1.12	4.25	NOT DETECTED
37.	05-02-2024	77.64	30.72	26.84	31.43	1.07	3.86	NOT DETECTED
38.	08-02-2024	81.29	32.88	29.13	34.57	1.15	4.12	NOT DETECTED
39.	12-02-2024	84.38	35.62	31.46	36.91	1.18	4.39	NOT DETECTED
40.	15-02-2024	82.05	33.73	29.85	34.56	1.12	4.30	NOT DETECTED
41.	19-02-2024	79.63	32.47	28.38	33.17	1.10	3.87	NOT DETECTED
42.	22-02-2024	75.15	30.26	26.92	31.60	1.06	3.75	NOT DETECTED
43.	26-02-2024	80.31	33.59	30.64	35.73	1.11	4.18	NOT DETECTED
44.	29-02-2024	77.39	31.47	28.73	33.42	1.08	3.91	NOT DETECTED
45.	04-03-2024	80.63	31.36	30.11	35.47	1.10	4.46	NOT DETECTED
46.	07-03-2024	76.27	29.84	28.35	32.73	1.04	4.15	NOT DETECTED
47.	11-03-2024	81.73	33.11	29.74	34.12	1.07	4.63	NOT DETECTED

Continue...

Name of Location		ADANI PORT – TUG Berth 600 KL Pupm House						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	HC µg/m <sup>3</sup>	Benzene µg/m <sup>3</sup>
48.	14-03-2024	84.12	35.62	32.17	37.65	1.14	4.76	NOT DETECTED
49.	18-03-2024	80.93	32.19	30.42	35.34	1.10	4.32	NOT DETECTED
50.	21-03-2024	84.31	33.65	33.47	38.54	1.13	4.19	NOT DETECTED
51.	25-03-2024	82.17	31.74	30.85	38.42	1.08	4.35	NOT DETECTED
52.	28-03-2024	86.42	34.17	32.75	36.13	1.12	4.64	NOT DETECTED
Permissible Value as per NAAQMS		100.0	60.0	80.0	80.0	2.0	---	5.0
Test Method		IS - 5182, Part-23	UERL/AIR/SOP/11	IS - 5182, Part - 2	IS - 5182, Part - 6	IS - 5182, Part - 10	Gas analyzer	IS – 5182, Part – 11



**Nikunj D. Patel**  
(Chemist)




**Jaivik S. Tandel**  
(Manager - Operations)

### Results of Ambient Air Quality Monitoring

Name of Location		PUB / Adani House						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	HC µg/m <sup>3</sup>	Benzene µg/m <sup>3</sup>
1.	02-10-2023	71.26	28.95	21.30	24.58	0.75	--	NOT DETECTED
2.	05-10-2023	68.79	26.35	20.57	23.97	0.70	2.56	NOT DETECTED
3.	09-10-2023	73.24	26.36	20.75	25.62	0.68	2.87	NOT DETECTED
4.	12-10-2023	76.48	29.60	22.42	27.25	0.70	2.74	NOT DETECTED
5.	16-10-2023	81.63	30.12	21.87	25.64	0.80	2.97	NOT DETECTED
6.	19-10-2023	78.42	28.79	23.55	28.10	0.77	2.87	NOT DETECTED
7.	23-10-2023	75.11	25.38	20.32	25.86	0.71	2.58	NOT DETECTED
8.	26-10-2023	80.65	29.81	22.58	26.84	0.78	3.10	NOT DETECTED
9.	30-10-2023	77.26	27.44	22.93	26.76	0.75	2.89	NOT DETECTED
10.	02-11-2023	74.17	29.55	23.31	28.29	0.78	2.60	NOT DETECTED
11.	06-11-2023	72.35	27.42	22.50	26.95	0.72	2.45	NOT DETECTED
12.	09-11-2023	75.67	29.93	24.82	28.43	0.80	2.76	NOT DETECTED
13.	13-11-2023	78.15	31.48	25.63	30.15	0.85	2.85	NOT DETECTED
14.	16-11-2023	74.51	29.20	23.26	28.73	0.81	2.65	NOT DETECTED
15.	20-11-2023	72.88	27.41	21.85	26.38	0.76	2.46	NOT DETECTED

Continue...

Name of Location		PUB / Adani House						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	HC µg/m <sup>3</sup>	Benzene µg/m <sup>3</sup>
16.	23-11-2023	75.63	30.19	24.48	29.83	0.80	2.71	NOT DETECTED
17.	27-11-2023	70.11	26.54	21.10	26.55	0.72	2.40	NOT DETECTED
18.	30-11-2023	73.26	28.79	23.92	28.37	0.76	2.53	NOT DETECTED
19.	04-12-2023	72.47	27.91	21.82	25.73	0.70	2.39	NOT DETECTED
20.	07-12-2023	76.29	30.31	23.58	28.19	0.75	2.45	NOT DETECTED
21.	11-12-2023	80.53	30.95	24.04	28.97	0.81	2.61	NOT DETECTED
22.	14-12-2023	82.65	31.10	25.31	30.26	0.82	2.78	NOT DETECTED
23.	18-12-2023	78.71	28.27	23.98	28.21	0.79	2.65	NOT DETECTED
24.	21-12-2023	75.20	27.52	21.93	25.67	0.72	2.58	NOT DETECTED
25.	25-12-2023	68.93	26.69	20.86	24.79	0.69	2.36	NOT DETECTED
26.	28-12-2023	71.38	28.61	23.13	28.45	0.73	2.51	NOT DETECTED
27.	01-01-2024	74.54	30.13	22.46	26.21	0.79	--	NOT DETECTED
28.	04-01-2024	77.37	32.59	25.03	29.17	0.84	3.12	NOT DETECTED
29.	08-01-2024	75.19	31.63	23.84	26.96	0.80	2.94	NOT DETECTED
30.	11-01-2024	72.84	28.16	21.69	25.32	0.74	2.8	NOT DETECTED
31.	15-01-2024	76.25	30.54	24.98	28.73	0.83	2.89	NOT DETECTED

Continue...

Name of Location		PUB / Adani House						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	HC µg/m <sup>3</sup>	Benzene µg/m <sup>3</sup>
32.	18-01-2024	69.98	28.63	21.00	25.37	0.73	2.76	NOT DETECTED
33.	22-01-2024	67.37	27.57	20.69	24.15	0.70	2.62	NOT DETECTED
34.	25-01-2024	71.83	30.49	21.76	26.33	0.74	2.78	NOT DETECTED
35.	29-01-2024	73.24	32.73	23.54	28.16	0.77	2.82	NOT DETECTED
36.	01-02-2024	76.57	32.81	23.12	27.37	0.79	2.98	NOT DETECTED
37.	05-02-2024	73.16	30.26	21.68	25.42	0.74	2.86	NOT DETECTED
38.	08-02-2024	70.62	28.96	20.21	24.38	0.69	2.71	NOT DETECTED
39.	12-02-2024	75.84	30.42	22.38	26.71	0.77	2.88	NOT DETECTED
40.	15-02-2024	72.68	29.82	21.45	24.60	0.69	2.64	NOT DETECTED
41.	19-02-2024	66.43	27.19	19.87	22.59	0.68	2.51	NOT DETECTED
42.	22-02-2024	69.15	28.79	20.62	23.10	0.70	2.69	NOT DETECTED
43.	26-02-2024	73.54	31.56	22.84	26.62	0.79	2.82	NOT DETECTED
44.	29-02-2024	70.69	30.11	20.03	24.27	0.72	2.73	NOT DETECTED
45.	04-03-2024	67.50	28.42	20.84	24.15	0.60	2.69	NOT DETECTED
46.	07-03-2024	65.84	25.73	19.87	22.58	0.68	2.45	NOT DETECTED
47.	11-03-2024	63.95	26.45	22.27	26.42	0.60	2.41	NOT DETECTED

Continue...

MoEF&CC (GOI) Recognized Environmental Laboratory under the EPA-1986 (31.03.2023 to 22.09.2024)

QCI-NABET Accredited EIA & GW Consultant Organization

GPCB Recognized Environmental Auditor (Schedule-II)

ISO 9001 : 2015 Certified Company

ISO 45001 : 2018 Certified Company

Name of Location		PUB / Adani House						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	HC µg/m <sup>3</sup>	Benzene µg/m <sup>3</sup>
48.	14-03-2024	67.35	29.13	20.57	24.48	0.65	2.68	NOT DETECTED
49.	18-03-2024	69.54	30.26	22.85	25.92	0.59	2.74	NOT DETECTED
50.	21-03-2024	74.13	27.41	23.36	26.10	0.70	2.85	NOT DETECTED
51.	25-03-2024	70.54	25.95	22.48	24.65	0.67	2.53	NOT DETECTED
52.	28-03-2024	65.48	27.30	19.84	23.39	0.61	2.49	NOT DETECTED
Permissible Value as per NAAQMS		100.0	60.0	80.0	80.0	2.0	---	5.0
Test Method		IS - 5182, Part-23	UERL/AIR/SOP/11	IS - 5182, Part - 2	IS - 5182, Part - 6	IS - 5182, Part - 10	Gas analyzer	IS - 5182, Part - 11



**Nikunj D. Patel**  
(Chemist)




**Jaivik S. Tandel**  
(Manager - Operations)

### Results of Ambient Air Quality Monitoring

Name of Location		CT-4 RMU-1						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	HC µg/m <sup>3</sup>	Benzene µg/m <sup>3</sup>
1.	02-11-2023	76.42	28.27	23.65	28.37	0.90	4.26	NOT DETECTED
2.	06-11-2023	72.59	26.92	21.37	26.55	0.84	4.05	NOT DETECTED
3.	09-11-2023	67.73	30.76	24.68	29.81	1.00	4.38	NOT DETECTED
4.	13-11-2023	74.25	33.13	26.72	31.64	1.05	4.76	NOT DETECTED
5.	16-11-2023	87.13	28.64	23.13	28.72	0.95	4.52	NOT DETECTED
6.	20-11-2023	84.25	26.49	22.51	26.94	0.88	4.36	NOT DETECTED
7.	23-11-2023	82.64	25.20	21.35	25.46	0.85	4.14	NOT DETECTED
8.	27-11-2023	76.37	23.58	18.96	23.89	0.76	3.96	NOT DETECTED
9.	04-12-2023	82.75	30.41	25.13	29.85	0.94	4.62	NOT DETECTED
10.	07-12-2023	78.38	27.53	22.96	25.27	0.82	4.41	NOT DETECTED
11.	11-12-2023	80.16	29.37	25.12	28.76	0.86	4.73	NOT DETECTED
12.	14-12-2023	84.48	33.81	27.64	32.49	0.98	4.89	NOT DETECTED
13.	18-12-2023	82.31	31.26	24.94	28.51	0.90	4.75	NOT DETECTED
14.	21-12-2023	76.47	27.83	23.46	27.25	0.81	4.52	NOT DETECTED

Continue...

Name of Location		CT-4 RMU-1						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	HC µg/m <sup>3</sup>	Benzene µg/m <sup>3</sup>
15.	25-12-2023	73.59	24.57	20.13	24.81	0.74	4.36	NOT DETECTED
16.	28-12-2023	79.11	29.32	22.53	26.76	0.79	4.48	NOT DETECTED
17.	01-01-2024	81.42	31.86	24.28	28.17	0.97	--	NOT DETECTED
18.	04-01-2024	84.26	34.48	26.84	31.46	1.00	4.82	NOT DETECTED
19.	08-01-2024	79.82	28.91	22.86	27.52	0.92	4.53	NOT DETECTED
20.	11-01-2024	82.57	31.49	25.22	29.35	1.00	4.68	NOT DETECTED
21.	15-01-2024	78.84	27.59	22.12	26.89	0.87	4.41	NOT DETECTED
22.	18-01-2024	80.64	29.17	23.79	27.42	0.91	4.65	NOT DETECTED
23.	22-01-2024	83.49	32.72	26.31	30.58	1.05	4.73	NOT DETECTED
24.	25-01-2024	85.27	35.49	29.32	33.24	1.10	4.82	NOT DETECTED
25.	29-01-2024	80.65	30.16	24.05	29.13	0.95	4.70	NOT DETECTED
26.	01-02-2024	78.62	28.96	22.10	26.93	0.82	4.45	NOT DETECTED
27.	05-02-2024	82.36	30.19	24.56	29.31	0.93	4.62	NOT DETECTED
28.	08-02-2024	84.16	32.46	27.84	33.46	0.97	4.87	NOT DETECTED
29.	12-02-2024	80.43	31.46	25.63	29.70	0.89	4.70	NOT DETECTED
30.	15-02-2024	77.29	29.66	22.38	27.62	0.76	4.62	NOT DETECTED

Continue...

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ISO 9001 : 2015 Certified Company

ISO 45001 : 2018 Certified Company

Name of Location		CT-4 RMU-1						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	HC µg/m <sup>3</sup>	Benzene µg/m <sup>3</sup>
31.	19-02-2024	75.73	27.43	20.96	25.17	0.70	4.39	NOT DETECTED
32.	22-02-2024	79.37	30.11	22.16	26.93	0.78	4.53	NOT DETECTED
33.	26-02-2024	82.64	32.83	25.31	29.62	0.86	4.81	NOT DETECTED
34.	29-02-2024	79.55	29.89	23.72	27.53	0.77	4.68	NOT DETECTED
35.	04-03-2024	85.13	34.25	25.81	28.47	0.79	4.85	NOT DETECTED
36.	07-03-2024	80.74	31.48	22.57	26.35	0.64	4.71	NOT DETECTED
37.	11-03-2024	78.93	28.52	21.76	26.11	0.57	4.52	NOT DETECTED
38.	14-03-2024	75.38	30.86	23.29	27.46	0.52	4.68	NOT DETECTED
39.	18-03-2024	81.52	33.47	24.92	29.53	0.76	4.82	NOT DETECTED
40.	21-03-2024	86.14	37.35	27.11	32.42	0.82	4.97	NOT DETECTED
41.	25-03-2024	83.74	34.68	25.24	30.48	0.73	4.72	NOT DETECTED
42.	28-03-2024	86.85	31.57	26.86	29.62	0.87	4.82	NOT DETECTED
<b>Permissible Value as per NAAQMS</b>		<b>100.0</b>	<b>60.0</b>	<b>80.0</b>	<b>80.0</b>	<b>2.0</b>	<b>---</b>	<b>5.0</b>
<b>Test Method</b>		<b>IS - 5182, Part-23</b>	<b>UERL/AIR/SOP/11</b>	<b>IS - 5182, Part - 2</b>	<b>IS - 5182, Part - 6</b>	<b>IS - 5182, Part - 10</b>	<b>Gas analyzer</b>	<b>IS - 5182, Part - 11</b>

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Consultant Organization

GPCB Recognized Environmental  
Auditor (Schedule-II)

ISO 9001 : 2015  
Certified Company

ISO 45001 : 2018  
Certified Company



**Nikunj D. Patel**  
(Chemist)



**Jaivik S. Tandel**  
(Manager - Operations)

**Results of Noise Level Monitoring**

Location Name		CT3 RMU-2					
Sr. No.	Sampling Date and Time	Noise Level Leq. dB(A) - Day Time					
		12-10-2023	13-11-2023	14-12-2023	11-01-2024	12-02-2024	14-03-2024
1	06:00 to 07:00	64.8	64.5	65.5	66.3	65.6	65.8
2	07:00 to 08:00	69.2	66.9	63.5	62.4	63.6	63.7
3	08:00 to 09:00	65.4	65.2	67.3	66.6	65.7	67.5
4	09:00 to 10:00	66.8	69.6	64.3	65.2	63.8	64.7
5	10:00 to 11:00	64.1	61.2	63.8	62.6	64.1	66.8
6	11:00 to 12:00	68.9	65.7	66.7	64.9	65.8	64.3
7	12:00 to 13:00	65.3	68.8	66.5	66.5	66.1	62.3
8	13:00 to 14:00	68.3	67.5	64.7	64.7	65.3	66.7
9	14:00 to 15:00	61.8	65.2	66.4	65.3	66.9	63.5
10	15:00 to 16:00	64.3	68.6	65.4	65.4	66.3	64.9
11	16:00 to 17:00	69.4	65.2	68.1	68.5	67.5	65.8
12	17:00 to 18:00	63.9	68.2	65.8	65.8	64.2	65.6
13	18:00 to 19:00	67.5	67.4	64.8	63.8	64.8	62.3
14	19:00 to 20:00	66.4	63.9	62.8	64.3	66.1	65.4
15	20:00 to 21:00	63.4	60.7	63.4	62.8	62.8	63.8
16	21:00 to 22:00	65.1	63.8	61.7	60.7	61.3	63.2
<b>Day Time</b>		<b>&lt;75 dB (A)</b>					

Continue...

Location Name		CT3 RMU-2					
Sr. No.	Sampling Date and Time	Noise Level Leq. dB(A) – Night Time					
		12-10-2023	13-11-2023	14-12-2023	11-01-2024	12-02-2024	14-03-2024
1	22:00 to 23:00	59.6	63.7	64.1	64.3	63.8	63.5
2	23:00 to 24:00	61.6	61.8	63.9	63.9	62.5	62.6
3	24:00 to 01:00	60.6	59.4	62.4	62.6	64.1	63.1
4	01:00 to 02:00	57.9	60.3	62.8	63.4	62.9	63.9
5	02:00 to 03:00	55.8	62.7	63.9	63.9	64.1	64.7
6	03:00 to 04:00	61.3	60.9	61.8	61.8	63.2	63.2
7	04:00 to 05:00	60.3	57.5	59.2	59.2	61.8	60.1
8	05:00 to 06:00	61.1	59.9	58.3	59.7	60.3	61.3
<b>Night Time</b>		<b>&lt;70 dB (A)</b>					

<b>Test Method</b>	<b>IS: 9989 : 1981</b>
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**Nikunj D. Patel**  
(Chemist)




**Jaivik S. Tandel**  
(Manager - Operations)

**Results of Noise Level Monitoring**

Location Name		Near Fire Station					
Sr. No.	Sampling Date and Time	Noise Level Leq. dB(A) - Day Time					
		05-10-2023	06-11-2023	07-12-2023	04-01-2024	05-02-2024	07-03-2024
1	06:00 to 07:00	63.4	64.4	62.7	64.3	65.1	64.1
2	07:00 to 08:00	66.4	67.3	64.8	64.8	63.2	65.3
3	08:00 to 09:00	69.3	65.7	66.4	65.8	66.2	65.8
4	09:00 to 10:00	61.3	62.8	63.7	64.8	65.3	67.1
5	10:00 to 11:00	63.1	65.5	67.1	65.2	67.2	65.4
6	11:00 to 12:00	68.3	63.6	65.7	66.7	65.3	63.8
7	12:00 to 13:00	65.7	64.2	66.4	65.1	64.8	65.2
8	13:00 to 14:00	66.7	67.4	68.3	68.3	67.3	66.5
9	14:00 to 15:00	60.4	61.2	65.2	66.3	65.5	66.9
10	15:00 to 16:00	67.5	64.8	63.8	62.9	63.8	65.2
11	16:00 to 17:00	64.7	62.8	61.3	61.3	63.6	64.4
12	17:00 to 18:00	67.1	60.1	63.5	64.7	65.2	63.7
13	18:00 to 19:00	63.2	64.9	66.4	66.4	65.7	62.8
14	19:00 to 20:00	66.8	61.3	63.8	64.6	63.6	64.6
15	20:00 to 21:00	64.2	64.5	62.4	63.8	64.1	63.6
16	21:00 to 22:00	61.3	60.7	62.1	63.1	63.6	62.4
<b>Day Time</b>		<b>&lt;75 dB (A)</b>					

Continue...

Location Name		Near Fire Station					
Sr. No.	Sampling Date and Time	Noise Level Leq. dB(A) - Night Time					
		05-10-2023	06-11-2023	07-12-2023	04-01-2024	05-02-2024	07-03-2024
1	22:00 to 23:00	59.9	58.8	60.2	59.9	61.4	62.7
2	23:00 to 24:00	58.4	61.6	63.8	62.6	63.6	61.8
3	24:00 to 01:00	62.4	62.3	64.6	64.6	62.5	62.3
4	01:00 to 02:00	57.5	58.4	62.3	62.3	63.1	64.4
5	02:00 to 03:00	61.7	61.3	61.3	62.8	61.6	62.3
6	03:00 to 04:00	60.1	60.6	59.1	59.1	58.9	60.8
7	04:00 to 05:00	61.3	59.3	58.5	58.5	58.5	61.5
8	05:00 to 06:00	58.2	57.6	58.1	59.6	57.8	60.4
<b>Night Time</b>		<b>&lt;70 dB (A)</b>					

<b>Test Method</b>	<b>IS: 9989 : 1981</b>
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**Nikunj D. Patel**  
(Chemist)




**Jaivik S. Tandel**  
(Manager - Operations)

**Results of Noise Level Monitoring**

Location Name		ADANI PORT – TUG Berth 600 KL Pump House					
Sr. No.	Sampling Date and Time	Noise Level Leq. dB(A) - Day Time					
		09-10-2023	09-11-2023	11-12-2023	08-01-2024	08-02-2024	11-03-2024
1	06:00 to 07:00	60.5	63.8	64.2	63.1	62.8	63.4
2	07:00 to 08:00	65.4	65.4	66.1	65.3	64.8	63.8
3	08:00 to 09:00	68.9	62.6	64.8	63.7	64.9	65.2
4	09:00 to 10:00	65.3	67.4	66.4	66.4	65.3	66.5
5	10:00 to 11:00	67.3	63.3	66.3	64.9	65.6	65.2
6	11:00 to 12:00	65.3	68.4	67.4	65.2	66.2	67.4
7	12:00 to 13:00	67.4	67.2	64.8	63.7	63.9	65.7
8	13:00 to 14:00	69.2	63.8	62.5	61.9	63.1	64.2
9	14:00 to 15:00	67.3	66.3	68.2	68	67	66.7
10	15:00 to 16:00	69.8	60.4	63.5	64.5	65.3	63.5
11	16:00 to 17:00	68.2	63.5	65.7	65.7	63.8	64.1
12	17:00 to 18:00	64.3	67.9	65.9	64.6	63.4	62.4
13	18:00 to 19:00	65.4	68.1	62.6	62.6	63.8	64.5
14	19:00 to 20:00	63.6	65.2	64.1	62.5	64.2	65.1
15	20:00 to 21:00	66.1	64.1	61.7	61.7	60.8	64.5
16	21:00 to 22:00	62.8	62.3	63.5	62.5	61.8	61.9
<b>Day Time</b>		<b>&lt;75 dB (A)</b>					

Continue...

Location Name		ADANI PORT – TUG Berth 600 KL Pump House					
Sr. No.	Sampling Date and Time	Noise Level Leq. dB(A) - Night Time					
		09-10-2023	09-11-2023	11-12-2023	08-01-2024	08-02-2024	11-03-2024
1	22:00 to 23:00	62.7	61.4	62.3	63.1	62.5	61.2
2	23:00 to 24:00	62.3	63.5	60.5	61.3	60.7	60.7
3	24:00 to 01:00	56.8	64.1	62.3	63.7	63.5	62.7
4	01:00 to 02:00	60.1	62.7	64.6	64.6	63.6	63.4
5	02:00 to 03:00	56.5	60.6	63.2	63.2	64.5	63.8
6	03:00 to 04:00	57.5	59.4	61.7	62.5	63.1	62.6
7	04:00 to 05:00	60.7	58.7	60.3	60.3	59.6	61.3
8	05:00 to 06:00	59.5	56.4	57.4	57.9	59.2	58.7
Day Time		<70 dB (A)					

Test Method	IS: 9989 : 1981
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**Nikunj D. Patel**  
(Chemist)




**Jaivik S. Tandel**  
(Manager - Operations)

**Results of Noise Level Monitoring**

Location Name		PUB/Adani House					
Sr. No.	Sampling Date and Time	Noise Level Leq. dB(A) - Day Time					
		02-10-2023	02-11-2023	04-12-2023	01-01-2024	01-02-2024	04-03-2024
1	06:00 to 07:00	64.2	62.5	63.1	62.5	63.5	61.9
2	07:00 to 08:00	62.8	65.1	66.3	65.7	65.4	63.2
3	08:00 to 09:00	58.7	68.2	64.8	64.8	64.7	65.7
4	09:00 to 10:00	61.8	63.9	65.3	66.1	65.9	64.3
5	10:00 to 11:00	68.7	67.8	68.2	67.2	66.5	65.7
6	11:00 to 12:00	63.4	65.2	66.5	66.5	67.2	66.3
7	12:00 to 13:00	68.3	61.3	63.7	64.3	65.3	63.7
8	13:00 to 14:00	63.9	65.9	67.4	67.4	66.8	64.2
9	14:00 to 15:00	62.5	62.6	64.6	65.9	66.1	64.8
10	15:00 to 16:00	62.9	63.7	65.1	65.1	66.9	65.7
11	16:00 to 17:00	65.5	65.4	66.4	67.1	67.5	67.9
12	17:00 to 18:00	63.3	65.3	67.3	65.7	64.3	66.2
13	18:00 to 19:00	61.8	69.1	65.9	64.2	63.8	64.6
14	19:00 to 20:00	68.3	65.2	63.2	63.2	62.7	63.8
15	20:00 to 21:00	64.2	63.8	62.6	62.6	63.9	62.3
16	21:00 to 22:00	63.6	61.2	60.8	61.2	62.3	60.8
<b>Day Time</b>		<b>&lt;75 dB (A)</b>					

Continue...

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GPCB Recognized Environmental Auditor (Schedule-II)

ISO 9001 : 2015 Certified Company

ISO 45001 : 2018 Certified Company

Location Name		PUB/Adani House					
Sr. No.	Sampling Date and Time	Noise Level Leq. dB(A) - Night Time					
		02-10-2023	02-11-2023	04-12-2023	01-01-2024	01-02-2024	04-03-2024
1	22:00 to 23:00	57.4	60.5	59.7	58.6	59.2	60.7
2	23:00 to 24:00	55.8	63.2	61.3	61.7	60.3	58.4
3	24:00 to 01:00	53.9	61.4	62.3	63.3	62.9	60.7
4	01:00 to 02:00	58.6	64.8	61.9	61.9	60.3	62.1
5	02:00 to 03:00	59.3	60.1	59.7	59.5	57.8	60.5
6	03:00 to 04:00	53.8	58.2	57.6	57.4	56.3	61.3
7	04:00 to 05:00	56.3	57.5	56.3	56.3	56.8	58.6
8	05:00 to 06:00	55.6	59.3	57.5	58.1	57.3	58.1
Day Time		<70 dB (A)					

Test Method	IS: 9989 : 1981
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**Nikunj D. Patel**  
(Chemist)




**Jaivik S. Tandel**  
(Manager - Operations)

**Results of Noise Level Monitoring**

Location Name		CT-4 RMU-1				
Sr. No.	Sampling Date and Time	Noise Level Leq. dB(A) - Day Time				
		22-11-2023	18-12-2023	15-01-2024	15-02-2024	18-03-2024
1	06:00 to 07:00	62.2	63.7	62.8	64.2	63.3
2	07:00 to 08:00	65.2	66.4	65.3	64.9	65.2
3	08:00 to 09:00	63.8	68.9	68.9	67.8	66.3
4	09:00 to 10:00	66.8	65.4	64.1	65.3	67.2
5	10:00 to 11:00	64.1	66.3	65.8	63.8	65.4
6	11:00 to 12:00	63.4	65.6	66.7	65.2	66.8
7	12:00 to 13:00	65.3	64.3	65.3	62.3	65.1
8	13:00 to 14:00	68.1	67.2	67.5	66.8	65.4
9	14:00 to 15:00	64.9	65.2	64.2	63.8	64.3
10	15:00 to 16:00	66.3	67.8	66.8	64.9	66.1
11	16:00 to 17:00	64.8	65.1	66.2	66.3	64.8
12	17:00 to 18:00	65.3	64.5	64.5	65.1	63.7
13	18:00 to 19:00	66.2	67.4	67.4	66.7	65.2
14	19:00 to 20:00	64.8	65.3	64.37	65.2	64.8
15	20:00 to 21:00	63.2	64.7	64.7	63.7	61.7
16	21:00 to 22:00	60.6	62.5	62.4	63.1	62.7
<b>Day Time</b>		<b>&lt;75 dB (A)</b>				

Continue...

Location Name		CT-4 RMU-1				
Sr. No.	Sampling Date and Time	Noise Level Leq. dB(A) - Night Time				
		22-11-2023	18-12-2023	15-01-2024	15-02-2024	18-03-2024
1	22:00 to 23:00	60.4	62.8	63.6	62.9	61.8
2	23:00 to 24:00	63.2	60.5	61.4	63.2	64.3
3	24:00 to 01:00	60.1	64.3	64.3	63.4	62.7
4	01:00 to 02:00	58.4	61.6	62.8	64.3	64.3
5	02:00 to 03:00	60.2	62.4	62.4	63.8	62.4
6	03:00 to 04:00	57.4	64.1	63.8	64.6	64.1
7	04:00 to 05:00	56.2	62.6	63.7	62.4	63.4
8	05:00 to 06:00	57.3	60.1	60.3	58.6	60.2
Day Time		<70 dB (A)				

Test Method	IS: 9989 : 1981
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**Nikunj D. Patel**  
(Chemist)




**Jaivik S. Tandel**  
(Manager - Operations)

### Results of Stack Monitoring

Sr. No.	Parameter	Unit	Hot Water System-1 (Liquid Terminal)	Hot Water System-2 (Liquid Terminal)	Thermic Fluid Heater (Bitumin-1)	Thermic Fluid Heater (Bitumin-2)	GPCB LIMIT	Method of Test
<b>Oct-23</b>								
1	Particulate Matter	mg/Nm <sup>3</sup>	20.16	20.53	23.28	22.45	150	IS 11255 (Part - 1)
2	Sulphur Dioxide as SO <sub>2</sub>	ppm	7.41	6.74	8.32	9.75	100	IS 11255 (Part - 2)
3	Oxides of Nitrogen as NO <sub>x</sub>	ppm	23.68	20.38	20.61	23.18	50	IS 11255 (Part - 7)
<b>Nav-23</b>								
1	Particulate Matter	mg/Nm <sup>3</sup>	21.45	19.86	22.51	20.69	150	IS 11255 (Part - 1)
2	Sulphur Dioxide as SO <sub>2</sub>	ppm	7.86	6.13	7.89	8.92	100	IS 11255 (Part - 2)
3	Oxides of Nitrogen as NO <sub>x</sub>	ppm	24.15	19.87	19.60	21.45	50	IS 11255 (Part - 7)
<b>Dec-23</b>								
1	Particulate Matter	mg/Nm <sup>3</sup>	21.87	20.31	22.98	21.47	150	IS 11255 (Part - 1)
2	Sulphur Dioxide as SO <sub>2</sub>	ppm	7.91	6.80	8.03	9.28	100	IS 11255 (Part - 2)
3	Oxides of Nitrogen as NO <sub>x</sub>	ppm	24.43	20.12	20.50	22.13	50	IS 11255 (Part - 7)
<b>Jan-24</b>								
1	Particulate Matter	mg/Nm <sup>3</sup>	22.11	20.74	23.11	22.17	150	IS 11255 (Part - 1)
2	Sulphur Dioxide as SO <sub>2</sub>	ppm	8.12	6.96	8.27	9.49	100	IS 11255 (Part - 2)
3	Oxides of Nitrogen as NO <sub>x</sub>	ppm	24.73	20.62	21.06	22.86	50	IS 11255 (Part - 7)

Continue...

Sr. No.	Parameter	Unit	Hot Water System-1 (Liquid Terminal)	Hot Water System-2 (Liquid Terminal)	Thermic Fluid Heater (Bitumin-1)	Thermic Fluid Heater (Bitumin-2)	GPCB LIMIT	Method of Test
<b>Feb-24</b>								
1	Particulate Matter	mg/Nm <sup>3</sup>	21.87	20.52	23.84	21.96	150	IS 11255 (Part - 1)
2	Sulphur Dioxide as SO <sub>2</sub>	ppm	7.78	7.10	8.11	9.17	100	IS 11255 (Part - 2)
3	Oxides of Nitrogen as NO <sub>x</sub>	ppm	24.10	21.11	20.89	22.49	50	IS 11255 (Part - 7)
<b>Mar-24</b>								
1	Particulate Matter	mg/Nm <sup>3</sup>	22.43	21.19	22.95	23.41	150	IS 11255 (Part - 1)
2	Sulphur Dioxide as SO <sub>2</sub>	ppm	8.12	6.74	8.34	8.57	100	IS 11255 (Part - 2)
3	Oxides of Nitrogen as NO <sub>x</sub>	ppm	22.97	20.13	21.37	21.15	50	IS 11255 (Part - 7)



**Nikunj D. Patel**  
(Chemist)




**Jaivik S. Tandel**  
(Manager - Operations)

### Results of Stack Monitoring

Sr. No.	Parameter	Unit	D.G. Set-6, 7 & 8 (1250 KVA - CT2) Common Stack	D.G. Set-9 (1500 KVA - CT3)	D.G. Set-10 (1500 KVA - CT3)	D.G. Set-11 (1500 KVA - CT3)	GPCB LIMIT	Method of Test
			Mar-24	Mar-24				
			23-03-2024	21-02-2024	21-02-2024	21-02-2024		
1	Particulate Matter	mg/Nm <sup>3</sup>	22.46	16.27	19.72	17.11	150	IS 11255 (Part - 1)
2	Sulphur Dioxide as SO <sub>2</sub>	ppm	8.18	12.86	15.49	14.53	100	IS 11255 (Part - 2)
3	Oxides of Nitrogen as NO <sub>x</sub>	ppm	16.92	25.43	27.64	20.39	50	IS 11255 (Part - 7)
4	Carbon Monoxide	mg/Nm <sup>3</sup>	1.7	1.64	1.26	0.95	--	UERL/AIR/SOP/18
5	Non Methyl Hydro Carbon	ppm	Not Detected	Not Detected	Not Detected	Not Detected	--	UERL/AIR/SOP/27
Sr. No.	Parameter	Unit	D.G. Set-12 (1500 KVA) - CT4	D.G. Set-13 (1500 KVA) - CT4	D.G. Set-14 (1500 KVA) - CT4	D.G. Set-1 (500 KVA) - DG House - MPT	GPCB LIMIT	Method of Test
			Feb-24			Dec-22		
			24-02-2024	24-02-2024	24-02-2024	25-02-2024		
1	Particulate Matter	mg/Nm <sup>3</sup>	22.65	25.29	19.98	20.43	150	IS 11255 (Part - 1)
2	Sulphur Dioxide as SO <sub>2</sub>	ppm	8.12	8.91	8.56	7.28	100	IS 11255 (Part - 2)
3	Oxides of Nitrogen as NO <sub>x</sub>	ppm	20.37	22.13	18.11	26.86	50	IS 11255 (Part - 7)
4	Carbon Monoxide	mg/Nm <sup>3</sup>	1.12	1.87	1.51	1.13	--	UERL/AIR/SOP/18
5	Non Methyl Hydro Carbon	ppm	Not Detected	Not Detected	Not Detected	Not Detected	--	UERL/AIR/SOP/27

Continue...

MoEF&CC (GOI) Recognized Environmental Laboratory under the EPA-1986 (31.03.2023 to 22.09.2024)

QCI-NABET Accredited EIA & GW Consultant Organization

GPCB Recognized Environmental Auditor (Schedule-II)

ISO 9001 : 2015 Certified Company

ISO 45001 : 2018 Certified Company

Sr. No.	Parameter	Unit	D.G. Set-2 (500 KVA) - DG House - MPT	D.G. Set-3 (500 KVA) - DG House - MPT	D.G. Set-4 (500 KVA) - DG House - MPT	D.G. Set-5 (500 KVA) - DG House - MPT	GPCB LIMIT	Method of Test
			Feb-24					
			25-02-2024	25-02-2024	25-02-2024	25-02-2024		
1	Particulate Matter	mg/Nm <sup>3</sup>	24.69	22.36	27.11	22.1	150	IS 11255 (Part - 1)
2	Sulphur Dioxide as SO <sub>2</sub>	ppm	7.00	9.24	8.96	8.87	100	IS 11255 (Part - 2)
3	Oxides of Nitrogen as NO <sub>x</sub>	ppm	28.37	28.39	27.88	27.26	50	IS 11255 (Part - 7)
4	Carbon Monoxide	mg/Nm <sup>3</sup>	1.53	1.72	1.97	1.45	--	UERL/AIR/SOP/18
5	Non Methyl Hydro Carbon	ppm	Not Detected	Not Detected	Not Detected	Not Detected	--	UERL/AIR/SOP/27



**Nikunj D. Patel**  
(Chemist)




**Jaivik S. Tandel**  
(Manager - Operations)

### RESULTS OF BORE HOLE WATER

SR.NO.	TEST PARAMETERS	UNIT	Pump House-1	Pump House-2	Pump House-3	Near Unloading bays	Near ETP	TEST METHOD
			12-02-2024	12-02-2024	12-02-2024	12-02-2024	12-02-2024	
1.	pH @ 25 ° C	--	7.81	7.45	8.03	8.32	8.23	IS 3025(Part 11)1983
2.	Salinity	ppt	1.07	0.99	1.76	3.44	3	APHA 23 <sup>rd</sup> Ed.,2017,2520 B
3.	Oil & Grease	mg/L	BDL(MDL:5.0)	BDL(MDL:5.0)	BDL(MDL:5.0)	BDL(MDL:5.0)	BDL(MDL:5.0)	IS 3025(Part39)1991, Amd. 2
4.	Hydrocarbon	mg/L	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	GC/GCMS
5.	Lead as Pb	mg/L	BDL(MDL:0.01)	0.022	BDL(MDL:0.01)	0.109	BDL(MDL:0.01)	IS 3025 (PART 47) 1994
6.	Arsenic as As	mg/L	BDL(MDL:0.01)	BDL(MDL:0.01)	BDL(MDL:0.01)	BDL(MDL:0.01)	BDL(MDL:0.01)	APHA 23 <sup>rd</sup> Ed.,2017,3114-C
7.	Nickel as Ni	mg/L	BDL(MDL:0.02)	BDL(MDL:0.02)	BDL(MDL:0.02)	BDL(MDL:0.02)	BDL(MDL:0.02)	IS 3025 (PART 54) 2003
8.	Total Chromium as Cr	mg/L	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	IS 3025 (PART 52) 2003
9.	Cadmium as Cd	mg/L	BDL(MDL:0.003)	BDL(MDL:0.003)	BDL(MDL:0.003)	0.015	0.008	IS 3025(PART 41) 1992
10.	Mercury as Hg	mg/L	BDL(MDL:0.001)	BDL(MDL:0.001)	BDL(MDL:0.001)	BDL(MDL:0.001)	BDL(MDL:0.001)	APHA 23 <sup>rd</sup> Ed.,2017, 3112-B
11.	Zinc as Zn	mg/L	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	IS 3025(PART 49) 1994
12.	Copper as Cu	mg/L	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	IS 3025 (PART 42) 1992
13.	Iron as Fe	mg/L	1.236	1.776	BDL(MDL:0.1)	0.114	0.115	IS 3025(PART 53) 2003
14.	Insecticides/Pesticides	µg/L	Absent	Absent	Absent	Absent	Absent	USEPA 8081 B
15.	Depth of Water Level from Ground Level	meter	1.9	2.1	1.95	2.2	2.1	--



Mr. Nilesh Patel  
Sr. Chemist




Mr. Nitin Tandel  
Technical Manager

### Minimum Detection Limit

#### Ambient Air Quality Monitoring

Sr. No.	Test Parameter	Unit	MDL
1	Particulate Matter (PM10)	µg/m <sup>3</sup>	5 µg/m <sup>3</sup>
2	Particulate Matter (PM2.5)	µg/m <sup>3</sup>	5 µg/m <sup>3</sup>
3	Sulphur Dioxide (SO <sub>2</sub> )	µg/m <sup>3</sup>	4 µg/m <sup>3</sup>
4	Nitrogen Dioxide (NO <sub>2</sub> )	µg/m <sup>3</sup>	5 µg/m <sup>3</sup>
5	Carbon Monoxide (CO)	mg/m <sup>3</sup>	0.01 mg/m <sup>3</sup>
6	Ammonia (NH <sub>3</sub> )	µg/m <sup>3</sup>	5 µg/m <sup>3</sup>
7	Ozone (O <sub>3</sub> )	µg/m <sup>3</sup>	5 µg/m <sup>3</sup>
8	Lead (Pb)	µg/m <sup>3</sup>	0.5 µg/m <sup>3</sup>
9	Nickle (Ni)	ng/m <sup>3</sup>	1 ng/m <sup>3</sup>
10	Arsenic (As)	ng/m <sup>3</sup>	1 ng/m <sup>3</sup>
11	Benzene	µg/m <sup>3</sup>	1µg/m <sup>3</sup>
12	Benzo(o)Pyrene	ng/m <sup>3</sup>	0.1 ng/m <sup>3</sup>
14	Hydro Carbon	µg/m <sup>3</sup>	1 µg/m <sup>3</sup>

#### Stack Emission Monitoring

Sr. No.	Test Parameter	Unit	MDL
1	Suspended particulate matter	mg/Nm <sup>3</sup>	2 mg/Nm <sup>3</sup>
2	Sulphur Dioxide SO <sub>X</sub>	mg/Nm <sup>3</sup>	4 mg/Nm <sup>3</sup>
3	Oxides of Nitrogen NO <sub>X</sub>	mg/Nm <sup>3</sup>	5 mg/Nm <sup>3</sup>

**ETP Water**

Sr. No.	Test Parameter	Unit	MDL
1	Colour	Pt. Co. Scale	5
2	pH @ 27 ° C	--	2
3	Temperature	0C	5
4	Total Suspended Solids	mg/L	4
5	Total Dissolved Solids	mg/L	4
6	COD	mg/L	2
7	BOD (3 days at 27 0C)	mg/L	1
8	Chloride (as Cl) -	mg/L	1
9	Oil & Grease	mg/L	2
10	Sulphate (as SO4)	mg/L	1
11	Ammonical Nitrogen	mg/L	2
12	Phenolic Compound	mg/L	0.1
13	Copper as Cu	mg/L	0.05
14	Lead as Pb	mg/L	0.01
15	Sulphide as S	mg/L	0.05
16	Cadmium as Cd	mg/L	0.003
17	Fluoride as F	mg/L	0.2
18	Residual Chlorine	mg/L	0.1
19	Percent Sodium	%	--
20	Sodium Absorption ratio	--	--

**MARINE WATER**

Sr. No.	Test Parameter	Unit	MDL
1	pH	--	5
2	Temperature	oC	5
3	Total Suspended Solids	mg/L	4
4	BOD (3 Days @ 27oC)	mg/L	1
5	Dissolved Oxygen	mg/L	0.2
6	Salinity	ppt	0.01
7	Oil & Grease	mg/L	2
8	Nitrate as NO <sub>3</sub>	μmol/L	0.4
9	Nitrite as NO <sub>2</sub>	μmol/L	0.04
10	Ammonical Nitrogen as NH <sub>3</sub>	μmol/L	0.8
11	Phosphates as PO <sub>4</sub>	μmol/L	0.4
12	Total Nitrogen	μmol/L	2.2
13	Petroleum Hydrocarbon	μg/L	0.1
14	Total Dissolved Solids	mg/L	4
15	COD	mg/L	2

**Sea SEDIMENT**

Sr. No.	Test Parameter	Unit	MDL
1	Organic Matter	%	0.5
2	Phosphorus as P	µg/g	1
3	Texture	--	--
4	Petroleum Hydrocarbon	µg/g	0.1
5	Aluminum as Al	%	0.1
6	Total Chromium as Cr+3	µg/g	2
7	Manganese as Mn	µg/g	1
8	Iron as Fe	%	0.1
9	Nickel as Ni	µg/g	1
10	Copper as Cu	µg/g	1
11	Zinc as Zn	µg/g	1
12	Lead as Pb	µg/g	1
13	Mercury as Hg	µg/g	0.05

**BORE HOLE WATER**

Sr. No.	Test Parameter	Unit	MDL
1	pH @ 25 ° C	--	5
2	Salinity	ppt	--
3	Oil & Grease	mg/L	2
4	Hydrocarbon	mg/L	0.1
5	Lead as Pb	mg/L	0.01
6	Arsenic as As	mg/L	0.01
7	Nickel as Ni	mg/L	0.02
8	Total Chromium as Cr	mg/L	0.05
9	Cadmium as Cd	mg/L	0.003
10	Mercury as Hg	mg/L	0.001
11	Zinc as Zn	mg/L	0.05
12	Copper as Cu	mg/L	0.05
13	Iron as Fe	mg/L	0.1
14	Insecticides/Pesticides	µg/L	0.1
15	Depth of Water Level from Ground Level	meter	--

# **Annexure – 3**

## Details of Greenbelt Development at APSEZ, Mundra

	Total Green Zone Detail till Up to March 2024				
LOCATION	Area (In Ha.)	Trees (Nos.)	Palm (Nos.)	Shrubs (SQM)	Lawn (SQM)
SV COLONY	72.29	34920.00	7962.00	69696.00	100646.00
PORT & NON SEZ	81.61	149359.00	19220.00	75061.78	62966.38
SEZ	115.70	226120.00	20489.00	220583.60	28162.03
MITAP	2.47	8113.00	33.00	3340.00	4036.00
WEST PORT	104.29	248074.00	66816.00	24112.00	16369.00
AGRI PARK	8.94	17244.00	1332.00	5400.00	2121.44
SOUTH PORT	14.45	27530.00	3470.00	3882.00	3327.26
Samundra Township	58.26	63722.00	11834.00	23908.89	47520.07
Productive Farming (Vadala Farm)	0.00	0.00	0.00	0.00	0.00
<b>TOTAL (APSEZL)</b>	<b>457.99</b>	<b>775082.00</b>	<b>131156.00</b>	<b>425984.27</b>	<b>265148.18</b>
		<b>906238.00</b>			

## Details of Mangrove Afforestation done by APSEZ

Sl. no.	Location	District	Area (Ha)	Duration	Species	Implementation agency
1	Mundra Port	Kutch	24	-	Avicennia marina	Dr. Maity, Mangrove consultant of India
2	Mundra Port	Kutch	25	-	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)	Kutch	298	2011 - 2013	Avicennia marina	Forest Dept, Bhuj
6	Jangi Village (Bhachau)	Kutch	50	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	2014-15 & 2016-17	Avicennia marina & Biodiversity	GUIDE, Bhuj
9	Dandi Village	Navsari	800	2006 - 2011	Avicennia marina, Rhizophora mucronata, Ceriops tagal	GEC, Gandhinagar
10	Talaja Village	Bhavnagar	50	2011-12	Avicennia marina	Forest Dept, Talaja
11	Narmada Village	Bhavnagar	250	2014 - 2015	Avicennia marina	GEC, Gandhinagar
12	Malpur Village	Bharuch	200	2012-14	Avicennia marina	SAVE, Ahmedabad
13	Kantiyajal Village	Bharuch	50	2014-15	Avicennia marina	SAVE, Ahmedabad
14	Devla Village	Bharuch	150	210-16	Avicennia marina	SAVE, Ahmedabad
15	Village Tala Talav (Khambhat)	Anand	100	2015 - 2016	Avicennia marina	SAVE, Ahmedabad
16	Village Tala Talav (Khambhat)	Anand	38	2015 - 2016	Avicennia marina	GEC, Gandhinagar
17	Aliya Bet, Village Katpor (Hansot)	Bharuch	62	2017-18	Avicennia marina & Rhizophora spp.	GEC, Gandhinagar
18	Kukadsar- (Bhadeswar- Mundra)	Kutch	250	2021-22	Avicennia marina	Shreeji Enterprise, Amreli
19	Kukadsar- (Bhadeswar- Mundra)	Kutch	750	2022-23	Avicennia marina	Shreeji Enterprise, Amreli
20	Kukadsar- (Bhadeswar- Mundra)	Kutch	250	2023-24	Avicennia marina	Shreeji Enterprise, Amreli
<b>Total</b>			<b>4140</b>			

# **Annexure – 4**

## **ALGAL REMOVAL WORK FROM MANGROVE AREAS**

Creek area is regularly observed for checking algal encrustations. On the mangrove recruits & where the algal encrustation is found to be substantial, it is removed manually by deployment of required manpower. This operation is performed during the low tide conditions. The main object is to provide better growing condition for the growth of mangroves. Periodically, spread of *Prosopis* sp towards the mangrove areas is also observed as this species will compete with mangrove plants for growth.

### **Photographs of removal of algal encrustations:**



# **Annexure – 5**

# **NATIONAL POLLUTION RESPONSE EXERCISE NATPOLREX (IX)**

## **REPORT**

**Venue:** Off Vadinar

**Date:** 25<sup>th</sup> Nov 2023

**Exercise conducted by:** Indian Coast guard

**Resource agencies and stake holders involved:**

1. M/S Adani Port & SEZ, Mundra
2. Indian Oil Corporation LTD, Jamnagar
3. M/S Nayara Energy LTD VOTL, Vadinar
4. M/S Reliance Industries LTD, Sikka Jamnagar
5. M/S Essar Bulk Terminal, Salaya

**Attendees:**

1. Capt. Hemant Dhruv
2. Capt. Peeyush Suwalka
3. Dol 11 Crew with Master
4. Mr. Yogesh Nandaniya
5. Mr. MP Choudhary with his team
6. HMEL Team
7. SRS Team
8. Sea Care Team

## **Statement of facts**

**0650 hrs.:** Tug Victor left SPM & started proceeding to Vadinar for exercise.

**0700 hrs.:** Tug Dol 11 with crew and attendees left for Vadinar for NATPOLREX exercise from Ro-Ro pontoon.

**0810 hrs.:** Tug Dol 11 informed Vadinar Port Control that Tug Dol 11 & Victor will be entering Vadinar port limit for NATPOLREX exercise.

**0845 hrs.:** Briefing of drill carried out.



**0855 hrs.:** Informed ICG Commander Mishra on phone that Tug Dol 11 arrived at specified location 22 31.00 N 069 39.00 E. Commander Mishra advised to keep watch on VHF CH 71 for further communication with ICG vessel (Call sign: Coastguard Sajag)

**0945 hrs.:** Tug Dol 11 communicated with Coastguard Sajag for launching boom to demonstrate 'J' shape boom configuration. Coastguard Sajag advised to commence launching boom.

**0948 hrs.:** Commence lowering boom.

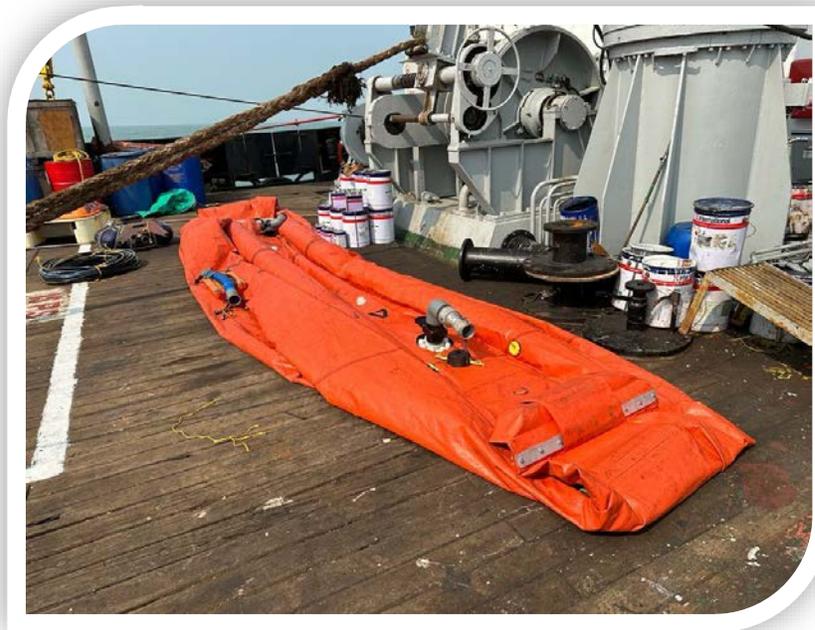


**1015 hrs.:** Completed lowering boom (5 section 250 m in length)

**1035 hrs.:** J-formation of boom completed. Same informed to Coastguard Sajag. Sajag advised maintaining position with 'J' shape boom configuration.



**1045 hrs.:** Skimmer deployed in water. The floating storage tank was kept ready on Dol 11 deck. The Overside OSD spray was pressurized and demonstrated with water only.



**1150 hrs.:** The whole operation observed by Coastguard Samarth & Sajag and appreciated the quick and professional response from Dol-11. The Coast guard advised to start securing gears & break off from position.



**1152 hrs.:** Secured all deployed equipment and started recovering boom.

**1236 hrs.:** Completed recovering boom and vessel started proceeding to Mundra. Same informed to Vadinar port control and Coast guard vessel Sajag.

**1245 hrs.:** Debriefing of drill carried out.



**1430 hrs.:** Dol 11 arrived Mundra port. Tug Victor arrived at IOCL SPM.

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MUNDRA  
OIL SPILL CONTINGENCY RESPONSE PLAN

**ANNEXURES**

<b>ANNEXURE 1</b>		<b>INITIAL OIL SPILL REPORT</b>	
Particulars of person, office reporting	Capt. Sachin Srivastava- HOD Marine Capt. Girish Chandra - HOS marine, APSEZ		
Tel No.	+91 6359883102		
Date & time of incident	19.01.2024 / 0900 hrs.		
Spill location	IOCL SPM		
Likely cause of spill	Hose rupture	Witness – Tug Dol 11	
Initial response action	Initiated OSCRP		
Any other information	NO		
Identity of informant	Tug Dol 11		
Time of FIR	0900 hrs.		
Source of spill	IOCL SPM		
Cause of spill	Floating Hose rupture		
Type of spill	Crude Oil		
Color code information (from CG)	Sheen		
Radius of slick	30-40 m		
Tail	15 m		
Volume	175 cubic meter approx.		
Quantity	150 tones		
Weather	N'Ely x 5-6 knots.		
Tide / current	Ebbing / 0.8 to 1.2 knots.		
Density	0.2 to 0.86 kg/m <sup>3</sup> approx.		
Layer thickness	0.02 mm approx.		
Air / Sea temp.	22 deg C /27 deg C		
Predicted slick movement	S'Wly		
Size of spill classification (Tier 1, 2 or 3)	Tier 1		

ADANI PORTS AND SPECIAL ECONOMIC ZONE LTD.  
MUNDRA  
OIL SPILL CONTINGENCY RESPONSE PLAN

**ANNEXURE 2**

**POLREP**

In case of an oil spill, APSEZ will provide information to Commandant Coast Guard District 1 Porbandar COMDIS 1 and Coast Guard Station Vadinar CGS Vadinar in the following format:

SN.	Parameter	Data
1.	Identity of the informant	Tug Dol 11
2.	Time of information receipt	0900 hrs.
3.	Source of Spill	IOCL SPM
4.	Cause of Spill	Floating Hose rupture
5.	Type of oil	Crude Oil
6.	Colour code information	Sheen
7.	Configuration	-
8.	Radius	30-40 m
9.	Tail	15 m
10.	Volume	175 cubic meter approx.
11.	Quantity	150 tones
12.	Weathered or Fresh	Fresh
13.	Density	0.2 to 0.86 kg/m <sup>3</sup> approx.
14.	Viscosity	53.36 CST@25 deg centigrade
15.	Wind	N'Ely x 5-6 knots.
16.	Wave Height	0.1 to 0.2 m
17.	Current	0.8 to 1.2 knots.
18.	Layer Thickness	0.2 to 0.4 mm approx.
19.	Ambient air temperature	22 deg C
20.	Ambient sea temperature	27 deg C
21.	Predicted slick movement	S'Wly
22.	Confirm Classification of spill size	Tier 1

## Drill Log Sheet

<b>Page Number:</b> 1 of 1	<b>Date:</b> 19 -01-2024
<b>Name:</b> Vikram Pratap Singh	<b>Position:</b> Radio Officer
<b>Contact Number:</b> 9825228673	<b>Signature:</b>

### **Activity Timeline:**

- 0900 hrs.: Tug Victor reported oil spill at IOCL SPM to Tug Dol 11.
- 0901 hrs.: Tug Dol 11 immediately reported to Marine Control and Diving Supervisor.
- 0901 hrs.: Marine Control informed all concerned departments including IOCL.
- 0902 hrs.: Tug Dol 11 proceeded to IOCL SPM.
- 0905 hrs.: Tug Dol 11 reached IOCL SPM and all SPM valves closed by diving team.
- 0906 hrs.: IOCL SPM team observed oil spillage from floating hose of IOCL SPM.
- 0906 hrs.: Tug Dol 11 commenced boom deployment and same time informed to control.
- 0907 hrs.: Tug Dol 11 requested Marine Control for Barge BB-10 for storage of recovered oil.
- 0907 hrs.: Marine Control deployed Barge BB-10 along with Tug Dol 2 to IOCL SPM.
- 0908 hrs.: Barge BB-10 underway with Tug Dol 2.
- 0910 hrs.: Marine Control informed to all vessels at anchor regarding oil spill near IOCL SPM area. The control room requested all underway vessels to pass 5 miles from IOCL SPM. Unberthing operations suspended.
- 0910 hrs.: Capt. Girish Chandra informed Commandant Konark Sharma ICGS Mundra about the incident through phone.
- 0912 hrs.: Tug Dol 11 requested to keep one tug stand by with additional boom at short notice.
- 0914 hrs.: Marine Control informed Tug Dol 10 & 15 to standby with OSD.
- 0915 hrs.: Informed commercial team (Mr. Jagdish Rabadia) and environment cell (Mr. Radhe Shyam Singh) by Mr. Sudhakar Singh.
- 0921 hrs.: Tug Dol 11 reported 150m boom deployed and continued to deploy remaining 100 meters.

0925 hrs.: Marine Control informed jetty team to be stand by with crew for mooring the Barge BB-10 at B-12 berth. Jetty supervisor also informed to deploy one hydra for loading/unloading of OSR equipment at SPM Store and jetty.

0932 hrs.: Dol 11 informed that spill is spread in an area of around 30-40 m<sup>2</sup>.

0933 hrs.: Tug Dol 11 reported 250 m boom deployment completed and commenced J-formation.

0931 hrs.: Mr. Mahendra Singh Solanki from Corporate affairs informed DM Bhuj office about the incident.

0936 hrs.: Mr. Sudhakar Singh informed HMEL team Mr. Ashok Tiwari about the incident through phone.

0936 hrs.: Initial intimation mail sent to GMB/MMD Kandla/Coast Guard Station/MRCC.

0940 hrs.: Patrolling boat Dol 19 reported underway with Capt. Girish Chandra and proceeding to IOCL SPM.

0944 hrs.: Tug Dol 11 reported J-formation completed, and oil containment is in progress and commenced skimmer deployment.

0949 hrs.: Barge BB-10 arrived at IOCL SPM with Tug Dol 2.

0950 hrs.: Skimmer lowered and commenced recovering of spilled oil to floating tank.

0950 hrs. Liquid team informed commercial department for 6 no. tanker/bowser for transportation of recovered oil from jetty to OWS unit. The team also informed to keep motor pump and other equipment stand by at berth B-12.

0956 hrs.: Barge BB-10 secured P/S of Tug Dol 11 and commenced transferring of oil in barge BB-10.

0959 hrs.: Tug Dol 11 reported approx. 10 T of recovered oil loaded in barge BB-10.

1000 hrs.: HMEL informed readiness for assisting to IOCL team for same.

1003 hrs.: Marine Control informed Tug Dol 17 with second set of booms to proceed for IOCL SPM.

1010 hrs.: Tug Dol 17 underway with second set of booms.

1020 hrs.: Liquid team informed Marine Control that motor pump and other equipment is standby at berth B-12.

1025 hrs.: Liquid team informed Marine Control that 6 no. of Tanker/bowser arrived and standby at berth B-12.

1046 hrs.: Joint Inspection team (ICG and OISD) boarded on Tug Dol 11.

1100 hrs.: Recovery of spilled oil completed (150 T).  
1100 hrs.: Drill called off and same time informed all concern.  
1101 hrs.: BB-10 cast off and proceed to B-12 berth for transfer of oil for disposal.  
1102 hrs.: Boom recovery started.  
1107 hrs.: Area assessed by diving team for recovered oil and confirmed all clear.  
1108 hrs.: Informed environment team for water sampling of spillage area.  
1124 hrs.: Environment team informed that area is clear of oil and no harm for sea.  
1125 hrs.: BB-10 arrived at B-12 berth.  
1130 hrs.: Liquid team started loading oil from BB-10 to tankers for disposal.  
1145 hrs.: Tanker loaded with oil departed from B12 for disposal of oil at Oil Water Separator unit.  
1202 hrs.: Tanker reached Oil Water Separator unit.  
1225 hrs.: Recovered oil transfer from tanker to OWS unit completed.  
1230 hrs.: Environment team informed that GPCB approved recycler has executed disposal.

### **Personnel & Boats Participated in Drill**

#### **Offshore**

1. Capt. Hemant Dhruv
2. Capt. Girish Chandra
3. Capt. Peeyush Suwalka
4. Mr. Yogesh Nandaniya
5. Mr. Ramdas Pawale
6. Mr. Upinder Samkaria
7. Mr. Shashikant Padave
8. Mr. Santosh Rasam
9. Mr. Vishwanath Chauhan
10. Mr. Dharamveer Yadav
11. Members from Sea Care
12. Crew of Tug Dolphin 11
13. Crew of Tug Victor
14. Crew of Boat Al Dariya
15. Tug Dol 2 and BB10
16. ICG Mundra – 04
17. Mr. Bhagwat Swaroop Sharma- Head Environment
18. Mr. Radheshyam Singh-Environment
19. Mr. Mayur Kasundra - Liquid Team

**Onshore:**

1. Capt. Sachin Srivastava
2. Sudhakar Singh
3. Mr. Chandrashekhar Kumar
4. Mr. Vikram Pratap Singh
5. Mr. Rupesh Pandey
6. Mr. Anish
7. Mr. Arshdeep

**Drill Performance Monitoring:**

SI. No	Activity	Time Taken
1.	Time taken to shift OSR equipment from SPM Store to load on DSV tugs	NA / 200-meter Fence boom and 1- skimmer is kept 24 x 7 on Tug Dol 11.
2.	Time taken for Tug cast off from time information given.	NA
3.	Time taken from tug cast off to Reach at Location.	NA
4.	Time taken for deploying 250-meter boom and skimmer after reaching at site.	27 min.
5	Time taken for J/U formation and deployment of skimmer.	11 min.

**Observations:**

SR. NO.	POINTS	ACTION TAKEN	TARGET DATE	RESPONSIBILITY	REMARKS
1	All discharge pipes of skimmer should be connectable in advance.	Point discussed with team during drill debriefing.	NA	NA	

# Drill snap - 19 Jan 2024

## Date 19 Jan 2024 OSR Drill at IOCL SPM

Pre Drill Briefing



Boom laying from Dol 11



J formation making in progress



Skimmer Operations



Inspection by ICG and OISD team



Discussion with ICG and APSEZ team



Joint Inspection (ICG and OISD) and APSEZL Mundra team on DSV Dolphin 11



APSEZL Mundra OSR Team on Tug Dolphin -11



# **Annexure – 6**

**ADANI PORTS & SPECIAL ECONOMIC ZONE LIMITED**  
**MOCK DRILL REPORT**

Date	:	29.03.2024
Time	:	16.20 Hrs.
Location	:	Barge berth, near TT-06 and T-1
Type/Text of the Scenario	:	Pin hole leakage in 12" bunker line. No Fire, No injury and no major spillage.

**INTRODUCTION:**

During bunkering activity progress on berth-01, FO(furnace Oil) leakage from 12" bunker line observed by Mr. Imtiyaz (job supervisor of M/s: MHS Engg) who supervised a hot work job at TT-06. Immediately Mr. Imtiyaz was informed to the Jetty In charge Mr. Gopal Raviya who was gone to T-1 for routine site visit. he reached at location and rechecked what exactly happen, after observing the leakage he informed to the Shift in charge in controller room and declared emergency.

Immediately POC, OHC and fire were informed, and subsequently intimated the same through message/ call to concern departments.

**LOCATION (WITH PHOTOGRAPH):**

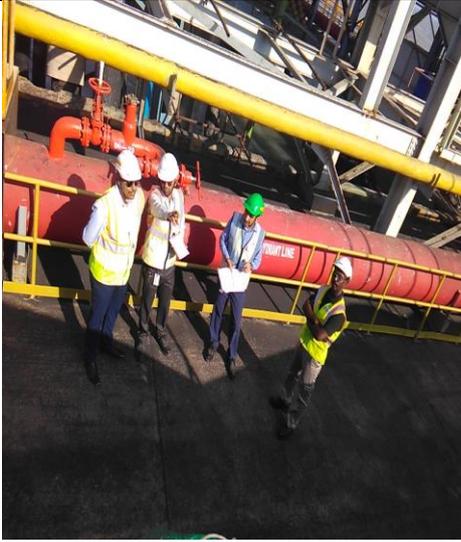


**ADANI PORTS & SPECIAL ECONOMIC ZONE LIMITED  
MOCK DRILL REPORT**

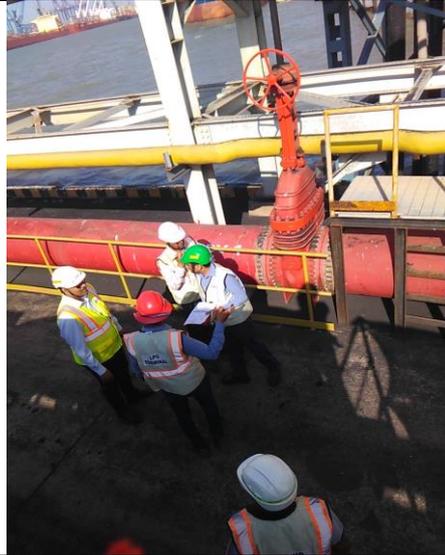
**SEQUENCE OF EVENTS WITH PHOTOGRAPHS:**

<p align="center"><b>FIRST INFORMER OBSERVED / GOING FOR INFORMING ABOUT INCIDENT</b></p>	<p align="center"><b>JETTY IN-CHARGE OBSERVING THE SCENARIO</b></p>
	
<p align="center"><b>AFTER OBSERVING THE SCENARIO JETTY IN-CHARGE DECLARED AN EMERGENCY &amp; ACT AS IC</b></p>	<p align="center"><b>FIRE TEAM REPORTING TO IC (INCIDENT CONTROLLER)</b></p>
	
<p align="center"><b>OBSERVER IN ACTION, OBSERVATIONS NOTED</b></p>	<p align="center"><b>OBSERVERS ARE DISCUSSING THEMSELF ABOUT WHAT GOING WELL, AND WHICH SEQUENCE NOT FOLLOWED</b></p>

## ADANI PORTS & SPECIAL ECONOMIC ZONE LIMITED MOCK DRILL REPORT



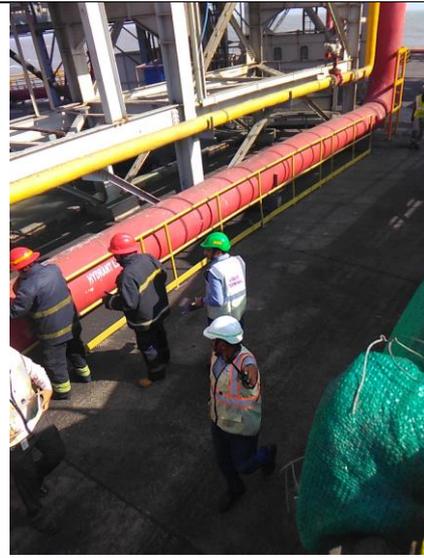
**FIRE TEAM REACHED AT LOCATION AND MAKING ARRANGEMENT FOR EMERGENCY RESPONSE**



**FIRE TEAM REACHED AT LOCATION AND MAKING ARRANGEMENT FOR EMERGENCY RESPONSE**



**ES – ERT VEHICLE REACHING TO THE INCIDENT LOCATION**

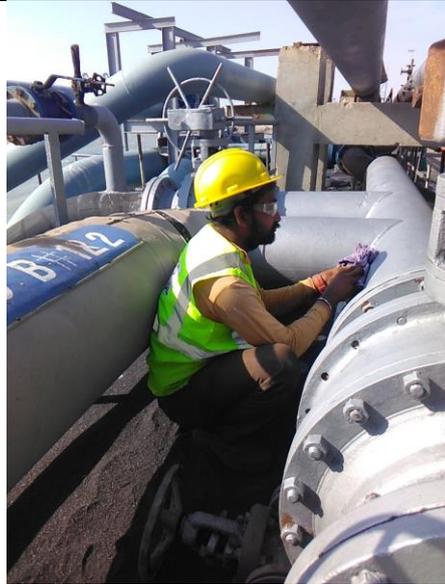


**ES TEAM STARTED THE RESPONSE**

## ADANI PORTS & SPECIAL ECONOMIC ZONE LIMITED MOCK DRILL REPORT



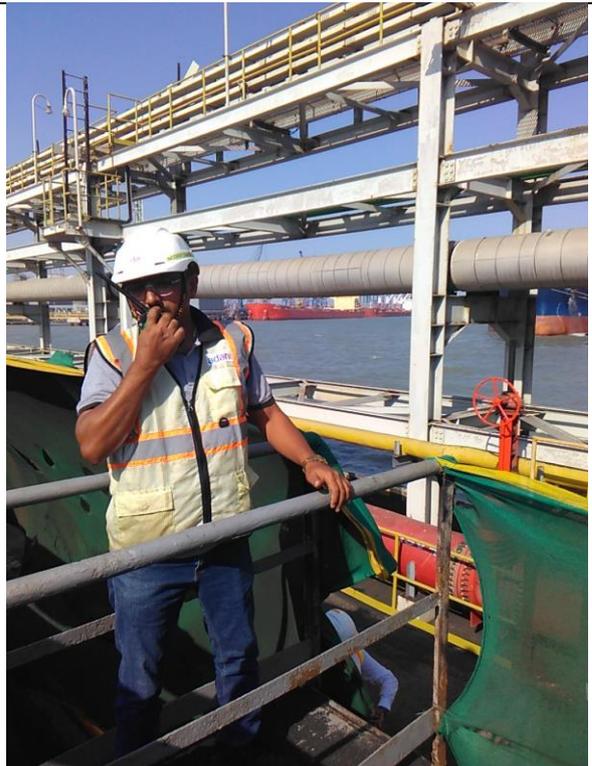
ES TEAM SUCCESFULLY ARREST THE LEAKAGE



IC DECLARRING ALL CLEAR AFTER LEAKAGE ARRESTING



INCIDENT BRIEFING AT ASSEMBLY POINT



INCIDENT BRIEFING AT ASSEMBLY POINT

## ADANI PORTS & SPECIAL ECONOMIC ZONE LIMITED MOCK DRILL REPORT



### RESPONSE TIME:

#	Description	Exact Time
1.	First responder informed to LT control room regarding emergency scenario	: 16:18 hrs.
2.	Incident controller comes on site	: 16:18 hrs.
3.	Declaration of Emergency	: 16:20 hrs.
4.	Ambulance reaching time at incident Point	: 16:30 hrs.
5.	Safety shift in-charge reaching time at incident point	: 16:24 hrs.
6.	Security team reaching time at incident point	: 16:23 hrs.
7.	Fire Team reaching time at incident Point	: 16:22 hrs.
8.	Rescue arrangement at site	: N/A.
9.	OHC Team Check the condition of person	: N/A.

**ADANI PORTS & SPECIAL ECONOMIC ZONE LIMITED**  
**MOCK DRILL REPORT**

10.	Person shift to OHC by ambulance	:	N/A.
11.	First person at Assembly Point	:	16:23 hrs.
12.	Last person at Assembly Point	:	16:29 hrs.
13.	Maintenance Arrangement at site	:	16:30 hrs.
14.	Workers and supervisor reached at location for Leak arrest and spillage control	:	16:30 hrs.
15.	Termination of Emergency and All clear siren	:	16:36 hrs.

**COMMUNICATION & ACTIONS:**

Action By	Information To / Action By	Remarks
First Responder	Information given to incident controller about situation / scenario	Good Response, Immediately informed to LT- Jetty In charge at site.
Site Incident Controller	Assess the site and declare on-site emergency.	
Concern Department/ Area In-charge	Inform to ISCR, Security, Fire, Medical, Safety etc.	
Engineering Services	LT Maintenance team reached the site and coordinated with IC.	
Corporate Affairs	NA	
HR/ Admin	Respond on call and ready for any type of HR/Admin related help	
Safety Team	Reached at site on time.	
OHC	OHC team response was quick. Ambulance reached on site	
Security Control Room	Reached at site on time and restrict the entry to T-1 at security gate.	
Fire Control Room	Standby fire tender team at T-1, was reached on site immediately and ready for respond.	

**COMMUNICATION TO MUTUAL AID GROUP**

**(IF REQUIRED, AS AND WHEN MUTUAL AID IS CALLED) – Not Required.**

To	By Whom/ Media	Standard	Performance
IOCL		2 min. after receiving information to Emergency Control Room	
HPCL			
JINDAL SAW			
ADANI POWER			



**ADANI PORTS & SPECIAL ECONOMIC ZONE LIMITED**  
**MOCK DRILL REPORT**

CGPL			
HMEL			

**RESPONSE TIME PERFORMANCE OF ACTION**

Agency	Standard Time	Performance	Rating (Max. 9/ Block)	
			+VE Marks	-VE Marks
Ambulance	4-5 Min	5 Min	9	
Safety	4-5 Min	4 Min	9	
Fire Services	2-3 Min	2 Min	9	

**A. PERFORMANCE OF OHS & F SERVICES & RESCUE SERVICES**

Performance	Performance	Rating (Max. 3 per Block)	
		+VE Marks	-VE Marks
Turn out/ response time of Fire Team	Fire team reached at site within benchmark of response time.	3	
Turn out/ response time of OHC Team	OHC team & Ambulance reached at site within benchmark of response time.	3	
Turn out/ response time of Safety Team and in coordination with incident controller mobilisation of personnel and resources.	Response time of Safety team is within benchmark and will coordinate with incident controller for mobilisation of personnel, resources, PPE's etc.	3	
Firefighting at the site	Reported to incident Controller and standby at location till declaration of all clear.	3	
Medical attention at the site	Reported to incident Controller and standby at location till declaration of all clear.	3	
Rescue of person	N / A	3	

**B. PERFORMANCE OF MAINTENANCE DEPARTMENT**

Performance	Performance	Rating (Max. 3 per Block)	
		+VE Marks	-VE Marks

## ADANI PORTS & SPECIAL ECONOMIC ZONE LIMITED

### MOCK DRILL REPORT

Power shut down/ cut off	Electrical Power cut off not address / ensure by IC or maintenance team		<b>3</b>
Immediate arrangements at the site	All arrangement were mobilised.	<b>3</b>	
Mobilizing of personnel and resources	Maintenance team reached at site with tool kit. Appropriate PPEs used.	<b>3</b>	
Maintenance activities being carried out at the site	Necessary maintenance to stop the leakage	<b>3</b>	
Clearing debris	Spill containment from incident location after clearance from incident controller was not carried out.	<b>1</b>	<b>2</b>
Other arrangement at required to meet emergency	Drip Tray was not placed under leakage area.		<b>3</b>

#### C. PERFORMANCE OF SECURITY SERVICES

Performance	Performance Rating	Rating (Max. 3 per Block)	
		+VE Marks	-VE Marks
Turnout of Security	Security Vehicle reached at 16:23 hrs.	<b>3</b>	
Performance of security guards	Only Emergency vehicles were only allowed inside Terminal with spark arrestor by security guards from the T-1 gate.	<b>3</b>	
Security officer's command & control	Security officers took charge and restricted the entry of unauthorized persons / also ensure that vehicles do not enter the incident site.	<b>3</b>	
Area cordoned off	Incident area cordon off from approach gate of T-01 gate but approach opened from Berth side.	<b>2</b>	<b>1</b>

## ADANI PORTS & SPECIAL ECONOMIC ZONE LIMITED

### MOCK DRILL REPORT

Prevent unwanted/ unauthorized entry into this area	Security officers restrict the entry of unauthorized persons / also ensure that vehicles do not enter the gate also co-ordinate properly with incident controller.	<b>3</b>	
Closer of gates	Vehicle & man movement areas were Partially closed.	<b>2</b>	<b>1</b>
Providing security coverage at main gate and directing concern person to the site.	Security guard was guided to emergency vehicle for scene.	<b>3</b>	

#### **D. PERFORMANCE OF OPERATION/ CONCERN DEPARTMENT**

Performance	Performance Rating	Rating (Max. 3 per Block)	
		+VE Marks	-VE Marks
Immediately pass the communication message through VHF / other available media to subordinates & emergency response team.	Communication / Information on emergency conveyed to all concern by incident controller.	<b>3</b>	
Stopping of operation / like critical operations first & on priority basis	Nearby operations / maintenance activities stopped by incident controller.	<b>3</b>	
Emergency response of particular department at site	Response time of concern department found adequate. security deputed at T-1 gate for guided to emergency vehicle for scene.	<b>3</b>	

## ADANI PORTS & SPECIAL ECONOMIC ZONE LIMITED

### MOCK DRILL REPORT

Support for evacuation of people at site and head count along with HR/ Admin	Evacuation was done by Operation team and head count was done Liquid Staff.	<b>3</b>	
Availability and response of emergency kit / equipment / Other.	Emergency response vehicle was immediately mobilized at the incident spot	<b>3</b>	
Audibility of the scenario on PA System by Persons	Manual Siren was activated through stand by fire tender	<b>3</b>	

**Observer – Mr. Bk Krishna, Mr. Bhushan Bhatt and Ranabhai Bambhaniya**

**Good Observations:**

1. Incident Controller (IC) reached at site within 2 minutes and took charge.
2. Bunker Operation was immediately stopped by control room.
3. Emergency respondents were informed by IC on the hazards / precautions.
4. Fire and rescue team arrived with SCBA set for emergency.
5. Coordination between Incident Controller and Control Room
6. Emergency evacuation ensured by Incident Controller (IC).
7. Control room communicated to all the concern members on emergency.
8. Communication of the Hazards and Controls at assembly point.
9. Proper communication between emergency team and incident controller during emergency response.

**Observations / Area of Improvement:**

**Scope of improvements are many as listed below:**

**Incident Location 12” Bunker line near TT-06 (Barge Berth)**

1. Drip Tray was not placed under the leakage area for not spreading the spillage.
2. Message for electrical power supply was not addressed by IC Incident Controller.
3. Berth side approach was not cordon off by security team.
4. Head count at assembly point was not done by Security / HR/ Admin / LT- Ops.
5. Wind flow direction was not ensured for safe evacuation of people from site.
6. Emergency siren code not followed for emergency declaration.
7. Clearance from the maintenance team was not taken by the incident controller (before All Clear message)
8. Incident controller himself was engaged in leak arrest activity and was not attending emergency teams coming to report.
9. There was no communication system available for maintenance team working in isolated area
10. All workers are not aware about the communication system available in T-01.

**ADANI PORTS & SPECIAL ECONOMIC ZONE LIMITED**  
**MOCK DRILL REPORT**

11. Awareness / Training need to be provided to all workers and employees for operating PA system / other communication system available in T-01.
12. Emergency contact number need to be displayed at All berths, security gate and other visible locations of T-01.
13. Necessary communication to relevant parties (Medical, Safety & Fire Services) was not done by ISCR (New Emergency Control Room)

**LT Exit and Assembly Point**

1. Assembly point for T-01 should be replaced / Relocate to T-01 security Gate.
2. A Landline telephone should be provided at T-01 security gate.

SI No	ATS Tracking ID	Observations	Recommendations	Responsibility	Target date of Completion
1	182281	Drip Tray was not placed under the leakage area for not spreading the spillage	It should be ensured that drip tray must be placed under the leakage area for not spreading the spillage.	LT-Ops	15-Apr-2024
2	182282	Message for electrical power supply was not addressed by IC Incident Controller.	IC (Incident Controller) should be address about all type of energy isolation.	LT-Ops	15-Apr-2024
3	182296	Berth side approach was not cordon off by security team.	Security team should be ensured about the area must be cordoned off from all direction.	Security	23-Apr-2024
4	182295	Head count at assembly point was not done by Security / HR/ Admin / LT-Ops.	Head count should be done at assembly point	Lt-Ops / HR	23-Apr-2024
5	182283	Wind flow direction was not ensured for safe evacuation of people from site.	In practice it should be ensured that evacuation process should be done by taking care of the wind flow direction (Wind shock installed at Fire Pump House & TT6).	Lt-Ops	15-Apr-2024
6	182284	Emergency siren code not followed for emergency declaration.	Emergency siren code need to be followed for emergency declaration.	Lt-Ops	15-Apr-2024
7	182285	Clearance from the maintenance team was not taken by the incident	IC incident controller should be taken clearance from all concern department before passing all clear message.	Lt-Ops	15-Apr-2024

**ADANI PORTS & SPECIAL ECONOMIC ZONE LIMITED**  
**MOCK DRILL REPORT**

		controller (before All Clear message).			
8	<a href="#">182286</a>	Incident controller himself was engaged in leak arrest activity and was not attending emergency teams coming to report.	IC incident controller should not be engaged in any physical activity during emergency and a deputy incident controller should be there for assisting to the incident controller.	Lt-Ops	15-Apr-2024
9	<a href="#">182287</a>	There was no communication system available for maintenance team working in isolated area.	VHF / IS phone or such type of communication media should be provided to the contractor team those are working in isolated area.	ES-LTM / LT-Ops	08-May-2024
10	<a href="#">182288</a>	All workers are not aware about the Installed PA System to communicate LT Control Room.	Awareness training about the communication device available in T-01 should be done for all concern parties.	ES-LTM / LT-Ops	08-May-2024
11	<a href="#">182289</a>	Awareness / Training need to be provided to all workers and employees for operating PA system / other communication system available in T-01.	Pictorial signage of use of PA system need to be displayed near PA system. Awareness training about the communication device available in T-01 should be done for all concern parties.	ES-LTM / LT-Ops	08-May-2024
12	<a href="#">182290</a>	Emergency contact number need to be displayed at All berths, security gate and other visible locations of T-01.	Emergency contact number need to be displayed on all critical location.	LT-Ops	23-Apr-2024
13	<a href="#">182291</a>	Necessary communication to relevant parties (Medical, Safety & Fire Services) was not done by ISCR (New Emergency Control Room)	ISCR should be communicate about emergency to all concern parties as per the ERDMP.	Security	23-Apr-2024
14	<a href="#">182292</a>	Current Available Emergency Assembly Points at Main Road may be created obstruct in emergency evacuation / vehicle movement.	Assembly point for T-01 should be replaced / Relocate to T-01 security Gate.	LT-OPS / MLTPL.	08-May-2024



## ADANI PORTS & SPECIAL ECONOMIC ZONE LIMITED

### MOCK DRILL REPORT

15	182293	There is no means of proper communication system available on T-01 security gate.	A dedicated communication system should be provided at T-01 security gate.	Security	23-Apr-2024
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#### Overall rating - 92

Marks from 96 to 100 - Excellent

Marks from 91 to 95 - **Very Good**

Marks below 90 - Needs Improvement

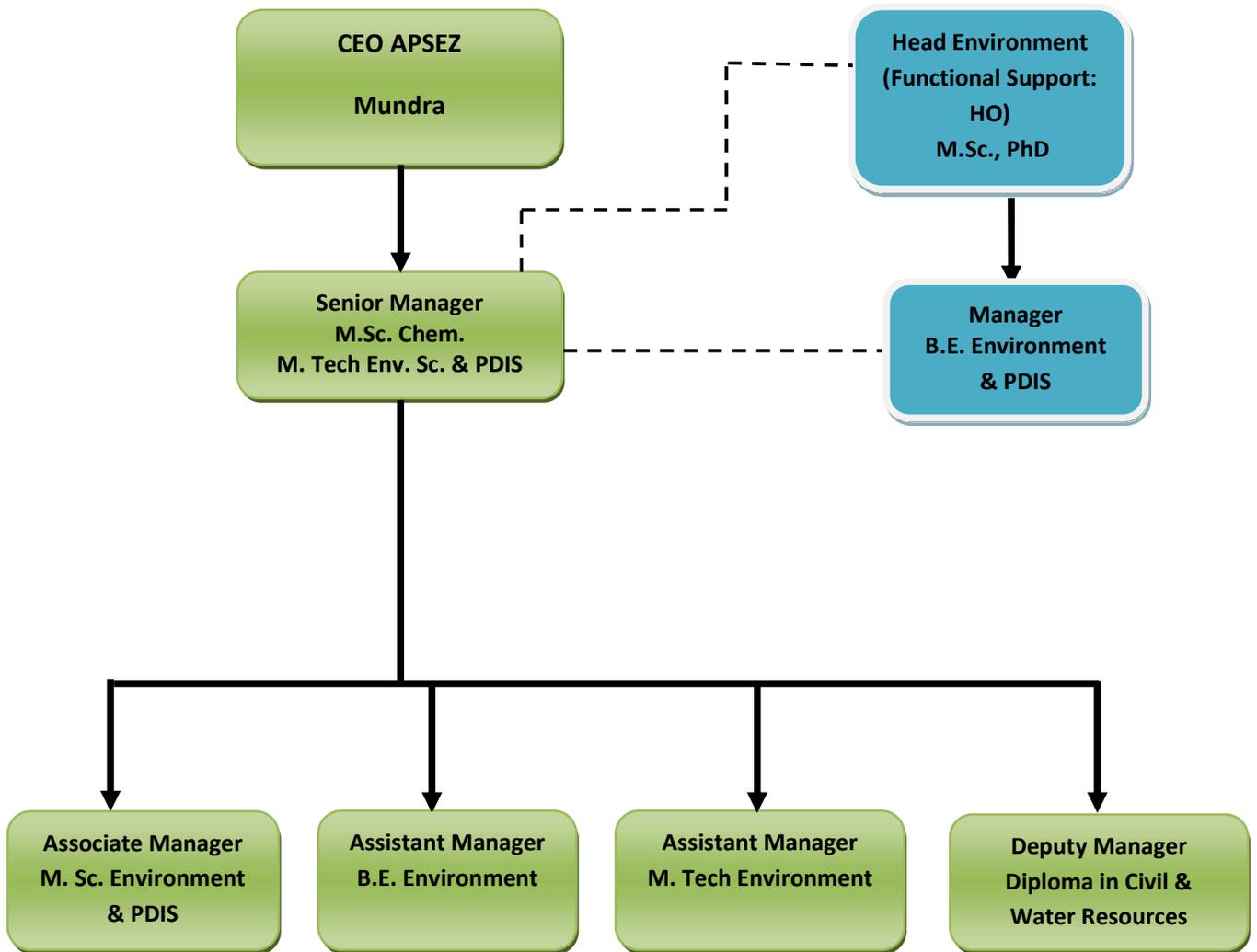
**VOTE OF THANKS:** - Rana Bambhaniya, Rama Rao and Swapnil Ashirgade

#### SUPPORTING STAFF:

Drill Organized By : Gaurang Chudasama and Swapnil Ashirgade  
Drill guided By : Rama Rao and Rana Bambhaniya  
Exercise Performance Assessor : Bk Krishna and Bhushan Bhatt  
Site incident controller : Gopal Raviya  
Report prepared By : Abhishek Panda

# **Annexure – 7**

**Updated Organogram of Environment Management Cell, APSEZ, Mundra**



# **Annexure – 8**

### Cost of Environmental Protection Measures

Sr. No.	Activity	Cost incurred (INR in Lacs)			Budgeted Cost (INR in Lacs)
		2021 - 22	2022 - 23	2023 - 24	2023 - 24
1.	Environmental Study / Audit and Consultancy	6.82	7.32	22.67	27
2.	Legal & Statutory Expenses	10.52	12.32	8.60	13
3.	Environmental Monitoring Services	14.31	15.32	13.37	19.20
4.	Hazardous / Non-Hazardous Waste Management & Disposal	107.09	104.035	130.11	148.68
5.	Environment Days Celebration and Advertisement / Business development	4.04	2.53	3.42	11.50
6.	Treatment and Disposal of Bio-Medical Waste	2.14	2.29	2.28	2.28
7.	Mangrove Plantation, Monitoring & Conservation	53.6	35.0	15	15.0
8.	Other Horticulture Expenses	921	956	904	904
9.	O&M of Sewage Treatment Plant and Effluent Treatment Plant (including STP, ETP of Port & SEZ & Common Effluent Treatment Plant)	252.27	141.33	186.94	212.9
10.	Expenditure of Environment Dept. (Apart from above head)	149.8	90.14	80.39	182.92
<b>Total</b>		<b>1371.79</b>	<b>1366.28</b>	<b>1366.78</b>	<b>1536.48</b>

# **Annexure – 9**

Date: 1<sup>st</sup> April, 2024

To,

**The Inspector General of Forest / Scientist C,  
Integrated Regional Office (IRO),**

Ministry of Environment, Forest & Climate Change (MoEF&CC),

Aranya Bhavan, A-wing, Room Number 409,

Near Ch-3 Circle, Sector 10 A,

Gandhinagar, Gujarat – 382007.

E-mail: [iro.gandhingr-mefcc@gov.in](mailto:iro.gandhingr-mefcc@gov.in)

**Sub :** Submission of Action Taken Report w.r.t. Certified Compliance to Waterfront Development Project of M/s. Adani Ports and Logistics at Mundra, District Kutchh, Gujarat -reg.

**Ref. :** 1. 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&CC letter No. 10-47/2008- IA.III.  
2. Environment and CRZ clearance validity extension order vide letter dated 7<sup>th</sup> October, 2015 bearing MoEF&CC letter No. 10-47/2008- IA.III.  
3. Certified Compliance Certification Report vide Letter No. J-11/14-2024-IROG NR/ I/66337/2024 dated 27<sup>th</sup> February, 2024.

Respected Sir,

With respect to the above subject and references, IRO-MOEF&CC, Gandhinagar had carried out the site visit of WFDP area, Mundra Port from 18<sup>th</sup> to 20<sup>th</sup> December, 2023 and have submitted certified EC compliance report vide Letter No. J-11/14-2024-IROG NR/ I/66337/2024 dated 27<sup>th</sup> February, 2024.

Action plan / Action taken report is prepared and being submitted as below, for further consideration -

Sr. No.	EC & CRZ Clearance Condition	Remarks from IRO, MoEF&CC	APSEZ's Action Taken / Action Plan
1.	<b>Specific Condition (i) of EC &amp; CRZ Clearance.</b>  No existing mangroves shall be destroyed during construction / operation of the	<b>Complied.</b> It is brought into the light of the EAC committee that the monitoring carried out by GUIDE has used LISS IV data having spatial resolution of 5.8m whereas the report submitted by NCSCM has	<b>Noted and Agreed.</b>  GUIDE has carried out mangrove mapping using authentic Indian satellite imagery of the year 2019 & 2021. GUIDE study leveraged the LISS IV (5.8-meter spatial resolution) multi-spectral imageries, which represent the highest resolution available from Indian satellites.

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 Corporate House, Shantigram, Nr. Vaishno Devi Circle, S.G. Highway, Khodiyar, Ahmedabad – 382421, Gujarat, India

Sr. No.	EC & CRZ Clearance Condition	Remarks from IRO, MoEF&CC	APSEZ's Action Taken / Action Plan
	Project.	<p>used 0.6m data for the mapping. The location of sampling for ground truthing mentioned in the GUIDE report was found vague while plotting manually on the map. The interpretation from GUIDE report is quite difficult when compared with the NCSCM report.</p> <p>It has been advised to conduct the survey through NCSCM and submit the report for interpretation. EAC committee may take a call.</p>	<p><b>Methodology adopted by GUIDE:</b></p> <p>a) <b>Satellite Imagery:</b> GUIDE meticulously utilized the LISS IV imagery to assess mangrove cover, distribution, and health. These images were obtained from only authorized Indian Government agency National Remote Sensing Centre, Hyderabad.</p> <p>b) <b>Ground Truthing:</b> To enhance the reliability of findings, GUIDE conducted extensive ground truthing. Field surveys were carried out to verify the accuracy of the satellite data.</p> <p><b>Authenticity and Verifiability:</b> GUIDE dataset stands out for its authenticity and verifiability. By combining satellite imagery with ground truthing GUIDE data is not only accurate but also reflects the ground reality, making it a valuable resource for mangrove conservation and management.</p> <p>Subsequently, APSEZ has corrected the report from GUIDE w.r.t. co-ordinates. The updated survey report is attached as <b>Annexure – 1</b>.</p> <p>However, as per suggestion given by your good office, APSEZ agreed to conduct a mangrove monitoring survey through NCSCM for the year 2023. APSEZ has already initiated to carry out such monitoring with NCSCM to get a techno commercial offer, but still there is no response from their side. (Mail conversation is attached as <b>Annexure – 2</b>).</p> <p>Mangrove monitoring study report carried out through NCSCM (once agreed) will be</p>

Sr. No.	EC & CRZ Clearance Condition	Remarks from IRO, MoEF&CC	APSEZ's Action Taken / Action Plan
			submitted to concerned regulatory authorities for their interpretation and recommendations if any. Undertaking stating the same is attached as <b>Annexure - 3</b> .
2.	<p><b>Specific Condition (viii) of EC &amp; CRZ Clearance.</b></p> <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><b>Complied</b></p> <p>Being a vast expanse under the head, it is advised to conduct the study through the Mahatma Gandhi Labour Institute.</p>	<p><b>Noted and Agreed.</b></p> <p>Below studies have already been conducted by APSEZ.</p> <p>a) CSR Impact Assessment to <i>"assess the Social Impact created by the Mobile Health Care Units (MHCU) operated by the Adani Foundation in the villages of Mundra intends to find out the change/improvement in the health status of the beneficiaries"</i> carried out through M/s. SOULACE CONSULTING PVT LTD. during the period FY 2022-23 (Report's cover page is attached as <b>Annexure - 4</b>).</p> <p>b) Assessment of Water Conservation Programs to <i>"assess changes in the various activities that may be attributed to the Foundation's water harvesting initiatives"</i> carried out in the year 2022 through M/s. THINKTHROUGH CONSULTING (Report's cover page attached as <b>Annexure - 5</b>).</p> <p>The frequency to carry out CSR Impact Assessment is once in two years. As per recommendations, APSEZ will approach the Mahatma Gandhi Labor Institute to conduct the upcoming CSR assessment study in FY 2024-25. The assessment reports will be submitted along with half yearly EC compliance report and recommendations given in study report will be implemented in proper manner.</p>

Sr. No.	EC & CRZ Clearance Condition	Remarks from IRO, MoEF&CC	APSEZ's Action Taken / Action Plan
3.	<p><b>Specific Condition (6) of CRZ Recommendations.</b></p> <p>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 rainwater during rainy seasons.</p>	<p><b>Partly Complied.</b></p> <p>The unit has developed a garland drain all along the coal storage area through which water goes into a common sump. It is advised to clean the garland drains. It is advised to use collected wastewater for dust suppression after filtration.</p> <p>The first wash of the storm drain should be diverted into the sump.</p>	<p><b>Complied.</b></p> <p>Cleaning of garland drains is being done on regular basis and water collected in the sump is being used for dust suppression after proper filtration / sedimentation.</p> <p>Photographs showing garland drain &amp; common sump / dump pond are attached as <b>Annexure - 6.</b></p> <p>The first wash of storm water drain during monsoon will be diverted into common sump for sedimentation and reused for dust suppression.</p>
4.	<p><b>Specific Condition (16) of CRZ Recommendations.</b></p> <p>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</p>	<p><b>Partly Complied.</b></p> <p>As the port is handling coal, certain specialized infrastructure is required to be installed at the port:</p> <p>a) Installation of hooks at the corner of the berths for fixing of green curtains.</p> <p>b) All the water outlets at the berth should be connected through pipelines from which</p>	<p><b>Complied / Agreed to comply.</b></p> <p>All the mitigations measures are being taken for abatement of fugitive dust emission within port premises and complying with the coal handling guidelines issued by GPCB. However, as per recommendations given by your good office to install certain specialized infrastructure, APSEZ has taken the following steps:</p> <p>a) APSEZ has provided hydraulic operated spill plate &amp; side wall to prevent any spill of coal into the sea during vessel operations. Photographs of the same are</p>





Sr. No.	EC & CRZ Clearance Condition	Remarks from IRO, MoEF&CC	APSEZ's Action Taken / Action Plan
			<p>After that, APSEZ has already awarded work for refurbishing of damaged part of wind breaking wall. During the site visit it was also verified by IRO officials that refurbishing work was in progress. The same will be completed by the month of June'2024.</p> <p>Photographs showing installed wind breaking wall and ongoing refurbishing work are attached as <b>Annexure – 10</b>.</p>

Requested to kindly consider our submission for further consideration and acknowledge the same.

Thanking you,  
Yours Faithfully,

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



**Dr. Anil Kumar Trivedi**  
**(Head – Environment)**

Encl. As Above

## **ANNEXURE – 1**

# **UNDERTAKING FOR MANGROVE MONITORING**

## UNDERTAKING

I, Dr. Anil Kumar Trivedi son of Late Shri Rajkumar Sharma, age 45-years Head – Environment of Adani Ports and SEZ Limited having its registered office at Adani Corporate House, Shantigram, Near Vaishnodevi Circle, S G Highway, Ahmedabad-382421, Gujarat hereby undertake as mentioned below:

- APSEZ is carrying out mangrove monitoring in and around creek of APSEZ, Mundra at every 2 years in compliance with recommendations of approved mangrove conservation plan.
- APSEZ has carried out last mangrove monitoring through M/s. Gujarat Institute of Desert Ecology (GUIDE), Bhuj for the year 2021 (till March). Report has submitted along with half yearly EC compliance report.
- APSEZ agreed to conduct a mangrove monitoring survey through NCSCM (once agreed) / any other reputed organization for the year 2023.
- Mangrove monitoring study report carried out through reputed organization will be submitted to concerned regulatory authorities for their interpretation and recommendations if any.
- All the above-mentioned information is correct to the best of my knowledge.

**For, Adani Ports and SEZ Limited**

**Dr. Anil Kumar Trivedi**  
**Head – Environment**

Date: 1<sup>st</sup> April, 2024

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

Registered Office: Adani Corporate House, Shantigram, Nr. Vaishno Devi Circle, S.G. Highway, Khodiyar, Ahmedabad – 382421, Gujarat, India

## **ANNEXURE – 2**

# **MANGROVE MONITORING REPORT – GUIDE**

## Final Report

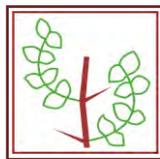
# Monitoring and Distribution of the Mangroves Along the Creeks in and Around APSEZ, Mundra, Kachchh, Gujarat



*Submitted to:*

Adani Ports and Special Economic Zone Ltd. (APSEZL),  
Mundra, Kachchh District, Gujarat

*Submitted by: -*



Gujarat Institute of Desert Ecology  
P.O. Box # 83, Opp. Changleshwar Temple,  
Mundra Road, Bhuj,  
Kachchh-370001, Gujarat

November- 2023

## **Project Personnel**

### **Project Co-Ordinator**

Dr. V. Vijay Kumar, Director

### **Principal Investigator**

Mr. Dayesh Parmar, Project Officer

### **Co-Principal Investigator**

Dr. Kapilkumar Ingle, Project Scientist

### **Team Member**

Mr. Deep Dudiya, JRF

Mr. Raj Joshi

Mr. Arjan Rabari

## TABLE OF CONTENTS

---

<b>1. INTRODUCTION .....</b>	<b>1</b>
1.1. About Adani Ports and Special Economic Zone Ltd. (APSEZL).....	2
1.2. Origin of the Study .....	2
1.3. Objectives of the Study.....	5
<b>2. STUDY AREA .....</b>	<b>6</b>
2.1. Location .....	6
2.2. Climate.....	8
2.2.1. Tidal Regime.....	8
2.2.2. Currents .....	8
2.2.3. Salinity.....	9
<b>3. METHODOLOGY AND DATA USED .....</b>	<b>10</b>
3.1. Methodology.....	10
3.2. Data Used .....	10
3.2.1. Pre-processing.....	11
3.3. Zonation.....	11
3.4. Mangrove Vegetation.....	12
3.5. Field Work .....	14
<b>4. RESULTS AND ANALYSIS.....</b>	<b>20</b>
4.1. Overall APSEZ Mangrove Assessment .....	20
4.2. Creek Wise Assessment.....	23
4.2.1. Kotadi Creek Area .....	23
4.2.2. Baradi mata Creek area.....	25
4.2.3. Bocha-Navinal Creek Area .....	28
4.2.4. Khari Creek .....	31
4.3. Mangrove Vegetation.....	33
4.3.1.: Diversity .....	33
4.3.2.: Density .....	34
4.3.3. Regeneration and Recruitment Class of Mangroves.....	37
<b>5. CONCLUSION.....</b>	<b>40</b>
5.1. Shoreline and Mangrove Cover Changes .....	40
5.2. Recommendations .....	41

## LIST OF FIGURES

---

Figure 2.1: Location Map of The Study Area.....	7
Figure 3.1: Study Area in Four Different Zone.....	12
Figure 3.2: Mangrove Data Collection During Field Visits .....	14
Figure 3.3: Ground Truthing Data and Mangrove Data Collection Points .....	15
Figure 3.4: Surveyed and Collected Ground Truthing Data Various Categories of Mangroves.....	19
Figure 4.1: Comparison of Various Categories of Mangroves in APSEZ Between 2019 and 2021 .....	21
Figure 4.2: Distribution of Various Categories of Mangroves in March 2019 .....	22
Figure 4.3: Distribution of Various Categories of Mangroves in March 2021 .....	22
Figure 4.4: Comparison of Various Categories of Mangroves in Kotadi Creek Zone Between 2019 and 2021 .....	23
Figure 4.5: Distribution of Mangroves in 2019 in Kotdi Creek Zone System. ....	24
Figure 4.6: Distribution of Mangroves in 2021 in Kotdi Creek Zone System. ....	24
Figure 4.7: Change Analysis from 2019 to 2021 on Categories of Mangroves in Kotadi Creek System.....	25
Figure 4.8: Comparison of Various Categories of Mangroves in Baradi Mata Creek Zone Between 2019 and 2021.....	26
Figure 4.9: Distribution of Mangroves at Baradi Mata Creek Zone in 2019 .....	27
Figure 4.10: Distribution of Mangroves at Baradi mata Creek Zone in 2021.....	27
Figure 4.11: Change Analysis From 2019 To 2021 On Categories of Mangroves in Baradi Mata Creek System.....	28
Figure 4.12: Comparison of Various Categories of Mangroves in Bocha-Navinal Creek Zone Between 2019 and 2021 .....	29
Figure 4.13: Distribution of Various Categories of Mangroves in Bocha- Navinal Creek Zone System for The Year 2019 .....	29
Figure 4.14: Distribution of Various Categories of Mangroves in Bocha -Navinal Creek Zone System for The Year 2021 .....	30
Figure 4.15: Change Analysis From 2019 To 2021 On Categories of Mangroves in Bocha- Navinal Creek System .....	30
Figure 4.16 : Comparison of Various Categories of Mangroves in Khari Creek Zone Between 2019 and 2021 .....	31
Figure 4.17 : Distribution of Various Categories of Mangroves in Khari Creek Zone System for The Year 2019.....	32
Figure 4.18: Distribution of Various Categories of Mangroves in Khari Creek Zone System for The Year 2021.....	32
Figure 4.19: Change Analysis From 2019 To 2021 On Categories of Mangroves in Khari Creek System.....	33
Figure 4.20 : Diversity of Mangrove Species in APSEZ Area, Mundra .....	39

## LIST OF TABLES

---

<b>Table 3.1: Satellite Data for Mangrove mapping procured from NRSC .....</b>	<b>11</b>
<b>Table 4.1: Distribution of Various Categories of Mangroves in APSEZ During 2019 and 2021 .....</b>	<b>21</b>
<b>Table 4.2: Distribution of Various Categories of Mangroves in Kotadi Creek Zone During 2019 and 2021 .....</b>	<b>23</b>
<b>Table 4.3: Distribution of Various Categories of Mangroves in Baradi Mata Zone Creek During 2019 and 2021 .....</b>	<b>26</b>
<b>Table 4.4: Distribution of Various Categories of Mangroves in Bocha- Navinal Creek Zone During 2019 and 2021 .....</b>	<b>29</b>
<b>Table 4.5: Distribution of Various Categories of Mangroves in Khari Creek Zone During 2019 and 2021 .....</b>	<b>31</b>
<b>Table 4.6: Density of Trees in the Kotadi Creek Area .....</b>	<b>34</b>
<b>Table 4.7: Density of Trees in the Baradi mata Area .....</b>	<b>35</b>
<b>Table 4.8: Density of Trees in the Bocha-Navinal Creek Area .....</b>	<b>36</b>
<b>Table 4.9: Density of Trees in the Khari Creek Area .....</b>	<b>36</b>
<b>Table 4.10: Density of Younger Classes in the Kotadi Area (Plant/Ha) .....</b>	<b>37</b>
<b>Table 4.11: Density of Younger Classes in the Baradi mata Area (Plant/Ha) .....</b>	<b>38</b>
<b>Table 4.12: Density of Younger Classes in the Bocha-Navinal Area (Plant/Ha).....</b>	<b>38</b>
<b>Table 4.13: Density of Younger Class in Khari creek .....</b>	<b>39</b>

## 1. INTRODUCTION

The Kachchh district of the Gujarat State is located between latitude 23.13°-24.68°N and longitude 68.10°-71.80°E, encompassing an area of 45,612 km<sup>2</sup>. The coastal stretch of the district constitutes the entire northern coast of Gulf of Kachchh (GoK) which is one of the three major Gulf systems in India and is endowed with high biological diversity along with physical and chemical peculiarities. Kachchh coast constitutes about 25.37% and 5.3% of the coastal stretch of Gujarat and India respectively. In spite of its high aridity (4 in a scale of 1- 4) along with scanty and erratic rainfall with an annual average of 520.9 mm (1988-2017). Kachchh coast has diverse ecological habitats and ecosystems like mangroves, sandy coasts, mudflats, creeks and other tidal incursions which enhance manifold its coastal landscape diversity and its natural resources. Besides, extensive mangrove formations and a vast continental shelf of 1,64,000 km<sup>2</sup> facilitates a rich fishery resource.

Kachchh coast supports the mangrove extent of 798.74 km<sup>2</sup>, constituting 68% of state's mangroves (1175 km<sup>2</sup>) which is the largest mangrove entity in India's western coast as per Forest Survey of India 2021 (FSI report 2021). Due to the presence of rich natural resources and favourable natural conditions, Kachchh coast has become a zone of intensive industrial development. Since late 1990's, industrial development is being promoted aggressively in view of its very rich mineral deposits, shortest sea route to Gulf countries and easy availability of land which is at premium in other coastal regions of the state. Announcement of tax holidays during the post-earthquake in 2001 by the state government has provided further impetus for coastal industrial development. Many of these developments are beginning to have implications on ecological, social and economic spheres. Kachchh coast faces threats from climate change, pollution and habitat changes which are also important to understand the impacts on the mangroves.



Adani Port is one of the fastest growing and largest private ports in the country and also encompassing a SEZ (Special Economic Zone) area. The port in year 2013-14 has handled >100 million tons of cargo. The port is equipped with road, rail and air connectivity which has attracted few big and many small industries of this area.

On the other hand, the area also harbours a luxuriant mangrove forest which is very close to the Port and SEZ.

### **1.1. About Adani Ports and Special Economic Zone Ltd. (APSEZL)**

The former Gujarat Adani Port Ltd., now named as Adani Ports and Special Economic Zone Ltd. (APSEZL) started its operations in Mundra during the year 1998 with an all-weather, open-sea jetty and port backup at Navinal Island. The Port has since then undergone four expansions, namely a railway line and container terminal in 2000, Single Point Mooring and Pipeline for crude oil terminal in 2004, a Multipurpose wharf Terminal-II in 2007, and a Waterfront development project in 2009 which includes the development of North Port, South Port, East Port & West Port and its associated infrastructure facilities. In addition to these, port-based special economic zone and two thermal power plants exists which form a major industrial cluster of this coast.

### **1.2. Origin of the Study**

The northern Gulf of Kachchh in the western coast of India has extensive formation of mangrove. Ministry of Environment, Forest and Climate Change have accorded Environment and CRZ Clearance (EC) vide Letter No. F.No.10-138/2008-IA.III dt. 15<sup>th</sup> July, 2014 & 12<sup>th</sup> February, 2020 to M/s Adani Ports and Special Economic Zone Ltd (APSEZ), to set up a multi-product SEZ at Mundra, Kachchh, Gujarat. The project involves development of SEZ in a notified SEZ area of 8481.2784 ha. Adani Ports and Special Economic Zone Ltd. (APSEZL) covering a total area of 9625 ha, over and above 10,000 ha including port and its back-up area.

While issuing the Environmental Clearance (EC) to the project, the MoEF & CC have stipulated General and Special conditions in their Environment Clearance. Further,



inline to the MoEF&CC final order, vide F.No.10-47/2008-IA.III dated 18<sup>th</sup> Sept. 2015 which also contained special conditions, two of which (sr. no *iv* and *v* of the order) are as follows:

(iv) A Comprehensive and integrated conservation plan including detailed bathymetry study and protection of creeks/mangrove area including buffer zone, mapping of coordinates, 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 disappearance of mangroves near Navinal creek. The preservation of the 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 Baradi mata and others.

(v) 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.

Accordingly, Adani Ports and Special Economic Zone Limited (APSEZ) had requested the National Centre for Sustainable Coastal Management (NCSCM) for preparation of

Comprehensive and Integrated plan for preservation and conservation of mangroves and associated creeks. The components of plan are analysis of mangrove health by comparing the coverage between 2011 and 2016, bathymetry of creeks, socio-economics of villages adjoining creeks of APSEZ. One of the key recommendations is monitoring of coverage of mangrove in the late 2019 and comparing its extent of distribution with the data reported in 2016-17. As per reported in the Conservation plan there has been overall increase in mangrove area by 246 ha in 2016-17 in the creeks in and around APSEZ compared to 2011 indicating existence of near healthy conditions for growth of the mangroves. It was recommended that the trend of mangrove cover needs to be studied in Jan/March



2020 using satellite images of late 2019 and if the trend continues, only monitoring is needed. The Conservation plan was submitted to the Gujarat Coastal Zone Management Authority and in its meeting held in October, 2019, then plan was approved as per their email dt 22nd Sept 2020. The major recommendation relating to mangroves that were specified in the conservation plan are as follows:

2.1. There has been overall increase in mangrove area by 246 ha in 2016-17 in the creeks in and around APSEZ compared to 2011 indicating existence of near healthy conditions for growth of the mangroves. No action is needed at present except at Navinal creek, Bocha island and off Bocha creek. The trend of mangrove cover needs to be studied in Jan/March 2020 using satellite images of late 2019 and if the trend continues, only monitoring needed. The tidal range in the mangroves is also to be observed annually using tide poles to ensure that the flow of tidal water remains same as observed in April 2017 during the field study. If degradation of mangroves to the extent of 10% due to inadequate seawater is observed in Kotdi and Baradimata creeks, initially the mouth areas need to be made free from silt. If tidal flow does not improve after one year and if the extended banks are noticed which might be due to siltation, silt need to be removed on the banks where there are no mangrove roots. If the tidal conditions still do not improve after one year, the interior parts of the creeks need to be dredged in a phased manner from 0.5 m to 1 m. Otherwise, the monitoring of mangrove needs to be carried out once in two years and whenever, degradation is noticed the above strategy needs to be implemented.

2.2. In the Navinal creek, if degradation of mangroves or reduction of mangrove cover by even 10% is noticed in 2020 due to decrease in tide water flow, dredging of Navinal creek from beyond port operation areas up to 4.5 km to increase the depth by 1 m in a phased manner must be taken up to facilitate increased tidal water flow into the mangrove areas of Bocha island. Otherwise, the monitoring of mangrove needs to be carried out once in two years and whenever, degradation is noticed the above strategy needs to be implemented.



In view of the above, Adani Ports and Special Economic Zone Ltd. (APSEZL) has approached M/s. Gujarat Institute of Desert Ecology (GUIDE) to conduct a detailed study of the mangrove coverage using the satellite images of 2021 and also the changes in the mangrove areas of APSEZ between 2019 and 2021. In order to comply with the above recommendations relating to monitoring of mangrove, the plant distribution in the creeks in and around APSEZL, Mundra, Gujarat with the following objectives were formulated.

### **1.3. Objectives of the Study**

1. To map the current extent of mangrove cover and its changes in comparison to 2021 data, through GIS and RS in the APSEZ area.
2. To assess and monitor the changes in the mangrove cover between 2019 and 2021 by using RS and GIS in the APSEZ area.
3. LISS-IV (MSS) ortho rectified imagery data will be used for the mangrove mapping study.
4. Monitoring of mangrove density in the APSEZ area at Mundra through assessment of the vegetation cover in the area.
5. Formulating an appropriate management plan based on the results for the sustained well being and conservation of mangroves in APSEZ area, Mundra.



## 2. STUDY AREA

### 2.1. Location

Kachchh coast constitutes the entire northern shore of the Gulf of Kachchh marked by narrow beaches and wide mudflats. The Mangrove cover of the Mundra taluka is about 19.1 km<sup>2</sup> distributed mostly along the creek systems. The coastal stretch of Mundra is dissected by extensive mudflats and creek systems, many of which harbour good mangrove formations. Major creek systems in the area are Navinal, Bocha, Baradi mata and Kotadi creeks. These creeks again divide into minor creek complexes. Many of these creeks support mangrove stands, especially along the eastern and western side of the waterfront area of APSEZ. Koylavalu creek is luxuriantly lined by mangrove patches, predominantly with the species, *Avicennia marina*. The Adani Port and Special Economic Zone Ltd.-APSEZ is located at about 3 km from Bacha mouth towards eastern extension. The present study was focused towards the mangrove stand at Bocha / Navinal creek, Kotdi creek, Baradi Mata creek and Khari creek adjoining to the waterfront area of APSEZ which falls within the conservation zone of APSEZ (Figure 2.1) that earmarked as conservation zone.

#### **Bocha/Navinal and East of Bocha Mangrove Stand**

Bocha Island is a finger like projection surrounded by the Bocha creek on the west and Navinal creek on the eastern part. The Adani/MICT container terminal is located right across the Bocha Island at a distance of 100m. The island supports mature and healthy mangrove stands.

#### **Kotadi and Baradi mata**

Kotadi and Baradi mata creek systems on the western part of APSEZL area include luxuriant mangrove patches. These two creeks bifurcate further at their tail end into several minor creeks forming a complex water way with many small Islands. Many of these Islands harbour healthy mangrove stands.



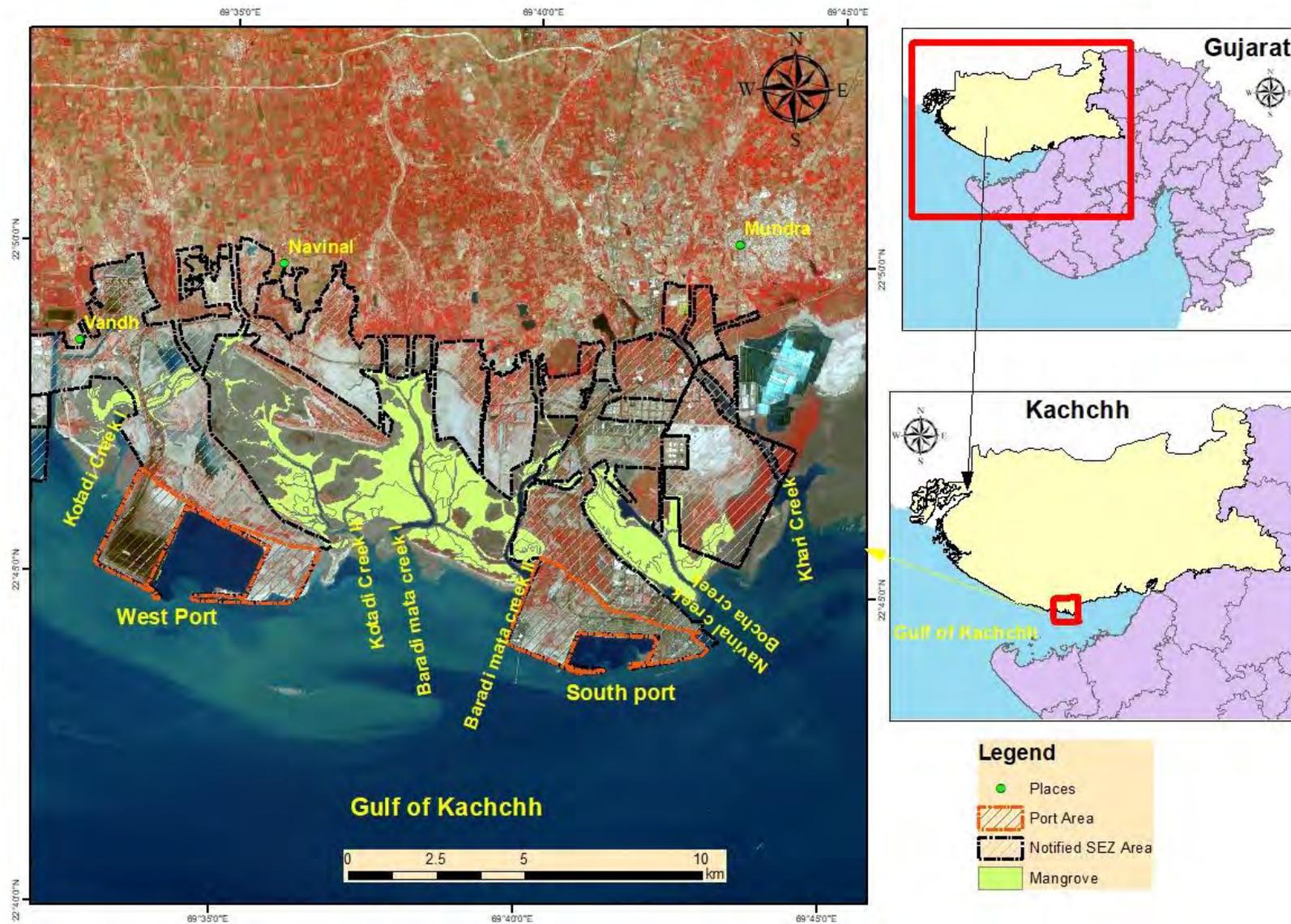


Figure 2.1: Location Map of The Study Area



## 2.2. Climate

As per the Indian Meteorological Department, Govt. of India, the highest monthly mean of daily maximum temperature of the study area is 36<sup>0</sup>C. The dry bulb temperature goes up to 47.8<sup>0</sup>C, considering max Humidity of 95%. The wind is predominantly from the south-west as well as from the west to some extent. The wind velocity is 65 km/hr.

Due to its arid nature, annual rainfall in Kachchh is generally poor, ranging from 250-350 mm which is often irregular. However, the mean annual rainfall during 1932 to 2021 was higher at Mundra (407 mm) comparing to other coastal talukas of Kachchh district due to good rainfall during the last 3-4 years. Rain during monsoon is confined to only 12-16 days and occurs as an instant downpour. Freshwater input into the near coastal waters is quite meagre and appears to influence the coastal erosion. Annual temperature fluctuation in the district is extreme, ranging from 7- 47 <sup>0</sup>C with a yearly average humidity of 60% which increases to 80% during the southwest monsoon and decreases to 50% during November-December. The phenomenon of drought is common, with 2 drought years in a cycle of 5 years (Thivakaran *et al.*, 2015).

### 2.2.1. Tidal Regime

Tides at Mundra are the mixed type, predominantly semi-diurnal type with a Mean High-Water Spring (MHWS) of 6.66 m and Mean High water Neap (MHWN) of 5.17 m. The phase difference is not uniform for successive tides in the Gulf and it varies as per tidal conditions ((ICMAM, 2004).

### 2.2.2. Currents

The currents in the Gulf and associated creeks are largely tide induced and oscillations are mostly bimodal reversing in direction with the change in the tidal phase. The influence of wind on variations in current is minor. The current reversals are quite sharp occurring within 30 - 60 min. The maximum current



speed varied from 0.5 to 1.2 m/s. The predominant direction of the current is 45° during flood and 220° during ebb.

The circulation is generally elliptical with the major axis in the east-west direction. These trajectories suggest that the excursion lengths are in the range of 10 to 15 km depending on the tidal phase (neap or spring)(NIO, 2009).

### **2.2.3. Salinity**

Salinity is an indicator of freshwater intrusion in nearshore coastal waters as well as the excursion of salinity in inland water bodies such as estuaries, creeks, and bays. Normally seawater salinity is 35.5 ppt but may vary depending on evaporation, precipitation, and freshwater addition. Salinity largely influences several processes such as dissolution, dispersion, dilution, etc. in seawater due to high dissolved salt content and hence high density. In the absence or minimum of freshwater inflow, the salinity varies from 35.9 to 38.0 ppt.

Due to its arid nature, annual rainfall in Kachchh is generally poor, ranging from 250-350 mm which is often irregular. However, mean rainfall (1932 to 2001) was higher at Mundra (407 mm) due to very good rainfall during the last 3-4 years. Except very good rainfall years, freshwater input into the near coastal waters is quite low and appears to influence coastal flora like mangroves explaining poor floral diversity. Annual temperature fluctuation in the district is extreme, ranging from 7- 47°C with a yearly average humidity of 60% which increases to 80% during south-west monsoon and decreases to 50% during November-December. The phenomenon of drought is common, with 2 drought years in a cycle of 5 years.



### **3. METHODOLOGY AND DATA USED**

Basic approach for the present exercise was identification of the threats and pressures on the mangrove ecosystem.

#### **3.1. Methodology**

Satellite imageries were procured from National Remote Sensing Centre (NRSC) who are the only authorized distributor of satellite images in India, for availability of high-resolution satellite imagery especially multi-spectral images similar to the images used to study the mangrove distribution. The present report on mangrove distribution is based on LISS IV satellite images of March 2019 and March 2021, as cloud free images. The details of the satellite imagery used for the present study are given below (Table 3.1). The methodology adopted to map the distribution of mangroves is by NDVI method using ERDAS Software by using satellite images which delineate vegetation and non -vegetation data. Further, based on the Ground truthing, colour and tone of satellite data of the mangrove and other vegetation are delineated by using manually digitizing on the computer screen. Further, it has limitations as it is not a direct digital data and the mangroves details are obtained from satellite images by directly digitizing from the computer screen.

The categories of mangrove cover as dense, sparse and scattered area evaluated based on the percentage of mangrove cover in the study area. The percentages used for different classes are dense mangrove (40-70% cover), sparse mangrove (10-40% cover) and scattered mangrove (< 10% cover) (Kathiresan, K. (2022). There could be a possible error of less than 10 % in mangrove categorization (as dense, sparse and scatter) and also extent of total coverage in terms of hectare.

#### **3.2. Data Used**

The Multi-date satellite LISS-IV imageries, were procured from NRSC, Hyderabad, was used for the analysis of the present study.



**Table 3.1: Satellite Data for Mangrove mapping procured from NRSC**

Satellite	Date	Sensor	Resolution (m)
IRS-R2	23 March 2019	LISS -IV	5.8
IRS-R2A	19 March 2021	LISS -IV	5.8

### 3.2.1. Pre-processing

Pre-processing of satellite data includes correction of geometric, atmospheric, and radiometric aspects and clipping of the area to obtain the exact imagery of the project sites. The rectification operation aims to correct distorted images to create a more correct representation of the original scene. It typically involves the initial processing of raw image data to correct geometric distortions.

**Radiometric Correction:** The Radiometric correction addresses variations in the pixel intensities (DNs) that have not been caused by the object or scene scanned. These variations include differing sensitivities or malfunctioning of the detectors, topographic effects and atmospheric effects.

**Geometric Correction:** The Geometric correction addresses errors in the relative positions of pixels. These errors are induced by the sensor viewing the geometry or terrain variations. A geometric correction was done based on Ground Control Points (GCPs) and the image was re-sampled using the nearest neighbourhood interpolation method.

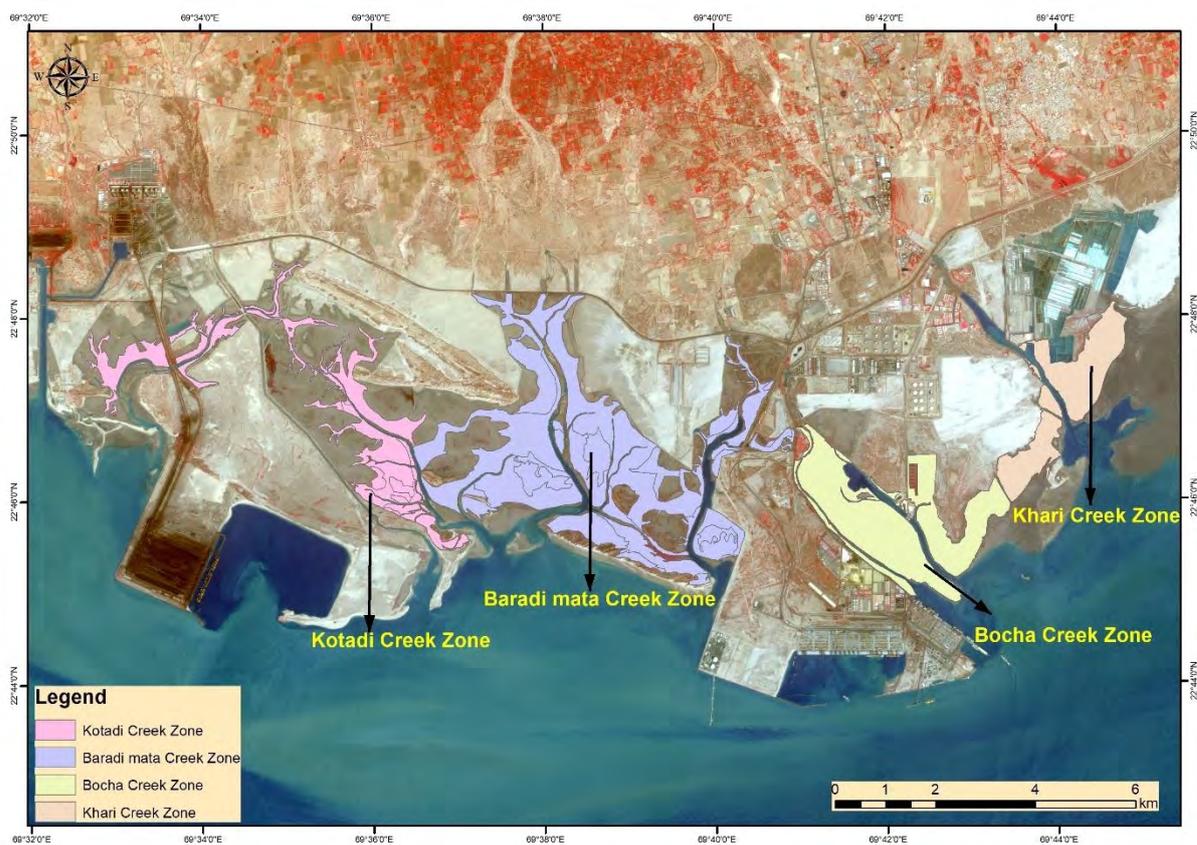
### 3.3. Zonation

**Zoning of the Study Area:** Considering the extent of the area, the whole Mundra mangrove formation was divided into smaller zones in order to facilitate better evaluation and understanding of the ecosystem. Moreover, this kind of zoning helps to analyse the root cause of the issues, enabling better understanding of the ecosystem level problems. Accordingly, Mundra coast was divided into four zones as indicated below for the purpose of this study;



- Zone 1:       Bocha-Navinal creek Zone (The Island proper and areas in and around Adani house and between Bocha and Navinal creek)
- Zone 2:       Baradi mata creek zone (Creek’s west of south port to surrounding to Baradi mata temple)
- Zone 3:       Kotadi creek Zone (Creeks surrounding to West Port)
- Zone 4:       Khari creek Zone (Area both the side of Khari creek)

Representative study points covering all the zones were studied on ground and documented for status, Figure 3.1 shows the earmarked zones in the study area.



**Figure 3.1: Study Area in Four Different Zone**

### 3.4. Mangrove Vegetation

The survey area of APSEZ was divided in the three zones for the survey. During the survey of the mangroves in these three areas, the density and diversity of mangroves in prefixed sites was carried out. The selected sites were located in the intertidal belts and the adjacent estuarine environment of APSEZ area. The major part of assessment was done during low tide of the project sites. The density of the



tree class along with the regeneration and recruitment classes were recorded from the study area. In general, plants or seedlings with a height <50 cm were considered as regeneration class and those are in between 50 cm to 100 cm as recruitment class. For regeneration class, 1 m × 1 m and for recruitment class plants, 2 m x 2 m quadrates were used randomly for the measurement. For mature plants, 10 m x 10 m quadrates were used at the selected sites. The mature plants with height more than 100 cm and girth more than 7 cm were considered as trees. The equipments utilized in this study were user-friendly and easy to carry such as ranging rods, pipes, measuring tape, rope, etc.





**Figure 3.2: Mangrove Data Collection During Field Visits**

### **3.5. Field Work**

Field investigation is a vital part of the project. Fieldwork helps to check and collect most of the ground information required for mangrove mapping. The reconnaissance field survey had been undertaken to get acquainted with the general patterns of vegetation of the area. The variation and tonal patterns had been observed on existing images. Traverses along all dense mangrove, sparse mangrove, scatter mangrove and major creeks have been noticed and were considered for collecting ground truth data between maps/images and on the ground. The fieldwork was conducted during the period between 03<sup>rd</sup> to 07<sup>th</sup> July 2023; 11<sup>th</sup> to 16<sup>th</sup> September 2023 and 16<sup>th</sup> to 20<sup>th</sup> October 2023 for collecting ground truthing data to cover the entire APSEZ area.



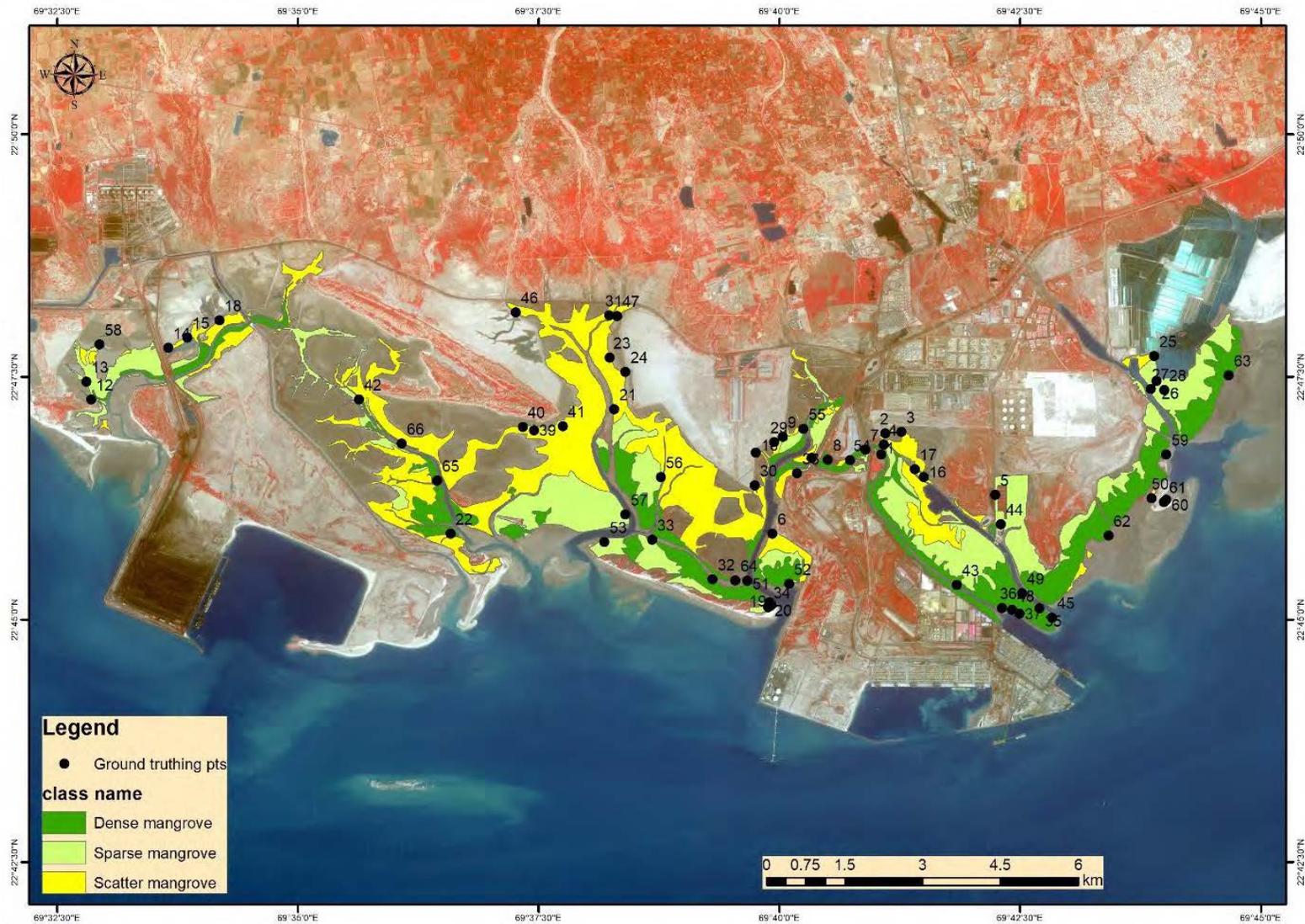
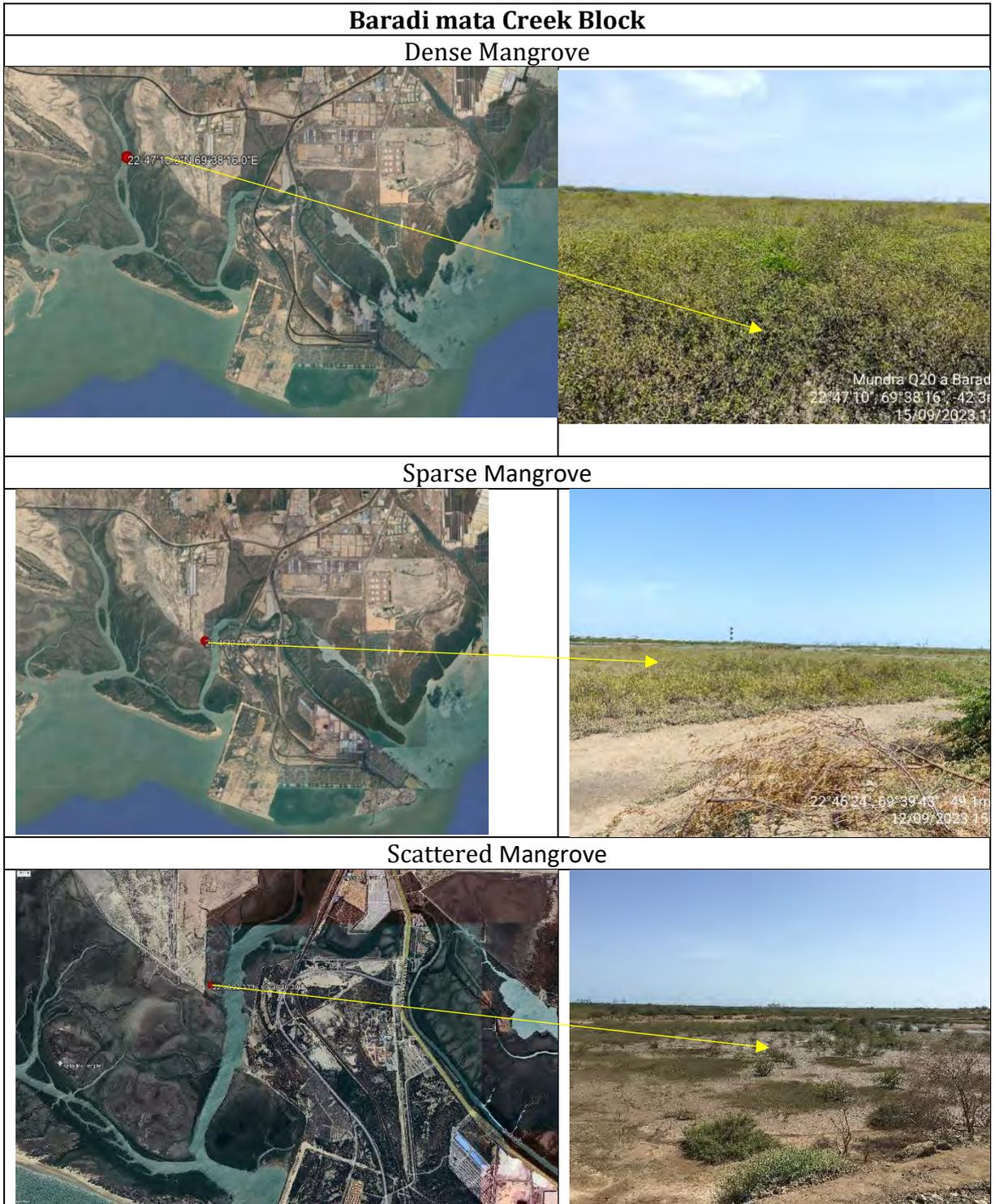


Figure 3.3: Ground Truthing Data and Mangrove Data Collection Points



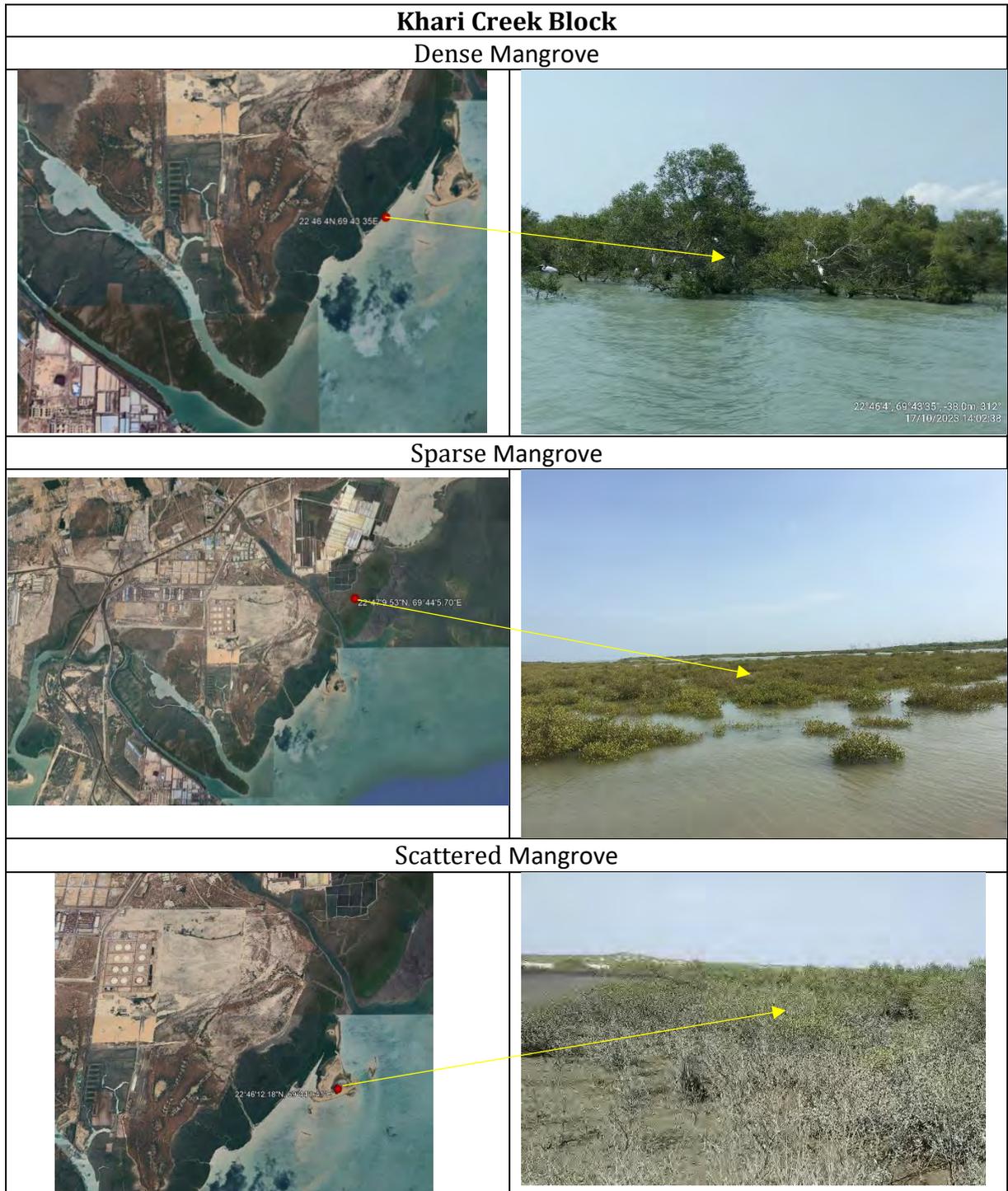
<b>Kotadi Creek Block</b>	
<b>Dense Mangrove</b>	
	
<b>Sparse Mangrove</b>	
	
<b>Scattered Mangrove</b>	
	





<b>Bocha-Navinal Creek Block</b>	
<b>Dense Mangrove</b>	
	 <p>Mundra Bocha Isl 22°45'14", 69°42'33", -42.1m, 1 14/09/2023 15:02</p>
<b>Sparse Mangrove</b>	
	
<b>Scattered Mangrove</b>	
 <p>EPS/SIO/NOAA/US Navy/ICA/CSBCO Image © 2023 Maxar/Earthstar</p>	 <p>22°46'52", 69°41'1", -42.7m 11/09/2023 13:4</p>





**Figure 3.4: Surveyed and Collected Ground Truthing Data Various Categories of Mangroves**



## 4. RESULTS AND ANALYSIS

The Kotadi, Baradi mata, Navinal, Bocha-Navinal and Khari creeks experience high tidal ranges up to 6m and with average tidal range of 2 to 4.5m which varies annually. The creeks have mangrove formation due to muddy substratum and the mangroves are tide fed and tidal flow into the mangroves occurs only during high tide. This makes the mangroves as intertidal one and any change of tidal conditions in the creeks affect the growth and distribution of mangroves. Distribution of mangroves in Kotadi, Baradi mata, Navinal, Bocha and Khari creeks as well as in the Bocha island was studied using LISS IV satellite images (2019 March and 2021 March).

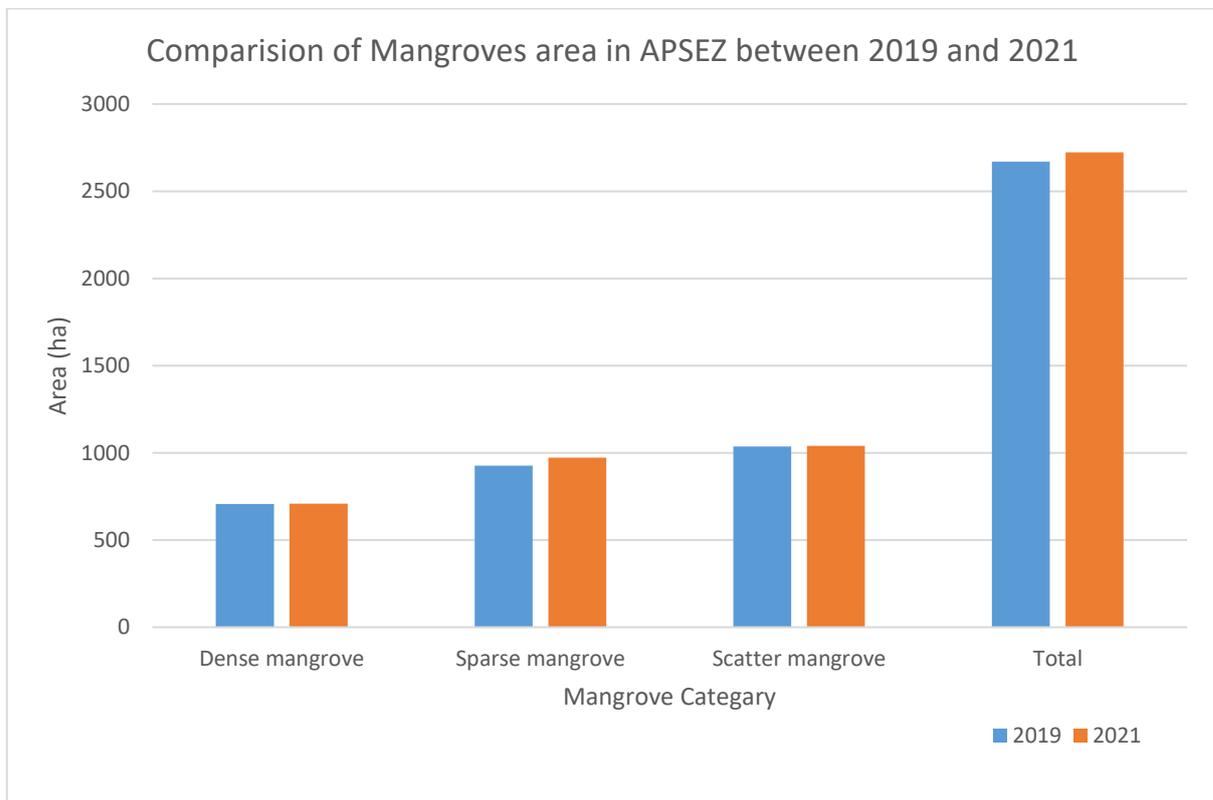
### 4.1. Overall APSEZ Mangrove Assessment

Mangrove areas are known to vary over time and may be mixed with associate vegetation. However, by analysing the colour and tone of multi-spectral high-resolution LISS IV (5.8 m spatial resolution) satellite data and extensive ground truthing survey data in each block of the study area, mangrove coverage could be more accurately estimated. The mangrove cover in the creeks in and around APSEZ showed a positive trend from March 2019 to March 2021, with an overall increase of 52.79 ha (1.9%) compared to the cover during the year 2019. The total mangrove cover during 2019 was 2670.08 ha which has increased to 2722.87 ha during the year 2021 (Table 4.1). This indicates that the mangrove and the tidal system in the creeks were not adversely affected by any anthropogenic or natural disturbances during this period. The analysis of the data revealed that the dense mangrove category has increased by 3.01 ha (0.11%) due to sparse mangrove converted to dense mangrove, while sparse mangrove category has increased by 45.90 ha (1.7%) which is mainly due to the conversion of scattered mangroves into sparse mangroves. The scattered mangrove category has also showed an increase by 3.88 ha (0.14%), which is suggesting the recruitments and regeneration of mangroves in the area. The changes in the mangrove cover are summarized in Table 4.1 and Figure 4.3.



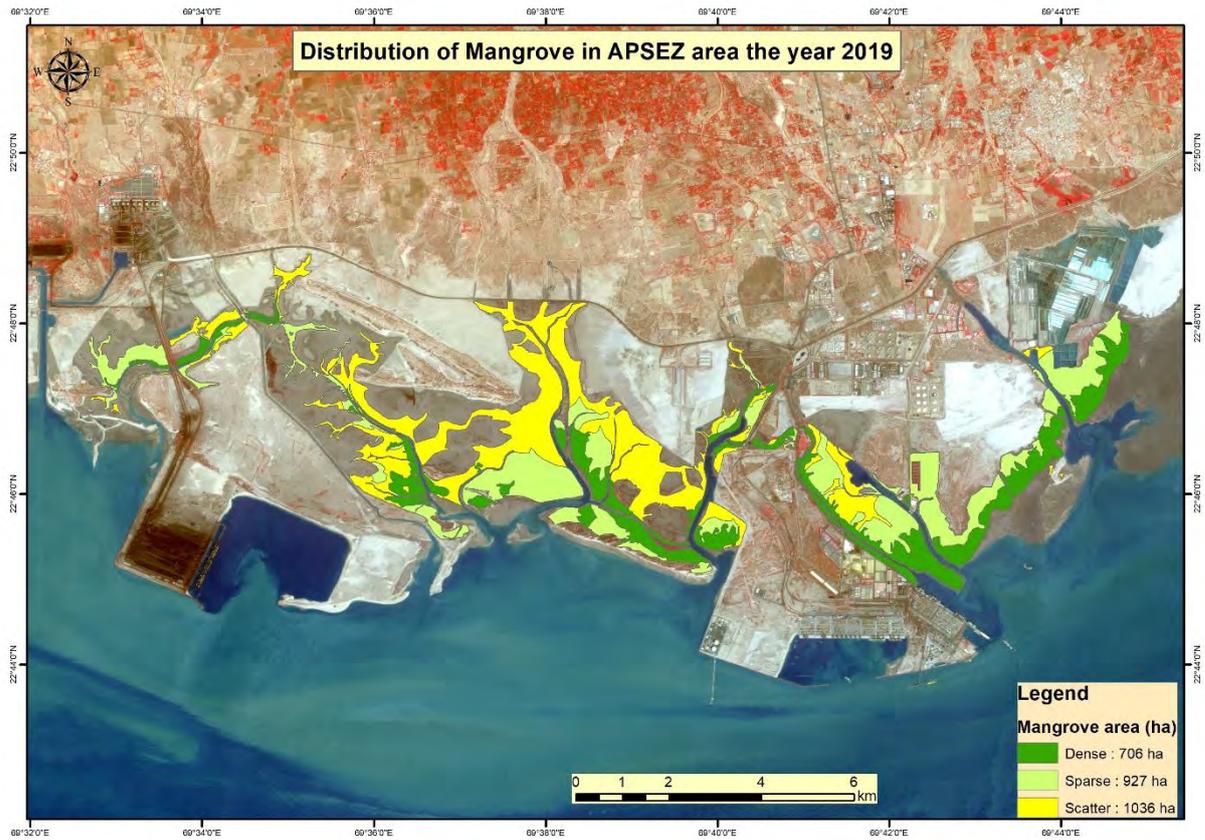
**Table 4.1: Distribution of Various Categories of Mangroves in APSEZ During 2019 and 2021**

Class	Area (ha)		
	2019	2021	Change
Dense Mangrove	706.02	709.03	3.01
Sparse Mangrove	927.31	973.22	45.90
Scattered Mangrove	1036.74	1040.62	3.88
Total	2670.08	2722.87	52.79

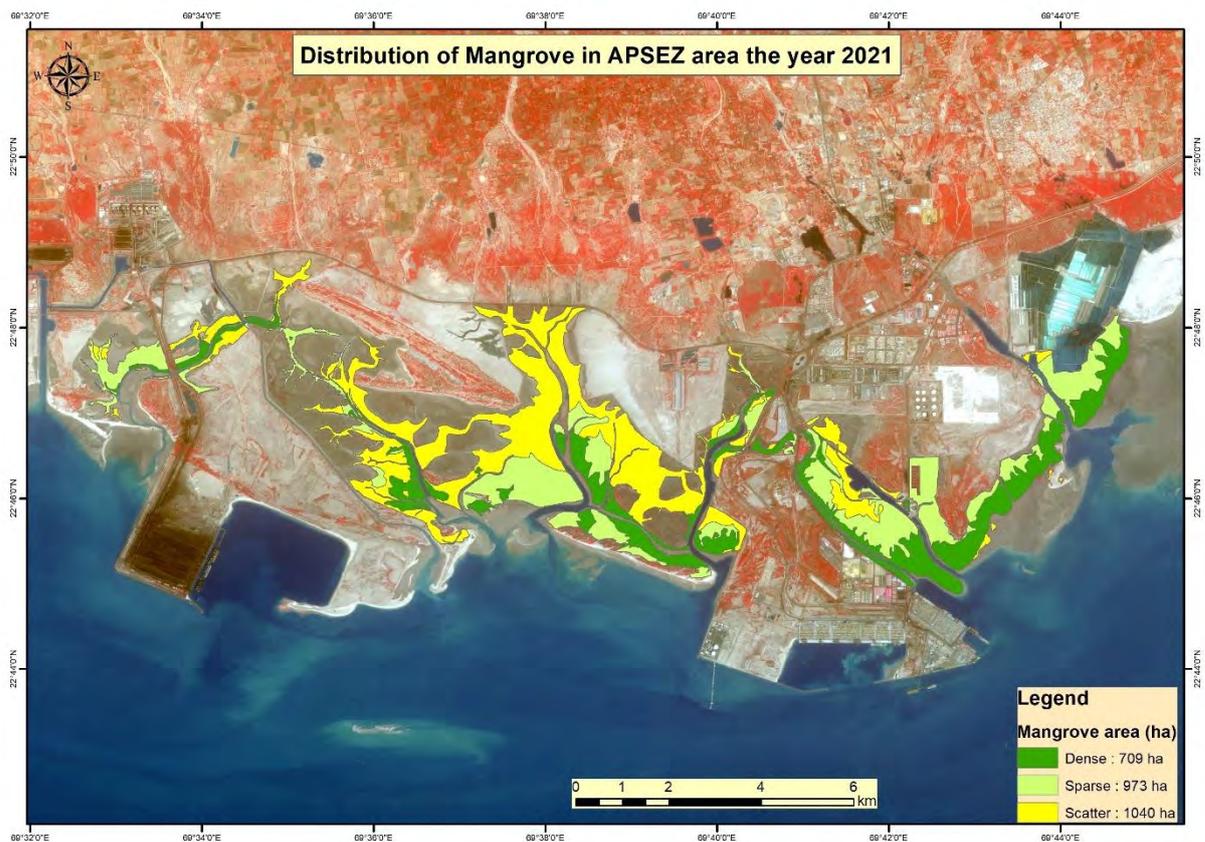


**Figure 4.1: Comparison of Various Categories of Mangroves in APSEZ Between 2019 and 2021**





**Figure 4.2: Distribution of Various Categories of Mangroves in March 2019**



**Figure 4.3: Distribution of Various Categories of Mangroves in March 2021**



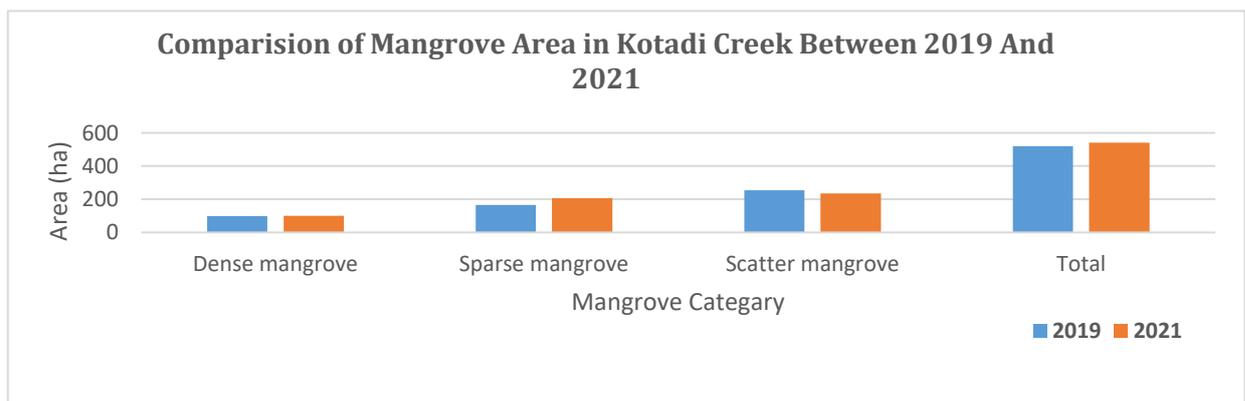
## 4.2. Creek Wise Assessment

### 4.2.1. Kotadi Creek Area

The study site Kotadi creek, which has two mouths: Kotadi-I on the western end of west port of Adani and Kotadi-II located east of Kotdi-I. The tidal flow reaches up to 4.5 km in Kotadi-I and up to 7.4 km in Kotadi-II during high tide periods. The mangrove cover at these sites were compared for the period, during March 2019 and March 2021 using satellite images and field surveys. There are three categories: dense, sparse, and scattered mangroves and it was found that the total mangrove area increased by 21.43 ha (4.1%) from 2019 to 2021 (Table 4.2). The dense category increased by 0.3% (1.78 ha), while the sparse category increased by 39.71 ha and the area of scattered category decreased by 20 ha (Figure 4.4 to Figure 4.7) from the 2019 imagery. These results indicate that the mangroves in Kotadi creek are healthy and benefited from the regular tidal flow. The decrease in the area of the of scattered category and increase of sparse are due to natural transitions in mangrove growth stages, from scattered to sparse category.

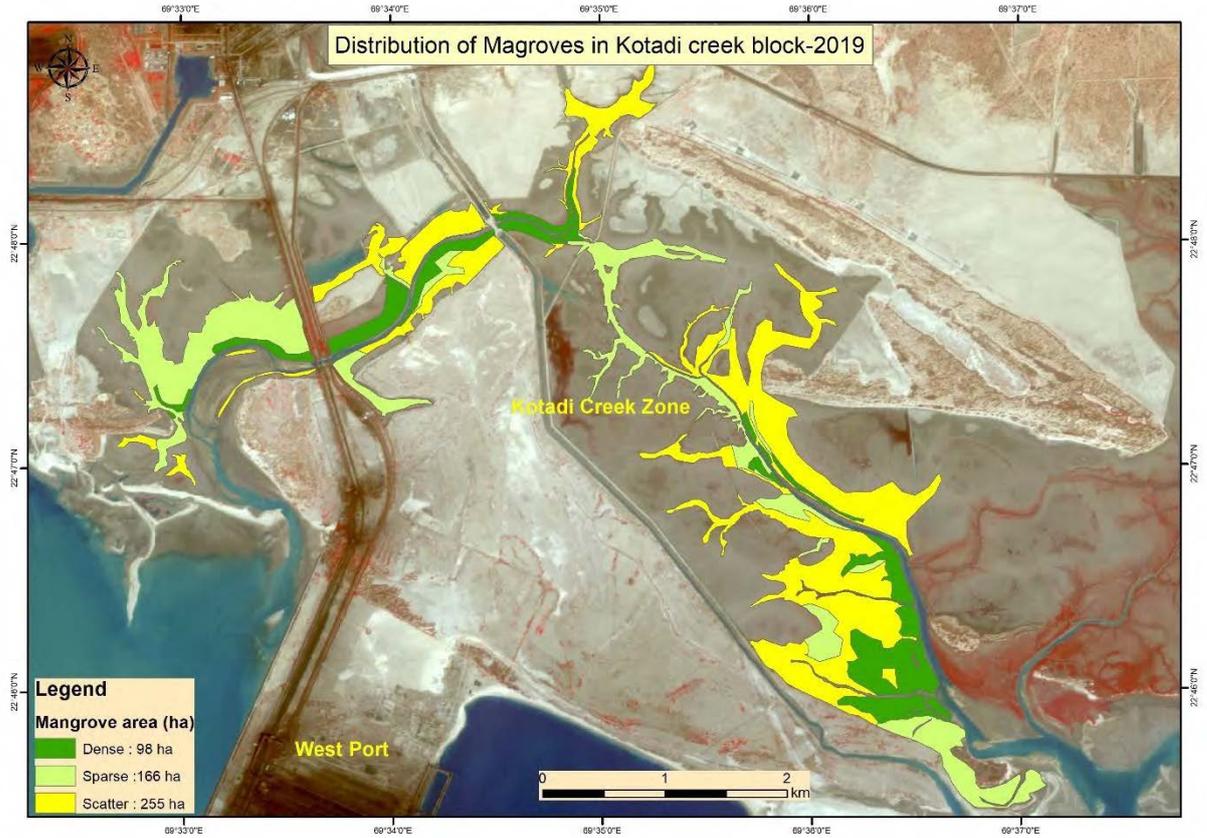
**Table 4.2: Distribution of Various Categories of Mangroves in Kotadi Creek Zone During 2019 and 2021**

Class Name	Area(ha)		
	2019	2021	Change
Dense Mangrove	98.12	99.89	1.78
Sparse Mangrove	166.21	205.92	39.71
Scattered Mangrove	255.01	234.96	-20.05
Total	519.34	540.77	21.43

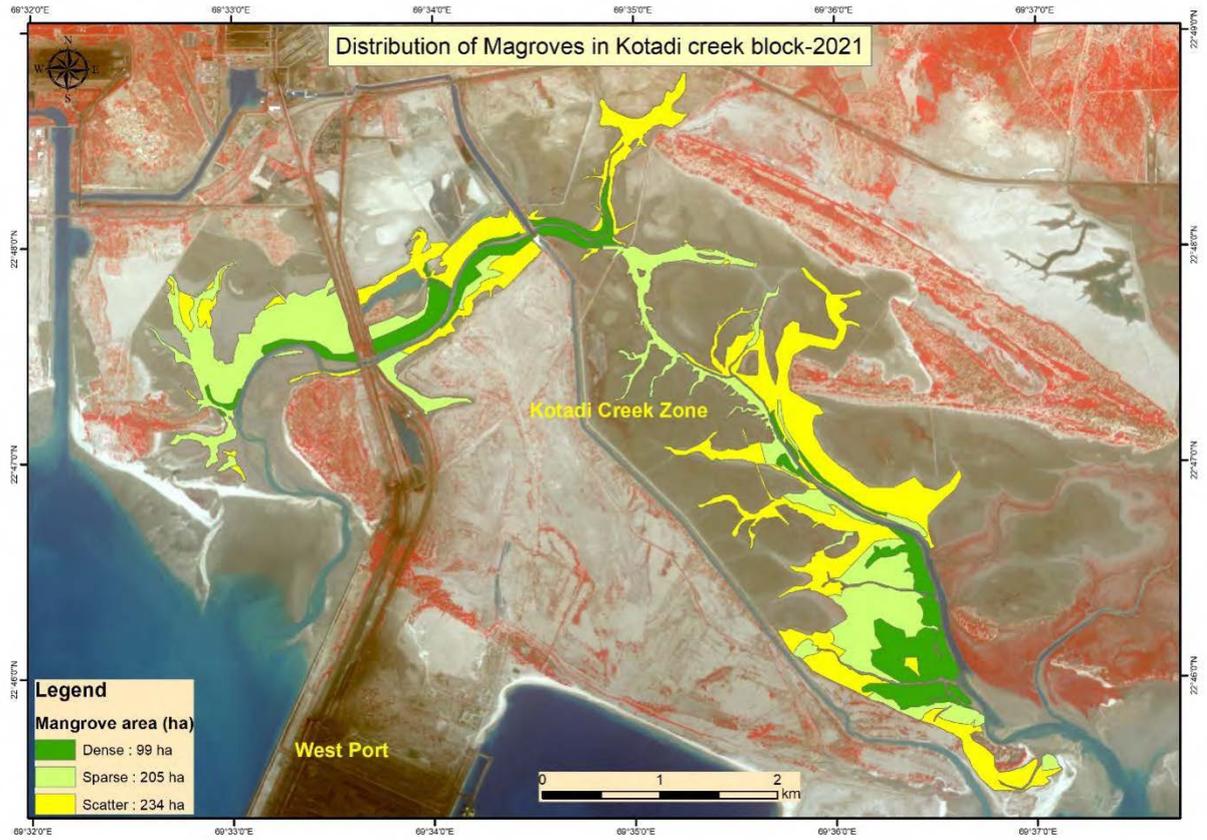


**Figure 4.4: Comparison of Various Categories of Mangroves in Kotadi Creek Zone Between 2019 and 2021**



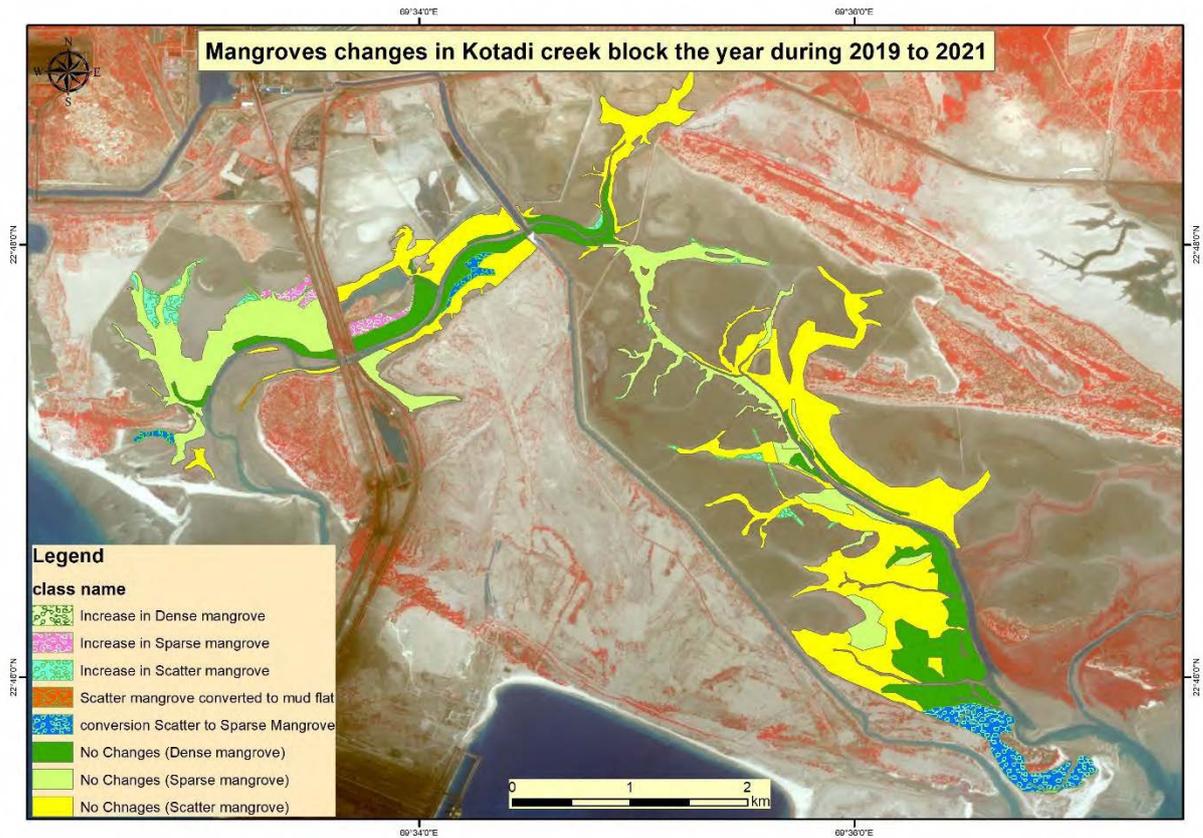


**Figure 4.5: Distribution of Mangroves in 2019 in Kotadi Creek Zone System.**



**Figure 4.6: Distribution of Mangroves in 2021 in Kotadi Creek Zone System.**





**Figure 4.7: Change Analysis from 2019 to 2021 on Categories of Mangroves in Kotadi Creek System**

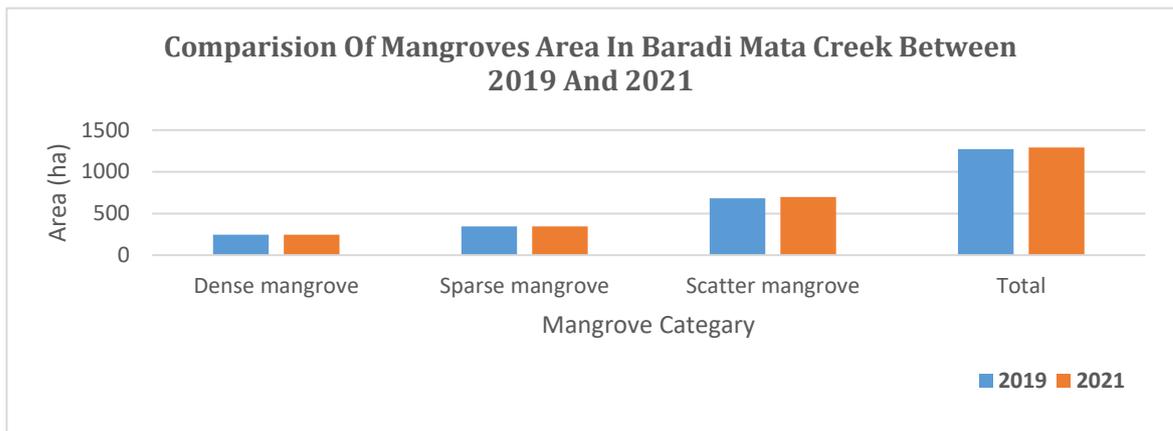
#### 4.2.2. Baradi mata Creek area

This creek remains uninfluenced by human interventions except for navigation by the fishing community from the nearby villages. The status (growth cover) of the mangroves was assessed between 2019 and 2021 and the results are shown in (Table 4.3 and to Figure 4.11). The comparative study of the images revealed the overall improvement in mangrove coverage to the extent of 15.91 ha (1.2% increase) mostly with formation of new mangroves in the form of scattered mangroves with minor inter-conversion in categories of sparse to dense, The data on mangrove distribution has showed an increase from 2019 to 2021 especially improvement to higher categories (i.e., from scattered to sparse and further to dense) and also the formation of new mangroves was also significant. These results lead to infer that the mangroves in the creek are in a healthy condition with normal regular tidal flow.



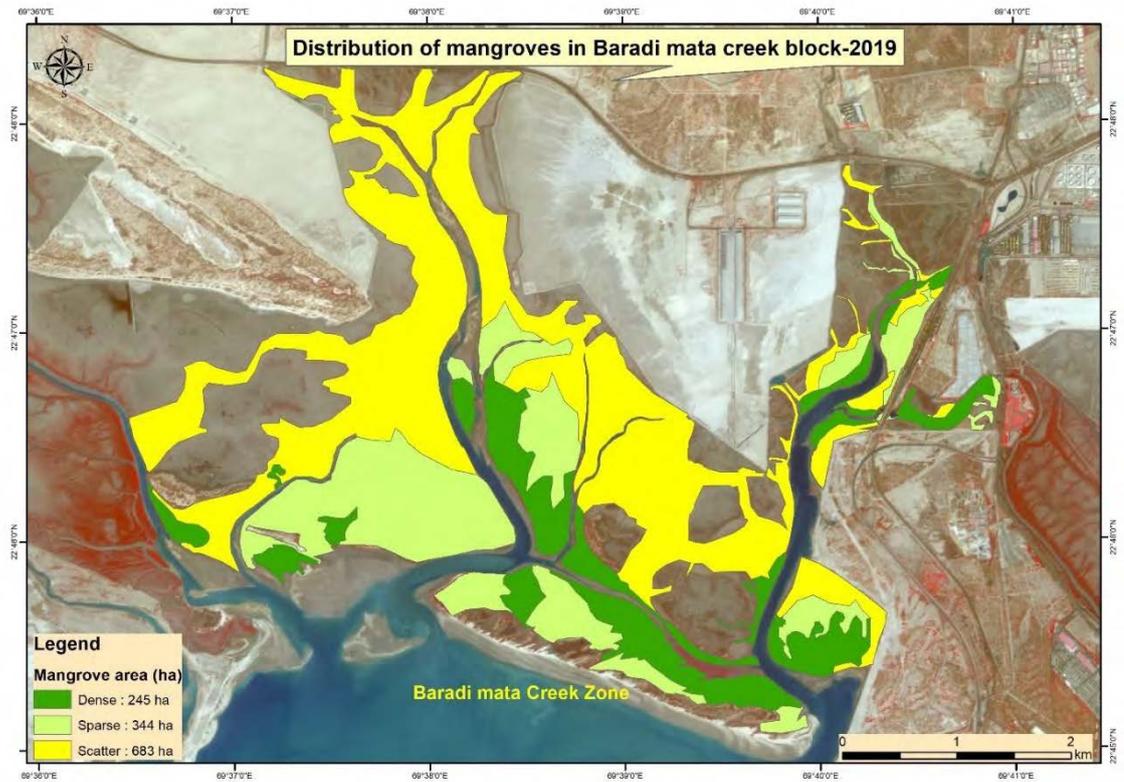
**Table 4.3: Distribution of Various Categories of Mangroves in Baradi Mata Zone Creek During 2019 and 2021**

Class Name	Area (Ha)		
	2019	2021	Change
Dense Mangrove	245.22	245.94	0.72
Sparse Mangrove	344.83	345.92	1.09
Scatter Mangrove	683.76	697.86	14.10
Total	1273.81	1289.72	15.91

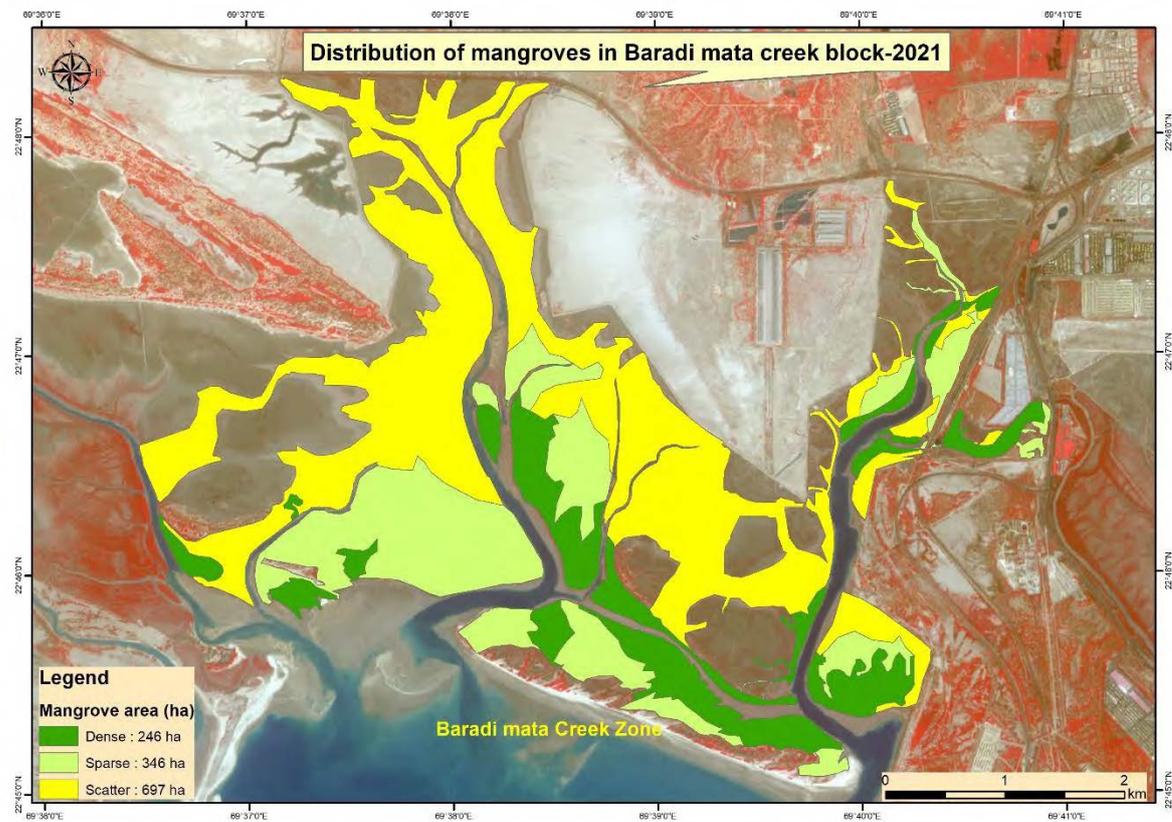


**Figure 4.8: Comparison of Various Categories of Mangroves in Baradi Mata Creek Zone Between 2019 and 2021**



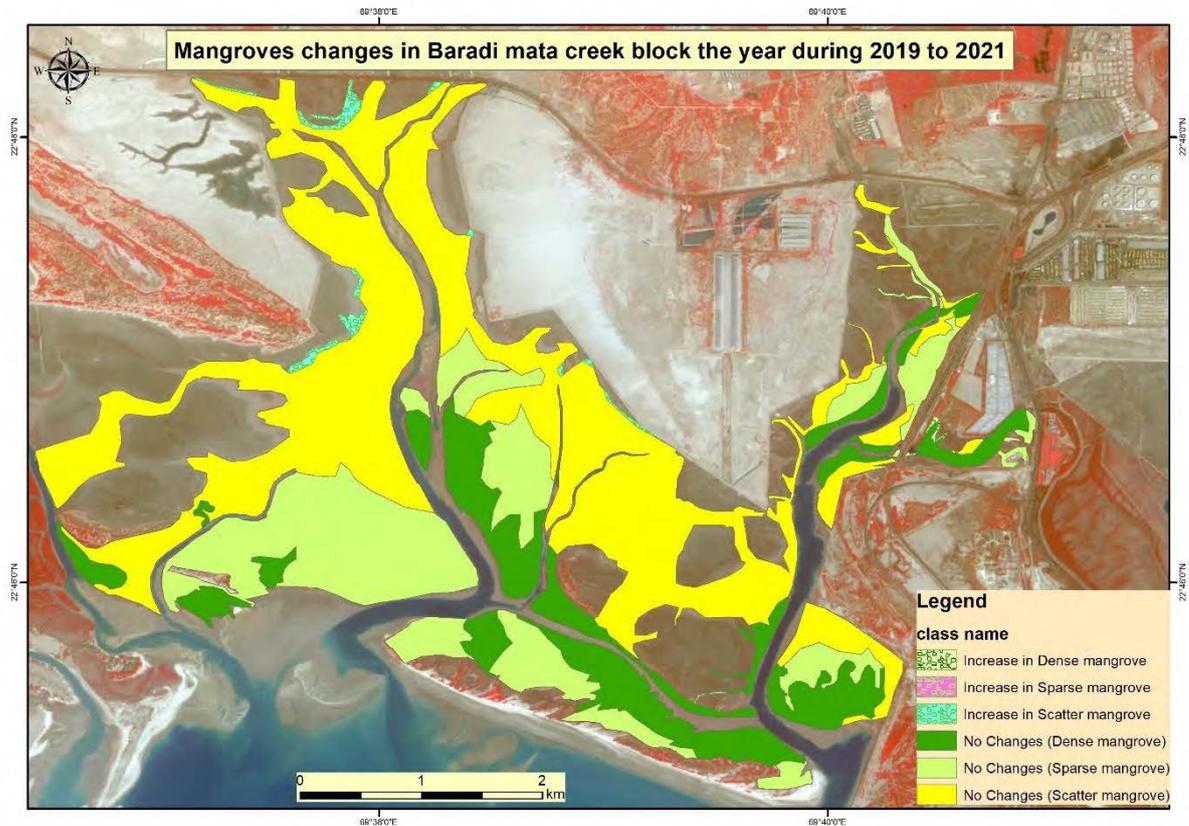


**Figure 4.9: Distribution of Mangroves at Baradi Mata Creek Zone in 2019**



**Figure 4.10: Distribution of Mangroves at Baradi mata Creek Zone in 2021**





**Figure 4.11: Change Analysis From 2019 To 2021 On Categories of Mangroves in Baradi Mata Creek System**

#### 4.2.3. Bocha-Navinal Creek Area

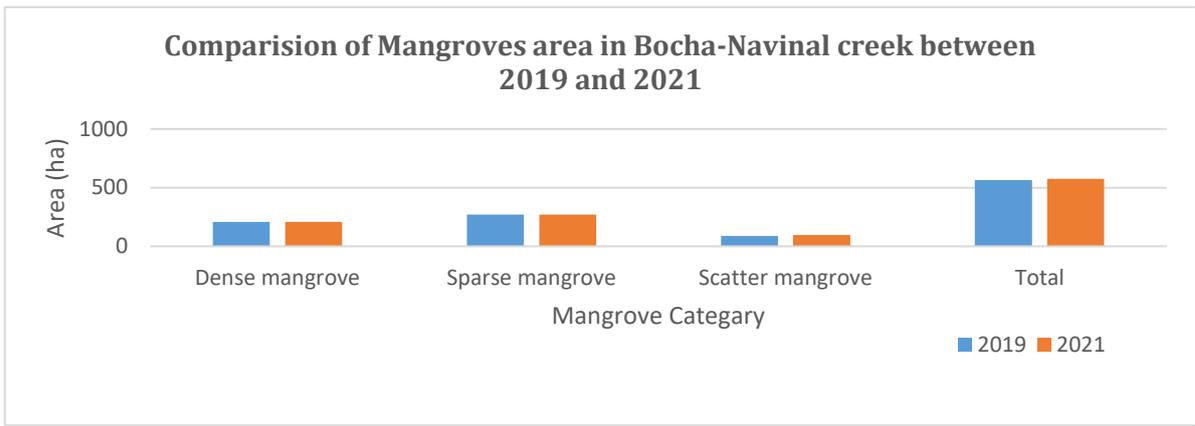
The study area comprises two creeks, Navinal creek, Bocha creek, and bocha island, thus form a complex of creek system. The Navinal creek is adjacent to Adani Port and joins the Bocha creek in the north, forming Bocha island that has dense mangroves. The mouth of Navinal creek is also known as the entrance to the Port and receives good tidal inflow. The Navinal creek narrows down as it flows northward and eastward to merge with Bocha creek (Figure 2.1). The banks of all the two creeks have fair to good mangrove growth, with dense mangroves particularly along the border of the Bocha island and the nearby minor creeks (Figure 4.12 to Figure 4.15). For the comparative study, the satellite images and field survey results on the mangrove cover for the period March 2019 and March 2021 were considered. The three classes of the mangrove types: dense, sparse, and scattered were observed. The total mangrove area has increased by 7.74 ha (1.3%) from 2019 to 2021 data (Table 4.4). These results suggest that the mangroves in



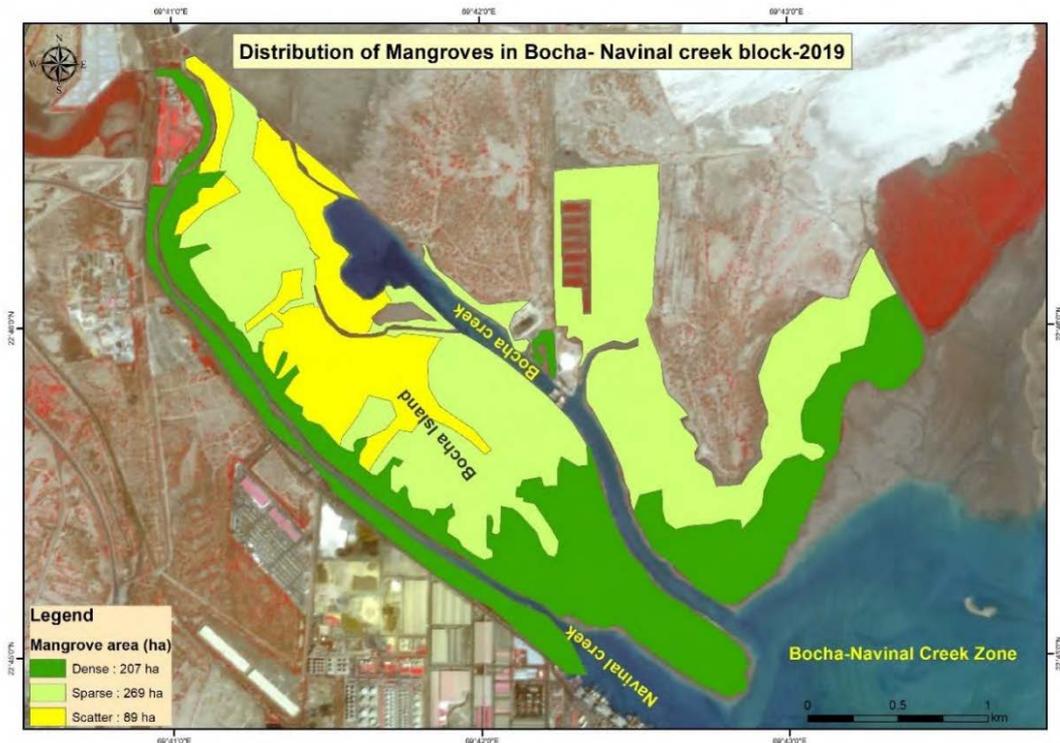
Bocha -Navinal, creek and Bocha island system are healthy and influenced by the normal regular tidal flow.

**Table 4.4: Distribution of Various Categories of Mangroves in Bocha- Navinal Creek Zone During 2019 and 2021**

Class Name	Area (ha)		
	2019	2021	Changes
Dense Mangrove	207.42	206.30	-1.13
Sparse Mangrove	269.44	271.43	1.98
Scatter Mangrove	89.17	96.06	6.89
<b>Total</b>	<b>566.04</b>	<b>573.78</b>	<b>7.74</b>

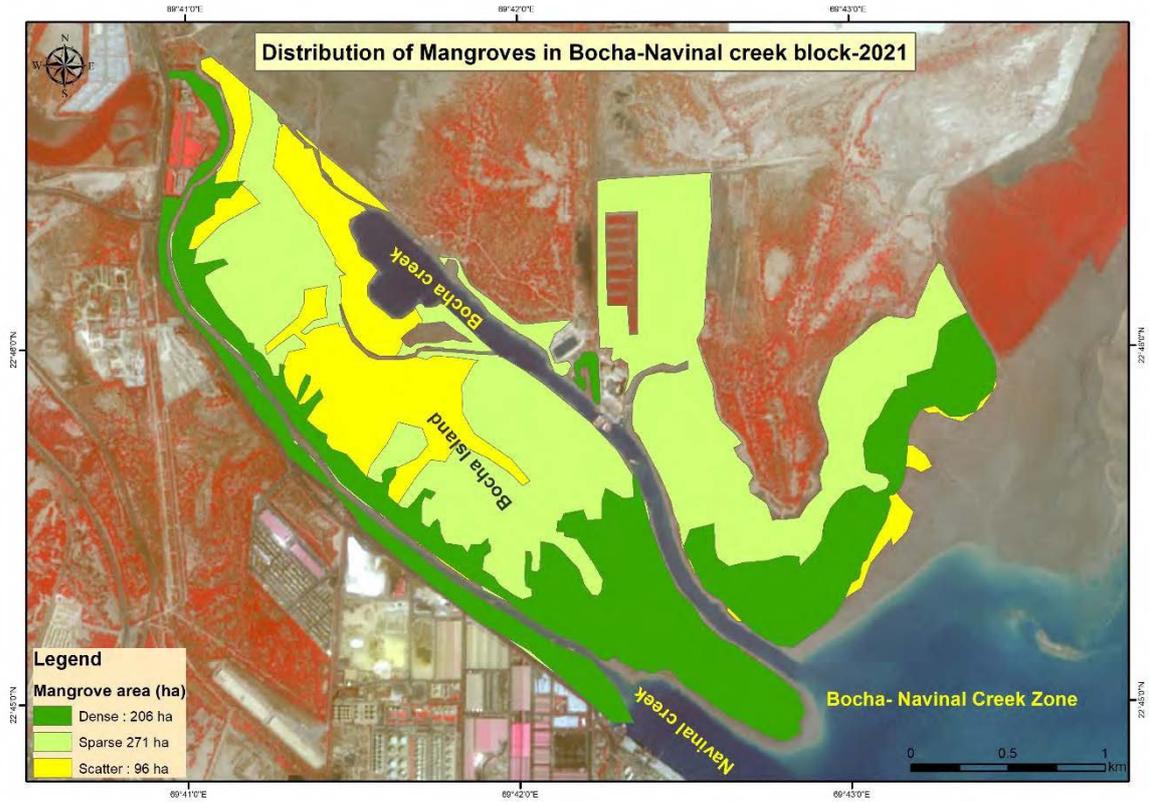


**Figure 4.12: Comparison of Various Categories of Mangroves in Bocha-Navinal Creek Zone Between 2019 and 2021**

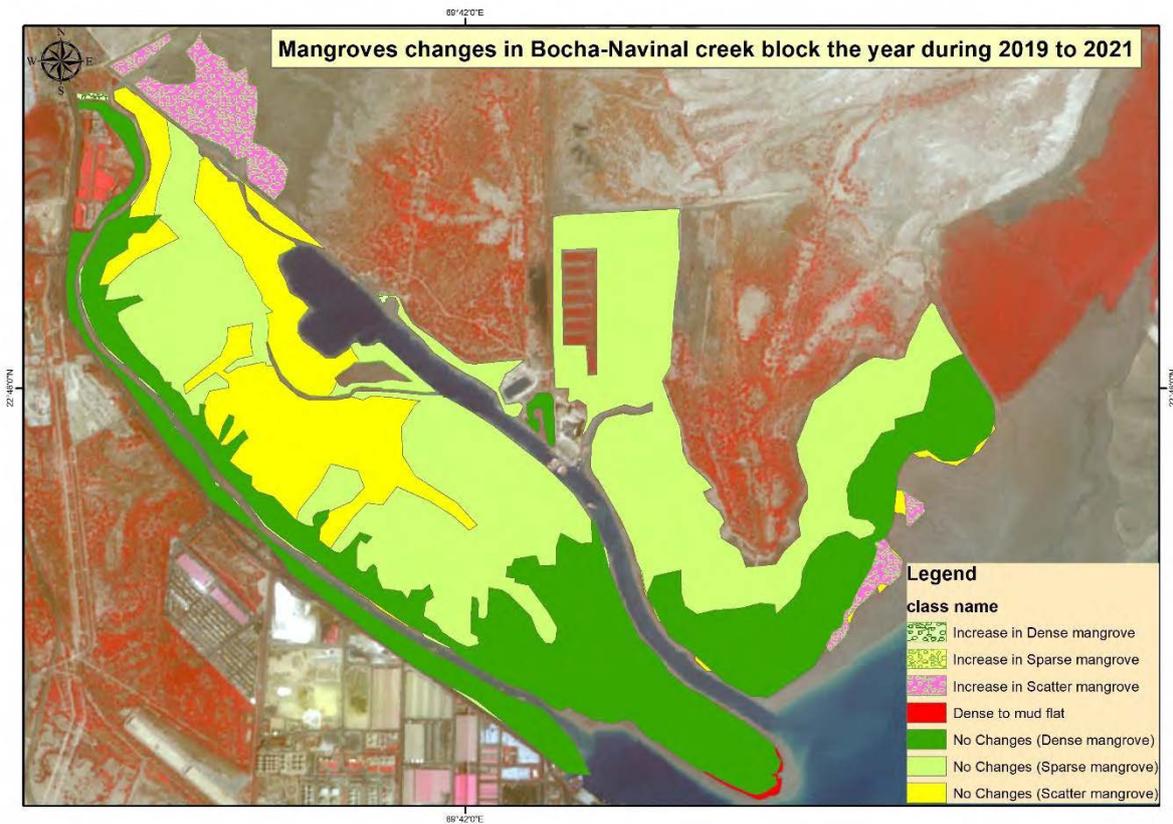


**Figure 4.13: Distribution of Various Categories of Mangroves in Bocha- Navinal Creek Zone System for The Year 2019**





**Figure 4.14: Distribution of Various Categories of Mangroves in Bocha - Navinal Creek Zone System for The Year 2021**



**Figure 4.15: Change Analysis From 2019 To 2021 On Categories of Mangroves in Bocha- Navinal Creek System**

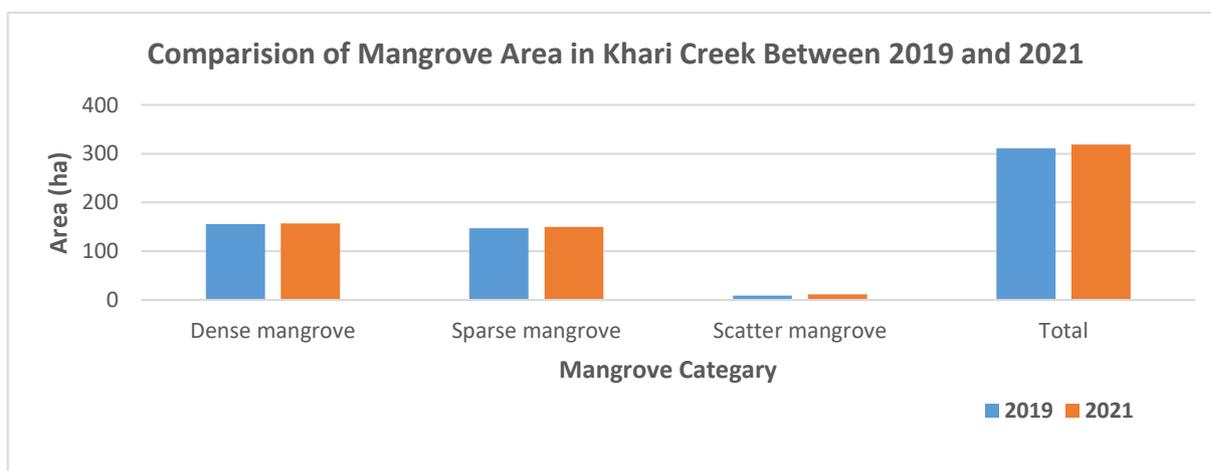


#### 4.2.4. Khari Creek

The creek experiences normal tidal flow with settlements located in the northern part of the creek (Junabunder village). Study is to assess the changes in mangrove distribution and density in Khari creek (Junabunder) between March 2019 and March 2021, using satellite imagery and field surveys and the data is given in Table 4.5 and Figure 4.16. and categories of mangroves are indicated in Figure 4.17 to Figure 4.19. The data indicates that there is a marginal increase of mangroves to the extent of 7.71 ha which is 2.47% compared to 2019 level. Dense mangrove is marginally increased mostly due to conversion of sparse mangrove to dense mangrove. Sparse mangrove has been increasing due to transformation of scatter to sparse category. The minor increase in scatter category is due to regeneration and recruitment class. Overall, mangrove is healthy in this block due to the favourable tidal regime and the low human pressure in the creek. the mangrove density has increased mainly due to the conversion of sparse and scatter mangroves to dense mangroves, indicating an improvement in mangrove quality.

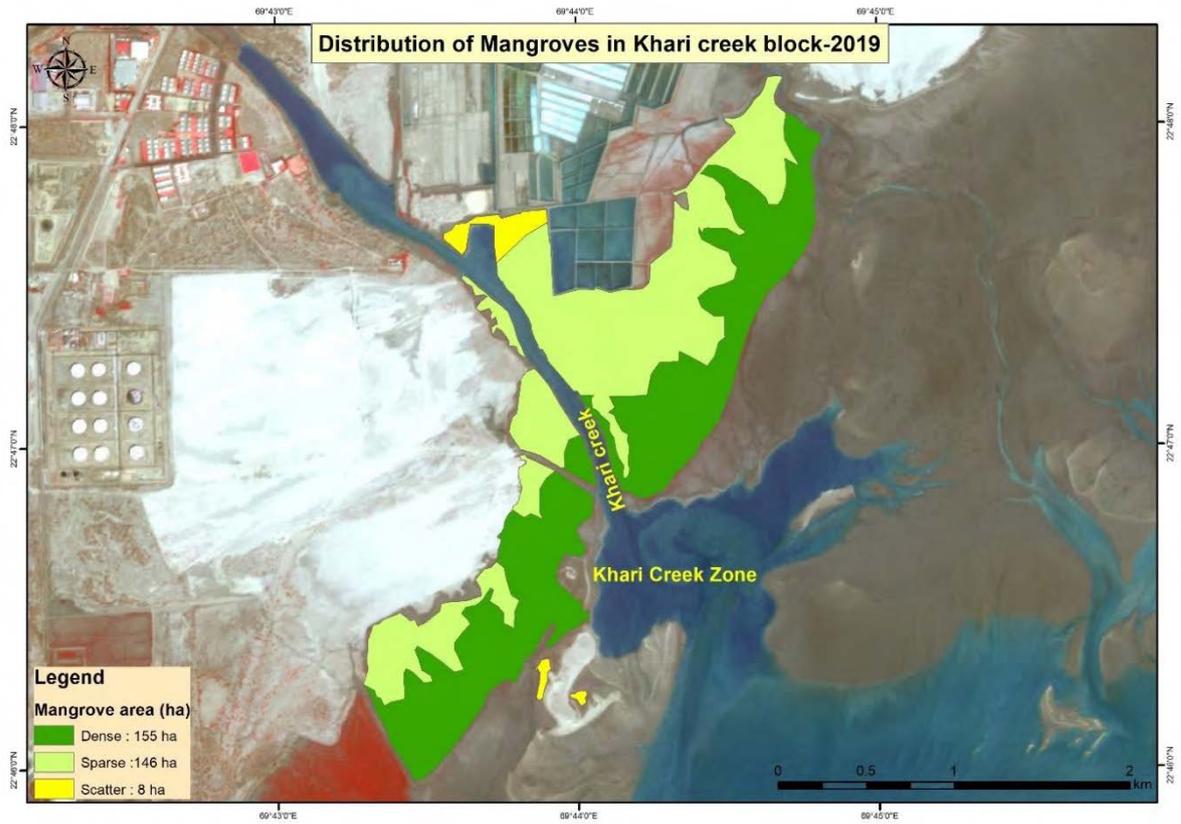
**Table 4.5: Distribution of Various Categories of Mangroves in Khari Creek Zone During 2019 and 2021**

Class Name	Area (ha)		
	2019	2021	Changes
Dense Mangrove	155.26	156.90	1.64
Sparse Mangrove	146.84	149.95	3.11
Scatter Mangrove	8.80	11.75	2.95
Total	310.90	318.60	7.71

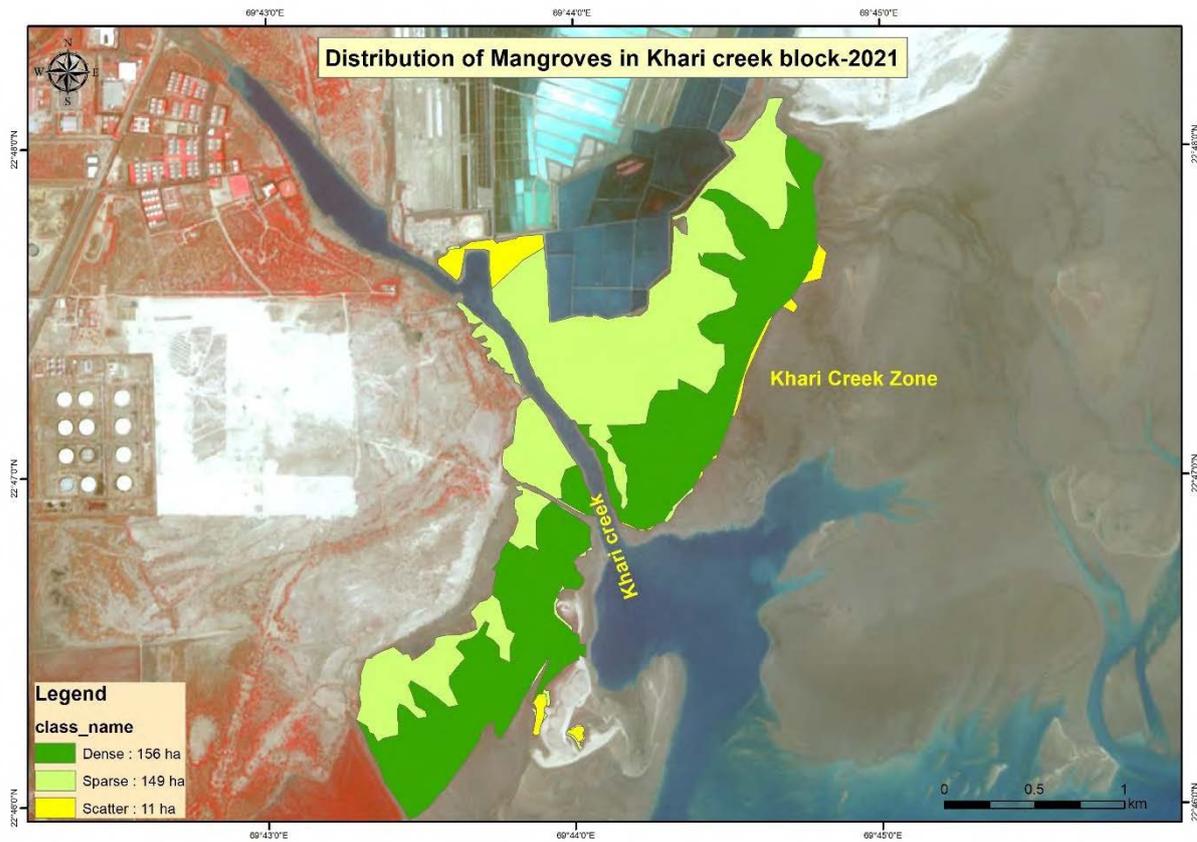


**Figure 4.16 : Comparison of Various Categories of Mangroves in Khari Creek Zone Between 2019 and 2021**



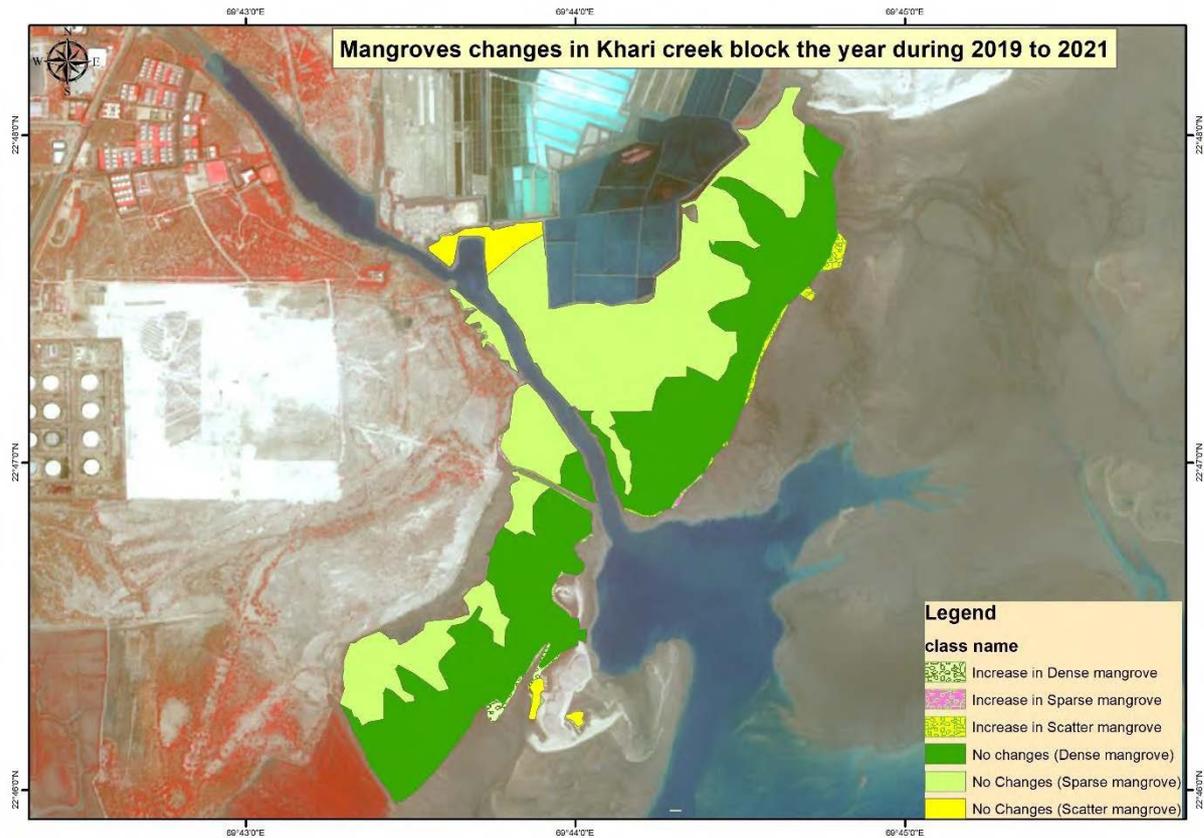


**Figure 4.17 : Distribution of Various Categories of Mangroves in Khari Creek Zone System for The Year 2019**



**Figure 4.18: Distribution of Various Categories of Mangroves in Khari Creek Zone System for The Year 2021**





**Figure 4.19: Change Analysis From 2019 To 2021 On Categories of Mangroves in Khari Creek System**

### 4.3. Mangrove Vegetation

In India, the state of Gujarat encompasses the longest coastline (1650 km) and largest coastal area (28,000 km<sup>2</sup>), which supports the second largest mangrove cover of the country, which is almost 23 % of the Indian mangrove cover (Devi and Pathak, 2016). Gujarat mangrove cover is divided in three parts, Kachchh and Gulf of Kachchh (GOK), Saurashtra, and Gulf of Khambhat and South Gujarat.

#### 4.3.1. : Diversity

In Gujarat a total of 15 species of mangrove have been recognized as true mangroves (Ragavan *et al.*, 2016), but this diversity is very less compared to the other Indian states. The diversity of mangroves in Gujarat is concentrated mainly in the Gulf of Khambhat and South Gujarat regions. The availability of freshwater inflow into this area resulted in the highest floristic diversity of mangroves than the other parts of the state. In general, the Gujarat mangrove cover is fully dominated by single mangrove species (Mono-floral) which is *Avicennia marina*



specifically along the coastal belt of the the Gulf of Kachchh. The extreme tolerance to low rainfall, higher salinity, evapo-transpiration and temperature, etc. of this species made it successful in the Gujarat coasts. A few true mangroves species can be found in the Gulf of Kachchh sporadically. The distribution of the other halophytes such as *Suaeda*, *Salvadora*, *Salicornia*, etc. and mangrove associate plants was also recorded. At the survey sites, two more true mangrove species which are *Rhizophora mucronata* and *Cerops tagal* plants were also found however, they are very less in number and present in small patches.

#### 4.3.2. : Density

The overall average mature tree density (>100 cm) recorded was 1471 trees/ha (Ranging from 1120 to 1944 trees/ha) in the entire study area of APSEZ. The area wise density recorded was higher in Khari creek area (1944 trees/ ha) followed by Baradi mata area (1565 trees/ ha) and Bocha/Navinal creeks (1256 trees/ha). Among the study locations, lowest tree density was observed in the Kotadi creek area which was 1120 trees/ha. Further, major part of Bocha Island and surrounding areas supports good population of well matured and grown-up trees of *A. marina*, along with the presence of a few well matured trees of *Rhizophora mucranata* and *Cerops tagal*.

**Table 4.6: Density of Trees in the Kotadi Creek Area**

Q. Number	Latitude	Longitude	No of Tree Per Ha
12	22° 47' 16"	69° 32' 51"	1100
13	22° 47' 27"	69° 32' 48"	1100
14	22° 47' 48"	69° 33' 39"	500
15	22° 47' 54"	69° 33' 51"	600
18	22° 48' 5"	69° 34' 11"	0
22	22° 45' 53"	69° 36' 35"	2500
42	22° 47' 16"	69° 35' 38"	700
58	22° 47' 50"	69° 32' 56"	400
65	22° 46' 25"	69° 36' 32"	2500
66	22° 46' 49"	69° 36' 5"	1800
Average			1120



**Table 4.7: Density of Trees in the Baradi mata Area**

Q. Number	Latitude	Longitude	No of Tree per Ha
6	22° 45' 53"	69° 39' 56"	1200
7	22° 46' 45"	69° 40' 54"	1700
8	22° 46' 39"	69° 40' 30"	1200
9	22° 46' 53"	69° 40' 2"	1800
10	22° 46' 43"	69° 39' 45"	1200
11	22° 46' 40"	69° 40' 20"	600
19	22° 45' 9"	69° 39' 55"	2000
20	22° 45' 11"	69° 39' 54"	600
21	22° 47' 10"	69° 38' 17"	400
23	22° 47' 42"	69° 38' 14"	2400
24	22° 47' 33"	69° 38' 24"	3300
29	22° 46' 50"	69° 39' 57"	600
30	22° 46' 23"	69° 39' 45"	800
31	22° 48' 8"	69° 38' 14"	1300
32	22° 45' 25"	69° 39' 18"	1700
33	22° 45' 49"	69° 38' 41"	2300
34	22° 45' 8"	69° 39' 53"	1600
38	22° 46' 30"	69° 40' 11"	1200
39	22° 46' 57"	69° 37' 27"	2100
40	22° 46' 59"	69° 37' 20"	1400
41	22° 46' 60"	69° 37' 45"	1700
46	22° 48' 10"	69° 37' 16"	800
47	22° 48' 8"	69° 38' 19"	300
51	22° 45' 24"	69° 39' 40"	2900
52	22° 45' 22"	69° 40' 6"	2800
53	22° 45' 48"	69° 38' 11"	1900
54	22° 46' 39"	69° 40' 44"	4400
55	22° 46' 58"	69° 40' 15"	700
56	22° 46' 28"	69° 38' 46"	900
57	22° 46' 5"	69° 38' 24"	700
64	22° 45' 24"	69° 39' 33"	2000
Average			1565



**Table 4.8: Density of Trees in the Bocha-Navinal Creek Area**

Q. Number	Latitude	Longitude	No of Tree per Ha
1	22° 46' 42"	69° 41' 3"	200
2	22° 46' 55"	69° 41' 6"	200
3	22° 46' 56"	69° 41' 16"	1000
4	22° 46' 48"	69° 41' 5"	2100
5	22° 46' 17"	69° 42' 15"	2600
16	22° 46' 28"	69° 41' 30"	1500
17	22° 46' 33"	69° 41' 24"	1200
35	22° 45' 7"	69° 42' 42"	1800
36	22° 45' 7"	69° 42' 19"	1500
37	22° 45' 4"	69° 42' 30"	1500
43	22° 45' 21"	69° 41' 51"	1800
44	22° 45' 59"	69° 42' 18"	1100
45	22° 45' 1"	69° 42' 50"	1200
48	22° 45' 6"	69° 42' 25"	900
49	22° 45' 16"	69° 42' 31"	700
62	22° 45' 52"	69° 43' 25"	800
Average			1256

**Table 4.9: Density of Trees in the Khari Creek Area**

Q. Number	Latitude	Longitude	No of Tree per Ha
25	22° 47' 43"	69° 43' 54"	1800
26	22° 47' 28"	69° 43' 55"	3500
27	22° 47' 23"	69° 43' 52"	1700
28	22° 47' 22"	69° 43' 60"	1200
50	22° 46' 15"	69° 43' 52"	1800
59	22° 46' 42"	69° 44' 1"	1600
60	22° 46' 14"	69° 44' 1"	2200
61	22° 46' 13"	69° 43' 60"	2500
63	22° 47' 31"	69° 44' 40"	1200
Average			1944



### 4.3.3. Regeneration and Recruitment Class of Mangroves

The average density of the regeneration class of mangroves in the sampling site (saplings with a height of <50 cm) was recorded at 62,727 plants/ha (Ranging from 22,500 to 96,250 plants/ha) and for recruitment class mangrove, the overall average was recorded as 10,455 plants/ha (Ranging from 8,125 to 14,167 plants/ha) during the study. The highest regeneration class (96,250 plants/ha) was recorded in Bocha/Navinal and is followed by Kotadi creeks (78,889 plants/ha) and this creek system also supports highest density of recruitment class (14,167 plants/ ha) in the entire study area. Although, the density of trees is comparatively less in this area, it is favourable for the dispersal of seeds and germination for younger classes. This can further be representing that ecosystem is favourable for younger class mangrove formation. The lowest regeneration (22,500 plants/ ha) and recruitment (8,125 plants/ha) class was recorded in the Khari creek area; however, the mature tree density was highest in this area (1944 trees/ha. The ratio of recruitments to tree is 1:7 and regeneration to recruitment is 42:7 in the study area. The density of mature trees and younger classes (recruitment and regeneration) in the APSEZ showed that this area supports healthy mangrove ecosystem and that the mangrove area as well as the density will increase significantly in the near future.

**Table 4.10: Density of Younger Classes in the Kotadi Area (Plant/Ha)**

Sr No	Q. Number	Latitude	Longitude	Regeneration	Recruitment
1	12	22° 47' 16"	69° 32' 51"	10000	0
2	13	22° 47' 27"	69° 32' 48"	40000	10000
3	14	22° 47' 48"	69° 33' 39"	350000	10000
4	15	22° 47' 54"	69° 33' 51"	60000	15000
5	18	22° 48' 5"	69° 34' 11"	90000	17500
6	42	22° 47' 16"	69° 35' 38"	100000	32500
7	58	22° 47' 50"	69° 32' 56"	30000	10000
8	65	22° 46' 25"	69° 36' 32"	30000	15000
9	66	22° 46' 49"	69° 36' 5"	0	17500
Average				78,889	14167



**Table 4.11: Density of Younger Classes in the Baradi mata Area (Plant/Ha)**

Sr No	Q. Number	Latitude	Longitude	Regeneration	Recruitment
1	6	22° 45' 53"	69° 39' 56"	170000	7500
2	7	22° 46' 45"	69° 40' 54"	30000	10000
3	8	22° 46' 39"	69° 40' 30"	60000	20000
4	9	22° 46' 53"	69° 40' 2"	140000	10000
5	10	22° 46' 43"	69° 39' 45"	80000	0
6	11	22° 46' 40"	69° 40' 20"	40000	5000
7	19	22° 45' 9"	69° 39' 55"	0	7500
8	21	22° 47' 10"	69° 38' 17"	60000	17500
9	29	22° 46' 50"	69° 39' 57"	30000	2500
10	30	22° 46' 23"	69° 39' 45"	90000	12500
11	31	22° 48' 8"	69° 38' 14"	30000	10000
12	39	22° 46' 57"	69° 37' 27"	30000	5000
13	40	22° 46' 59"	69° 37' 20"	50000	7500
14	41	22° 46' 60"	69° 37' 45"	20000	7500
15	46	22° 48' 10"	69° 37' 16"	30000	20000
16	47	22° 48' 8"	69° 38' 19"	40000	37500
17	52	22° 45' 22"	69° 40' 6"	10000	0
18	53	22° 45' 48"	69° 38' 11"	20000	7500
19	54	22° 46' 39"	69° 40' 44"	10000	0
20	55	22° 46' 58"	69° 40' 15"	40000	5000
21	56	22° 46' 28"	69° 38' 46"	60000	7500
22	57	22° 46' 5"	69° 38' 24"	100000	10000
23	64	22° 45' 24"	69° 39' 33"	50000	7500
Average				49,583	9,063

**Table 4.12: Density of Younger Classes in the Bocha-Navinal Area (Plant/Ha)**

Sr No	Q. Number	Latitude	Longitude	Regeneration	Recruitment
1	1	22° 46' 42"	69° 41' 3"	10000	5000
2	2	22° 46' 55"	69° 41' 6"	20000	7500
3	3	22° 46' 56"	69° 41' 16"	110000	10000
4	4	22° 46' 48"	69° 41' 5"	140000	12500
5	5	22° 46' 17"	69° 42' 15"	260000	5000
6	16	22° 46' 28"	69° 41' 30"	140000	10000
7	17	22° 46' 33"	69° 41' 24"	50000	17500
8	43	22° 45' 21"	69° 41' 51"	40000	15000
				96,250	10,313



**Table 4.13: Density of Younger Class in Khari creek**

Sr No	Q. Number	Latitude	Longitude	Regeneration	Recruitment
9	50	22° 46' 15"	69° 43' 52"	20000	2500
10	59	22° 46' 42"	69° 44' 1"	20000	10000
11	60	22° 46' 14"	69° 44' 1"	20000	0
12	61	22° 46' 13"	69° 43' 60"	30000	20000
Average				22,500	8,125



**Figure 4.20 : Diversity of Mangrove Species in APSEZ Area, Mundra**



## 5. CONCLUSION

### 5.1. Shoreline and Mangrove Cover Changes

The distribution of mangroves in the creeks in and around APSEZ was analysed using satellite images from March 2019 and March 2021. The major findings are:

- ✓ The mangrove cover in the study area has increased by 52.79 ha from 2019 to 2021, indicating that the mangrove ecosystem and the tidal regime were not adversely affected during this period.
- ✓ The tide levels in the creeks were observed to be normal and adequate for the growth of mangroves.
- ✓ The dense mangrove cover has showed an increase in Kotadi creek, Khari Creek and Baradi mata creeks while it was not much changed in Bocha/Navinal creek system.
- ✓ Further Kotadi creek showed highest increase of sparse mangrove area (39.71ha) while Baradi mata creeks (14.10ha) and Bocha/Navinal creek system (6.89ha) showed an increase in scattered mangrove areas.
- ✓ Nevertheless, overall, an increase in all three categories of mangroves in the study area between 2019 and 2021, indicating a healthy status of mangroves.
- ✓ The study measured the density of mature trees, recruitments (young trees), and regeneration (seedlings) in different locations. Mangrove tree density is influenced by many factors like salinity, tidal inundation, fresh water flow, sediment characterises, etc. The ratio between mature tree density and recruitment class among all the stands (1:7) indicating good entrance of recruitment classes into mature tree category. A conducive physical milieu with favourable tidal range and less anthropogenic pressure seems to favour the present mangrove strands in a healthy state.
- ✓ The conservation and management and recommendation plan are indicated below:



## 5.2. Recommendations

- ❖ The mangrove cover in the APSEZ area was found in healthy condition with dense, sparse and scattered mangroves, which has overall increase of 52.79 ha between 2019 and 2021, indicating that the mangrove ecosystem and the tidal regime were not adversely affected during this period. Therefore, future attempt should be restoration of sparse and scattered mangrove areas and convert it into dense patches. This could be restored to dense formation through physical amendment measures *viz.*, canal digging, removing blockage in natural canal systems, and by other physical means.
- ❖ The Mundra coastal scenario supports *A. marina* which is predominant, due to lack of continuous fresh water source which is atypical in this part. Nevertheless, presence of other mangrove species though sporadically recorded, *viz.*, *R. mucronate* and *C. tagal*, which gives a confidence for plantation in the sparse and scattered mangrove areas following zonation techniques. Plantation of these species is expected to create a seed bank in due course of time which would eventually convert single species stand of *A. marina* into multi species formation which in turn enhance the marine biodiversity of the area.
- ❖ Kotadi creek area has highest recruitment class mangroves while highest regeneration class was recorded from Bocha/Navinal creeks. Promoting natural regeneration where the mangrove stand has got the capacity to self-renewal will ensure sustained well-being on the stand and its succession. Natural regeneration capacity of the stand is based on the extent of entrance of younger classes such as saplings into mature tree category. The observation that natural seedling recruitment is occurring normally will indicate that the system is functioning normally. The present study shows that natural regeneration in the studied mangrove formations is normal as indicated by the entrance of younger classes into adult categories. Continued observation of this natural succession in regular mangrove monitoring studies is necessary to assess and ascertain that the natural procession of succession is maintained.



- ❖ Plantation of suitable saline tolerant plant species (shrubs and trees) also helps in controlling the soil erosion along the coastal area.
- ❖ The establishment of facilities and the expansion of infrastructure over the coming years will bring about notable changes in the landscape and seascape in and around the Adani Ports and Special Economic Zone Ltd (APSEZL). Long-term human-centred/induced activity of this magnitude in any coastal belt will have repercussions on its natural resources and ecosystems. As mangroves, mudflats and tidal creeks are the major ecological entities within the Adani Ports and Special Economic Zone Ltd (APSEZL), their conservation and management warrants priority and calls for a holistic approach. Thus, measures should be taken to conserve and preserve the mudflats and mangroves within the Adani Ports and Special Economic Zone Ltd (APSEZL) to retain their tangible and intangible ecological benefits. The conservation and management plan presented in the proceeding section has the following broad aspects and different activities under each aspect are dealt with.
- ❖ The creation of baseline information to track subsequent changes in natural shoreline formation within the Adani Ports and Special Economic Zone Ltd (APSEZL) observations through GIS and RS tools have to be adopted. The GIS maps may be utilized for the purpose and could serve as a base map. Changes in creek systems, shoreline configuration and other land use categories could be monitored through this exercise once in three years.
- ❖ Periodical monitoring, preferably once in 2 years, and comparison of results with baseline data to underline changes will pave way for the formulation of mitigation and conservation efforts.
- ❖ Mudflats and mangrove conservation and restoration measures could subsequently be undertaken based on the results of the monitoring programs.
- ❖ Research needs to be undertaken to assess the economic and ecological benefits of sustainable development of shoreline configuration.



- ❖ Awareness should be generated among local people about the shoreline configuration changes in the surrounding areas and the consequences, particularly to the fishermen community.



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## **ANNEXURE – 3**

# **MAIL COMMUNICATION WITH NCSCM**

## Chiragsing Rajput

---

**From:** Chiragsing Rajput  
**Sent:** Thursday, March 28, 2024 4:10 PM  
**To:** edcprojects@ncscm.org; Purvaja Ramachandran  
**Cc:** Ashvin Kumar Patni; Dhanesh Tank; Bhagwat Swaroop Sharma; Piyush Bhanji Sanghani; Robin Rs; Deepak S; Radheshyam Singh; Anil Trivedi  
**Subject:** RE: Request for Proposal-Monitoring of Mangrove Distribution in creeks in and around APSEZ Mundra Site

Dear Sir / Madam,

We are awaiting for your best Techno commercial offer in line with trailing mail.

Thanks & Regards,  
Chiragsing Rajput

---

**From:** Chiragsing Rajput <Chiragsing.Rajput@adani.com>  
**Sent:** Thursday, March 21, 2024 9:06 AM  
**To:** edcprojects@ncscm.org; Purvaja Ramachandran <purvaja@ncscm.res.in>  
**Cc:** Ashvin Kumar Patni <AshvinKumar.Patni@adani.com>; Dhanesh Tank <Dhanesh.Tank@adani.com>; Bhagwat Swaroop Sharma <Bhagwat.Sharma1@adani.com>; Piyush Bhanji Sanghani <Piyush.sanghani@adani.com>; Robin Rs <robin.ocean1@gmail.com>; Deepak S <deepak.s.ocean@gmail.com>; Radheshyam Singh <Radheshyam.Singh@adani.com>; Anil Trivedi <Anil.Trivedi@adani.com>; Anshul Sanduja <Anshul.Sanduja@adani.com>  
**Subject:** Re: Request for Proposal-Monitoring of Mangrove Distribution in creeks in and around APSEZ Mundra Site

Dear Sir / Madam,

We are awaiting for your best Techno commercial offer in line with trailing mail.

Thanks & Regards,  
Chiragsing Rajput

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**From:** Chiragsing Rajput <[Chiragsing.Rajput@adani.com](mailto:Chiragsing.Rajput@adani.com)>  
**Sent:** Friday, March 15, 2024 12:34:08 PM

**To:** [edcprojects@ncscm.org](mailto:edcprojects@ncscm.org) <[edcprojects@ncscm.org](mailto:edcprojects@ncscm.org)>; Purvaja Ramachandran <[purvaja@ncscm.res.in](mailto:purvaja@ncscm.res.in)>  
**Cc:** Ashvin Kumar Patni <[AshvinKumar.Patni@adani.com](mailto:AshvinKumar.Patni@adani.com)>; Dhanesh Tank <[Dhanesh.Tank@adani.com](mailto:Dhanesh.Tank@adani.com)>; Bhagwat Swaroop Sharma <[Bhagwat.Sharma1@adani.com](mailto:Bhagwat.Sharma1@adani.com)>; Piyush Bhanji Sanghani <[Piyush.sanghani@adani.com](mailto:Piyush.sanghani@adani.com)>; Robin Rs <[robin.ocean1@gmail.com](mailto:robin.ocean1@gmail.com)>; Deepak S <[deepak.s.ocean@gmail.com](mailto:deepak.s.ocean@gmail.com)>; Radheshyam Singh <[Radheshyam.Singh@adani.com](mailto:Radheshyam.Singh@adani.com)>; Anil Trivedi <[Anil.Trivedi@adani.com](mailto:Anil.Trivedi@adani.com)>  
**Subject:** RE: Request for Proposal-Monitoring of Mangrove Distribution in creeks in and around APSEZ Mundra Site

Dear Sir / Madam,

We are awaiting for your best Techno commercial offer in line with trailing mail.

Thanks & Regards,  
Chiragsing Rajput

-----Original Message-----

From: Chiragsing Rajput

Sent: Monday, March 4, 2024 4:41 PM

To: [edcprojects@ncscm.org](mailto:edcprojects@ncscm.org); Purvaja Ramachandran <[purvaja@ncscm.res.in](mailto:purvaja@ncscm.res.in)>

Cc: Ashvin Kumar Patni <[AshvinKumar.Patni@adani.com](mailto:AshvinKumar.Patni@adani.com)>; Dhanesh Tank <[Dhanesh.Tank@adani.com](mailto:Dhanesh.Tank@adani.com)>; Bhagwat Swaroop Sharma <[Bhagwat.Sharma1@adani.com](mailto:Bhagwat.Sharma1@adani.com)>; Piyush Bhanji Sanghani <[Piyush.sanghani@adani.com](mailto:Piyush.sanghani@adani.com)>; Robin Rs <[robin.ocean1@gmail.com](mailto:robin.ocean1@gmail.com)>; Deepak S <[deepak.s.ocean@gmail.com](mailto:deepak.s.ocean@gmail.com)>; Radheshyam Singh <[Radheshyam.Singh@adani.com](mailto:Radheshyam.Singh@adani.com)>; Anil Trivedi <[Anil.Trivedi@adani.com](mailto:Anil.Trivedi@adani.com)>

Subject: RE: Request for Proposal-Monitoring of Mangrove Distribution in creeks in and around APSEZ Mundra Site

Dear Sir / Madam,

We are awaiting for your best Techno commercial offer in line with trailing mail.

Thanks & Regards,  
Chiragsing Rajput

Environment Cell | Adani Ports & Special Economic Zone Ltd.

Mob +91 9687678443 | Ext. 59523 | [chiragsing.rajput@adani.com](mailto:chiragsing.rajput@adani.com) | [www.adani.com](http://www.adani.com) Adani Corporate House, 3rd Floor, North Wing, Shantigram, Ahmedabad - 382421, Gujarat, India.

-----Original Message-----

From: Chiragsing Rajput

Sent: Wednesday, February 28, 2024 10:39 AM

To: [edcprojects@ncscm.org](mailto:edcprojects@ncscm.org)

Cc: Ashvin Kumar Patni <[AshvinKumar.Patni@adani.com](mailto:AshvinKumar.Patni@adani.com)>; Dhanesh Tank <[Dhanesh.Tank@adani.com](mailto:Dhanesh.Tank@adani.com)>; Bhagwat Swaroop Sharma <[Bhagwat.Sharma1@adani.com](mailto:Bhagwat.Sharma1@adani.com)>; Piyush Bhanji Sanghani <[Piyush.sanghani@adani.com](mailto:Piyush.sanghani@adani.com)>; Purvaja Ramachandran <[purvaja@ncscm.res.in](mailto:purvaja@ncscm.res.in)>; Robin Rs <[robin.ocean1@gmail.com](mailto:robin.ocean1@gmail.com)>; Deepak S <[deepak.s.ocean@gmail.com](mailto:deepak.s.ocean@gmail.com)>; Radheshyam Singh <[Radheshyam.Singh@adani.com](mailto:Radheshyam.Singh@adani.com)>; Anil Trivedi <[Anil.Trivedi@adani.com](mailto:Anil.Trivedi@adani.com)>

Subject: RE: Request for Proposal-Monitoring of Mangrove Distribution in creeks in and around APSEZ Mundra Site

Dear Sir / Madam,

We are awaiting for your best Techno commercial offer in line with trailing mail.

Regards  
Chiragsing Rajput

-----Original Message-----

From: Chiragsing Rajput

Sent: Tuesday, February 20, 2024 11:00 AM

To: [edcprojects@ncscm.org](mailto:edcprojects@ncscm.org)

Cc: Ashvin Kumar Patni <[AshvinKumar.Patni@adani.com](mailto:AshvinKumar.Patni@adani.com)>; Dhanesh Tank <[Dhanesh.Tank@adani.com](mailto:Dhanesh.Tank@adani.com)>; Bhagwat Swaroop Sharma <[Bhagwat.Sharma1@adani.com](mailto:Bhagwat.Sharma1@adani.com)>; Piyush Bhanji Sanghani <[Piyush.sanghani@adani.com](mailto:Piyush.sanghani@adani.com)>; Purvaja Ramachandran <[purvaja@ncscm.res.in](mailto:purvaja@ncscm.res.in)>; Robin Rs <[robin.ocean1@gmail.com](mailto:robin.ocean1@gmail.com)>; Deepak S <[deepak.s.ocean@gmail.com](mailto:deepak.s.ocean@gmail.com)>; Radheshyam Singh <[Radheshyam.Singh@adani.com](mailto:Radheshyam.Singh@adani.com)>; Charanjit Singh <[Charanjit.Singh@adani.com](mailto:Charanjit.Singh@adani.com)>

Subject: RE: Request for Proposal-Monitoring of Mangrove Distribution in creeks in and around APSEZ Mundra Site

Dear Sir / Madam,

We are awaiting for your best Techno commercial offer in line with trailing mail.

Regards  
Chiragsing Rajput

-----Original Message-----

From: Chiragsing Rajput

Sent: Monday, February 12, 2024 5:19 PM

To: [edcprojects@ncscm.org](mailto:edcprojects@ncscm.org)

Cc: Ashvin Kumar Patni <[AshvinKumar.Patni@adani.com](mailto:AshvinKumar.Patni@adani.com)>; Dhanesh Tank <[Dhanesh.Tank@adani.com](mailto:Dhanesh.Tank@adani.com)>; Bhagwat Swaroop Sharma <[Bhagwat.Sharma1@adani.com](mailto:Bhagwat.Sharma1@adani.com)>; Piyush Bhanji Sanghani <[Piyush.sanghani@adani.com](mailto:Piyush.sanghani@adani.com)>; Purvaja Ramachandran <[purvaja@ncscm.res.in](mailto:purvaja@ncscm.res.in)>; Robin Rs <[robin.ocean1@gmail.com](mailto:robin.ocean1@gmail.com)>; Deepak S <[deepak.s.ocean@gmail.com](mailto:deepak.s.ocean@gmail.com)>; Radheshyam Singh <[Radheshyam.Singh@adani.com](mailto:Radheshyam.Singh@adani.com)>

Subject: RE: Request for Proposal-Monitoring of Mangrove Distribution in creeks in and around APSEZ Mundra Site

Dear Sir / Madam,

We are awaiting for your best Techno commercial offer in line with trailing mail.

Regards  
Chiragsing Rajput

-----Original Message-----

From: Chiragsing Rajput

Sent: Monday, February 5, 2024 12:26 PM

To: [edcprojects@ncscm.org](mailto:edcprojects@ncscm.org)

Cc: Ashvin Kumar Patni <[AshvinKumar.Patni@adani.com](mailto:AshvinKumar.Patni@adani.com)>; Dhanesh Tank <[Dhanesh.Tank@adani.com](mailto:Dhanesh.Tank@adani.com)>; Bhagwat Swaroop Sharma <[Bhagwat.Sharma1@adani.com](mailto:Bhagwat.Sharma1@adani.com)>; Piyush Bhanji Sanghani <[Piyush.sanghani@adani.com](mailto:Piyush.sanghani@adani.com)>; Purvaja Ramachandran <[purvaja@ncscm.res.in](mailto:purvaja@ncscm.res.in)>; Robin Rs <[robin.ocean1@gmail.com](mailto:robin.ocean1@gmail.com)>; Deepak S <[deepak.s.ocean@gmail.com](mailto:deepak.s.ocean@gmail.com)>

Subject: RE: Request for Proposal-Monitoring of Mangrove Distribution in creeks in and around APSEZ Mundra Site

Dear Sir / Madam,

Please find attached RFQ for conducting Monitoring of Mangrove Distribution in creeks in and around Adani Ports and Special Economic Zone Limited (APSEZ), Mundra site between 2021 to 2023.

So kindly provide us your best Techno-commercial proposal for the same at earliest.

Thanks & Regards,

Chiragsing Rajput

Environment Cell | Adani Ports & Special Economic Zone Ltd.

Mob +91 9687678443 | Ext. 59523 | [chiragsing.rajput@adani.com](mailto:chiragsing.rajput@adani.com) | [www.adani.com](http://www.adani.com) Adani Corporate House, 3rd Floor, North Wing, Shantigram, Ahmedabad - 382421, Gujarat, India.

-----Original Message-----

From: Radheshyam Singh <[Radheshyam.Singh@adani.com](mailto:Radheshyam.Singh@adani.com)>

Sent: Wednesday, December 20, 2023 7:03 PM

To: [edcprojects@ncscm.org](mailto:edcprojects@ncscm.org); [purvaja@ncscm.res.in](mailto:purvaja@ncscm.res.in); [mahapatra.sac@gmail.com](mailto:mahapatra.sac@gmail.com)

Cc: Ashvin Kumar Patni <[AshvinKumar.Patni@adani.com](mailto:AshvinKumar.Patni@adani.com)>; Dhanesh Tank <[Dhanesh.Tank@adani.com](mailto:Dhanesh.Tank@adani.com)>; Chiragsing Rajput <[Chiragsing.Rajput@adani.com](mailto:Chiragsing.Rajput@adani.com)>; Bhagwat Swaroop Sharma <[Bhagwat.Sharma1@adani.com](mailto:Bhagwat.Sharma1@adani.com)>; Piyush Bhanji Sanghani <[Piyush.sanghani@adani.com](mailto:Piyush.sanghani@adani.com)>

Subject: Request for Proposal-Monitoring of Mangrove Distribution in creeks in and around APSEZ Mundra Site

Dear Sir/Madam,

Please provide us Techno-commercial proposal for conducting Monitoring of Mangrove Distribution in creeks in and around Adani Ports and Special Economic Zone Limited (APSEZ), Mundra site for the duration of Mar-2021 to Mar-2023.

## **ANNEXURE - 4**

# **CSR HEALTH IMPACT ASSESSMENT**

---

# CSR Impact Assessment Report

Prepared For



Adani Ports & SEZ Ltd

Prepared By



**SOULACE CONSULTING PVT LTD**

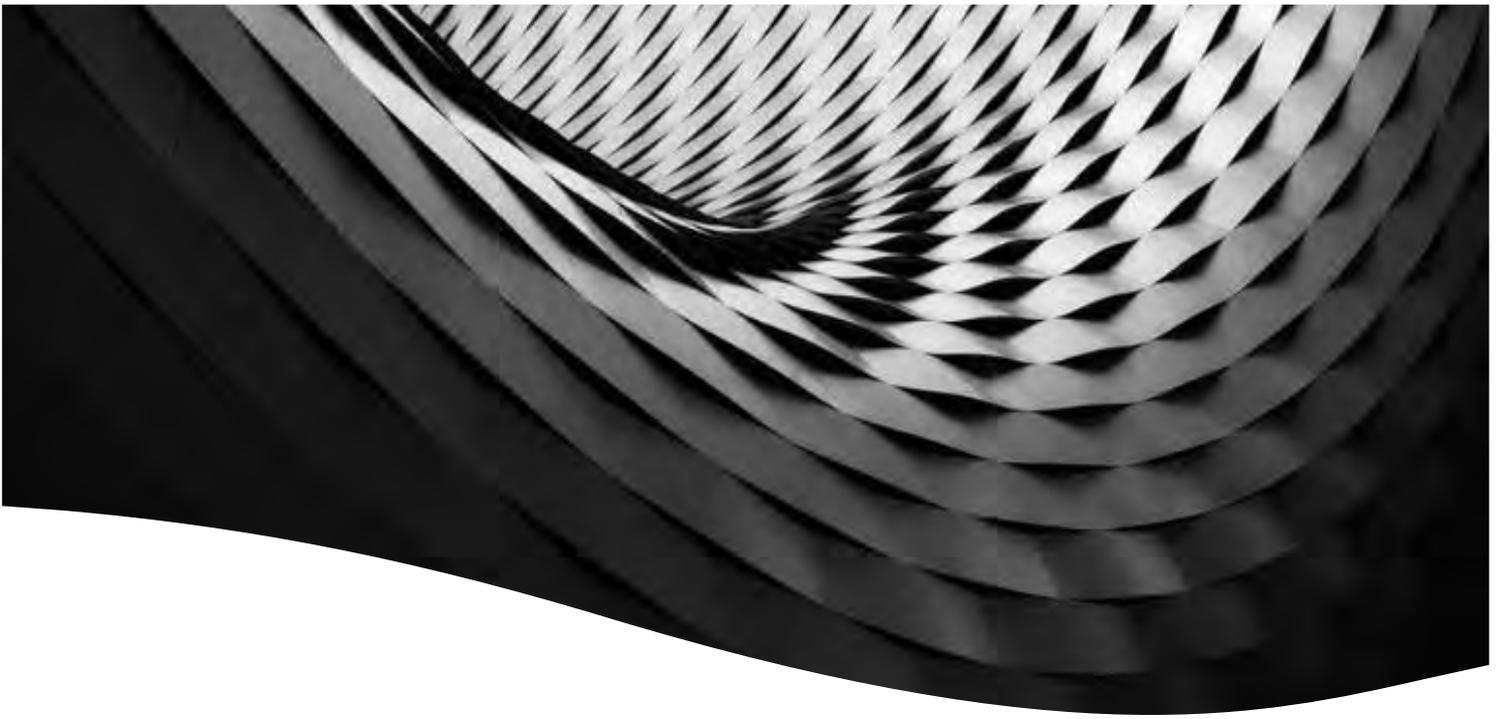
**ISO 27001:2013 Certified**

DELHI NCR | MUMBAI | KOLKATA

Website: [www.soulace.in](http://www.soulace.in); Email: [enquiry@soulace.in](mailto:enquiry@soulace.in)

## **ANNEXURE - 5**

# **ASSESSMENT OF WATER CONSERVATION PROGRAMS**



# Outcome Assessment of Water Conservation Programs

Report

2<sup>nd</sup> November 2022

Adani Ports and Special Economic Zone (APSEZ)



Thinkthrough Consulting

## **ANNEXURE - 6**

# **PHOTOGRAPHS OF GARLAND DRAIN AND DUMP POND**

**PHOTOGRAPHS OF CLEANING OF GARLAND DRAINS**



**PHOTOGRAPHS OF CLEANING OF COMMON SUMP**



## **ANNEXURE - 7**

# **PHOTOGRAPHS OF SPILL PLANT AND SIDE WALL AT GSU**

**PHOTOGRAPHS OF HYDRAULIC OPERATED SPILL PLATE WITH SIDE WALL**  
**TO PREVENT COAL SPILL**



Side Wall



Spill Plate

## **ANNEXURE - 8**

# **PHOTOGRAPHS OF FILTERS AT JETTY OUTLET**

FILTERS AT JETTY OUTLET



Filters at Jetty  
Outlet



## **ANNEXURE - 9**

# **PHOTOGRAPHS OF HOUSEKEEPING AWARENESS**

**Photographs of Awareness Training Programme for Proper House Keeping**



## **ANNEXURE – 10**

# **PHOTOGRAPHS OF WIND SCREEN AND ONGOING REFURBISHING WORK**

**Photographs of Installed Wind Screen and Ongoing Refurbishing work**



**Installed Wind Screen**



**Ongoing Refurbishing work of Wind Screen**