Half Yearly EC Compliance Report Submission - APSEZ, Mundra - Port Expansion 2000 period of April 23 to Sept.23 -Part-1

Bhagwat Swaroop Sharma <Bhagwat.Sharma1@adani.com>

Wed 11/29/2023 8:19 PM

To:eccompliance-guj@gov.in <eccompliance-guj@gov.in>;iro.gandhingr-mefcc@gov.in <iro.gandhingr-mefcc@gov.in>
Cc:ec-rdw.cpcb@gov.in <ec-rdw.cpcb@gov.in>;ro-gpcb-kute@gujarat.gov.in <ro-gpcb-kute@gujarat.gov.in>;ms-gpcb@gujarat.gov.in <ms-gpcb@gujarat.gov.in>;mefcc.ia3@gmail.com <mefcc.ia3@gmail.com>; monitoring-ec@nic.in <monitoring-ec@nic.in>;direnv@gujarat.gov.in <direnv@gujarat.gov.in>;Charanjit Singh <Charanjit.Singh@adani.com>;Sujalkumar Shah <sujal.shah@adani.com>

1 attachments (19 MB)

EC Compliance Report_Port Expansion_Apr'23 to Sep'23-part-1.pdf;

adani

Ports and Logistics

APSEZL/EnvCell/2023-24/068 **Date:** 28.11.2023

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: eccompliance-guj@gov.in, iro.gandhingr-mefcc@gov.in

Sub : Half Yearly Compliance for Environment and CRZ clearance for 'Expansion of notified Multi-product SEZ by adding 1840 Ha notified SEZ with existing approved area of 6641.2784 ha to make it 8481.2784 ha at Mundra' by M/s Adani Ports and Special Economic Zone Ltd.

Ref : Environmental Clearance granted by Ministry of Environment, Forest and Climate Change, F. No. 10-138/2008-IA.III dated 12th February, 2020.

Dear Sir,

Please refer to the above cited reference for the said subject matter. In connection to the same, it is to state that copy of the compliance report for the Environmental and CRZ Clearance for the period of April 2023 to September 2023 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

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, 8th floor, Sachivalaya, Gandhi Nagar – 382010.
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

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

Half Yearly EC Compliance Report Submission - APSEZ, Mundra - Port Expansion 2000 period of April 23 to Sept.23 -Part-2

Bhagwat Swaroop Sharma <Bhagwat.Sharma1@adani.com>

Wed 11/29/2023 8:24 PM

To:eccompliance-guj@gov.in <eccompliance-guj@gov.in>;iro.gandhingr-mefcc@gov.in <iro.gandhingr-mefcc@gov.in>
Cc:ec-rdw.cpcb@gov.in <ec-rdw.cpcb@gov.in>;ro-gpcb-kute@gujarat.gov.in <ro-gpcb-kute@gujarat.gov.in>;ms-gpcb@gujarat.gov.in <ms-gpcb@gujarat.gov.in>;mefcc.ia3@gmail.com <mefcc.ia3@gmail.com>;monitoring-ec@nic.in <monitoring-ec@nic.in>;
direnv@gujarat.gov.in <direnv@gujarat.gov.in>;Charanjit Singh <Charanjit.Singh@adani.com>;Sujalkumar Shah <sujal.shah@adani.com>

1 attachments (11 MB)

EC Compliance Report_Port Expansion_Apr'23 to Sep'23-part-2.pdf;

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Ports and Logistics

APSEZL/EnvCell/2023-24/068 **Date:** 28.11.2023

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,
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E-mail: eccompliance-guj@gov.in, iro.gandhingr-mefcc@gov.in

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adani

Ports and Logistics

APSEZL/EnvCell/2023-24/060 **Date:** 28.11.2023

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: eccompliance-guj@gov.in, iro.gandhinagr-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 20th 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 April 2023 to September 2023 is being submitted through soft copy (e-mail communication).

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Thank you,
Yours Faithfully,
For, **M/s Adani Ports and Special Economic Zone Limited**

Bhagwat Swaroop Sharma
Head – Environment
Mundra & Tuna Port

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Copy to:

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Ports and Logistics

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:

April – 2023 to September – 2023

Index

- 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.

adani Ports and Logistics	**Adani Ports and Special Economic Zone Limited, Mundra**	**From: Apr'23** **To : Sep'23**

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 20th September, 2000.'**

<table>
<tr><th>Sr. No.</th><th>Conditions</th><th>Compliance Status as on 30-09-2023</th></tr>
<tr><td colspan="3">A. Specific Condition</td></tr>
<tr><td>i</td><td>All the conditions stipulated by the Gujarat Pollution Control Board vide their NOC No. PC/NOC/Kutch/391/18424 dated 10.6.99 and No. PC/NOC/Kutch/222(2)16880 dated 1.5.99 shall be strictly implemented.</td><td>Complied.

Consent to operate (CC&A) has been renewed from GPCB vide consent no. AWH-117045 valid till 20th November 2026. The copy of CtO renewal was submitted along with last half yearly compliance report for the period Oct'21 to Mar'22.

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.

<table>
<tr><th>Sr. No.</th><th>Permission</th><th>Project</th><th>Ref. No. / Order No.</th><th>Valid till</th></tr>
<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&A Correction</td><td>Mundra Port Terminal</td><td>PC/CCA-KUTCH-39(7)/GPCB ID 17739/592900</td><td>19.06.2021</td></tr>
</table>

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. A copy of CCA correction letter is attached as ANNEXURE-1.</td></tr>
<tr><td>ii</td><td>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 of shall be strictly</td><td>Complied.

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 Annexure- A.</td></tr>
</table>

Sr. No.	Conditions	Compliance Status as on 30-09-2023
	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, 1. 100% utilization of treated water for horticultural purpose. 2. Water-free urinals are installed and in operation within APSEZ. 3. Recirculation of water from fixed firefighting system to reservoir through flexible pipe during testing of firefighting system. 4. Conservation of Condensate from Air Conditioner and use for gardening. 5. Water flow reducers are provided in taps of Adani House, Tug Berth, CT2, CT3 & CT4 buildings to reduce the water consumption and are in use. 6. Attending leakages and damages of water lines at various locations of APSEZ. 7. Process optimization 8. Aware to people by display of poster/sticker/ slogan of water saving at wash basin/bathroom/toilets areas of APSEZ & Residential colonies. 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

Sr. No.	Conditions	Compliance Status as on 30-09-2023
		compliance report for the period Apr'19 to Sep'19. During FY 2023-24 Approx. 4.58 ML of rainwater has been recharged to increase the ground water table. 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. However, Adani Foundation – CSR arm of Adani Group has carried out rainwater harvesting activities in the nearby villages for benefit of the locals. 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. 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. 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. **Our water conservation work is as below.** **Water Conservation Projects** – Below tabulated Water Conservation Projects completed during 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	150+ farmer's 260+ Acre Area

Sr. No.	Conditions	Compliance Status as on 30-09-2023

			ingress, and preventing water run	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.
- 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 MCFT water to go into sea and get recharged current year.

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.

Please refer **Annexure – 2** 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

<table>
<tr><th>Sr. No.</th><th>Conditions</th><th>Compliance Status as on 30-09-2023</th></tr>
<tr><td></td><td></td><td>of INR 953.50 lakh. Out of which, Approx. INR 374.81 lakh are spent in FY 2023-24 till Sep'23.</td></tr>
<tr><td>vi</td><td>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.</td><td>Complied.

During Maintenance dredging in this area, it is ensured that at least 50 m distance is maintained.</td></tr>
<tr><td>vii</td><td rowspan="2">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 be implemented. It shall be ensured that there is no dumping of dredged material in the CRZ.</td><td>Complied.

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.

In order to ensure no damage to marine ecology Marine water & sediment monitoring 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. Summary of the same for duration from Apr'23 to Sep'23 is mentioned below.

Total Sampling Locations: 09 Nos.
<table>
<tr><th rowspan="2">Parameter</th><th rowspan="2">Unit</th><th colspan="3">Surface</th><th colspan="3">Bottom</th></tr>
<tr><th>Min</th><th>Max</th><th>Average</th><th>Min</th><th>Max</th><th>Average</th></tr>
<tr><td>pH</td><td>--</td><td>7.95</td><td>8.27</td><td>8.14</td><td>7.81</td><td>8.15</td><td>7.98</td></tr>
<tr><td>BOD (3 Days @ 27 oC)</td><td>mg/L</td><td>2.2</td><td>3.8</td><td>3.01</td><td>BDL(MDL:1.0)</td><td>BDL(MDL:1.0)</td><td>BDL(MDL:1.0)</td></tr>
<tr><td>TSS</td><td>mg/L</td><td>94</td><td>154</td><td>120.26</td><td>72</td><td>128</td><td>101.04</td></tr>
<tr><td>DO</td><td>mg/L</td><td>5.85</td><td>6.37</td><td>6.15</td><td>5.52</td><td>6.22</td><td>5.83</td></tr>
<tr><td>Salinity</td><td>ppt</td><td>34.89</td><td>36.94</td><td>36.00</td><td>35.62</td><td>37.84</td><td>36.73</td></tr>
<tr><td>TDS</td><td>mg/L</td><td>35860</td><td>37844</td><td>36675</td><td>36540</td><td>38124</td><td>37299</td></tr>
</table>
*BDL – Below Detection Limit
*MDL – Minimum Detection Limit

Please refer Annexure – 3 for detailed analysis reports. Approx. INR 5.08 Lakh is spent for all environmental monitoring activities during the FY 2023-24 till Sep'23 for overall APSEZ, Mundra.</td></tr>
<tr><td>viii</td><td>The mangrove afforestation shall be undertaken at the identified sites and the progress report in this regard shall be</td><td>Complied.

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</td></tr>
</table>

Sr. No.	Conditions	Compliance Status as on 30-09-2023
	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.	consultation with Dr Maity, (Mangrove Consultant of India). 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. To enhance the marine biodiversity, till date APSEZ has carried out mangrove afforestation in 3890 ha. area across the coast of Gujarat. Total expenditure for the same till date is INR 1070.8 lakh. Details on Mangroves afforestation & Green belt development carried out by APSEZ till date is annexed as **Annexure – 4**. 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. 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. 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. Please refer attached **Annexure – 2** for CSR activity report carried out by Adani Foundation.

Sr. No.	Conditions	Compliance Status as on 30-09-2023
ix	No ground water shall be withdrawn for this project.	Complied. 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 4.14 MLD during compliance period i.e. Apr'23 to Sep'23.
x	The project proponent shall ensure that the construction workers do not cut the Mangroves for fuel wood etc.	Complied. All construction activities are completed and project is in operation phase since long time.
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.	Complied. 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). 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. 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.
xii	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	Complied. Project is in operation phase. Sewage generated from port is being treated in designated ETP and treated sewage is used for horticulture purposes.

Location	Capacity	Quantity of Treated Water	Type of ETP / STP

Sr. No.	Conditions	Compliance Status as on 30-09-2023
	equipment's in the creeks.	

		(Avg. from Apr'23 to Sep'23)	
LT	265 KLD	107 KLD	Activated Sludge

Summary of ETP treated water analysis results during compliance period as mentioned below.

Frequency of Analysis: Once in a month

Parameter	Unit	Min	Max	Average	Perm. Limit[$]
pH	--	6.74	7.52	7.29	6.5 – 8.5
SS	mg/L	18	32	24.33	100
TDS	mg/L	732	1106	852	2100
COD	mg/L	72.6	89.4	79.5	100
BOD	mg/L	20	27	23.67	30
Ammonical Nitrogen as NH_3-N	mg/L	20.6	28.80	24.50	50

[$] as per CC&A granted by GPCB

The quality of marine water, treated effluents, air emissions and noise levels are being regularly analyzed by NABL accredited and MoEF&CC accredited agency namely M/s. Unistar Environment and Research Labs Pvt. Ltd., Vapi. Please refer **Annexure – 3.**

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.

For detailed analysis reports for the period Apr'23 to Sep'23. Approx. INR 5.08 Lakh is spent for all environmental monitoring activities during the FY 2023-24 till Sep'23 for overall APSEZ.

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	Complied.

Sr. No.	Conditions	Compliance Status as on 30-09-2023
	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.	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 Environment, Government of Gujarat for carrying out the supervision and/or the monitoring of the construction activities.	Complied. Construction activities are completed and project is in operation phase. As part of the directions given by MoEF&CC vides order dated 18th Sep, 2015, following studies were conducted. 1. NCSCM (MoEF&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-

Sr. No.	Conditions	Compliance Status as on 30-09-2023
		17. The cost of said study was 3.15 Cr, which was incurred by APSEZ. As a part of mangrove conservation plan, APSEZ has done following activities. 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. b. Tidal observation in creeks in and around APSEZ – The cost of the said activity was INR 1.0 Lacs incurred by APSEZ. c. Algal & Prosopis removal from Mangrove area - The cost of the said activity is INR 2.35 Lacs incurred by APSEZ during FY 2022-23. The details of algal & prosopis removal were submitted as part of compliance report for the duration of Oct'22 to Mar'23. d. Awareness of mangroves importance in surrounding communities & Fodder support - The expenditure for fodder supporting activities was approx. 90.20 Lacs during FY 2023-24 till Sep'23, which was incurred by APSEZ. This is activity is being done on continuous basis as a part of CSR activity. 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. 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 paid by APSEZ.

Sr. No.	Conditions	Compliance Status as on 30-09-2023
		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 is attached as **Annexure-5** 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 2594 Ha in year 2019. Now, according to GUIDE Mangrove monitoring study report November 2023 (attached as **ANNEXURE-5**), 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. **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%).**

Sr. No.	Conditions	Compliance Status as on 30-09-2023
		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.
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.	Complied. 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&CC accredited agency namely M/s. Unistar Environment and Research Labs Pvt. Ltd., Vapi. Monitoring reports for the period from Apr'23 to Sep'23 is enclosed as **Annexure – 3**.
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.	Complied. APSEZ is practicing well defined traffic control procedure. A VTMS service for Gulf of Kutch is operated by Directorate General of Lighthouses and Lightships (DGLL), Govt. of India. APSEZ is practicing well defined traffic control procedure. Marine Control of APSEZ provides traffic update to vessels in Mundra Port Limit on VHF Channel- 77. Arrival and departure information in Gulf of Kutch is provided to VTMS information cell through an agent or directly by sending an e-mail to vtsmanagergulfofkutch @ yahoo.com and vtsgok@yahoo.com. Mundra port has subscribed and taking VTMS feed from Kandla from link www.vts.gov.in.
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 and the same shall be	Complied. 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.

Sr. No.	Conditions	Compliance Status as on 30-09-2023
	strictly implemented. Regular mock drills shall be carried out to ensure fitness of the equipment in place.	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. Latest Regional Level Pollution Response exercise "SWACHCHH SAMUDRA-NW 2022" was carried out by Indian Coast Guard on 19th April, 2023 at Mundra, Gujarat. All participants from various Oil Handling Agencies and Stakeholders (HEML, IOCL, APSEZ, Deendayal Kandla Port (KPT), Coast Guard) were participated in this exercise. Details of the same is attached as **Annexure - 6** Mock drills are conducted regularly by APSEZ. Last Oil Spill Mock drill was conducted on 18 & 19.04.2023. Oil Spill Mock Drill report is enclosed as **Annexure – 6**.
xix	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.	Complied. 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. 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. Recommendations of Marine EIA by NIO with respect to pollution emergency contingency plan for Multipurpose Terminal, Container, Dry & Break Bulk Terminal as well as associated facilities are addressed in Oil Spill Response Plan. 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.
B. General Condition		

adani Ports and Logistics	**Adani Ports and Special Economic Zone Limited, Mundra**	**From: Apr'23** **To : Sep'23**

Status of the conditions stipulated in Environment Clearance under CRZ notification

<table>
<tr><th>Sr. No.</th><th>Conditions</th><th>Compliance Status as on 30-09-2023</th></tr>
<tr><td>i</td><td>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.</td><td>Already complied. Not applicable at present.

All construction activities are carried out confirming to the existing rules and regulation and as per the CRZ notification.

Approval under the preview of GMB, PESO and Factories act were taken prior to start of construction.</td></tr>
<tr><td>ii</td><td>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.</td><td>Complied.

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&CC accredited agency namely M/s. Unistar Environment and Research Labs Pvt. Ltd., Vapi. Summary of the same for duration from Apr'23 to Sep'23 is mentioned below. Monitoring Reports are attached as Annexure – 3 for the same.

Number of Sampling Locations of port ground water: 5
<table>
<tr><th>Parameters</th><th>Unit</th><th>Min</th><th>Max</th><th>Average</th></tr>
<tr><td>pH @ 25 ° C</td><td>--</td><td>7.67</td><td>8.49</td><td>8.22</td></tr>
<tr><td>Salinity</td><td>ppt</td><td>0.37</td><td>5.82</td><td>3.13</td></tr>
<tr><td>Oil & Grease</td><td>mg/L</td><td>*BDL</td><td>*BDL</td><td>*BDL</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</td><td>*BDL</td><td>*BDL</td></tr>
<tr><td>Arsenic as As</td><td>mg/L</td><td>*BDL</td><td>*BDL</td><td>*BDL</td></tr>
<tr><td>Nickel as Ni</td><td>mg/L</td><td>0.03</td><td>0.25</td><td>0.09</td></tr>
<tr><td>Total Chromium as Cr</td><td>mg/L</td><td>*BDL</td><td>*BDL</td><td>*BDL</td></tr>
<tr><td>Cadmium as Cd</td><td>mg/L</td><td>0.01</td><td>0.15</td><td>0.05</td></tr>
<tr><td>Mercury as Hg</td><td>mg/L</td><td>*BDL</td><td>*BDL</td><td>*BDL</td></tr>
<tr><td>Zinc as Zn</td><td>mg/L</td><td>0.06</td><td>0.14</td><td>0.08</td></tr>
<tr><td>Copper as Cu</td><td>mg/L</td><td>*BDL</td><td>*BDL</td><td>*BDL</td></tr>
<tr><td>Iron as Fe</td><td>mg/L</td><td>0.15</td><td>0.95</td><td>0.42</td></tr>
<tr><td>Insecticides/Pesticides</td><td>µg/L</td><td>ND*</td><td>ND*</td><td>ND*</td></tr>
</table></td></tr>
</table>

Sr. No.	Conditions	Compliance Status as on 30-09-2023
		<table><tr><td>Depth of Water Level from Ground Level</td><td>meter</td><td>1.90</td><td>2.14</td><td>2.02</td></tr></table> *ND = Not Detectable *BDL – Below Detection Limit Approx. INR 5.08 Lakh is spent for all environmental monitoring activities during the FY 2023-24 till Sep'23 for overall APSEZ.
iii	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.	Complied. 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. Shoreline Resources available with APSEZ, for deployment during shoreline cleanup/ emergent situation: <table><tr><th>Item</th><th>Quantity</th></tr><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 m³ skimmer</td><td>2 sets</td></tr><tr><td>Lamor Side Collector system (Recovery Capacity 123 m³/ 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></table> 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. IMO module course organized by Maritime Training

Sr. No.	Conditions	Compliance Status as on 30-09-2023
		Institute is conducted & 24 personnel have achieved IMO level 1 & 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. 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.
iv	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.	Complied. Oil spill contingency plan is in place to handle Tier 1 level oil spills considering different accident scenarios, and the vulnerable areas are identified and mitigation plan is prepared. Oil spill contingency response plan 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. 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.
v	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	Being complied Site is provided with environment monitoring equipment with sufficient & competent staff of Third-Party laboratory accredited by NABL & MoEF&CC. Ambient Air Quality (twice in a week) and Noise (once in a month) monitoring are being carried out by NABL and MoEF&CC accredited agency namely M/s. Unistar Environment and Research Labs Pvt. Ltd., Vapi. Summary of the same for duration from Apr'23 to Sep'23 is mentioned below. **Total Ambient Air & Noise Sampling Locations: 4 Nos.**

Parameter	Unit	Min	Max	Average	Perm. Limit$

Sr. No.	Conditions	Compliance Status as on 30-09-2023
	order to ensure that the 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.	**AAQM** PM_{10} µg/m³ 40.32 89.74 74.85 100 $PM_{2.5}$ µg/m³ 14.28 48.49 30.74 60 SO_2 µg/m³ 5.87 41.11 22.94 80 NO_2 µg/m³ 8.13 48.83 27.33 80 **Noise** | **Unit** | **Leq Min** | **Leq Max** | **Leq Ave.** | **Leq Perm. Limit*** Day Time dB(A) 58.50 69.90 64.57 75 Night Time dB(A) 54.20 64.80 59.73 70 $ 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 Apr'23 to Sep'23 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 – 3** for the same. Approx. INR 5.08 Lakh is spent for all environmental monitoring activities during the FY 2023-24 till Sep'23 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 Oct'22 to Mar'23 was submitted through e-mail to Regional Office of Integrated Regional Office (IRO) @ Gandhinagar, Zonal Office of CPCB @ Baroda, GPCB @ Gandhinagar & Gandhidham and

adani Ports and Logistics	Adani Ports and Special Economic Zone Limited, Mundra	From: Apr'23 To : Sep'23

Status of the conditions stipulated in Environment Clearance under CRZ notification

<table>
<tr><th>Sr. No.</th><th>Conditions</th><th>Compliance Status as on 30-09-2023</th></tr>
<tr><td></td><td></td><td>Dept. of Forests & Env., Gandhinagar on dated 30.05.2023. Copy of the same is also available on our web site https://www.adaniports.com /ports-downloads. Please refer below for the details regarding past six compliance submissions.
.
<table>
<tr><th>Sr. No.</th><th>Compliance period</th><th>Date of submission</th></tr>
<tr><td>1</td><td>Apr'20 to Sep'20</td><td>26.11.2020</td></tr>
<tr><td>2</td><td>Oct'20 to Mar'21</td><td>25.05.2021</td></tr>
<tr><td>3</td><td>Apr'21 to Sep'21</td><td>30.11.2021</td></tr>
<tr><td>4</td><td>Oct'21 to Mar'22</td><td>30.05.2022</td></tr>
<tr><td>5</td><td>Apr'22 to Sep'22</td><td>30.11.2022</td></tr>
<tr><td>6</td><td>Oct'22 to Mar'23</td><td>30.05.2023</td></tr>
</table></td></tr>
<tr><td>vi</td><td>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.</td><td>Already complied. Not Applicable at present.

Construction Activity is already completed. Adequate infrastructure facilities as mentioned in the condition were provided during construction phase.

The facility for drinking water, toilet and rest shelter are provided for the dignity of operation labors.

Photographs of the same were provided along with the compliance submission for the duration of Oct'16 to Mar'17.</td></tr>
</table>

<table>
<tr><th>Sr. No.</th><th>Conditions</th><th>Compliance Status as on 30-09-2023</th></tr>
<tr><td>vii</td><td rowspan="2">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.</td><td>Complied.

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.

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.

Third party analysis of the treated water, Flue Gas, Ambient Air and Noise is being carried out regularly by NABL and MoEF&CC accredited agency namely M/s. Unistar Environment and Research Labs Pvt. Ltd., Vapi.

Summary of six-monthly monitoring of Flue gas emission is provided below.

Total Nos. of Stacks: 15 Nos.
<table>
<tr><th>Parameters</th><th>Unit</th><th>Min</th><th>Max</th><th>Average</th><th>Permissible Limit$</th></tr>
<tr><td>PM</td><td>mg/Nm^3</td><td>16.39</td><td>28.53</td><td>22.00</td><td>150</td></tr>
<tr><td>SO_2</td><td>ppm</td><td>5.79</td><td>17.65</td><td>9.21</td><td>100</td></tr>
<tr><td>NOx</td><td>ppm</td><td>16.26</td><td>30.41</td><td>22.66</td><td>50</td></tr>
</table>
$ as per CC&A granted by GPCB

Six monthly reports of flue gas emissions for duration from Apr'23 to Sep'23 is attached as Annexure – 3.

Summary of Ambient Air and Noise for duration from Apr'23 to Sep'23 is provided in general condition No. v above.

<u>Waste Management</u> – APSEZ has adopted 5R concept for environmentally sound management of different types of solid & liquid wastes. Please refer below details about management of each type of waste.

<u>Non-Hazardous Solid Waste</u>: A well-established system for</td></tr>
</table>

Sr. No.	Conditions	Compliance Status as on 30-09-2023
		segregation of dry & wet waste is in place. All wet waste (Organic waste) is being segregated & utilized for compost manufacturing and/or biogas generation for cooking purpose. The compost is further used by in house horticulture team for greenbelt development. Whereas dry recyclable waste is being sorted in various categories. Presently manual sorting is being done for sorting of different types of solid waste. Segregated recyclable materials such as Paper, Plastic, Cardboard, PET Bottles, 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 TUVRheinland 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

Sr. No.	Conditions	Compliance Status as on 30-09-2023

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. However, during the compliance period, there was no disposal of downgrade chemicals.
- Expired paint materials is being disposed by incineration through common facility i.e. M/s. Saurashtra Enviro Projects Pvt. Ltd., Bhachau. However, during the compliance period, there was no disposal of downgrade chemicals.
- Downgrade chemicals generated from cleaning of storage tanks / pipelines are being sold to authorized solvent recovery facilities namely M/s. Acquire Chemicals, Ankleshwar however during the compliance period, there was no disposal of downgrade chemicals.
- 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.
- 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 Apr'23 to Sep'23) for different types of wastes at APSEZ:

Type of Waste	Quantity in MT	Disposal method
Hazardous Waste		
Pig Waste	3.70	Co-processing at cement industries
Oily Cotton waste	52.64	
Used / Spent Oil	82.93	Sell to registered recycler

Sr. No.	Conditions	Compliance Status as on 30-09-2023

ETP/CETP Sludge	12.71	Co-processing at cement industries
Discarded Containers / Barrels	1.90	Sell to registered recycler
Other Waste		
E-Waste	31.37	Sell to registered recycler
Battery Waste	7.95	Sell to registered recycler
Bio Medical Waste	3.29	To approved CBWTF Site
Non-Hazardous Waste		
Recyclables Dry Waste / Scrap	1377.09	After recovery sent for recycling / Reuse within premises
Non-Recyclable Dry Waste (RDF)	253.54	Co-processing at Cement Industries
Wet Waste (Food waste + Organic waste)	459.04	Converted to Manure for Horticulture use / Biogas for cooking purpose
Horticulture Waste	405.30	Used for making of compost and utilize for horticulture purpose

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. • Ships berthing at Mundra Port comply with MARPOL / DG Shipping regulations. • 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. • The reception facility for all category of waste except Annex VI as per IMO and DG Shipping requirements is available in the port. • 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 & than segregated waste is being disposed in line with 5R principles. • Waste categorized in Annex – 1 (Sludge Oil) category is directly collected and disposed by GPCB authorized recyclers. • No discharge such as bilge wastes, sewage or any

Sr. No.	Conditions	Compliance Status as on 30-09-2023
		other liquid wastewater is allowed into marine environment inside port limits. • 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.
ix	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.	Complied. 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. **APPLICABLE REGULATION** ➢ Port Security Law (ISPS) ➢ Indian Port Act ➢ Gujrat Maritime Board Act 1981 ➢ Navigational Safety Port Committee (NSPC) ➢ All relevant international rules and regulations on MARPOL, Load lines etc.
x	During operation phase proper precautions should be taken to avoid any oil spills and no oily wastes shall be discharged into the water bodies.	Complied. 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. Available mechanisms to avoid oil spills are identified as below. <u>At liquid terminal:</u> • Immediate shut off valve from vessel and shore. • Periodical testing of lines • Immediate suction of material by pump. • Emergency operation shut down.

Sr. No.	Conditions	Compliance Status as on 30-09-2023
		At Marine Operations: • Scupper plug, dip tray, absorbent pad, saw dust is provided to address confined spillage/leakage. At Container Terminals: • Leak cart is available for collect spilled chemical. • Spill control materials in place. • Oil drums are stored in covered shed where pellets are used. Tray provided to collection of spillage/leakage if occurred. 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.
xi	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.	Complied. 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 four persuasions as below. ❖ Education ❖ Community Health ❖ Rural Infrastructure ❖ Sustainability Livelihood Brief information about activities in the main four persuasions is mentioned below. Activities carried out for the same are summarized as below.

Area	Activity
Community Health	• Mobile Heath Care Units and Rural Clinics • 07 Rural Clinics • 06 villages of Mundra & 01 village Mandvi block has benefited by rural clinic service. • Total Patients Benefitted FY 23-24 upto Sep 23: - 10629 (direct & indirect). • 2 financially challenged patients has been supported with Dialysis treatment at 58 Times which added day in their Life. • Shaping Lives: From Pagdiya Fishing to Prosperity: 01 people benefitted for oral cancer treatment. **Health camp:**

adani Ports and Logistics	**Adani Ports and Special Economic Zone Limited, Mundra**	**From: Apr'23** **To : Sep'23**

Status of the conditions stipulated in Environment Clearance under CRZ notification

Sr. No.	Conditions	Compliance Status as on 30-09-2023	
			• 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. • Specialty health (Gynec, ophthalmic, specialty health camp): - 1489 Patients Benefited. • General health camp: - 1448Patients benefited. • Blood Donation Camp: 1558 people have donated blood. • Women's Health: Provided health services to more than 2230 women benefitted through gynec health checkup. • Dialysis Support: During this year, 2 patients were supported for regular dialysis with 58 Times which added day in their Life. • Medical Supports: 1007 beneficiary in 35 village. • Eradicate cataract-related vision for senior citizen: benefited 473 peoples of 9 villages. • **Ayushman card facilitation:** Ayushman card issued to 5584 for 25 village. • 1071 –Economically Challenged patients have been supported for operation, OPD, IPD, Medicines and lab-test. • 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 & Mandvi Taluka. • 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 16000 cattle benefitted.
		Sustainable Livelihood – Fisher folk, Agriculture & Women	• **Vehicle Transportation Facilities:** extend vehicle transportation services to school-going children from Luni and Randh Fishermen Settlements to the AVMB School, Bhadreshwar Similarly, we ensure for Juna Bandar Fisherfolk Students to the nearest Government School (Total 218 nos. students benefitted). • **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). • **Cement Roof Sheet Support:** fisherfolk Home were significantly damaged by the **Bipor 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." • **Potable water Distribution:** Providing access of potable Drinking water Facilities to Nine sherfolk vasahat on Daily bases, either By Water tanker or Linkage with Nearest Gram panchayat.

adani Ports and Logistics	Adani Ports and Special Economic Zone Limited, Mundra	From: Apr'23 To : Sep'23

Status of the conditions stipulated in Environment Clearance under CRZ notification

Sr. No.	Conditions	Compliance Status as on 30-09-2023	
			• More than 5000 Fisherfolk Population are getting benefit which impact on their health and efficiency. • Water distribution to Luni & Bavadi Bandar Fishfolk Vasahat: 35000 KL water for 936 people. • **Sagar Mitra Card:** 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." • 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. • **Organic Vegetable Shop Inauguration:** 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. • **Awareness Sessions at Village Level:** Spreading awareness on natural farming benefits and address their concerns and 250 farmers benefitted. • **Hands-On Training & Exposures:** Arranged Workshop and training to emphasizing on real-world techniques (5 workshop). • **Link with Government Scheme**: facilitation of govt. Cow Nurturing scheme to promote eco-friendly farming practices (857 nos. formers benefitted). • To promote Natural farming Adani Foundation has originated cow-based farming initiative with interconnected techniques which can increase farmer yield. • Adani foundation and Agri Department jointly organized district level workshop on Natural Farming Practice with Gram Seva. • **Natural farming-** 1392 farmers benefitted by 20 nos of training from which 60 farmers chemical usage is reduced to half extent in 500 Acres approximately. • 257 nos. of Facilitation of Home Biogas-under Gobardhan Yojna during FY2023-24 till Sep'23. • **Natural Farming Certification: O**btained natural farming certification through the Gujarat Organic Product Certification Agency (GOPCA) for the 35 Farmers who are Members of Raj shakti Sahakrai Mandali. • **Marketing Assistance:** Provide platforms and resources ensuring fair prices and broader consumer reach. • **Dates Restoration:** Due to Bipor Joy cyclone, farming community faced a severe setback as numerous Date, Mango, and other fruit plants were

Sr. No.	Conditions	Compliance Status as on 30-09-2023
		damaged and uprooted. These plants, which served as a vital source of income for farmers, were left in shambles. As of the current date, 615 Date plants have been successfully restored. • **Kitchen Garden Kit:** 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. • Benefited 837 people linkages with Govt. cow based Nurturing Scheme. • Supported 1500 farmers for barrel & wormi compost. • 19 nos. of Market Linkage for supporting to Green carnival at Samudra Township & Shantivan colony Now 302+ farmers are collaborated with Mandli. • 257 Farmers have started to preparing Jiva Mrut & Gaukrupa Amrutam Bio-fertilizer and using in agricrop. Series of Training is arranged by ATMA and Adani Foundation. • Adani Foundation has also provided 7.99 lacs kg Dry Fodder and 23.53 lacs kg Green fodder in 24 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. 90.20 Lacs during FY 2023-24 upto Sep'23. • 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. • **Grass Land development:** AF converted 213 acres of denuded village common pastureland gauchar into fertile and productive grassland in Zarpara, Siracha, Gundal , Kukadsar village to transform into Fodder Sustain village. **Women Empowerment:** • **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 Rs 31 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. ➢ 160+ women - Monthly average income @ 7000 of each member over Month. • **Job Sourcing – Govt:**

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Sr. No.	Conditions	Compliance Status as on 30-09-2023	
			➢ 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. ➢ 387 Women supported till date for job sourcing of 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 till Sep'23 Approx. INR 51.75 lakh were spent for Fisherfolk Amenities work in different core areas. • Till FY 2023-24 till Sep'23, Adani Foundation has done total expenditure of INR 1389.94lakh 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.
		Education	• Conduct baseline assessment of 6314 Students, 2541 Students were progressive learner (3 to 7 Std.). • Kutch University has conducted an impact assessment of IT on Wheels, which has been evaluated and certified by the DEO Office. • Exposure Visit of Project officers from three different locations to learn about the best practices. • Computer Classes in High school: 200 Students took advantage of this computer classes. • Career Counselling in 8 Utthan High Schools. • Plastic Bag Free village workshop in all High schools. • Remedial classes during summer break. • **Day Celebration:** World Book Day, World Environment Day, National Reading Day, International Yoga Day, National Plastic, Bag Free Day, Raksha Bandhan, Independence Day & Celebration of Sports Day. Planned various Capacity Building Program (CBP) & Exposure visit for Utthan Sahayak & Students. • **Achievements:** • Utthan sahayak motivate mothers to open an account of Sukanya Samrudhi Yojana • Utthan supported Taluka levels Kala Utsav in Primary & High Schools. • Utthan Sahayak supported Taluka level Science

Status of the conditions stipulated in Environment Clearance under CRZ notification

Sr. No.	Conditions	Compliance Status as on 30-09-2023	
			Fair. •06 students selected in District Level Sports School (DLSS). • Planned various Capacity Building Program (CBP) & Exposure visit for Utthan Sahayak & Students. • Provided facility for preparing JNV, NMMS & PSE examination. 877 Students preparing Competitive Exam. 354 JNV, 273 PSE & 250 NMMS.. • **Empowering Communities through Free and Compulsory Education:** Adani Vidya Mandir, Bhadreshwar, was established in June 2012 with the goal to have access of quality and cost free Education with essential amenities like food, uniforms, and books, to Financial Weaker community children of the Mundra Block. The school boasts excellent infrastructure and resources necessary for the holistic development of each student. Children are admitted to the school form Senior Kg to 10th Standard. • **Few notable points:** • We are empowering economically disadvantaged families through free and quality education. • We are fostering an environment of academic excellence. • Pioneering Excellence: The First Gujarati Medium School in Gujarat Accredited by NABET • Over 600 Students Learning Each Year in AVMB • More than 35% of enrolled students in AVMB come from the Fisherfolk community. Workshop was conducted on Mental Health and behavioral change. • AVMB got 1st rank in Vaadan, Gayan and drawing in Kala Maha Kumbh competition and selected for Next block level competition. • AVMB selected for district level Kho-kho Match competition organized by SGFI-School Game Federation of India, • 2 students selected for District Level Athletic Competition. • 100% Success: Adani Vidya Mandir Bhadreshwar's Remarkable Achievement in Gujarat Board Standard 10th Examination. • **Training Skill Development:** Conducted skill development programs for women in various fields such as tailoring, handicrafts, and food processing These training programs helped women develop their skills and start their own businesses We have trained over 91 women in various skills, and many of them have started their own businesses. • Total 182 nos. of male & female trained in various skill development programme.
		Rural Infrastructure & Environmental Sustainability	Adani foundation designed and build various structure and provide service in the Health, Education, agriculture and sustainable livelihood area. **WORK COMPLETED**

adani Ports and Logistics	**Adani Ports and Special Economic Zone Limited, Mundra**	**From: Apr'23** **To : Sep'23**

Status of the conditions stipulated in Environment Clearance under CRZ notification

<table>
<tr><th>Sr. No.</th><th>Conditions</th><th>Compliance Status as on 30-09-2023</th></tr>
<tr><td></td><td></td><td>
Below tabulated Water Conservation Projects completed during Compliance period:
<table>
<tr><th>Sr. No.</th><th>Project</th><th>Unit</th><th>Outcome</th><th>Impact</th></tr>
<tr><td>1</td><td>Check dam Restrengthening-Nana Kapaya</td><td>1</td><td>Water Storage Capacity increased by 48000 Cum</td><td>60 + farmer's 120+Acre Area of Agri land can be Irrigated</td></tr>
<tr><td>2</td><td>Recharge Borewell</td><td>21</td><td>Reduce Salinity ingress, and preventing water run</td><td>150+ farmer's 260+ Acre Area of Agri land for Irrigated</td></tr>
<tr><td>3</td><td>Pipe Culvert at Checkdamat Bhujpur</td><td>1</td><td>prevent water runoff into seaside.</td><td>35 farmer's 120+ Acre Area of Agri land can be Irrigated</td></tr>
</table>

Home Biogas: Current year FY 2023-24 upto Sep'23 we process to facilitate 258 Gobardhan unit through Gov.
377 - AC Roof sheet support to Fisherfolk Vasaha 1700+ Benefited.
2 Development of Common Gathering flooring work – 4000+ Benefited.
195 Stall – Vegetable market– 900+ Benefited.
Solar Panel System at Mundra – 600+ Benefited.
Maintenance, Fencing & Material Support - 30+ Benefited.
Renovation of Shed at Shekranpir Bhopavandh - 2000+ Benefited.
Earlier Completed Activities/Project:40 RRWHS structure have been completed.
Total 229 nos. Bore-well recharging activity is completedPercolation well Recharging work at Bhadiya & Mota Kandgra village.
Sluice gate Construction to Control Flood during Flooding at Khoydivadi Vistar Bhujpur.
Pond Beatification and Bund Strengthening at Bhujpur village.
Check dam gate valve construction at Bhujpur which controlled more than 350 MCFT water to go into sea and get recharged current year.
commissioning of Community Training Centre at Shekhadiya.
Two Pond Deepening at Zarpara under Amrut Sarovar Yojna.
Ground recharge activities (pond deepening work for 61 ponds) individually and 26 ponds under Sujlam Suflam Jal Abhiyan.

</td></tr>
</table>

Sr. No.	Conditions	Compliance Status as on 30-09-2023	
			• Pond Pipeline work at Prasla Vistar Zarpara which increase recharge capacity more than 25% in 100 hector area. • JCB & Hitachi Machine Support for Pre-Moonson activities. Repairing and Maintenance work of Approach at Luni, Bavdi and Navinal Fishermen Bandar. • 3 Re-strengthening of Approach Road. • Renovate Blood storage Lab CHC Mundra Renovation Blood storage Lab CHC Mundra. • Constructed 2 nos. of CC Road of 700 mtr. • Constructed Community Training center Shekadiya. • Constructed 2 nos. Disable Widow Toilet Block • Installed R.O. Plant at Mokha with capacity 1000ltr /HR. • 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:** • **Miyawaki Forest Development, Nana Kapaya** - Native species planation in the 2 acre area at Nana Kapaya village creating a flourishing mini-forest with 5,508 trees. • **Massive Public Plantation Drives:** Barren spaces were transformed into lush green havens through our massive public plantation drives. One notable example is the Bhupur Visri Mata Temple, where 25,000 trees were planted. • **Prakrurath:** This initiative goes beyond just planting trees; it is about fostering a sense of responsibility towards our environment. Through 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 1.27 Lac tree plantation have been done that has enriched the local ecosystem and also 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 monthly meeting conducted to assess the annual phase wise growth of ongoing activities. • **Multi-Species Mangrove Park** - 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

Sr. No.	Conditions	Compliance Status as on 30-09-2023
		(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, • Mangroves Biodiversity Park within one year • **Home biogas** - Under Gram Utthan Project, Adani Foundation is supporting home biogas to farmers to Uthhan Villages phase wise. Total 325 farmers are supported with Biogas as sustainable environment protection. • As per SORI use of biogas each farmer can save Rs.23400/year. **Water Conservation Projects** – Below tabulated Water Conservation Projects completed during 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 Checkdamat Bhujpur	1	prevent water runoff into seaside.	35 farmer's 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.

Sr. No.	Conditions	Compliance Status as on 30-09-2023	
			• 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 MCFT water to go into sea and get recharged current year.
		Skill Development	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. **ASDC, Mundra** • **Digital Literacy:** Digital literacy training was provided to seven students at Bhujpur Government High School, and as a part of the DEO project, certificates were distributed. • **RTG Crane operator:** RTG crane operator training is successfully given to 15 candidates. • **Beauty therapist:** The distribution of certificates for beauty therapist training celebrated the successful culmination of the program. • **Mud work:** After the mud work training in Dhrab Village, a certificate distribution ceremony was held, benefiting a total of 30 female participants. • **Advance Excel training:** Eighteen employees from Sumitomo India Ltd. Co. underwent advanced Excel training, significantly boosting their skills. • **Youth Employment:** Our main objective is to offer sustainable employment opportunities to the local fishing community in APSEZ Mundra. We bridge the gap between industries and Fisherfolk youth by facilitating job placements. • Currently, we have successfully engaged a total of 12 Fisherfolk youth in this endeavor. ASDC and Thermax Foundation Done MoU. **ASDC, Bhuj:** • **Digital Literacy:** ASDC has partnered with Tally as the Knowledge Partner for its Tally - GST course. The first batch, consisting of 16 students from Bhuj location, achieved a remarkable 100% pass rate. • **Real-time exposure:** Twenty-five Nursing Assistant trainees gained valuable real-time experience in

Sr. No.	Conditions	Compliance Status as on 30-09-2023
		Emergency services through interactions with 108 Ambulance services and an industry visit. • We offer on-the-job training to nursing students to build their confidence and prepare them for delivering high-quality patient care. • **Hydrography training:** Provided practical Hydrography training to nine participants. • **Entrepreneurship Development Programme (EDP):** Conducted EDP training in collaboration with CED, Gandhinagar, for a total of 30 trainees. • **Placement:** We successfully hosted a placement drive at our center on April 23rd, where 11 out of 15 candidates secured positions at KK Patel Hospital with an impressive average monthly salary of Rs. 17,000. • **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 –this will give them identity, confidence and right to speak in any decision for home, village and working area. Please refer **Annexure – 2** 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 374.81 lakh is spent during the FY 2023-24 till Sep'23.
xii	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.	Not applicable at present. Construction activities are completed. No such activity is carried out during the compliance period of Apr'23 to Sep'23.
xiii	The dredging operations, if any, to be undertaken with the prior approval of this Ministry, shall be executed with appropriate safeguard measures to prevent	Complied Capital dredging is completed and only maintenance dredging is being carried out, if required.

Sr. No.	Conditions	Compliance Status as on 30-09-2023
	turbidity conditions in consultation with the expert agencies such as CWPRS / NIO.	
xiv	For employing unskilled, semi-skilled and skilled workers for the project, preference shall be given to local people.	Complied Adani Foundation – CSR Arm of Adani Group is doing following activities as a part of Skill Development in surrounding communities in Kutch area. • Adani Skill Development Center (ASDC), Mundra & Bhuj is providing skill development training to the locals for Soft Skill, Technical Training and Carrier Guidance & knowledge-based training. • 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. • 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. • ASDC imparted various soft skilled and technical training to make Atma Nirbhar India. • During FY 2023-24 till Sep'23 various trainings provided to enhance the socio-economic development. • Preference is given to local people for employment based on their qualification and experience. • All Mangrove plantations are done in consultation with GUIDE and Local forest dept. • 24 hectare of mangrove afforestation at Mundra was done through active participation of local fishermen at the cost of INR 25.0 Lac. • 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. • 4445 Man-days Fisherman person days employed in Mangroves Plantation during the FY 2022-23. The

Sr. No.	Conditions	Compliance Status as on 30-09-2023
		Foundation has also supported Pagadiya fishermen as painting laborers by providing them with employment and job in various field. Details on skill development training imparted during compliance period i.e. Apr'23 to Sep'23 by Adani Foundation are available in CSR report enclosed as **Annexure – 2**.
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.	Complied. Tug (Dolphin-11) has firefighting system of 1200 m^3/hr. along with 20 ton lifting "A" frame and diving support facility for support at offshore. 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, 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.
xvi	Regular drills should be conducted to check the effectiveness of the on-site Disaster Management Plan.	Complied.

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Sr. No.	Conditions	Compliance Status as on 30-09-2023

Location	Month	Scenario
AICTPL	Apr'23	Assumed that lasher felt dizzy while working on the deck and fall in water.
ACMTPL	Apr'23	Assuming an electrical fire occurred in the ground floor electrical panel.
ACMTPL	May'23	Assumed that fire observed in RTG 540.
AICTPL	May'23	Assumed that two ITV collided at wharf due to over speeding.
ACMTPL	Jun'23	Suppose smoke is discovered coming from a container stacked in yard 7K49 because the shipper mis declared the cargo.
AICTPL	Jun'23	Assumed that two ITV collided at wharf due to over speeding.
ACMTPL	Jul'23	Assumed that while working on the deck, Lasher felt lightheaded and fell into the water.
AICTPL	Jul'23	Assuming that one supervisor Mr. Ratan tapariya was started vomiting due to food poisoning while taking meal.
AICTPL	Aug'23	Assumed that one by-road trailer collided with jersey barrier while entering terminal due to over speeding and sharp turning.
ACMTPL	Aug'23	Yard supervisor observed leakage from one hazardous tank container ACNU1090875 Hazardous class 4 UN 3394, yard location 7A 05 G3.
Liquid Terminal	Aug'23	One person observed in unconscious condition due to Styrene Monomer Leak and spillage inside dyke wall of tank T-8

Regular drills are being conducted for effectiveness of the system. There were 11 drills conducted for various scenarios during compliance period (Apr'23 to Sep'23) as mentioned below.

Safety Mock drill report (latest report) conducted during the compliance period is enclosed as **Annexure – 7.**

adani Ports and Logistics	**Adani Ports and Special Economic Zone Limited, Mundra**	**From: Apr'23** **To : Sep'23**

Status of the conditions stipulated in Environment Clearance under CRZ notification

<table>
<tr><th>Sr. No.</th><th>Conditions</th><th>Compliance Status as on 30-09-2023</th></tr>
<tr><td>xvii</td><td>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.</td><td>Complied
All the recommendations are being implemented.

Few Marine EIA recommendations:
<table>
<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 & 24 personnel have achieved IMO level 1 & 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&CC accredited agency namely M/s. Unistar Environment and Research Labs Pvt. Ltd., Vapi.
Monitoring reports for the period from Oct'22 to Mar'23 is enclosed as Annexure – 3.</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 Marpol 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 & Tariff Structure is made available for conducting ship movement to the concerned staff and made available on web link www.adaniports.com/pdfs/PIB_06122013.pdf
Port Information Booklet is also made available on web link www.adaniports.com/Port_Operations_Port_Tariffs.aspx</td></tr>
</table></td></tr>
</table>

adani Ports and Logistics	Adani Ports and Special Economic Zone Limited, Mundra	From: Apr'23 To : Sep'23

Status of the conditions stipulated in Environment Clearance under CRZ notification

Sr. No.	Conditions	Compliance Status as on 30-09-2023
		Few Risk Assessment Recommendations of EIA of Multipurpose Terminal carried out in 1995: 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 team report to Sr. Manager (Environment) at Corporate, who heads the Environment Management Cell who directly reports to the top management. Environment Management Cell Organogram were submitted as part of compliance report submission for the duration of Apr'21 to Sep'21. And there is no further change.
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	Complied Separate budget for the Environment protection measures is earmarked every year. All environment and

Sr. No.	Conditions	Compliance Status as on 30-09-2023
	account and there should be no diversion of these funds for any other purpose. A year wise expenditure on environmental safeguards should be reported to this Ministry.	horticulture activities are considered at corporate level and budget allocation is done accordingly. No separate bank account is maintained for the same however, all the expenses are recorded in advanced accounting system of the organization. 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 823.48 lakh are spent during the year FY 202-24 till Sep'23. Detailed breakup of the expenditures for the past 3 years is attached as **Annexure – 8**.
xxi	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.	Complied APSEZL is always extending full support to the regulatory authorities during their visit to the project site. 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. Inline to the compliance certification process of Environment Clearance condition of Waterfront Development Plan, RO, MoEF&CC Bhopal had visited the site on 27th & 28th January, 2020 for compliance verification. APSEZ provided all requisite information and documents required by the Regional Officer MoEF&CC. During the said compliance verification visit and as per the compliance certification received, there was no non-compliance observed. 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 17th 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.

Status of the conditions stipulated in Environment Clearance under CRZ notification

Sr. No.	Conditions	Compliance Status as on 30-09-2023
		Inline to the compliance of MoEF&CC Order dated 18th September 2015, Joint Review Committee (JRC) comprising officials from various competent authorities visited the APSEZ, Mundra from 1st to 3rd September, 2021 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&CC vide dated 01.12.2021, there was no non-compliance observed.
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 conditions subsequently, if deemed necessary, for environmental protection, which shall be complied with.	Point Noted.

adani Ports and Logistics	Adani Ports and Special Economic Zone Limited, Mundra	From: Apr'23 To : Sep'23

Status of the conditions stipulated in Environment Clearance under CRZ notification

Sr. No.	Conditions	Compliance Status as on 30-09-2023
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.
xxvii	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 http://www.envfor.nic.in/.	Already Complied.
xxviii	The Project Proponents should inform the Regional Office as well as the Ministry the date	Already Complied.

Sr. No.	Conditions	Compliance Status as on 30-09-2023
	of financial closure and final approval of the project by the concerned authorities and the date of start of Land Development Work.	
xxix	The Project Proponent should make specific arrangements for rainwater harvesting in the project design and the rainwater so harvested should be optimally utilized.	Complied 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. 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.

adani Ports and Logistics	Adani Ports and Special Economic Zone Limited, Mundra.	From : Apr'23 To : Sep'23
Status of the conditions stipulated under CRZ Recommendation		

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 28th October 1999.

Sr. No.	Conditions	Status as on 30-09-2023
A. 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.	Already Complied. Not applicable at present Environmental Clearance was granted based on the submission of said documents. Rapid EIA was submitted on Feb 29, 2000 & Risk Assessment Report containing worst case scenario and detailed oil spill control management plan was submitted on Dec 28, 1999. For more details, please refer to general condition no xvii of the compliance of EC and CRZ clearance.
2	The company in no case tap ground water.	Complied. Please refer to Specific Condition no. ix of the compliance of EC and CRZ clearance above for details.
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.	Already Complied. Not applicable at present The company has not cut any mangroves. APSEZ has carried out 24 hectare of mangrove plantation near Navinal creek. To enhance the marine biodiversity, till date APSEZ has carried out mangrove afforestation in 3890 ha. area across the coast of Gujarat. Total expenditure for the same till date is INR 1070.8 lakh.
4	The company shall carry out the mangroves plantation programme in	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

Sr. No.	Conditions	Status as on 30-09-2023
	addition to 25-acre mangrove plantation to be done with the help of the NIO, in consultation with the forest department.	greenbelt with plantation of more than 9.06 Lacs saplings within the APSEZ area. Details on Mangroves afforestation & Green belt development carried out by APSEZ till date is annexed as **Annexure – 4**. 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 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. 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. Please refer attached **Annexure – 2** for CSR activity report carried out by Adani Foundation. 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. Please refer to Specific Condition no. viii of the compliance of EC and CRZ clearance above for details. **Conservation of mangroves:** • In and around APSEZ, approx. 1800 ha. Mangrove area was identified by NIO in an EIA report prepared in the year 1998. • Out of this 1800 ha area, 1254 ha area was further demarcated as potential mangrove conservation by NIO in

Sr. No.	Conditions	Status as on 30-09-2023

the year 2008 (as part of the EIA report of WFDP).

- It may be noted that the entire area of 1254 ha is not covered with mangroves.
- 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.

As per MoEF&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 **March 2017 (Total 2340) and September 2019** with an extent of **256 Ha (Total 2596 Ha Area)** which is about **10.94%** 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 **502 Ha** between 2011 and 2019.

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&CC for their examination and recommendation vide (with a copy to MoEF&CC vide letter dated 04.06.2018 & reminder letter vide dated 4th Jan, 2019). Presentation on the findings of the report was made to GCZMA committee on 4th October 2019 and the recommendation for the same has been received vide email dtd 22nd Sept, 2020 with conditions. Details of the same were submitted as a part of previous half yearly EC compliance report for the period Oct'20 to Mar'21.

As a part of GCZMA recommendations and NCSCM mangrove conservation action plan, APSEZ has undertaken following activities.

Sr. No.	Recommendations	Compliance

adani Ports and Logistics	**Adani Ports and Special Economic Zone Limited, Mundra.**	**From : Apr'23** **To : Sep'23**

Status of the conditions stipulated under CRZ Recommendation

Sr. No.	Conditions	Status as on 30-09-2023		
		1.	Mangrove mapping and monitoring in and around APSEZ	• APSEZ entrusted NCSCM, Chennai to carry out Monitoring of mangrove distribution in creeks in and around APSEZ and shoreline changes in Bocha island. • 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 & 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%. • 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. • Hence, there is an overall growth of mangroves in creeks in and around APSEZ, Mundra is 502 Ha between 2011 and 2019. • The cost of the said study was INR 23.56 Lacs incurred by APSEZ. • According to GUIDE Mangrove monitoring study report November 2023 (attached as ANNEXURE-5), 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. • 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%). • The cost of the said study was INR

<table>
<tr><th>Sr. No.</th><th>Conditions</th><th colspan="3">Status as on 30-09-2023</th></tr>
<tr><td></td><td></td><td></td><td></td><td>23.60 Lacs incurred by APSEZ.

Summary of Mangrove mapping and monitoring (from 2011 to 2021):
<table>
<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>%</th></tr>
<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</td><td>2670</td><td>74</td><td>2.85%</td></tr>
<tr><td>2019 to 2021 till March</td><td>2723</td><td>53</td><td>1.99%</td></tr>
<tr><td>Total</td><td>2723</td><td>629</td><td>28 %</td></tr>
</table></td></tr>
<tr><td></td><td></td><td>2.</td><td>Tidal observation in creeks in and around APSEZ</td><td>• APSEZ carried out the tidal observations at locations similar to 2017 in Kotdi, Baradimata, Navinal, Bocha and Khari creeks under the guidance of NCSCM.
• The observed tidal ranges indicate that the creeks experience normal tidal ranges, adequate for the growth of mangroves.
• The cost of the said activity was INR 1.0 Lacs.</td></tr>
<tr><td></td><td></td><td>3.</td><td>Removal of Algal and Prosopis growth from mangrove areas</td><td>• Algal and Prosopis growth monitoring was done in and around mangrove area and algal encrustation was found in some of the mangrove areas, which has been removed manually.
• The cost of the said activity was INR 2.35 Lacs during the FY 2022-23. The details of Removal of Algal and Prosopis growth from mangrove areas was submitted during the last compliance period Oct'22 to Mar'23.</td></tr>
<tr><td></td><td></td><td>4.</td><td>Awareness of mangroves importance in surrounding communities</td><td>• 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 24 Villages. Project is covering total 32372 Cattels / 2707 farmers and hence enhancing cattle productivity during FY 2023-24 till Sep'23.</td></tr>
</table>

Sr. No.	Conditions	Status as on 30-09-2023
		• Awareness of mangroves importance in surrounding communities & Fodder support - The expenditure for fodder supporting activities was approx. 90.20 Lacs during FY 2023-24 till Sep'23, which was incurred by APSEZ. • • **Grass Land development:** 213 acres of gauchar land has been cleaned and allocated for Grass land development with strong Community Contribution and Mobilization. • 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. • 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 is attached as **Annexure - 9.** • Refer CSR report attached as **Annexure – 2**. 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. 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. 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

Sr. No.	Conditions	Status as on 30-09-2023
		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 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 is attached as **Annexure-5** 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 2594 Ha in year 2019. Now, according to GUIDE Mangrove monitoring study report November 2023 (attached as **ANNEXURE-5**), 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.

Sr. No.	Conditions	Status as on 30-09-2023
		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%).
5	The company shall ensure that the construction labors do not cut mangroves for fuel, etc.	Already Complied. Not applicable at present Construction activity is already completed. 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 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 **Annexure – 3.** 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.

adani Ports and Logistics	Adani Ports and Special Economic Zone Limited, Mundra.	From : Apr'23 To : Sep'23

Status of the conditions stipulated under CRZ Recommendation

Sr. No.	Conditions	Status as on 30-09-2023
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 in consultation with the NIO.	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.
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	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.

adani Ports and Logistics	**Adani Ports and Special Economic Zone Limited, Mundra.**	**From : Apr'23** **To : Sep'23**
Status of the conditions stipulated under CRZ Recommendation		

Sr. No.	Conditions	Status as on 30-09-2023
	activities only after the construction design and methodology is approved by NIO.	
14	Any other conditions may be stipulated by this department from time to time.	Point noted.

Annexure – 1

GUJARAT POLLUTION CONTROL BOARD

PARYAVARAN BHAVAN, SECTOR 10-A,
GANDHINAGAR - 382010,
(T) 079-23232152

By R.P.A.D.

NO: PC/ CCA- KUTCH-39(8)/ GPCB ID: 17739/748148 Date: -18/07/2023

Correction in Consolidated Consent & Authorization order no AWH-117045 date of issue 09/03/2022 (Under the provisions/rules of Environmental acts)

To,
M/s. Adani Ports & Special Economic Zone Limited,
Plot no. 169/P, At Navinal Island,
Tal: Mundra,
Dist: Kutch - 370 421.

Subject : Correction of Consolidated Consent and Authorization of this Board.

Reference : 1. This office has issued CCA order no. **AWH—117045** issued vide order no. GPCB/CCA-KUTCH-39(7)/ ID-17739/625051 dated 09/03/2022.
2 Your application CTN inward ID 7001067 dated 30/03/2022.

In exercise of the power conferred under section-27 of the Water (Prevention and Control of Pollution) Act-1974, under section-21 of the Air (Prevention and Control of Pollution)-1981 and Authorization under rule 6(2) of the Hazardous & Other Waste (Management &Transboundary Movement) Rules-2016 & as amended framed under the Environmental (Protection) Act-1986 and without reducing your responsibility under the said Acts/Rules in anyway. The Board had granted CCA vide order no. **AWH – 117045** issued vide letter no. GPCB/CCA-KUTCH-39(7)/ ID-17739/625051 dated 09/03/2022.

And whereas Board is empowered to amended/ corrected consent order conditions. Accordingly, considering your request for correction in the said CCA order vide CTN inward ID 7001067 dated 30/03/2022, the said CCA order no. AWH-117045 is hereby corrected/ amended as below;

1. **The condition no. 3.5 of the said order is amended as below:**
   3.5 The quantity of domestic waste water shall not exceed 263 KL/Day.
2. **The condition no. 5.2 of the said order is amended as below:**
   5.2 **M/s. Adani Ports & Special Economic Zone Ltd.,** is hereby granted an authorization based on the enclosed signed inspection report for generation, collection, treatment, storage, transport of hazardous waste on the premises situated at **Plot no. 169/P, At Navinal Island, Taluka: Mundra, Dist: Kutch.**

Sr. No.	Waste	Quantity per Annum	Schedule &Category	Facility
1	Used/ Spent Oil	360 MT	I- 5.1	Collection, storage, Transportation, Disposal by selling out to registered recyclers/ reprocessor and/ or reuse within premises.
2	ETP Sludge	109.5 MT	I-35.3	Collection, storage, Transportation & disposal by sent out for co processing at cement industries and/ or CHWIF site.

3	Sludge & filters contaminated with oil	5 MT	I-3.3	Collection, storage, Transportation, Disposal by co-processing at cement industries and/or CHWIF site
4	Waste Residue containing Oil/ oily rags	150 MT	I-33.2	Collection, storage, Transportation & disposal by sent out for co processing at cement industries and/ or CHWIF site.
5	Pig Waste	24 MT	I-3.1	Collection, storage, Transportation, Disposal by co-processing at cement industries and/or CHWIF site
6	Tank Bottom sludge	Whatever Quantity generated	I-3.2	Collection, storage, Transportation, Disposal by co-processing at cement industries and/or CHWIF site/ or recycling to registered recycler.
7	Discard containers/ barrels	25 MT	I-33.3	Collection, storage, Transportation, Disposal by reuse within premises and / or selling out to registered decontamination.
8	Asbestoses Waste	Whatever Quantity generated	I-15.1	Collection, storage, Transportation, Disposal at CHWIF site.
9	Glass Wool Waste	Whatever Quantity generated	II/C-9	Collection, storage, Transportation, Disposal by co-processing at cement industries and/or incineration at CHWIF site and / or recycling through registered recycler.
10	Downgrade Chemical	Whatever Quantity generated	I-20.2	Collection, storage, Transportation, Disposal by reuse within premises and / or selling out to authorized solvent recover.
11	Waste Oil	1,80,000 MT (0.18 MMTA)	I-5.2	Collection, storage, Transportation,, Disposal by selling out to registered recyclers
12	Expired Paint Material	10 MT	I-21.1	Collection, storage, Transportation, Disposal by co-processing at cement industries and/or CHWIF site

GPCB

GUJARAT POLLUTION CONTROL BOARD

PARYAVARAN BHAVAN, SECTOR 10-A,
GANDHINAGAR - 382010,
(T) 079-23232152

3. Rest of conditions of CCA order no. AWH—117045 issued vide order no. GPCB/CCA-KUTCH-39(7)/ ID-17739/625051 dated 09/03/2022 shall remain unchanged & industry shall comply with the same judiciously.

For and on behalf of
Gujarat Pollution Control Board

(T.C. Patel)
Unit Head

Annexure – 2

Kutch CSR

Six Monthly Report

2023-24

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

Preface

Taking inspiration from the philosophy of our Chairman of trusteeship, the Adani Foundation strives to create sustainable opportunities. It does so by facilitating quality education, enabling the youth with income-generating skills, promoting a healthy society by women empowerment and supporting infrastructure development.

With an aim to contribute to the holistic development of communities, the Adani Foundation is contributing to the global agenda of meeting Sustainable Development Goals (SDGs).

Adani Foundation Gujrat sites are catalyst for rural communities residing in villages of Kutch,, Surat and Bharuch District. AF has transformed thousands of lives by serving community to uplift their standard of living by performing CSR activities in various in terms of Infrastructure, Social development, Education, Agriculture, Women empowerment, Water conservation and management and empowering fishermen and Tribal community.

Pankti Shah
Head CSR Gujrat
Adani Foundation

INDEX

CSR Kutch

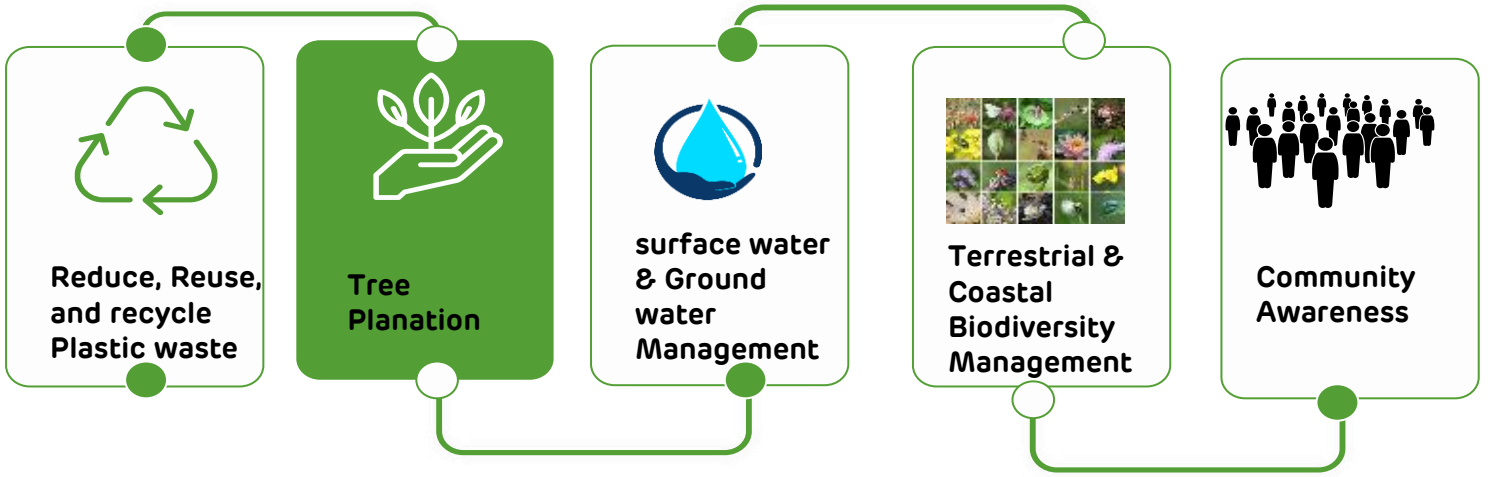
Demographic Details

Block	Villages	No. of HHs	Population
Mundra	61 Village and 9 Fishermen Vasahat	35192	153179
Anjar	3 Villages	4350	18500
Nakhtrana	8 Villages	4093	16373
Bite – 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 Panel Making Unit
7. Green to PVC Mundra Limited
8. Adani Kandla Bulk Terminal Port Pvt Limited
9. Adani Solar Limited – Bitta, Abdasa
10. Adani Green Energy Limited – Nakhatrana
11. Adani Green Energy Limited - Khavda
12. Adani Transmission Limited – Mandvi

Environment Sustainability

Action to environment Sustainability



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, groundwater recharging, and water conservation.

Environment Sustainability

Water Conservation Project

The water landscape of our Business periphery villages has undergone a significant transformation due to our proactive approach to groundwater and surface water conservation and management work. Our mission is clear – to nurture and sustain water resources. We are primarily focusing on initiatives such as pond deepening, reinforcing check dams, implementing Rainwater Harvesting Systems (RRWHS), setting up borewells, and cleaning river inlets.

These efforts have led to enhanced water storage, ensured consistent water access for drinking and agricultural use.

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 sea side.	35 farmer's 120+Acre Area of Agri land can be Irrigated

*** Funded by -Mundra Petro chem Limited**

Impact

- **483** Total area covered (Acre)
- **335** Total Farmers benefitted (No)
- **7%** TDS Reduction
- **7.2%** Increase Revenue %
- **1150** Reduce in health expenses Monthly

Environment Sustainability

Vruksh Se Vikas – Massive Drive

Since 2014, we has embarked a transformative journey to execute a wide range of tree plantation drive in collaborating with local communities and forestry departments .

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

2.Massive Public Plantation Drives: Barren spaces were transformed into lush green havens through our massive public plantation drives. One notable example is the Bhupur Visri Mata Temple, where 25,000 trees were planted.

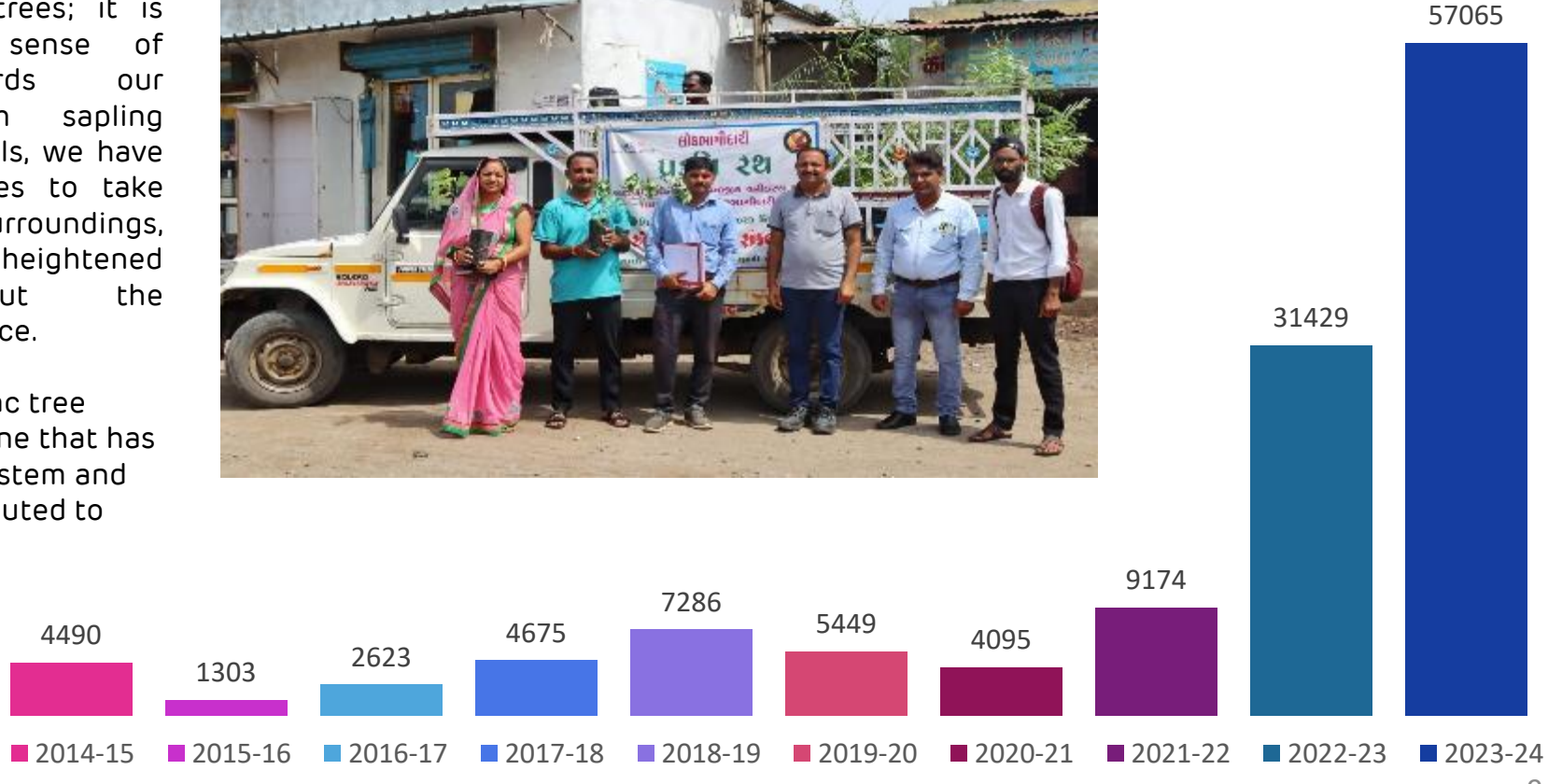
Environment Sustainability

Vruksh Se Vikas – Massive Drive

1.27 Lac tree plantation

Prakrurath: This initiative goes beyond just planting trees; it is about fostering a sense of responsibility towards our environment. Through 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 1.27 Lac tree plantation have been done that has enriched the local ecosystem and also significantly contributed to carbon sequestration



Environment Sustainability

Home Bio Gas

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.

Phase	unit	Unit Cost In Rs.	AF Support in Lac	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
Total	**583**	**149200**	**77.45**	**20.2**	**132.46**	**230.11**

*** Funded by -Mundra Petro chem Limited**

Environment Sustainability

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

• Spices of Mangroves	• Coastal Spices as habitat preservation	• Hector Avicennia marine plantation	• Hector Biodiversity park
4+	**60+**	**160+**	**20+**

*** Funded by -Mundra Petro chem Limited**

Mangrove Plantation Work Detail

Sr. No	Year	Number	Men 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	
	Total	**742000**	**56523**	

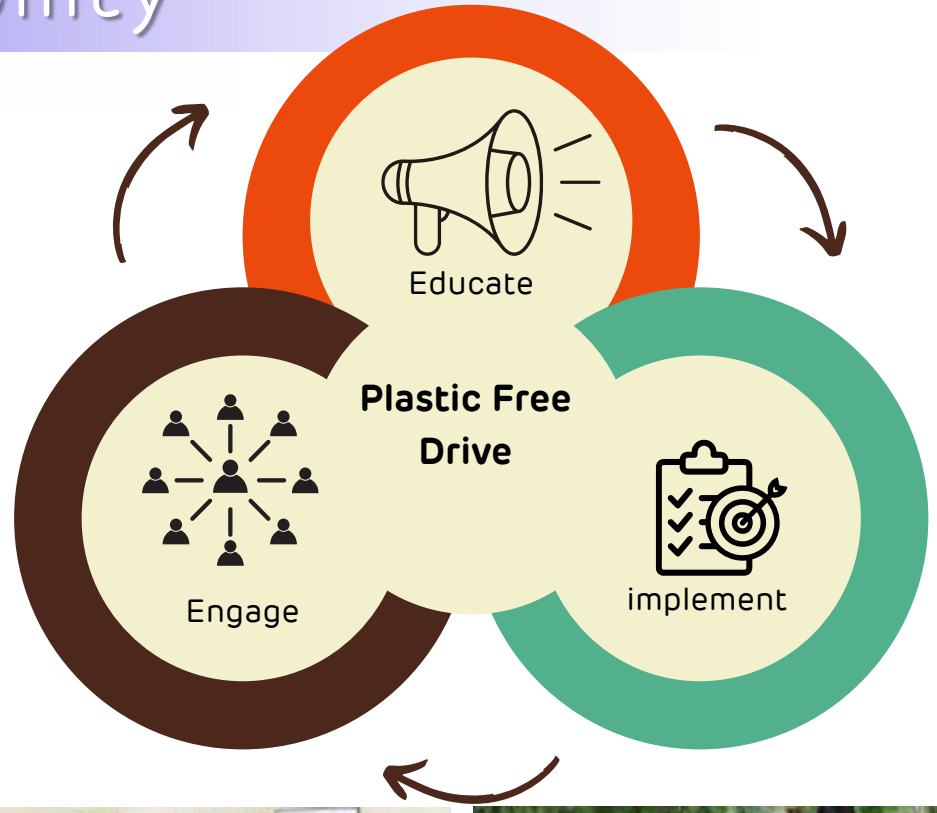
Environment Sustainability

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 to APSEZ plastic waste management plant.

Outreach :-
10000 Students of Primary Schools.
990 Students of Secondary Schools of Mundra Block.



* Funded by -Mundra Petro chem Limited

Environment Sustainability

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 GPVC- Mundra Petro chemical limited

250 Farmers	05 exposure	857 Farmers	257 Gobardhan	35 Farmers	Rs.7.47 Lacs RG
• **Awareness Sessions at Village Level:** Spreading awareness on natural farming benefits and address their concerns.	• **Hands-On Training & Exposures :** Arranged Workshop and training to emphasizing on real-world techniques.	• **Link with Government Scheme**: facilitation of govt. Cow Nurturing scheme to promote eco-friendly farming practices.	• **Bio-gas Support:** Link with Gov Gobar Dhan Biogas Unit Nutrient-rich slurry serves as an essential organic fertilizer for natural farming	• **Natural Farming Certification Process** to obtain natural farming certification through the Gujarat Organic Product Certification Agency (GOPCA) for the 35 Farmers who are Members of Raj shakti Sahakrai Mandali.	• **Marketing Assistance:** Provide platforms and resources ensuring fair prices and broader consumer reach.

UTTHAN – FLAGSHIP EDUCATION PROGRAM OF ADANI FOUNDATION

Project Utthan, launched by the Adani Foundation in 2018–19, is an innovative intervention to enhance students' learning capabilities, provide facilities to schools, and achieve better learning outcomes at the grassroots level. The project adopts government primary schools to convert it as model schools, tutors' progressive learners, introduces English as a third language, and conducts various academic and co-curricular activities to enhance quality of education. It also works on staff capacity building and engages educators, SMC members and parents, especially mothers, to improve children's basic literacy and numeracy skills.

*** Funded by – Kutchh Copper Limited**

- Adopting government primary schools
- Main streaming Progressive learners
- Enhancing Learning Outcomes
- Arresting dropout rates
- Introducing English as a Third Language
- Enabling Joyful Learning Spaces
- Collaborating for teachers' capacity building

UTTHAN OBJECTIVES

- Strengthening Government primary schools
- Appointing an Utthan Sahayak in each school who acts as a catalyst and facilitator
- Providing resources and facilities
- Literacy, numeracy and skills for life
- Government school teachers' capacity building
- Special focus on 'Priya' Vidyarthi's (progressive learners)
- Training students for Competitive exam

UTTHAN REACH

10499	999	250	150	150	3000
69	8	2	5	5	2
Primary School	High School	Adani Evening Education Centre	Adani Competitive Coaching Centre	Adani English Coaching Centre	IT On Wheels

PROGRESSIVE LEARNER

2541 Progressive Learner; Assessment of 6314 Students (3 to 7 Std.)

MOTHERS MEET

400+ Mothers Meet : 10000+ Mothers Joined.

COMPETITIVE EXAM

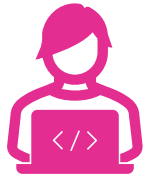
877 Students preparing Competitive Exam. 354 JNV, 273 PSE & 250 NMMS

ENGLISH : THIRD LANGUAGE

5000+ Facilitating English from Classes 1-4.

LIBRARY ACTIVITY

72000+ Book Issued : 924 Library Activities, OASIS 200+ Reading Workshop



IT ON WHEELS

4170 students Empowered with digital skills & knowledge.

SUMMER CAMP

4300+ students of Primary & High Schools participated .

Our other various initiatives include:

- ✓ Kutch University has conducted an impact assessment of IT on Wheels, which has been evaluated and certified by the DEO Office.
- ✓ Exposure Visit of Project officers from three different locations to learn about the best practices.
- ✓ Computer Classes in High school : 200 Students took advantages of this computer classes.
- ✓ Career Counselling in 8 Utthan High Schools.
- ✓ Plastic Bag Free village workshop in all High schools.
- ✓ Remedial classes during summer break.
- ✓ Day Celebration : World Book Day, World Environment Day, National Reading Day, International Yoga Day, National Plastic, Bag Free Day, Raksha Bandhan, Independence Day & Celebration of Sports Day.
- ✓ Planned various Capacity Building Program (CBP) & Exposure visit for Utthan Sahayak & Students.
- ✓ Achievements : • Utthan sahayak motivate mothers to open an account of Sukanya Samrudhi Yojana • Utthan supported Taluka levels Kala Utsav in Primary & High Schools. •Utthan Sahayak supported Taluka level Science Fair. •06 students selected in District Level Sports School (DLSS).

Utthan in High Schools

Utthan Aligned With GoI & GoG

NEP 2020 | Samagra Shiksha | Nipun Bharat | RTE

Utthan in High Schools

8 High school

2 teachers hired, (1 Math's & Science, and 1 English)

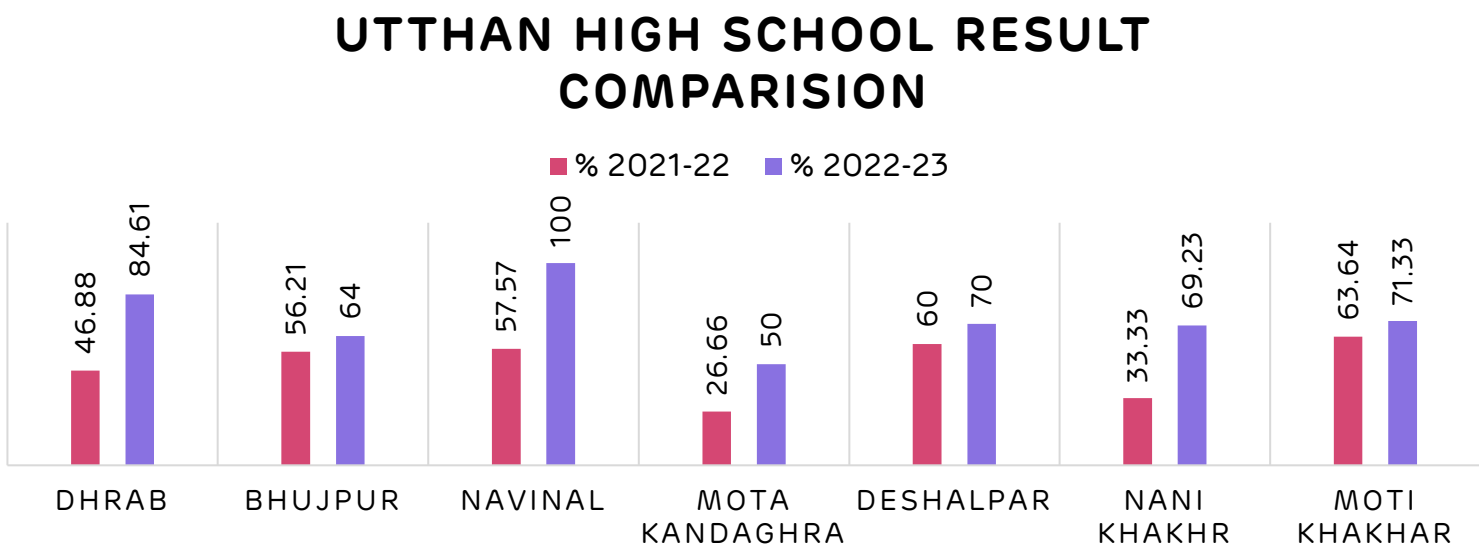
Goal is to improve the students' fundamental skills in these subjects.

2 AEEC

help students improve their academic performance by revising the syllabus and clearing their doubts

Our trained teachers and volunteers provide personalized guidance and feedback to the students in a conducive learning environment these programs will boost the confidence and skills of the students and prepare them for a brighter future.

Good Board Result



Adani Education Evening Centre is running in 2 centers, where Utthan Sahayak teaches Maths, Science & English for an additional 2 hours. This has had an impact on the board results.

Adani Vidya Mandir, Bhadreshwar

Empowering Communities through Free and Compulsory Education

Adani Vidya Mandir, Bhadreshwar, was established in June 2012 with the goal to have access of quality and cost free Education with essential amenities like food, uniforms, and books, to Financial Weaker community children of the Mundra Block.. The school boasts excellent infrastructure and resources necessary for the holistic development of each student. Children are admitted to the school form Senior Kg to 10th Standard.

Few notable points:

- We are empowering economically disadvantaged families through free and quality education
- We are fostering an environment of academic excellence.
- Pioneering Excellence: The First Gujarati Medium School in Gujarat Accredited by NABET
- Over 600 Students Learning Each Year in AVMB
- More than 35% of enrolled students in AVMB come from the Fisherfolk community.

- Work shop was conducted on Mental Health and behavioral change
- AVMB got 1st rank in Vaadan, Gayan and drawing in Kala Maha Kumbh competition and selected for Next block level competition
- AVMB selected for district level Kho-kho Match competition organized by SGFI-School Game Federation of India,
- 2 students selected for District Level Athletic Competition

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

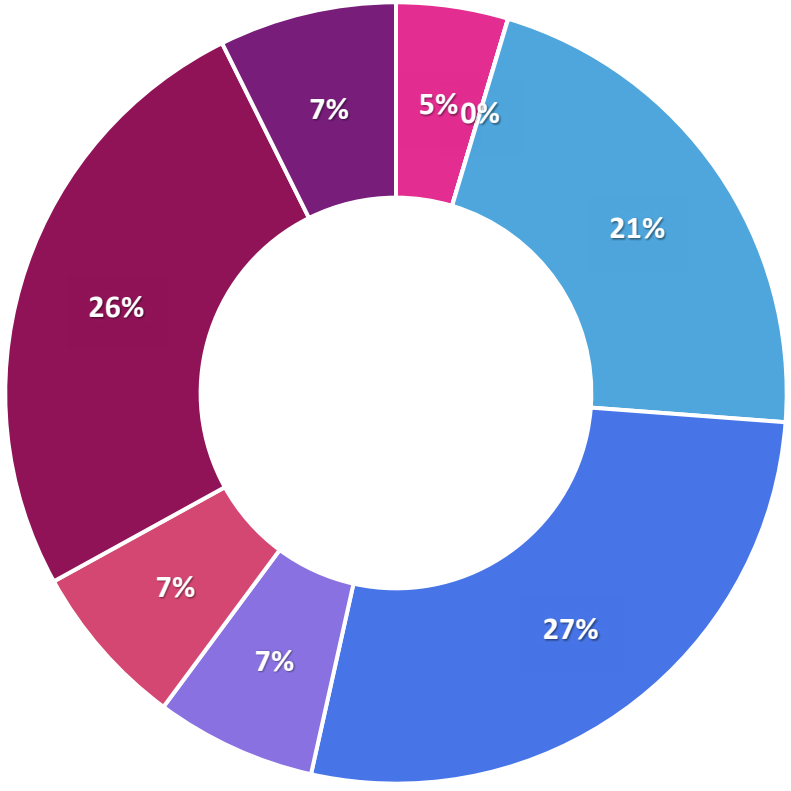
100% Success: Adani Vidya Mandir Bhadreshwar's Remarkable Achievement in Gujarat Board Standard 10th Examination.

Community Health

Quality healthcare is not just about addressing illness; it's about providing everyone an equal opportunity to not just long life, but also rich in quality.

At the Adani Foundation, our steadfast commitment is to offer accessible and affordable healthcare. Through Our diverse healthcare initiatives which are dedicated to cultivating a healthier society to the develop strong and vibrant nation."

CH MIS Data Month April to Sep - 2023		
Sr. No.	**Projects**	**Total**
1	Medical Supports	**1007**
2	Diaylsis	**58**
3	Mobile Van	**4690**
4	Rural Clinice	**5939**
5	Health Camp	**1448**
6	Speciality Health Camp	**1489**
7	Ayushman Card	**5584**
8	Blood Donation Camp	**1598**
Total		**21757**



Our Mobile Health Care Units and Rural Clinic Services have made significant strides in delivering essential healthcare to remote rural areas and underserved populations Since the inception.

MHCU Outreach :- 29 Villages -31 Stoppage
Rural Clinic:- 7 Villages Of Mundra And Mandavi Block

SROI 1:541 (Ref.Soulace impact assessment report)

- **10629 individuals** benefited from the services.
- **35 villages** villages covered.
- **20 %** average savings on healthcare-related costs.
- **25%** People are aware and become health Conscious

29-Villages
31-MHCU
Stoppage
7-Rural clinic

Medical Support Poor Patients.
Adani Foundation's Medical support program is a beacon of hope for the less fortunate, offering aid for a diverse range of ailments, from kidney problems to heart conditions and beyond at Our Adani Hospital Mundra.

In the critical cases, after stabilizing patients we refre them to GKGH, Bhuj, for advanced treatment with ened to end co-ordination

Live Impacted -1008 People

Community Health

Dialysis Support:
In Mundra, where water quality challenges contribute to a higher prevalence of urinary infection lead to kidney failure cases. Our Dialysis Support Program is designed to assist those in extreme need and Financial weaker.
The program is not only alleviating their financial burden but also enabling them to lead healthier lives.

Live Impacted:- Two Patients 58 Times

Our health camp initiatives are designed to bridge healthcare gaps in underserved regions, offering a holistic approach for community well-being with combining Preventive and Precautionary measure through Awareness session , Health check Camp, screening and treatment.

The "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.

Outreach:- 9 Villages
Lives Impacted:-473

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

As well as we arranged gynecological and ophthalmic and general health camp at Village level in collaboration with KCL limited, GKGH Bhuj, and THO Mundra,

CH MIS Data Month April to Sep - 2023

Sr.	Projects	Total
1	Health Camp	1448
2	Speciality Health Camp	1489
3	Blood Donation Camp	1598
	Total	**4535**

*Funded by – Kutchh Copper Limited

Community Health

Ayushman card facilitation

Ayushman Bharat PM-JAY is a global healthcare milestone, offering an unprecedented health cover of Rs. 5 lakhs per family annually for secondary and tertiary care. Adani Foundation has started 100% Ayushman Card coverage in all villages of Mundra in coordination with the District Health Department.

Villages -25 Villages
Live Impacted:- 5,584 Ayushman cards have been Issue.

25 Village
5,584 Ayushman cards Issue

Women Health & Well Being
Outreach-18 Village
Lives Impacted:-2230+ women.

- **Gynec Health Check-ups:** Conducted thorough check-ups, with GKGK referrals when necessary.

Sustainable Livelihood Development

"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.

We have started green Carnival to provided a platform for these farmers to sell their agricultural produce in our two colonies in Mundra. Encouraged by positive feedback, the farmers have set-up a organic Agri produce shop in Mundra, It serves as an inspiration for others to embrace eco-friendly agricultural practices. Now 302+ farmers are collaborated with Mandli.

Previously, these farmers used to sell their produce in bulk to vendors. Now, they are able to sell directly to consumers, leading to a 35% increase in their income. Furthermore, they have applied for the "GOPCA" certificate from the Gujarat Organic Product Certification Agency, highlighting their commitment to organic farming practices.

They have started Collective organic farming in the 200 acre of agri land with proper fencing and technique.

Rajshakti Prakrut sahakari Mandali had Opportunity to meeting with honorable Governor of Gujarat Achrya devvrat at Gandhinagar on 30 August. As well as had exposure to Gautirth vidhyapith Bansi ghar Gaushala,Ahmedabad.

Sustainable Livelihood Development

Dates Restoration

In the aftermath of the devastating Bipor Joy cyclone, our farming community faced a severe setback as numerous Date, Mango, and other fruit plants were damaged and uprooted. These plants, which served as a vital source of income for farmers, were left in shambles.

To address this crisis and provide a ray of hope, we embarked on the Dates Restoration Project in collaboration with Krishi Vigyan Kendra (KVK) and other agricultural experts. This project aimed to rejuvenate and revive the fallen Date plants.

As of the current date, 615 Date plants have been successfully restored. These plants are now on the path to recovery and are expected to bear fruit in the upcoming season this will providing significant financial relief to farmers.

Kitchen Garden Kit

We have ve 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.

Tree Restored : 500 Unit

Each Date trees is projected to yield approximately Rs. 25,000, Total Yield in Next Season:-Rs.1.53 Cr.

*** Funded by – Mundra Petrochemicals Limited**

Sustainable Livelihood Development

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

Grassland Development Program
We have started Grass land development with a primary objective to create a self-sustaining village by converting common pastureland (Gauchar) into fertile and productive grasslands to ensure a reliable source of fodder for the community, especially during challenging times.

Total area :- 213 acres of gauchar land has been cleaned and allocated for Grass land development with strong Community Contribution and Mobilization.

Villages : Zarpara ,Siracha, Gundal , Kukadsar
Out put:- Cattle relayed for one Month due to fodder Production

Cattle Health camp
we had arranged Cattle Health Camps, in close coordination with Government Veterinary doctors and the Animal Husbandry Department, dedicated to ensuring the crucial veterinary care to a significant number of cattle, effectively addressing their immediate health needs. To date, we have successfully treated more than 500 cattle, ensuring their health and vitality.

799413 Kg Dry Fodder Support

2353303 Lac Kg Green Fodder Support

24 Beneficiary Villages

16000 Cattle benefitted :-

Sustainable Livelihood –Fisherfolk Community

Education

Vehicle Transportation Facilities
We extend vehicle transportation services to school-going children from Luni and Randh Fishermen Settlements to the AVMB School, Bhadreshwar Similarly, we ensure for Juna Bandar Fisherfolk Students to the nearest Government School and enable them to school for regularity and easy to reach school.

Funded By AF - 165 Students
Funded By - 53 Students

Education Kits Support
Education Kits including notebooks, guides, and bags, to fisherfolk students studying in 9th to 12th standard to enhance their learning experience

Funded By AF - 15 Students
Funded By GPVC - 42 Students

Outcome

- Increased Attendance- 75%
- Enhanced Learning: 20%
- Parental Engagement:- 25%
- Cultural Shift:-10%

Educational awareness sessions were conducted in four Fisherfolk Vasahat of GPVC Villages to highlight the importance of education, with a particular focus on promoting girl-child education.
Primary Schools - 445 Students
Secondary Students - 42 Students

Youth employment
Our main objective is to offer sustainable employment opportunities to the local fishing community in APSEZ Mundra. We bridge the gap between industries and Fisherfolk youth by facilitating job placements.
Currently, we have successfully engaged a total of 12 Fisherfolk youth in this endeavor.

Scholarship Support
We are deeply committed to empowering the future of fisherfolk communities through education. To this end, we provide scholarship support to 30 deserving students, covering their actual school fees. In our unwavering commitment to promoting gender equality and advancing girl child education, we extend 100% fee support to female candidates and 80% to male candidates."

*** Funded by – Mundra Petrochemicals Limited**

Sustainable Livelihood –Fisherfolk Community

Cement Roof Sheet Support

fisherfolk Home were significantly damaged by the Bipor 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."

Potable water Distribution

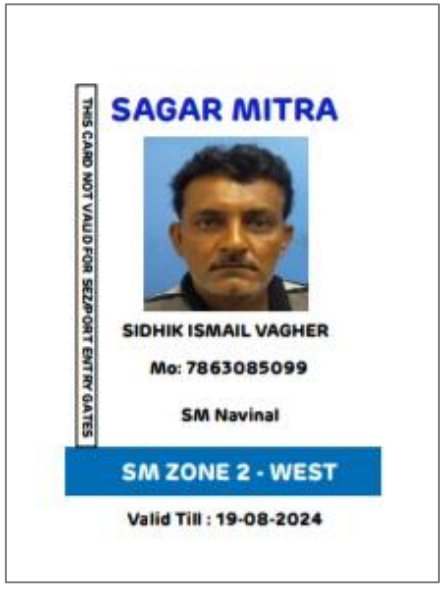
Providing access of potable Drinking water Facilities to Nine sherfolk vasahat on Daily bases, either By Water tanker or Linkage with Nearest Gram panchayat.

More than 5000 Fisherfolk Population are getting benefit which impact on their health and efficiency.

Sr. no	Vashat Name	Population	Water Quantity in KL
1	Luni Bandar	401	15000
2	Bavdi Bandar	535	20000

Sagar Mitra

We have 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."



Women Empowerment

Project Saheli

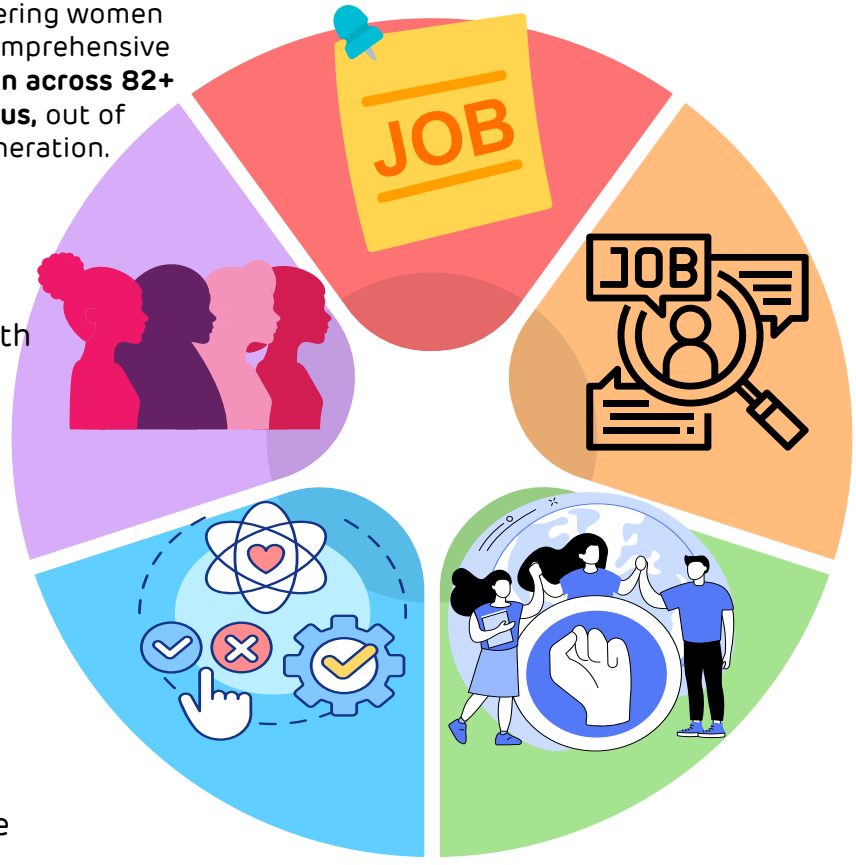
- Kutch Copper Limited is dedicated to empowering women both financially and socially. To that end, a comprehensive training program that has reached **850 women across 82+ Self Help Groups with 30+ Lacks saving Corpus,** out of which 5 groups have outstanding revenue generation.

Self Help Groups

- 82 Self Help Groups in coordination with National Rural Livlihood Mission.
- 850+ Members
- 31 Lacs Saving Amount Corpus

Making SHG Self Reliant

- 16 SHG are on path ways of self reliance.
- Various handicraft, dry and fresh food making, stitching, tie and die etc.
- 160+ women - Monthly average income @ 7000 of each member oer 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
- 387 Women supported till date for job sourcing of 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

*** Funded by – Kutchh Copper Limited**

Women Empowerment

Menstrual Hygiene Awareness

Objective :-
To educate and empower rural girls and women about menstrual health, break down negative social views on menstruation, supply to enhance their overall health, education, and empowerment."

18 Villages

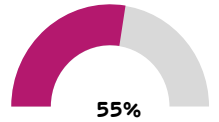
1587 Women participated

494 School girls

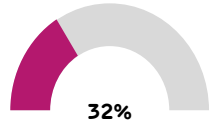
Till date 36% women had never used sanitary Napking single time now they started using due to our intervention. This will reduce UTI @ 22%. As our sample survey

Process

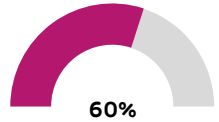
- Conducted Awareness Session at Village level
- Awareness Session at Schools
- Provide Sanitary pad
- Feed back and Evolution



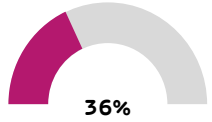
Women Never heard about Menstrual hygiene



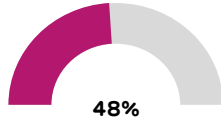
Women faced mild infection in life-time



were using cloths on regular basis



Women had never Used sanitary pads



Women had no information about UTI

Source :Women Sample Survey Report July 2023

*** Funded by – Kutchh Copper Limited**

Women Empowerment

Millet Program

Village Name	Women Participated	Millet dish prepared
Bidada	67	22
Moti Bhujpur	61	12
Mundra	50	20
Mota Bhadiya	50	22
Mandvi	50	24
Siracha	40	14
Tragdi	24	13
Nani Bhujpur	37	23
Kandagra	36	15
Navinal	36	24
Nani-Khakhar	36	18
Nana Bhadiya	25	12
Deshalpar	33	17
Total	**545**	**236**

*** Funded by – Kutchh Copper Limited**

International year of Millets-2023

With the vision of promoting the culture touch, awareness, benefits and consumption of millets in Mundra, we conducted Millet competition in Nine villages.

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, and facilitating access to clean drinking water for villagers.

GPVC

Restrengthening & Desilting of Check dam – 720+ Benefited

Road Renovation and Civil Maintenance Work at Fisherman Vasahat – 600+ Benefited

Construction of Pipe Culvert – 400+ Benefited

River Cleaning and JCB Support - 2250+ Benefited

10 JCB Support for 45 days to Farmers for Cleaning Vadi vistar after cyclone – 1650+ Benefited

6 Percolation Bore well Recharge – 4000+ Benefited

KCL

4 location Pipe Support – 4800+ Benefited

Renovation of High School at Zaarapa – 2200+ Benefited

Renovation of Approach road Vadi Vistar at Mota bhadiya village.- 7200 Benefited

3 Villages - Renovation of Godown and Gaushala Shed

Community Infrastructure Development

377 - AC Roof sheet support to Fisherfolk Vasahat – 1700+ Benefited

2 Development of Common Gathering flooring work – 4000+ Benefited

195 Stall – Vegetable market– 900+ Benefited

Solar Panel System at Mundra – 600+ Benefited

Maintenance, Fencing & Material Support - 30+ Benefited

Renovation of Shed at Shekranpir Bhopavandh - 2000+ Benefited

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.

Connect With Government & community

Health teams and ambulances on standby in case of emergency.

Health Team

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

AWAZ DE

4500+ Workforce migration with basic amenities.

Relocate to a secure location

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

Duty delegation

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-oridnate with Gram pancahayat 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

Some Glimpses of BiporJoy Relief Work

PROJECT UDAAN

202 institutes visit

5 Corporate visit

13226 Participants

The Project Uddan is an educational initiative led by the Adani Foundation, with the overarching goal of inspiring students to think big through a comprehensive educational mission. As part of this initiative, educational tours are organized, allowing school and college to visit various Adani Group facilities, including Adani Port, Adani Power, and Adani Wilmar refineries at different locations. These tours provide valuable insights for students to aspire for great achievements in their own lives. Moreover, the project enhances students' learning experiences and encourages them to envision themselves as future entrepreneurs, innovators, and leaders.

During six month Udaan project had conducted 202 institutes visit and 5 corporate visit. Total 13226 participants (7688 Male Students, 4861 Female Students and 677 Faculties).

Adani Skill Development Centre

Total Admission in Both centre 2023-24

Mundra

Courses	Female	Male	Total	Revenue Generated
Digital literacy	4	3	7	4130
Hydrography	-	3	3	15,000
Advance Excel training	-	18	18	18,850
RTG Crane Operator	-	15	15	1,50,000
Mud work	30	-	30	Fees Received on F.Y. 2022-23
Solar Technician	-	-	Training Completed on F.Y. 2022-23	42260
Total	**34**	**39**	**73**	**2,30,240**

Bhuj

Courses	Female	Male	Total	Revenue Generated
Digital literacy	34	10	44	25960
Hydrography	-	9	9	45,000
EDP – Tie up with CED	09	21	30	14500
GDA	14	09	23	1,35,280
5 S	-	01	01	590
Interview Skills	-	01	01	00
Industrial Safety	-	01	01	3540
Total	**57**	**52**	**109**	**2,24,870**

Adani Skill Development Centre, Mundra

Digital Literacy

Digital literacy training was provided to seven students at Bhujpur Government High School, and as a part of the DEO project, certificates were distributed .

RTG Crane operator

RTG crane operator training is successfully given to 15 candidates.

Beauty therapist

The distribution of certificates for beauty therapist training celebrated the successful culmination of the program

Mud work

After the mud work training in Dhrab Village, a certificate distribution ceremony was held, benefiting a total of 30 female participants.

Advance Excel training

Eighteen employees from Sumitomo India Ltd. Co. underwent advanced Excel training, significantly boosting their skills.

Adani Skill Development Centre, Bhuj

Digital Literacy

ASDC has partnered with Tally as the Knowledge Partner for its Tally - GST course. The first batch, consisting of 16 students from Bhuj location, achieved a remarkable 100% pass rate.

Real-time exposure

Twenty-five Nursing Assistant trainees gained valuable real-time experience in Emergency services through interactions with 108 Ambulance services and an industry visit.

We offer on-the-job training to nursing students to build their confidence and prepare them for delivering high-quality patient care.

Hydrography training

Provided practical Hydrography training to nine participants.

Entrepreneurship Development Programme (EDP)

Conducted EDP training in collaboration with CED, Gandhinagar, for a total of 30 trainees.

Placement

We successfully hosted a placement drive at our center on April 23rd, where 11 out of 15 candidates secured positions at KK Patel Hospital with an impressive average monthly salary of Rs. 17,000.

AKBPTL - TUNA

ADANI KANDLA BULK TERMINAL PVT LTD -TUNA

Potable Water Distribution
Potable water (17.5 KL per Day) Distribution to Vira and Dhavlvaro Bandar on regular base through Water tanker Regularly through **AKBTPL and GWIL**

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

Total 7410 Kg Dry and 447473 Green Fodder Distribution 1228 3 Villages1228.

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.

The paver block work at Vandi and Tuna Common Gathering which enhances their usability and convenience for the community. During the monsoon season, certain areas of Wandi village get waterlogged , .we took measures to clean and address the issue Immediately.

AGEL-Dayapar

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, it 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, PTC India

Sr. No.	CSR Activities	Beneficiaries	
1	Ayushman Health card Camp	86	Nana Valaka & Mota Valka
2	General health camp	267	Nana Valaka & Mota Valka Ghadani, Paneli
3	Animal Health camp	1,500+	Gahadani
4	Tree Plantation	5,435	AGEL Surrounding Villages

Village Name									
Village Detail	Mota Valka	Paneli	Ghadani	Ludbay	Amara	Muru	Deshalpar	Haroda	Total
Total Household	224	87	357	278	700	218	351	120	2335
Population	926	520	2224	1509	1913	1329	2025	718	11164
Male	473	261	1110	807	943	696	1026	379	5695
Female	453	259	1114	702	970	633	999	339	5469
BPL	79	34	155	83	180	123	138	24	816
ICDS-Anganwadi	2	1	2	1	2	1	1	1	11
Children Number	180	18	112	35	65	35	32	15	492
Primary School	2	1	2	1	2	1	1	1	11
Students	298	61	242	145	325	143	237	40	1491
Higher secondary School	No	No	No	No	1	No	1	1	3
Students					35		63	20	118
Disable Person	3	3	11	7	5	2	6	5	42
Pond/Chackdams	9	12	8	8	8	6	4	7	62
Two Wheeler	125	40	100	37	80	47	117	40	586
Four Wheeler	25	10	30	15	30	21	38	3	172
Loading Vehicle	1	2	1	6	3	7	9	4	33
Cattle Poppulation	3905	672	1937	3911	1375	1250	1375	1250	15675
Cow	100	166	180	100	175	230	80	100	1131
Buffalo	3750	162	367	3756	350	220	325	250	9180
Sheep/Goat	55	344	1390	55	850	800	970	900	5364
Total Milk Production-(Ltr)	1520	1000	1100	1400	514	700	550	600	7384
Dairy	2	1	2	1	2	1	1	1	11
Land Details (Accor)	2112	3009	2914	268	3154	5678	2015	2043	21193
Farming Land (irrigated)	452	447	805	10	914	317	715	450	4110
Non Irrigated	345	300	510	94	720	335	93	110	2507
Gauchar & Other Land	1315	2262	1599	164	1520	5026	1207	1483	14576
Health Facilities									0
PHC	1	1	1	1	1	1	1	No	7
CHC	No	No	No	No	1	No	1	No	2
Drinking Water									
Home connection	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Sanitation									
Toilet facilities	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Electric Facilities									
Individual home connection	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Women SHG	7	3	8	2	1	5	11	No	37

AGL Khavda

Adani 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 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[1].

It is expected to play a major role in fulfilling India's vision of generating 450 gigawatts (GW) of renewable power by 2030

Tree plantation:- We distributed 650 tree saplings to primary schools along with an awareness session highlighting the importance of trees.

Ayushman Card Facilitation to Dinara, Khavda, Birndiyari, Gorivalli Villages. Total 311 Card Issued.

We have conducted Primary baseline assessments and created Village profile of 07 villages and identify their specific needs, aspirations, and developmental potential.
Though we have started some entry point activities and Based on Village profile data Initially we will start Project Utthan and Some Health and Livelihood projects.

Village Name								
Village Detail	Mota & Kotada	Kuran	Mota Dinara	Nana Dinara	Khavda	Tuga & Jam Kunariya	Khari	Total
Total Poppulation	5500	1800	7500	4000	11000	3300	3600	36700
Total Family	700	300	3000	2500	800	673	470	8443
SC	NO	YES	NO	NO	YES	NO	YES	
ST	NO	NO	NO	NO	YES	NO	NO	
OBC	YES	YES	YES	YES	YES	YES	YES	
General	NO	YES	NO	NO	YES	NO	YES	0
BPL	35	60	500	300	37	500	100	1532
ICDS-Anganwadi	YES	YES	YES	YES	YES	YES	YES	
Children Number	250	45	350	200	300	300	150	1595
Primay School	YES	YES	YES	YES	YES	YES	YES	
Secondary School	NO	YES	NO	YES	YES	YES	NO	
Higher secondary School	NO	YES	NO	NO	YES	NO	NO	
Above 18 to 30 Yrs: 10th pass	15	200	60	12	40	50	40	417
Disable Person	40	12	100	17	10	15	25	219
Senior cityzone	100	100	100	500	500	80	300	1680
Widow	50	60	60	50	20	30	60	330
Unemployed Youth	200	45	40	20	50	120	100	575
Two Wheeler	150	150	250	50	300	70	200	1170
Four Wheeler	15	50	50	25	80	15	20	255
Loading Vehicle	10	43	50	90	100	57	30	380
Cattle Poppulation								
Cow	3400	400	4000	6000	250	8000	3000	25050
Buffalo	3000	350	3000	300	1500	600	10000	18750
Sheep	200	100	1000	1500	50	360	150	3360
Goat	600	2000	2500	200	800	3300	2500	11900
Total Milk Production-(Ltr)	1500	600	2000	6000	3000	3200	4000	20300
Dairy	2	2	3	4	2	2	2	17
Land Details (Accor)								
Farming Land	1000	2500	12500	3200	741	2000	600	22541
Gauchar	200	4500	2000	1800	100	412	480	9492
Health Facilities								
Sub-PHC	NO	YES	YES	NO	NO	NO	YES	
PHC	NO	NO	NO	YES	NO	NO	NO	
CHC	NO	NO	NO	NO	YES	NO	NO	
Drinking Water								
Home connection	YES	YES	YES	YES	YES	YES	YES	
Sanitation								
Toilet facilities	NO	YES	YES	YES	YES	YES	YES	
Electric Facilities	YES	YES	YES	YES	YES	YES	YES	
Individual home connection	YES	YES	YES	YES	YES	YES	YES	
Women SHG	NO	NO	NO	NO	NO	NO	NO	
Sakhi mandal	NO	NO	NO	NO	NO	NO	NO	

Sanghi Cement

Sanghi Cement, located near Moti ber village of Abdasa block , in Kutch, Gujarat. stands as a notable player in the cement industry. The company's presence in the region has a significant impact on the local economy and community.

We have conducted Primary baseline assessments of sanghi Cement Periphery 10 villages. The primary objective of this initiative is to gain a deep understanding of the socio-economic and environmental conditions of these villages, to identify their specific needs, aspirations, Based on that We will design Comprehensive CSR Projects in the core of education, healthcare, livelihood enhancement, women's empowerment,.

6.6 MMTPA capacity Clinker Plant

6.1 MMTPA capacity Cement Plant

143 MW capacity power plants

Village Name											
Village Detail	Nani Ber	Moti ber	Vayor	Hothaiy	Aakri Moti	Nava Vas	Golay	Pakho	Jadva	Pipar	Total
Total House Hold	137	606	1129	116	227	79	288	39	732	192	3545
Poppulation	478	2205	4027	534	426	215	642	130	254	881	9792
Male	248	1272	2715	266	224	111	316	72	373	429	6026
women	230	933	1312	268	202	104	326	58	359	452	4244
BPL											
0-16 Roster	17	24	39	7	51	13	8	9	12	41	221
0-20 Roster	53	56	76	18	70	20	44	11	25	76	449
others	36	21									57
ICDS-Anganwadi	1	3	4	1	2	1	2	0	1	1	16
Children Number	32	122	284	66	34	27	87	0	31	26	709
Boy	20	80	169	35	22	15	45	0	20	15	421
Girl	12	42	115	22	13	12	32	0	11	11	270
Primay School	1	3	2	1	2	1	1	1	1	4	17
Studnets Number	114	401	407	93	59	21	136	19	141	203	1594
Boy	64	213	219	35	33	11	74	8	72	100	829
Girl	50	188	188	22	26	10	62	11	69	103	729
Secondary School	NO	NO	1	NO	No	No	No	NO	No	No	1
Studnets Number	4	4	55	0	5	0	3	0	8	6	85
Boy	0	0	37	0		0		0			37
Girl	0	0	18	0		0					18
Higher secondary School	NO	NO	YES	NO	NO	No	No	0			0
Arts stream-Students	8	5	18	0	0	0		0	10	0	41
Science Stream	No	0	4	0	0	0		0			4
Agriculture											0
Farmers	55	85	151	35	84	15	63	0	53	43	584
Gruh Udhuog	1	0	0	0	0		0	0			1
Cattle Poppulation											0
cow	137	430	366	61	212	350	276	180	1228	581	3821
Buffalo	429	537	426	310	224	43	551	227	1127	841	4715

Village Name											
Village Detail	Nani Ber	Moti ber	Vayor	Hothaiy	Aakri Moti	Nava Vas	Golay	Pakho	Jadva	Pipar	Total
Land Details (Hector)											
Forest	195	191	0	0	0	432	1098	513	0	0	2429
not usable	128	35	406	0	705	116	23	399	1020	4236	7068
Non agri	386	323	35	466	35	0	16	478	1543	9	3291
barred	444	760	209	154	893	24	0	60	96	634	3274
Farming Land	710	281	1083	134	710	66	1167	0	338	400	4889
Gauchar	0	83	113	48	1142	0	32	128	398	98	2042
others					118						118
Irrigation Land-(Hector)		0									0
Canal	102	0	0	0		0	0	0	0		102
well	35	80	50	44	3	0	0	0	0	200	412
lift irrgation	15	44	0	0		0	16	0	56		131
Health Facilities											0
Sub-PHC	No	1	2	No	No	No	No	No	No	1	4
PHC	No	No	1	No	No	No	No	No	No	No	1
CHC	No	No	No	No	No	No	No	No	No	No	0
District Hospital	No	No	No	No	No	No	No	No	No	No	0
Drinking Water											0
Home connection	85	227	990	116	172	79	288	39	254	102	2352
without connection	52		139	0	25	0					216
Sanitation		227									227
Toilet facilities	137	227	990	116	167	60	288	39	200	100	2324
without drainage connection	50		840	0	30	19			54		993
Electric Facilities											0
individual home connection	137	227	990	116	113	60	91	37	240	100	2111
Agri connection	35		10	7	7	0		10	30	2	101
Women SHG	2	2	3	0	1	0		0	3	2	13
Sakhi mandal	11	12	23	4	1	0	5	0	4	15	75
Others											0
Senior Citizen card	5	3		2	21	2	2	0	2	10	47
Widow Penson	1	1		4	3		1	1	26	8	45
Ayushman Card	20	35		32	24		0	0	0	0	111
Disable Pension			3		0		1	0	2	0	6
LPG Gas	58	1	780	10	19	10	60		100	15	1053

ATL-Mandvi & Rapar Block Villages

Adani Transmission is a company active in the power transmission and distribution sector in India and internationally. It holds a significant position as one of India's largest private sector power transmission companies, with a combined network spanning over 12,000 circuit kilometers. We wil start CSR initiatives in 12 villages located within the Mandavi and Rapar Block areas, intersected by the Adani Transmission Line."

We have conducted Primary baseline assessments and created Village profile of 12 villages and identify their specific needs, aspirations, and developmental potential. Based on that We have started CSR Activities in the core of education, healthcare, livelihood enhancement, women's empowerment,.

Village Name							
Village Detail	Kidiyanagar	Bhimasar	Moti khakhar	Gangapar	Moti Bhadai	Nani Bhadai	Total
Total House Hold	1300	1765	436	80	250	116	3947
Poppulation	9000	15000	2139	272	1171	498	28080
BPL	250	290	50	1	31	10	
ICDS-Anganwadi	10	10	1	0	1	1	23
Children Number	30	600	34	0	38	20	722
Primay School	10	13	2	1	1	1	28
Studnets Number	1083	1547	246	6	160	160	3202
Secondary and high secondry School	125	245	144	0	120	NA	634
Agriculture							0
Farmers	650	750	150	80	200	105	1935
Gruh Udhuog	1	0	1	NA	NA	NA	2
Cattle Poppulation							
Cow	400	750	700	100	686	600	3236
Buffalo	2600	1000	500	NA	768	188	5056
Sheep	1500	2500	1000	NA	100	NA	5100
Goat	1500	2500	1000	NA	200	NA	5200
Land Details (acers)	16702	4777	1000	3000	10460.00	4637	40576
Forest	0	100	NA	50	0	NA	150
not usable	1500	100	NA	200	1000	NA	2800
Non agri	NA	386	NA	300	1000	2537	4223
barred	NA	444	NA	450	NA	NA	894
Farming Land	11500	3500	600	1800	7800	2000	27200
Gauchar	3000	237	400	200	600	100	4537
Irrigation Land-(Hector)		0					
well	550	650	150	80	200	105	1735
lift irrgation	100	100	100	60	150	80	590
Health Facilities							0
Sub-PHC	1	1	1	NA	NA	NA	3
PHC	1	1		NA	NA	NA	2
CHC	No	No		NA	NA	NA	0
District Hospital	No	No		NA	NA	NA	0
Drinking Water	1300	1765	436	80	250	116	3947
Home connection	1300	1765	436	NA	250	116	3867
without connection	0	0	0			NA	0
Sanitation							0
Toilet facilities	1200	1650	400	80	200	100	3630
without drainage connection	100	115	36	NA	50	16	317
Electric Facilities							0
individual home connection	1300	1765	436	80	250	116	3947
Agri connection	600		1	80	NA	105	786
Women SHG	2	2	1	NA	200	0	205
Sakhi mandal	10	12	3	NA	1	1	27
Others						0	0
Widow Penson	400	400	40	5	50	25	920
Disable Pension	60	55	13	2	11	10	151

Events

Mother's Day Celebration

On May 14th, we celebrated Mother's Day in Mundra. Mrs. Chhaya ben Gadhvi, former District Education Chairperson of Kutch, delivered an inspiring speech about the importance of mothers in shaping families and our nation's future. More than 200 Mother had participated.

Inauguration of Ground water Recharging projects

On May 17th, Inaugurated a groundwater recharging project involving 21 percolation wells. We were honored to have notable attendees, including Mr. S.K. Prajapati (DDO Kutch), Mr. Rakshit Shah (EDM, APSEZ, Mundra), Mr. Mahendra Gadhvi (Chairman, Kutch Jilla Panchayat), and local Taluka Panchayat Presidents at the event.

Employee Volunteer Program

On May 14th and 15th, 2023, in Samudra Township, Mundra, the Adani Foundation organized a "Joy of giving" in partnership with the Indian Coast Guard Station, Mundra, with the noble aim to assisting those in need with essential items. We gathered old but usable clothes, utensils, and books to provide support to those less fortunate.

Organic Vegetable Shop Inauguration

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 open market

Events

Launching Of "Prakruti Rath"

On June 2nd, 2023, Adani Foundation Mundra and Kutch Copper Limited, along with the Government of Gujarat's Social Forestry Department, launched "Prakruti Rath," a 30-day environmental initiative aimed to distribute 50,000 tree saplings to 61 villages via an innovative vehicle that educates about environmental awareness.

Vegetables Kitchne Garden Kits Distribution

On June 3rd, Mundra Petrochemical and Adani Foundation celebrated World Environment Day in collaboration with the District Horticulture Department and distributed kitchen garden kits to over 500 farmers. In the Esteemed presenece of Mr.Amit Arora Collector Kutch.

State-level Kabaddi Tournament

State-level Kabaddi tournament was scheduled through The Maharana Pratap Group of Bhujpur ,more than 21 teams had participated from across Gujarat. We sponsored Rs. 25,000 to The winning team Rs. 15,000 to runner sup Team . We continue to support and encourage young talents for their growth and achievements..

Inauguration of Dates Restoration

Adani Foundation surveyed cyclone-caused agricultural crop damage, particularly date trees. They initiated a comprehensive project in partnership with KVS to restore the trees, commencing on June 24th in the presence of Mr. Anirudh Dave, MLA of Mundra-Mandvi, and Mr. Rakshit Shah, Executive Director of APSEZ, Mundra.

Events

Education Kits Distribution

On June 23rd, Mundra Petrochemicals organized a special program to distribute education kits to students in grades 9 to 12 from the Fisherfolk community. Mr. Omprakash Sir, representing Mundra Petrochemicals, shared an inspiring message about the Important of education. 40 students had benefited.

Inauguration Of Vegetable Market

Adani Foundation developed the Vegetable Market in Mundra, offering 195 stalls for convenient vegetable trading. It was handed over to Mundra Nagarpalika on June 24th, with Mr. Anirudh Dave (MLA Mundra-Mandavi) and Mr. Rakshit Shah (Executive Director of APSEZ, Mundra) present.

Guru Purnima Day Celebration

On July 3rd, Project Uthhan Mundra celebrated Guru Purnima Day across 69 primary schools and 8 high schools. The day commenced with a special prayer dedicated to the teachers (Gurus), followed by engaging activities such as drama performances and elocution competitions among the students.

Millet Food Competition

AF organized a Millet Dish competition on July 14th. in Collaboration of ICDS Department.Top three winners were recognized, and rewarded them, encouraging millet-based cooking

Events

Conservation of the Mangrove Ecosystem

On July 26th, Mundra Petrochemical celebrated Mangrove Day with spreading awareness over 9th and 10th-grade students and Fisherfolk The session ended with a Mangrove plantation. 150 + People had participated.

Kala Utsav Program

Kalautsav program was organized in collaboration with the District Education Department, on the 11th of August. The event was featured with various competitions, including drawing, singing, and instrumental playing. 70+ students from secondary and higher secondary schools from42 School of Mundra had participated..

Rakshabadhan Celebration

On Rakshabandhan, eco-friendly Rakhi making competition took place in all Utthan schools of Mundra. 46 exceptional girl students tied their Rakhis to BSF soldiers in Jakhau as a gesture of respect and gratitude.

Dr. Priti G Adani mam's 58th Birthday

On August 29th, Mundra Petrochem Ltd. marked Dr. Priti G Adani's 58th birthday with three impactful initiatives: 8,000 tree plantings in Deshalpar village, 500 sapling distributions at Government High School, and a workshop for 60 farmers on sustainable farming, all geared towards enhancing the local ecology and community resilience.

VVIP and VIP visits

Kajal Oza – Vaidhya

Famous Gujarati author and motivational speaker Mrs. Kaajal Oza Vaidya visited our Natural farming fields in Mangra village.

Fulcrum Batch 0

HODs of different business group of Adani came for CSR visit of Batch-0 as part of Fulcrum Leadership Development Program at Mundra.

Jay Vasavda Visit

Famous Gujarati writer and orator Mr. Jay Vasavada had visited our CSR work.

Pranav Adani Sir's Visit

Mr. Pranav Adani, along with other VIP guests, visited the Mangrove Plantation area in Luni coastal.

VVIP and VIP visits

VIP Visit : Ms. Lisa

Mrs Lisa MacCallum, Independent Director of Adani Energy Solution had visited our CSR work at Mundra.

VIP Visit – Sairam Dave

Mr. Sairam Dave, a renowned humorist and educationalist, visited Uthhan to inspire and motivate the students and teachers.

Journalist Visit

All journalist team came from Jarkhand ref by Ms. Varsha Chainani. They visited Women Empowerment and Agriculture Projects

AVMB Visit – Sairam Dave

Mr. Sairam Dave, a renowned humorist and educationalist, visited AVMB to inspire and motivate the students and teachers.

Award & Recognized

The Gujarat State Disaster Management Authority has acknowledged Adani Ports and SEZ for their outstanding support in establishing the world's top-ranking Miyawaki forest at Smruti Van, Bhuj. The Adani Foundation team actively monitored the project's advancement and made frequent site visits to ensure effective coordination..

Mr. Rajubhai, a team member of the Adani Foundation, was honored with the District Level Van Mitra Award by the District Administration during the 74th Van Mahotsav for his outstanding contributions to intensive tree plantation initiatives.

Case Study

A Breath of Change: Soanbai's Bio Gas Journey

Sonbai Vishram, a diligent 46-year-old woman, resides with her close-knit family in Vadi Vistar, Zarapara. She oversees a herd of 13 cattle with enthusiasm while caring for her seven family members. However, her life was far from easy. Every day, she would wake up at the crack of dawn and head into the dense farm to gather firewood. The Chulha, a traditional clay stove, was her only means of cooking, but it came with a hefty price.

Chopping wood and inhaling the thick smoke took a toll on Sonbai's health. Her eyes stung, her chest felt heavy, and she often found herself coughing uncontrollably. Furthermore, a lot of time is consumed by cutting wood. She deeply longs for more moments with her family, rather than devoting all her time to woodcutting; this sometimes leads to feelings of regret and sadness.

Seeing her mother's condition, her daughter Jetbai felt deeply disheartened. Fortunately, she learned that Mundra Petrochem was distributing biogas through a government-funded project "Gobardhan" to assist those in needs. She reached out to the Mundra Petrochem team, and upon witnessing her helplessness, they extended their support. They took full responsibility for all the documentation, registration, banking work, and installation. They also cover 50% of beneficiaries' biogas expenses. Additionally, they offered comprehensive training in biogas usage and maintenance, along with regular follow-up visits.

As soon as the biogas stove was up and running, Sonbai's life began to transform. Cooking became a breeze, and the air in her kitchen was free of choking smoke. Now, after eight months of using biogas, Sonbai's health has shown remarkable improvement, and she feels more energetic than she has in years.

She couldn't believe the remarkable transformations that had occurred in her life. Now, whenever she meets our team, she expresses her gratitude, and witnessing her radiant smile and heartfelt thanks, we find the true reward for our efforts.

Rising Above the Menstrual Taboo

This is a story of Laxmiben and many women like her living in Zarpara village. As women, they have the incredible gift of giving birth, but they also go through the monthly menstrual cycle. However, in many villages, including Zarpara, menstruation is considered a taboo topic. Women are often hesitant to talk about their personal experiences, and many don't even know about the menstrual cycle and its science.

Seeing the challenges faced by these women, Devalben and Roopaben, with the support of the Adani Foundation, organized a menstrual hygiene awareness camp in Zarpara. In this camp, they provided education about menstrual health to all the women. In just a short session, women began to open up and talk freely about their experiences. They revealed that they had never used menstrual products and typically relied on old, used cloths. In addition to this, their daughters had to miss school due to a lack of resources and the uncomfortable feeling during their periods.

Hearing these stories, Devalben and Roopaben explained the harmful effects of using old cloths and not maintaining proper hygiene during menstruation. They introduced the women to different menstrual products and taught them how to use and dispose of them correctly. They also discussed the various health issues that could arise from poor menstrual hygiene. Many women realized that they had experienced symptoms of these health problems but had never paid attention to them.

To help the women understand better, they showed an informative video about the menstrual cycle. After the session, the women felt grateful for the knowledge they had gained. Many of them admitted that they had never taken menstruation seriously before but were now committed to practicing proper menstrual hygiene. Those with symptoms of menstrual health issues decided to seek medical advice and treatment. All the women pledged to use sanitary pads regularly and ensure that their children's health and education were not affected by menstruation.

Our team was equally delighted that these women had broken free from the menstrual taboo and were determined to prioritize their menstrual hygiene.

Mayuri's Journey: A Tale of Determination and Hope

Mayuri comes from a simple middle-class family with four sisters. Her mother is a homemaker, while her father is a wage earner. They didn't have a lot of money, and life was tough.

Despite the financial hardships, Mayuri applied for the PSE exam, hoping it would open doors for her future education. She embarked on this journey alone, being the sole girl in her class brave enough to take on the competitive exam.

Mayuri's life took a hopeful turn when she crossed paths with Utthan Sahayak. This mentor provided her with a comprehensive guide for the PSE exam. This guide was like a lifeline for her. It made her feel more confident and less confused.

Mayuri was determined to succeed. She worked really hard. She found books and old exam papers to study from. She even watched videos on YouTube to learn more. She spent 2-3 hours studying every day, sometimes giving up fun things to focus on her studies. She didn't keep all that knowledge to herself; she shared what she learned with her friends and even during school prayers.

Mayuri went to the library often and used teaching and learning materials to learn more. She read a lot and practiced so much that she became really good at school competitions and public speaking. Her general knowledge improved and she became an expert in Gujarati grammar.

But, despite all her hard work, Mayuri didn't get the top score in the PSE exam. It was really disappointing for her. She had worked so hard, and it felt like all her efforts were in vain. But, it wasn't all bad. This experience taught her to never give up and to keep hoping for a better future.

The Magic of Practice: a remarkable Handwriting Transformation

Buchiya Nita, a diligent third-grade student at Gundala Kanya School, faced a deep-seated issue - her handwriting. Despite the correctness of her content, her messy handwriting often cast a shadow on her answers, making them appear incorrect. She held a belief that her handwriting would never improve and that it didn't hold much significance.

One fateful day, a compassionate Utthan Sahayak named Chauhan Kinjalba stepped in to assist her. Kinjalba aimed to aid Nita in enhancing her handwriting and enlighten her about its importance. Kinjalba noticed the errors Nita made while writing and gently pointed them out, allowing Nita to rectify them independently.

Nita's daily homework included writing a paragraph. Through persistent practice and unwavering commitment, her handwriting gradually became neater over several months. The ultimate test arrived when a calligraphy competition was organized. To the delight of everyone, Nita secured the second position in the competition, and her heart brimmed with joy at the remarkable improvement in her handwriting.

From a mischievous troublemaker to a responsible scholar

The teacher-student relationship is like the two wheels of a cart. When both wheels work together smoothly, the cart goes forward without any interruption. However, if one wheel comes loose, the cart stops in its tracks.

One such story revolves around Kumbhar illiyash, a student at Gundala Kumar School. Utthan Sahayak learned from teachers and fellow students that Illiyash was quite mischievous. He occasionally took items from other kids in class, sometimes bothered his classmates, disrupted the class with his behavior, and frequently seemed disinterested in his lessons.

Utthan Sahayak decided to have a loving and understanding conversation with Illiyash to encourage him to change his behavior. They would sit together every day, and she would teach him new habits and engage him in various activities. Gradually, Illiyash started developing an interest in learning, and with consistent effort and engaging activities, his active mind was redirected toward education, leading to a positive change in his behavior.

Just as milk and curd complement each other, Illiyash, once a mischievous child, has transformed into a well-behaved student today.

Raisingh's Inspiring Journey: Overcoming Disability to Find Independence

This is the story of Raysi maheshwari, who lives in Mota Kapaya village. When he was just 2 years old, he was affected by polio, and as he grew, 75% of one of his legs became nonfunctional. His childhood was different from other kids, he faced a lot of difficulties in doing daily tasks and had to depend on others. It's truly hard to put into words the profound difficulties he endured because of his condition. In the face of disability, Raysi's thirst for education and his refusal to depend on others for his livelihood remained unwavering. His determination was unbreakable, and he fearlessly confronted every obstacle that crossed his path.

Raysi completed his education up to the 12th grade and started searching for a job to become financially independent. However, transportation was a big challenge for him. He had to walk long distances many times, even though it hurt because of his disability.

Fortunately, in 2021, he learned about a job fair organized by the Adani Foundation on World Divyank Day. He decided to participate and impressed the interview panel with his skills. As a result, he got a job as a Gate operator at Rangoli Gate, Adani Port with a monthly salary of Rs. 13,000. Because of his dedication and hard work, his salary was later increased to Rs. 18,000 within a short time.

In addition to the job, he received medical certificates and continuous support from our team. Raysi is married now and has two children. His wife is also disabled, and the Adani Foundation supported her with a wheelchair. Now, she can efficiently manage household chores in less time.

Raysi and his family deeply appreciate these assistances. He now earns enough to provide for his family and support his children's education. The family is no longer financially dependent on anyone and lives with dignity and happiness. The Adani Foundation feels fortunate to witness the positive changes in the lives of people like Raysi, and consider it as the most meaningful reward for their efforts.

Shaping Lives:
From Pagdiya Fishing to Prosperity

Fisherman of Luni Village, a father of four boys and a girl, toiled tirelessly in the trade of Pagdiya fishing to ensure his family's survival. Despite the inherent vulnerability and daily hardships, he nurtured a singular dream - to provide his children with education and a better quality of life.

Through immense sacrifice and unwavering determination, he managed to educate his children up to the primary level. However, as their education progressed, financial constraints became a significant impediment. Unfortunately, two of his children had to drop out after completing the seventh year of their education due to these financial limitations.

Upon learning about their struggles, our organization reached out to him, extending scholarships to support the further education of his children. This assistance rekindled hope, allowing his second child to rejoin high school. Subsequently, it paved the way for the third and fourth child to continue their studies up to the twelfth grade.
However, our support did not end after their high school graduation. We maintained consistent contact, providing guidance and mentorship to tailored their individual interests and strengths, with the aim of helping them establish their careers.

As a result of our interventions, the children have experienced a remarkable transformation. The eldest, Mr. Altaf, attended RTG training for three months and is now employed as an RTG Operator at Adani Port, earning a salary of Rs. 22,000 per month. The second son found employment at MICT as a supervisor, earning Rs. 17,000 per month. The third child pursued his passion for photography and started his own photography studio, earning more than Rs. 20,000 per month.

Their father, Ali Mammad, expressed his heartfelt gratitude towards the Adani Foundation for their scholarship support, which served as a beacon in shaping their children's lives.

Breaking Waves of Poverty: Empowering Fisher folk through Education

The Fisher folk community resides a significant distance from the main city. Their primary means of sustaining themselves centers on fishing. This community experiences financial hardship and lacks access to education. They are hesitant to explore other professions because they have no education, awareness, or support. The challenging circumstances of their parents also affect the well-being and future prospects of their children.

Due to financial struggles, the children in the fishing community could only manage to complete their primary education before being compelled to join their parents in fishing jobs. This heart-wrenching cycle not only robbed them of the opportunity for a brighter future but also kept their community trapped in the clutches of relentless poverty.

Upon discovering their dire circumstances, the Adani Foundation Team with Mundra Petrochemical empathetically engaged with the children, who tearfully expressed their deep desire for education but sadly acknowledged the lack of sufficient resources to afford the necessities for school.

In an effort to uplift underprivileged children in the community, our team decided to provide them with vital learning materials to alleviate their financial burden. We provided students in grades 9 to 12 with essential educational materials, including textbooks, notebooks, and school bags. This initiative benefited a total of 61 students from the villages: Navinal, Modva, Tragdi, and Zarapara.

As a result of our support, both the children and their parents found substantial financial relief concerning education. This resulted in a decrease in school dropouts, and the children started attending school consistently. They now study without the burden of financial constraints and have a renewed determination to chase their dreams and secure stable jobs.

We consider ourselves incredibly fortunate to have been able to assist these children. Our longstanding wish has been for the children of fisher folk not to be confined to the path of becoming fishermen but to instead pursue education and secure stable jobs, thus breaking the cycle of poverty.

Unleashing Potential: Education beyond Boundaries

Modhva is a small village in Mandvi having a handful population, the life here revolves around the gentle rhythm of fishing. Families struggle with making ends meet as meager earnings barely cover daily expenses. The children in the village receive a basic education, advancing only to classes 5 or 6. Unfortunately, after this stage, a significant number of these young learners are bound to leave school and join their parents in the fishing trade.

Acknowledging the plight of undereducated students, Adani Foundation in coordination with GPVC team organized distinct meetings with both the students and their parents. In a heartfelt confession, the students expressed their eagerness to attend school but due to the lack of a local high school and financial constraints, they were unable to attend the nearby high schools. The parents clarified that their village serves as the last settlement along the coastline. Consequently, because of its remote location, there are no available transportation facilities. Their means of livelihood barely cover their essential expenses, leaving them unable to afford personal vehicles or rely on daily public transportation. Many parents wish to educate their children but feel helpless to do so.

Recognizing the economic challenges faced by the parents and driven by a commitment to educate these vulnerable children, our team stepped forward to assist by offering a complimentary transportation solution. Through firm dedication, we secured a van capable of accommodating twelve students, which has now been provided to the villagers in need. A local resident has been entrusted with the role of the driver, receiving a fair wage for their service.

Since June 2023, a group of six girls and five boys have shown unwavering commitment to attending school in the village of Gondiyali, situated 16 km away from Modhva. The fear of dropping out no longer casts its shadow, and parents are relieved of the burden of transportation expenses.

Upholding the belief that education is a boundless right accessible to all, GPVC team wholeheartedly extend our wishes for a future brimming with opportunities and success for these children.

Shaping Lives:
From Pagdiya Fishing to Prosperity

Imagine finding yourself trapped in the clutches of old age, battling declining health, and struggling with dire financial constraints. What would be Next ? However, within these challenging and circumstances, there are some remarkable stories of individual ,Through his journey, we witness how timely intervention and unwavering support can breathe new life into individuals and their families, igniting a flame of hope, healing, and renewed optimism.
One such story is that of Siddique Bhai Khatri, a 63-year-old resident of Mundra, Kutch fighting a relentless battle with tobacco addiction, succumbs to the merciless grip of oral cancer. As he receives the devastating biopsy report, it not only reveals the grim reality of his failing health but also serves as a stark reminder of his near-empty bank balance. With the exorbitant cost of the necessary operation hovering around 2 lakhs, Siddique Bhai finds himself teetering on the precipice of desperation.

Recognizing the Adani Foundation as a trusted ally in times of health-related crises, Siddique Bhai connected to Kishor Bhai, a representative from the foundation. personally visited Siddique Bhai's home on same day, This gesture of care provided much-needed solace to Siddique Bhai and his worried wife, who openly shared their financial predicament and concerns about the illness.

Understanding the urgency of Siddique Bhai's situation, Kishor Bhai assisted him in swiftly obtaining the Ayushman Card. **Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (PM-JAY), offers comprehensive healthcare coverage of up to 5 lakhs for various hospitalization** within a remarkable 8-hour timeframe. This prompt response and timely access successfully underwent Sidikbhai to the much-needed operation at Adani GK General Hospital.

After a recovery period of 8 days, Siddique Chacha returned home, reinvigorated and ready to face life's challenges anew. Today, two months later, he can be seen in the marketplace, his eyes twinkling with joy and gratitude. Meeting Kishor Bhai, Siddique Chacha's eyes speak volumes, conveying his deep appreciation for the Ayushman Card and the support provided by the Adani Foundation.

As of the date, over 5584 Ayushman cards have been issued, enabling individuals to access essential healthcare services.

Press Note

દિવ્ય ભાસ્કર

કચ્છ ભાસ્કર 25-06-2023

મુન્દ્રામાં નવી શાકમાર્કેટ અઠવાડિયામાં ધમધમતી થશે

નગર અને બારોઇરોડના તમામ લારીધારકોને સ્થાયી થવા પાલિકાનું આહવાન

સ્ટોલ દીઠ રૂા.4500 ભાડું : લાઇટ બિલ પાલિકા ભોગવશે

ગૌતમભાઈ અદાણી ના ૬૧ માં જન્મદિવસની કચ્છ સ્થિત વિવિધ પ્રકલ્પો દ્વારાવિવિધ સેવાકીય કર્યો કરી ઉજવણી કરવામાં આવી

મુંદ્રા તાલુકાના તમામ લોકોને 'આયુષ્યમાન' હેઠળ આવરી લેવાશે

વાવાઝોડાનાં અસરગ્રસ્તોને ભોજન, આરોગ્ય સહિતની અદાણી જૂથની સેવા

ફાઉન્ડેશન દ્વારા લોકોને હજારો ફૂડ પેકેટ અપાયા : રેસ્કયુ ટીમ ખડેપગે રખાઈ

ઉમરપાડામાં ટીબીનાં ૭૦ દર્દીઓને ધારાસભ્ય ગણપત વસાવાના હસ્તે પૌષ્ટિક કીટનું વિતરણ

અદાણી ફાઉન્ડેશન દ્વારા ઉમરપાડાના ટીબીના દર્દીઓને છ મહિના સુધી કીટ આપવામાં આવશે

અદાણી ફાઉન્ડેશન દ્વારા મુંદ્રાના મહિલા સ્વસહાય જૂથને ગૌ દાન !

ગાય આધારિત ઉત્પાદનો લાભાર્થીઓ માટે 'કામધેનુ' સમાન

Press Note

રાજ્યપાલનું પ્રાકૃતિક ખેતી માટે આહ્વાન

મુંદરા સ્થિત અદાણી ફાઉ. સાથે શ્રી રાજશક્તિ પ્રાકૃતિક ખેતી મંડળીના ખેડૂતોએ મુલાકાત લીધી

રાજ્યપાલ આચાર્ય દેવવ્રતજીની કચ્છની સૌપ્રથમ શ્રી રાજશક્તિ પ્રાકૃતિક ખેતી સરકારી મંડળીના ખેડૂતોએ મુલાકાત લીધી હતી. તેમની સાથે અદાણી ફાઉન્ડેશનના ગુજરાત સીએસઆર વડા પંક્તિબેન શાહ અને પારાસભ્ય અનિરુદ્ધભાઇ દવે રહ્યા હતા.

ભુજ, તા. ૩૧ : અહીંના અદાણી ફાઉન્ડેશને ખેડૂતો પ્રાકૃતિક ખેતી અપનાવતા થાય અને લોકોને કેમિકલ યુક્ત પણ ખોરાક મળી રહે તેવા ઉમદા ઉદ્દેશને સાકાર કરવા બીડું ઝડપ્યું છે. આ સંદર્ભે મહત્વપૂર્ણ માર્ગદર્શન મેળવવા ગુરુવારે ગુજરાતના રાજ્યપાલ આચાર્ય દેવવ્રતજીની મુલાકાતનું આયોજન કરાયું હતું.

કચ્છની સૌ પ્રથમ શ્રી રાજશક્તિ પ્રાકૃતિક ખેતી સહકારી મંડળીના ખેડૂતોએ રાજ્યપાલની ફળદ્રુપ મુલાકાત લઇ પોતાના પ્રાકૃતિક ઉત્પાદનો દેવવ્રતજીને અર્પણ કરી પ્રાકૃતિક ખેતીના અનુભવોનું આદાન-પ્રદાન કર્યું હતું. આ મુલાકાત બાદ ખેડૂતોમાં નવી ઊર્જાનો સંચાર થયો હતો.

રાજ્યપાલે જણાવ્યું કે 'ખેડૂતોમાં મનમાં વાવેલા પ્રાકૃતિક ખેતીના વિચારો આજે મને ઊગી રહેલા દેખાય છે. મને પ્રાકૃતિક ખેતી કરતો ખેડૂત કદી દુઃખી જોવા નથી મળ્યો. આપ સૌ ખેતી કામ કરતી બહેનોને સાથે લાવ્યાં તે બદલ અભિનંદન આપું છું.' તેમણે ઉમેર્યું કે 'બહેનો એકવાર જે નક્કી કરી લે છે તેને જીવનભર પાળે છે. આપ સૌમાં ઋષિ પ્રકૃતિપ્રેમ રાજભવન સુધી ખેંચી લાવ્યો છે.' તદુપરાંત જે ખેડૂતોના ખેતરનો ઓર્ગેનિક કાર્બન ૨.૦થી વધુ છે તેઓને અભિનંદન આપ્યા હતા.

દેવવ્રતજીએ મુંદરા તાલુકાને પ્રાકૃતિક ખેતી તરફ લઈ જવાની સામૂહિક જવાબદારી ઉપાડવા ખેડૂતોને આહ્વાન કર્યું હતું. એટલું જ નહીં, પ્રાકૃતિક ખેતીના પાંચ આયામો જીવામૃત, ધન જીવામૃત, અગ્નિયા, આચ્છાદન અને પંચગવ્ય ઘરે જ બનાવી ખેતીમાં તેનો ઉપયોગ કરી ઉત્તમ ઉત્પાદનો મેળવવા સૂચન કર્યું હતું.

આ મુલાકાત માટે માંડવીના પારાસભ્ય અનિરુદ્ધભાઈ દવેએ ખેડૂતોને પ્રોત્સાહન પૂરું પાડતાં જણાવ્યું કે 'કચ્છ દરેક બાબતની પહેલ કરવામાં હંમેશાં અગ્રેસર છે ત્યારે મને વિશ્વાસ છે કે આપણા ખેડૂતો આ બાબતે પાછીપાની નહીં કરે. આપના ઉત્પાદનોને ઉત્તમ બજાર મળી રહે તે માટે આપણે સૌ સહિયારા પ્રયાસો કરીશું.'

આ પ્રસંગે અદાણી ફાઉન્ડેશનના સી.એસ.આર. હેડ પંક્તિબેન શાહે રાજ્યપાલને આભારસહ ખાતરી આપતાં જણાવ્યું કે 'પ્રકૃતિ પ્રત્યેનું ઋણ અદા કરવામાં અદાણી પરિવાર ક્યારેય પાછીપાની નહીં કરે. હંમેશાં ખેડૂતોની પડખે રહીને ઉદ્યોગગૃહના સામાજિક ઉત્તરદાયિત્વને નિભાવશે.'

ખેડૂતોએ ગૌવંશ આધારિત ખેતી માટે બંસીગીર ગોશાળા ખાતે ગોપાલ સુતરિયા પાસેથી પણ માર્ગદર્શન મેળવ્યું હતું. એટલું જ નહીં, દેશ-વિદેશમાં પ્રાકૃતિક ખેતઉત્પાદનોની માંગ વધી રહી છે ત્યારે તેની વેચાણ વ્યવસ્થાને સમજવા અમદાવાદ સ્થિત 'મુષ્ટિ ઇનોવેશન'ની મુલાકાત પણ લીધી હતી.

અદાણી ફાઉન્ડેશન દ્વારા હાથ ધરાયેલી પહેલોના પરિણામે શ્રી રાજશક્તિ પ્રાકૃતિક ખેતી સહકારી મંડળીની સ્થાપના કરવામાં આવી હતી. ૩૦ ખેડૂતોથી શરૂ કરાયેલી સંસ્થા આજે ૨૨૫થી વધુ સભ્ય સંખ્યા સાથે પ્રગતિના પંથે છે.

लोकतेज

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अदाणी फाउंडेशन, दहेज द्वारा 'पेड़ों के माध्यम से विकास' ग्रामीण विकास अभियान

फलदार पौधों से आने वाले वर्षों में किसान की आय में वृद्धि होगी

अदाणी फाउंडेशन अने अदाणी ग्रीन એનર્જી દ્વારા લખપતમાં આરોગ્ય કેમ્પ યોજાયા

આયુષ્યમાન કાર્ડ, તબીબી સારવાર અને પશુધનને રસીકરણ કરાયું

અદાણી નવચેતન વિદ્યાલય, જૂનાગામમાં કબાઉ છોડ અને શૈક્ષણિક કીટ આપી શાળા પ્રવેશોત્સવ

ભરૂચના પૂરગ્રસ્ત ત્રણ ગામમાં અદાણી ફાઉન્ડેશન દ્વારા રાશનકીટનું વિતરણ

અદાણી ફાઉન્ડેશન દ્વારા ભિદડામાં મધ્યસ્થ-રે ઉજવણી અંતર્ગત મિલેટ્સની વાનગી બનાવવાની હરીફાઈનું કરાયેલું આયોજન

અદાણી ફાઉ. દ્વારા મુંદ્રામાં પશુધનની સુરક્ષા માટે પશુ આરોગ્ય કેમ્પનું આયોજન

૨૦,૦૦૦ પશુઓને તંદુરસ્ત અને નિરોગી રાખવા અનોખી પહેલ

અદાણી ફાઉન્ડેશન અને કચ્છ ગ્રીન રિસિર્ટોના સહયોગથી મુંદ્રામાં પશુ આરોગ્ય કેમ્પનું આયોજન કરવામાં આવ્યું છે. જિલ્લા પંચાયત સંચાલિત પશુ દવાખાના દ્વારા પશુઓને રસીકરણ તથા ઉપયોગી સારવાર કરવામાં આવી રહી છે. મુંદ્રા તાલુકાના ૨૦,૦૦૦ જેટલા પશુઓને તંદુરસ્ત અને નિરોગી રાખવાના આ પહેલ કરવામાં આવી છે. પશુપાલકોની સુવિધા માટે આ કામગીરી તેમને ઘરઆંગણે જ પૂરી પાડવામાં આવે છે. પશુધનનું આરોગ્ય અને ઉત્પાદકતા જાળવી રાખવા બિમારી પહેલા જ તેમને રસીકરણ કરવામાં આવે છે. આરોગ્ય કેમ્પમાં કૃમિનાશક દવાઓ, નાના જીવો માટે ડિવર્મિંગ અને બેચી ગર્ભધારને અટકાવવા અસરકારક કામગીરી કરવામાં આવી રહી છે. જેમાં સ્થાનિકો, પશુપાલકો અને ગ્રામ પંચાયતોનો પૂરતો સહયોગ સાંપડી રહ્યો છે. અદાણી ફાઉન્ડેશન દ્વારા પશુઓની સારવાર માટે દવાઓ અને વ્યવસ્થા પૂરી પાડવામાં આવી છે. જ્યારે જિલ્લા પંચાયતના પશુપાલન વિભાગના પશુ ડોક્ટર્સ સેવા આપી રહ્યા છે. તો કચ્છ કલેક્ટર મોહમ્મદ કે'પી, સરહદ ડેરી, સ્થાનિક ગ્રામ પંચાયતો તેમજ ગોચર, ગૌસેવા સમિતિના સાથ -સહકારથી અદભુત કામગીરી થઈ રહી છે. મુંદ્રાના સિરાચા, નવીનાળ, ડગરિયા, ગ્રેજ, ભુજપુર, મોટી ખાખર વગેરે ગામોના ૮૩૦૦ પશુધનને સારવારની કામગીરી પૂર્ણ કરાઈ છે, જ્યારે આજના ગામોમાં આ કામગીરી ચાલુ છે. આરોગ્ય કેમ્પની સાથોસાથ પશુ પોષણ માટે ઉત્તમ પાકસ્વાસ એન.બી.-૨૧ નું વાવેતર, ખિનરાણ મિશ્ર અને ચેપી ગર્ભપાત નિયંત્રણની કામગીરી પણ્યવંત જારી છે. કચ્છમાં ખેતી અને પશુપાલન એ મુખ્ય વ્યવસાય છે, આ પહેલથી તેને મજબૂત બનાવવા માટેના પ્રયાસો થઈ રહ્યા છે. અદાણી ફાઉન્ડેશન દ્વારા પશુપાલનના મુખ્ય વર આયામોમાં પશુ સંવર્ધન, પશુ પોષણ, પશુ આરોગ્ય અને પશુ વ્યવસ્થાપનને મજબૂત બનાવવા ભરસક પ્રયાસો કરવામાં આવી રહ્યા છે. જેથી ખેડૂતો પ્રાકૃતિક ખેતી તરફ પ્રેરાય તે માટે બેઠકો અને ટ્રેનીંગ દ્વારા માર્ગદર્શન કરવામાં આવે છે.

બાળકોના ભવિષ્યને ઉજ્જવળ બનાવવા અદાણી ફાઉન્ડેશનના ભગીરથ પ્રયાસો

Annexure – 3

"Half Yearly Environmental Monitoring Reports "

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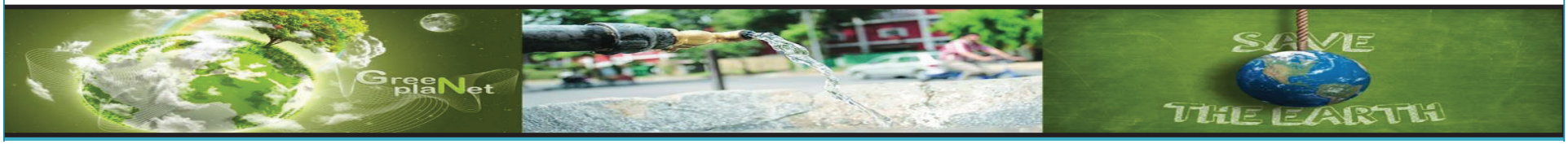

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MARINE WATER MONITORING SUMMARY REPORT

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

SR. NO.	TEST PARAMETERS	UNIT	Apr-23		May-23		Jun-23		Jul-23		Aug-23		Sep-23		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
1.	pH	--	8.22	8.06	8.18	8.05	8.06	7.92	7.98	7.91	8.01	7.89	8.05	7.92	IS 3025 (Part11)1983
2.	Temperature	°C	30.2	30	30.3	30.2	30.2	30.1	30	29.9	30	29.9	29.9	29.8	IS 3025 (Part 9)1984
3.	Total Suspended Solids	mg/L	118	96	122	114	124	110	118	102	128	110	144	118	APHA 23rd Ed.,2017,2540- D
4.	BOD (3 Days @ 27°C)	mg/L	2.8	BDL	2.9	BDL	3	BDL	3.1	BDL	3.2	BDL	2.9	BDL	IS 3025(Part 44)1993Amd.01
5.	Dissolved Oxygen	mg/L	6.32	6.02	6.37	5.96	6.3	5.89	6.22	5.82	6.32	6.02	5.95	5.75	APHA 23rd Ed.,2017,4500-O, B
6.	Salinity	ppt	36.89	37.18	36.52	37.48	35.84	36.56	35.74	36.33	35.76	36.42	35.24	35.7	By Calculation
7.	Oil & Grease	mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	IS 3025(Part39) 1991, Amd. 2
8.	Nitrate as NO_3	µmol/L	3.19	2.54	2.98	2.67	2.84	2.59	2.93	2.76	3.71	3.39	3.06	2.9	APHA 23rd Ed., 2017,4500 NO3-B
9.	Nitrite as NO_2	µmol/L	0.388	0.259	0.422	0.336	0.345	0.3	0.3	0.235	0.348	0.304	0.391	0.37	APHA 23rd Ed.,2017,4500NO_2B
10.	Ammonical Nitrogen as NH_3	µmol/L	3.15	2.93	3.45	3.1	2.49	2.06	2.54	2.45	3.42	3.39	3.32	3.26	APHA 23rd Ed., 2017,4500- NH3 B
11.	Phosphates as PO_4	µmol/L	0.73	0.65	0.6	0.47	0.517	BDL	1.16	1.05	1.26	1.16	1.68	1.47	APHA 23rd Ed.,2017,4500-P, D
12.	Total Nitrogen	µmol/L	6.728	5.729	6.852	6.106	5.675	4.95	5.77	5.445	7.478	7.084	6.771	6.53	APHA 23rd Ed., 2017,4500 NH3 - B
13.	Petroleum Hydrocarbon	µg/L	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	APHA 23rd ED,2017,5520 F
14.	Total Dissolved Solids	mg/L	37050	37640	37156	37890	36860	37422	36430	37106	36524	37156	36630	37102	APHA 23rd Ed.,2017, 2540- C
15.	COD	mg/L	24.07	12.04	27.97	11.99	32.26	16.13	24.31	12.16	28.31	12.13	15.95	7.98	APHA 23rd Ed.,2017, 5220-B

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

SR. NO.	TEST PARAMETERS	UNIT	Apr-23		May-23		Jun-23		Jul-23		Aug-23		Sep-23		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
A	Phytoplankton														
1.	Chlorophyll	mg/m³	3.01	2.56	2.98	3.22	3.05	2.66	2.36	3.24	3.12	3.02	2.99	3.41	APHA (23rd Ed. 2017)10200 H
2.	Phaeophytin	mg/m³	0.98	1.03	1.23	1.44	1.56	1.69	1.42	2.14	1.85	1.15	1.47	2.11	APHA (23rd Ed. 2017)10200 H
3.	Cell Count	No. x 10³/L	79	84	84	142	98	178	125	124	99	105	108	120	APHA (23rd Ed. 2017)10200 F
4	Name of Group Number and name of group species of each group	--	*Nitzschia*	*Navicula*	*Nitzschia*	*Navicula*	*Rhizosolenia*	*Ceratium*	*Melosira*	*Biddulphia*	*Ceratium*	*Cyclotella*	*Coscinodiscus*	*Nitzschia*	APHA (23rd Ed. 2017)10200 F
			Pinnularia	*Fragillaria*	*Navicula*	*Fragillaria*	*Biddulphia*	*Pinnularia*	*Pinnularia*	*Rhizosolenia*	*Diploneis*	*Pinnularia*	*Diploneis*	*Pinnularia*	
			Odontella	*Thalassiothrix*	*Odontella*	*Thalassiothrix*	*Skeletonema*	*Odontella*	*Skeletonema*	*Coscinodiscus*	*Odentella*	*Skeletonema*	*Rhizosolenia*	*Odontella*	
			Dinophysis	*Grammatophora*	*Dinophysis*	*Grammatophora*	*Thallassiosira*	*Thalassiothrix*	*Rhizosolenia*	*Skeletonema*	*Grammatophora*	*Thallassiosira*	*Dinophysis*	*Dinophysis*	
			Surirella	*Surirella*	*Thallassiosira*	*Surirella*	*Thalassionema*	*Thallassiosira*	*Pleurosigma*	*Thallassiosira*	*Melosira*	*Thalassionema*	*Thalassionema*	*Surirella*	

B	Zooplankton								
1	Abudance(Population)	noX103/ 100 m3	63	33	40	33	33	41	APHA (23rd Ed. 2017)10200 G
2	Name of Group Number and name of group species of each group		*Egg(Fish and Shrimps)*	*Egg(Fish and Shrimps)*	*Decapoda*	*Decapoda*	*Egg(Fish and Shrimps)*	*Crustacean Larvae*	
			Oikoplura	*Oikoplura*	*Copepods*	*Copepods*	*Oikoplura*	*Egg(Fish and Shrimps)*	
			Copepods nauplii	*Copepods nauplii*	*Crustacean Larvae*	*Crustacean Larvae*	*Copepods nauplii*	*Copepods*	
			Crustacean	*Crustacean*	*Crustacean*	*Crustacean*	*Crustacean*	*Crustacean*	
			Bivalve Larvae	*Bivalve Larvae*	*Oikoplura*	*Oikoplura*	*Bivalve Larvae*	*Bivalve Larvae*	
3	Total Biomass	ml/100 m³	15.32	14.25	15.36	16.58	15.86	16.54	

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

SR. NO.	TEST PARAMETERS	UNIT	Apr-23		May-23		Jun-23		Jul-23		Aug-23		Sep-23		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
C	Microbiological														
1	Total Bacterial Count	CFU/ml	150		210		278		266		286		254		APHA 23rd Ed.2017,9215-C
2	Total Coliform	/100ml	40		52		44		54		68		51		APHA 23rd Ed.2017,9222-B
3	Ecoli	/100ml	30		36		23		36		41		35		IS :15185:2016
4	Enterococcus	/100ml	25		22		19		22		29		20		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 23rd Ed.2017,9260-E
7	Vibrio	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		IS: 5887 (Part V):1976

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

SR. NO.	TEST PARAMETERS	UNIT	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	TEST METHOD
			SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	
1.	Organic Matter	%	0.51	0.42	0.47	0.46	0.42	0.48	IS: 2720 (Part 22):1972 RA.2015, Amds.1
2.	Phosphorus as P	µg/g	544.4	490.8	476.5	480.8	464.5	482.4	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	Heavy Metals								
5.1	Aluminum as Al	%	3.91	4.01	4.11	4.02	3.95	3.97	IS3025(Part 55)2003
5.2	Total Chromium as Cr+3	µg/g	138	114.4	117.2	112.2	115.6	118.2	EPA 3050B/7190 (Extraction &Analytical Method): 1986
5.3	Manganese as Mn	µg/g	580.1	594.4	612.4	627.1	590.4	606.2	EPA 3050B/7460 (Extraction &Analytical Method): 1986
5.4	Iron as Fe	%	3.86	3.92	3.96	3.89	3.85	3.89	EPA 3050B/7380 (Extraction &Analytical Method): 1986
5.5	Nickel as Ni	µg/g	55.28	48.6	41.2	44.28	45.34	41.38	EPA 3050B/7520 (Extraction &Analytical Method): 1986
5.6	Copper as Cu	µg/g	46.35	41.24	36.24	32.64	33.42	36.54	EPA 3050B /7210 (Extraction &Analytical Method):1986
5.7	Zinc as Zn	µg/g	110.8	128.5	119.5	124.2	130.5	124.4	EPA 3050B/7950 (Extraction &Analytical Method): 1986
5.8	Lead as Pb	µg/g	2.31	2.42	2.49	2.41	2.34	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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RESULTS OF SEDIMENT ANALYSIS [M1 LEFT SIDE OF BOCHA CREEK - N 22°45'183" E 069°43'241"]

SR. NO.	TEST PARAMETERS	UNIT	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	TEST METHOD
			SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	
D	Benthic Organisms								
1	Macrobenthos	--	*Amphipods*	*Amphipods*	*Polychates*	*Amphipods*	*Gastropods*	*Isopods*	APHA (23rd Ed. 2017)10500 C
			Decapod Larvae	*Sipunculids*	*Gastropods*	*Decapod Larvae*	*Isopods*	*Polychates*	
			Isopods	*Isopods*	*Isopods*	*Isopods*	*Amphipods*	*Sipunculids*	
			Gastropods	*Gastropods*	*Sipunculids*	*Gastropods*	*Sipunculids*	*Amphipods*	
2	MeioBenthos	--	*Turbellarians*	*Decapod Larvae*	Herpectacoids	Foraminiferan	*Polychates*	*Herpectacoids*	
			Herpectacoids	*Herpectacoids*	*Polychates*	*Turbellarians*	*Herpectacoids*	*Decapods Larvae*	
3	Population	no/m^2	356	333	368	244	250	333	

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

SR. NO.	TEST PARAMETERS	UNIT	Apr-23		May-23		Jun-23		Jul-23		Aug-23		Sep-23		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
1.	pH	--	8.15	7.91	8.24	8.09	8.16	7.98	8.09	7.96	8.14	7.85	8.11	7.88	IS 3025 (Part11)1983
2.	Temperature	°C	30.1	30.2	30.3	30.2	30.2	30.1	30.1	30	30	29.9	29.8	29.7	IS 3025 (Part 9)1984
3.	Total Suspended Solids	mg/L	142	114	128	106	132	110	108	98	142	122	128	106	APHA 23rd Ed.,2017,2540- D
4.	BOD (3 Days @ 27°C)	mg/L	2.9	BDL	3.1	BDL	2.9	BDL	3.2	BDL	3.3	BDL	2.8	BDL	IS 3025(Part 44)1993Amd.01
5.	Dissolved Oxygen	mg/L	6.22	5.92	6.27	5.86	6.2	5.79	6.12	5.72	6.32	5.81	5.85	5.75	APHA 23rd Ed.,2017,4500-O, B
6.	Salinity	ppt	36.94	37.24	36.57	37.62	36.24	37.11	36.12	36.48	36.18	36.52	34.89	35.62	By Calculation
7.	Oil & Grease	mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	IS 3025(Part39) 1991, Amd. 2
8.	Nitrate as NO_3	µmol/L	2.97	2.37	3.32	2.8	3.23	2.8	3.45	2.76	3.55	3.06	3.23	2.74	APHA 23rd Ed., 2017,4500 NO3-B
9.	Nitrite as NO_2	µmol/L	0.259	0.19	0.371	0.267	0.379	0.344	0.431	0.345	0.456	0.413	0.435	0.391	APHA 23rd Ed.,2017,4500NO_2B
10.	Ammonical Nitrogen as NH_3	µmol/L	3.49	3.23	4.31	3.79	3.96	2.93	2.84	2.49	3.48	3.39	3.39	3.26	APHA 23rd Ed., 2017,4500- NH3 B
11.	Phosphates as PO_4	µmol/L	0.47	0.43	0.43	BDL	0.56	0.6	1.47	1.37	1.58	1.37	2.11	1.9	APHA 23rd Ed.,2017,4500-P, D
12.	Total Nitrogen	µmol/L	6.719	5.79	8.001	6.857	7.569	6.074	6.721	5.595	7.486	6.863	7.055	6.391	APHA 23rd Ed., 2017,4500 NH3 - B
13.	Petroleum Hydrocarbon	µg/L	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	APHA 23rd ED,2017,5520 F
14.	Total Dissolved Solids	mg/L	36700	36930	37110	37640	36860	37520	36288	37124	36308	37142	36340	37160	APHA 23rd Ed.,2017, 2540- C
15.	COD	mg/L	20.06	8.02	35.96	7.99	40.32	12.1	20.26	8.1	24.26	12.13	19.94	7.98	APHA 23rd 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	Apr-23		May-23		Jun-23		Jul-23		Aug-23		Sep-23		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
A	Phytoplankton														
1.	Chlorophyll	mg/m³	3.12	2.78	2.63	2.89	2.56	3.02	3.02	2.59	3.02	2.84	3.15	3.56	APHA (23rd Ed. 2017)10200 H
2.	Phaeophytin	mg/m³	1.54	0.89	0.87	1.36	1.22	2.02	1	1.45	1.4	1.77	1.35	2.47	APHA (23rd Ed. 2017)10200 H
3.	Cell Count	No. x 10^3/L	105	63	86	102	102	102	145	86	125	96	120	127	APHA (23rd Ed. 2017)10200 F
4	Name of Group Number and name of group species of each group	--	*Odentella*	*Ceratium*	*Biddulphia*	*Ceratium*	*Thallassiosira*	*Surirella*	*Cyclotella*	*Pinnularia*	*Pinnularia*	*Coscinodiscus*	*Thalassiothrix*	*Odentella*	APHA (23rd Ed. 2017)10200 F
			Rhizosolenia	*Diploneis*	*Rhizosolenia*	*Diploneis*	*Melosira*	*Thalassiothrix*	*Pinnularia*	*Dinophysis*	*Thalassionema*	*Diploneis*	*Surirella*	*Rhizosolenia*	
			Coscinodiscus	*Odentella*	*Coscinodiscus*	*Odentella*	*Nitzschia*	*Navicula*	*Skeletonema*	*Rhizosolenia*	*Navicula*	*Rhizosolenia*	*Navicula*	*Coscinodiscus*	
			Grammatophora	*Grammatophora*	*Skeletonema*	*Grammatophora*	*Rhizosolenia*	*Skeletonema*	*Thallassiosira*	*Thallassiosira*	*Thallassiosira*	*Dinophysis*	*Thallassiosira*	*Grammatophora*	
			Thallassiosira	*Melosira*	*Thallassiosira*	*Melosira*	*Pleurosigma*	*Thallassiosira*	*Thalassionema*	*Coscinodiscus*	*Skeletonema*	*Thalassionema*	*Skeletonema*	*Thallassiosira*	
B	Zooplankton														
1	Abudance(Population)	noX103 / 100 m3	45		52		63		60		55		23		APHA (23rd Ed. 2017)10200 G
2	Name of Group Number and name of group species of each group		*Crustacean Larvae*		*Crustacean Larvae*		*Egg(Fish and Shrimps)*		*Egg(Fish and Shrimps)*		*Crustacean Larvae*		*Copepods nauplii*		
			Egg(Fish and Shrimps)		*Oikoplura*		*Oikoplura*		*Oikoplura*		*Egg(Fish and Shrimps)*		*Crustacean Larvae*		
			Copepods		*Copepods*		*Copepods nauplii*		*Copepods nauplii*		*Copepods*		*Oikoplura*		
			Crustacean		*Copepods nauplii*		*Crustacean*		*Crustacean*		*Crustacean*		*Bivalve Larvae*		
			Bivalve Larvae		*Bivalve Larvae*		*Bivalve Larvae*		*Bivalve Larvae*		*Bivalve Larvae*		*Oikoplura*		
3	Total Biomass	ml/100 m^3	17.41		16.35		17.59		16.88		16.45		14.25		

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

SR. NO.	TEST PARAMETERS	UNIT	Apr-23		May-23		Jun-23		Jul-23		Aug-23		Sep-23		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
C	Microbiological														
1	Total Bacterial Count	CFU/ml	136		180		268		288		186		200		APHA 23rd Ed.2017,9215-C
2	Total Coliform	/100ml	43		35		41		31		25		25		APHA 23rd Ed.2017,9222-B
3	E.coli	/100ml	27		20		22		26		14		27		IS :15185:2016
4	Enterococcus	/100ml	13		11		13		19		10		12		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 23rd Ed.2017,9260-E
7	Vibrio	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		IS: 5887 (Part V):1976

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

SR. NO.	TEST PARAMETERS	UNIT	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	TEST METHOD
			SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	
1.	Organic Matter	%	0.59	0.48	0.41	0.44	0.48	0.44	IS: 2720 (Part 22):1972 RA.2015, Amds.1
2.	Phosphorus as P	µg/g	538.4	554.2	572.2	580.4	568.5	574.6	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	%	3.95	4.04	4.12	4.08	4.02	3.98	IS3025(Part 55)2003
5.2	Total Chromium as Cr+3	µg/g	153.4	159.4	155.1	164.2	155.2	159.7	EPA 3050B/7190 (Extraction &Analytical Method): 1986
5.3	Manganese as Mn	µg/g	602.4	642.2	671.8	694.2	648.6	660.8	EPA 3050B/7460 (Extraction &Analytical Method): 1986
5.4	Iron as Fe	%	4.05	4.15	4.12	4.09	4.02	4.08	EPA 3050B/7380 (Extraction &Analytical Method): 1986
5.5	Nickel as Ni	µg/g	49.21	41.03	40.38	41.21	42.36	41.62	EPA 3050B/7520 (Extraction &Analytical Method): 1986
5.6	Copper as Cu	µg/g	41..64	41.15	40.33	41.46	42.62	41.23	EPA 3050B /7210 (Extraction &Analytical Method):1986
5.7	Zinc as Zn	µg/g	88.02	102.2	110.4	131.2	134.4	140.6	EPA 3050B/7950 (Extraction &Analytical Method): 1986
5.8	Lead as Pb	µg/g	2.44	2.31	2.24	2.31	2.22	2.09	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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RESULTS OF SEDIMENT ANALYSIS [M2 MOUTH OF BOCHA & NAVINAL CREEK - N 22°44'239" E 069°43'757"]

SR. NO.	TEST PARAMETERS	UNIT	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	TEST METHOD
			SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	
D			Benthic Organisms						
1	Macrobenthos	--	*Gastropods*	*Decapod Larvae*	*Amphipods*	*Amphipods*	*Sipunculids*	*Decapods Larvae*	APHA (23rd Ed. 2017)10500 C
			Isopods	Isopods	*Polychates*	*Polychates*	*Decapods Larvae*	Isopods	
			Amphipods	*Amphipods*	*Isopods*	*Isopods*	*Polychates*	*Amphipods*	
			Sipunculids	*Sipunculids*	*Gastropods*	*Gastropods*	*Isopods*	*Sipunculids*	
2	MeioBenthos	--	*Polychates*	*Polychates*	*Decapods Larvae*	*Decapods Larvae*	*Turbellarians*	*Foraminiferan*	
			Herpectacoids	*Turbellarians*	*Herpectacoids*	*Herpectacoids*	*Herpectacoids*	*Herpectacoids*	
3	Population	no/m²	301	268	300	360	264	244	

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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	Apr-23		May-23		Jun-23		Jul-23		Aug-23		Sep-23		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
1.	pH	--	8.14	8.01	8.27	8.11	8.21	8.06	8.11	7.96	8.14	7.88	8.16	7.97	IS 3025 (Part11)1983
2.	Temperature	°C	30.1	30	30.3	30.2	30.1	30	30	29.9	30.1	30	29.9	29.8	IS 3025 (Part 9)1984
3.	Total Suspended Solids	mg/L	102	94	110	86	96	74	104	88	114	94	102	86	APHA 23rd Ed.,2017,2540- D
4.	BOD (3 Days @ 27°C)	mg/L	3.1	BDL	3	BDL	2.6	BDL	2.8	BDL	2.9	BDL	2.7	BDL	IS 3025(Part 44)1993Amd.01
5.	Dissolved Oxygen	mg/L	6.02	5.81	6.17	5.76	6.1	5.69	6.02	5.62	6.22	5.92	6.05	5.85	APHA 23rd Ed.,2017,4500-O, B
6.	Salinity	ppt	36.29	37.02	36.24	37.19	36.18	36.88	35.94	36.28	35.98	36.42	35.24	35.81	By Calculation
7.	Oil & Grease	mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	IS 3025(Part39) 1991, Amd. 2
8.	Nitrate as NO_3	µmol/L	2.63	2.45	3.1	2.67	3.23	2.59	2.67	2.33	2.9	2.58	2.74	2.58	APHA 23rd Ed., 2017,4500 NO3-B
9.	Nitrite as NO_2	µmol/L	0.345	0.302	0.431	0.397	0.293	0.259	0.325	0.235	0.391	0.37	0.456	0.413	APHA 23rd Ed.,2017,4500NO_2B
10.	Ammonical Nitrogen as NH_3	µmol/L	2.93	2.8	3.1	2.67	3.97	3.84	2.67	2.58	3.32	3.23	3.42	3.32	APHA 23rd Ed., 2017,4500- NH3 B
11.	Phosphates as PO_4	µmol/L	0.43	BDL	0.82	0.6	0.56	BDL	1.37	1.26	1.26	1.05	1.58	1.47	APHA 23rd Ed.,2017,4500-P, D
12.	Total Nitrogen	µmol/L	5.905	5.552	6.631	5.737	7.493	6.689	5.665	5.145	6.611	6.18	6.616	6.313	APHA 23rd Ed., 2017,4500 NH3 - B
13.	Petroleum Hydrocarbon	µg/L	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	APHA 23rd ED,2017,5520 F
14.	Total Dissolved Solids	mg/L	36200	37120	36820	37622	36210	37330	35860	36540	35910	36572	36080	36640	APHA 23rd Ed.,2017, 2540- C
15.	COD	mg/L	16.05	8.02	31.97	19.98	36.29	24.19	16.21	8.1	20.22	12.13	15.95	7.98	APHA 23rd Ed.,2017, 5220-B

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

SR. NO.	TEST PARAMETERS	UNIT	Apr-23		May-23		Jun-23		Jul-23		Aug-23		Sep-23		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
A			Phytoplankton												
1.	Chlorophyll	mg/m³	3.1	2.45	2.45	2.22	3.2	2.47	2.69	2.98	2.56	2.88	2.57	2.83	APHA (23rd Ed. 2017)10200 H
2.	Phaeophytin	mg/m³	2.35	0.96	1.65	1.24	1.56	1.44	1.12	1.63	1.32	1.99	1.65	1.52	APHA (23rd Ed. 2017)10200 H
3.	Cell Count	No. x 10³/L	112	124	101	96	140	66	100	88	109	100	147	109	APHA (23rd Ed. 2017)10200 F
4	Name of Group Number and name of group species of each group	--	*Pinnularia*	*Pinnularia*	*Pinnularia*	*Pinnularia*	*Dinophysis*	*Rhizosolenia*	*Grammatophora*	*Odentella*	*Melosira*	*Pinnularia*	*Pinnularia*	*Pinnularia*	APHA (23rd Ed. 2017)10200 F
			Biddulphia	*Thalassionema*	*Dinophysis*	*Thalassionema*	*Pinnularia*	*Pinnularia*	*Rhizosolenia*	*Rhizosolenia*	*Pinnularia*	*Biddulphia*	*Biddulphia*	*Biddulphia*	
			Navicula	*Navicula*	*Rhizosolenia*	*Navicula*	*Thalassiothrix*	*Thalassiothrix*	*Nitzschia*	*Coscinodiscus*	*Skeletonema*	*Navicula*	*Navicula*	*Navicula*	
			Thallassiosira	*Thallassiosira*	*Thallassiosira*	*Thallassiosira*	*Grammatophora*	*Grammatophora*	*Thalassionema*	*Grammatophora*	*Rhizosolenia*	*Thallassiosira*	*Thallassiosira*	*Thallassiosira*	
			Skeletonema	*Skeletonema*	*Coscinodiscus*	*Skeletonema*	*Ceratium*	*Ceratium*	*Pleurosigma*	*Thallassiosira*	*Pleurosigma*	*Skeletonema*	*Skeletonema*	*Skeletonema*	
B			Zooplankton												
1	Abudance(Population)	noX103 / 100 m3	39		40		52		50		50		63		APHA (23rd Ed. 2017)10200 G
2	Name of Group Number and name of group species of each group		*Crustacean*		*Crustacean*		*Crustacean Larvae*		*Crustacean Larvae*		*Crustacean*		*Copepods*		
			Copepods nauplii		*Egg(Fish and Shrimps)*		*Egg(Fish and Shrimps)*		*Egg(Fish and Shrimps)*		*Copepods nauplii*		*Oikoplura*		
			Crustacean Larvae		*Crustacean Larvae*		*Copepods*		*Copepods*		*Crustacean Larvae*		*Crustacean Larvae*		
			Crustacean		*Crustacean*		*Crustacean*		*Crustacean*		*Crustacean*		*Crustacean*		
			Bivalve Larvae		*Bivalve Larvae*		*Bivalve Larvae*		*Bivalve Larvae*		*Bivalve Larvae*		*Bivalve Larvae*		
3	Total Biomass	ml/100 m³	17.45		15.24		15.78		17.45		15.26		15.69		

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

SR. NO.	TEST PARAMETERS	UNIT	Apr-23		May-23		Jun-23		Jul-23		Aug-23		Sep-23		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
C			Microbiological												
1	Total Bacterial Count	CFU/ml	200		190		200		198		254		188		APHA 23rd Ed.2017,9215-C
2	Total Coliform	/100ml	45		20		31		30		42		25		APHA 23rd Ed.2017,9222-B
3	E.coli	/100ml	21		16		20		22		31		14		IS :15185:2016
4	Enterococcus	/100ml	16		10		12		8		20		13		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 23rd Ed.2017,9260-E
7	Vibrio	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		IS: 5887 (Part V):1976

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

SR. NO.	TEST PARAMETERS	UNIT	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	TEST METHOD
			SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	
1.	Organic Matter	%	0.52	0.54	0.41	0.44	0.52	0.48	IS: 2720 (Part 22):1972 RA.2015, Amds.1
2.	Phosphorus as P	µg/g	.582.2	574.5	562.2	574.1	566.6	570.4	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	Heavy Metals								
5.1	Aluminum as Al	%	3.84	3.91	3.95	3.98	4.06	4.01	IS3025(Part 55)2003
5.2	Total Chromium as Cr+3	µg/g	164.2	142.8	129.5	134.8	144.2	138.4	EPA 3050B/7190 (Extraction &Analytical Method): 1986
5.3	Manganese as Mn	µg/g	614.9	610.4	618.6	604.4	610.2	616.1	EPA 3050B/7460 (Extraction &Analytical Method): 1986
5.4	Iron as Fe	%	4.14	4.06	4.09	4.12	4.06	4.09	EPA 3050B/7380 (Extraction &Analytical Method): 1986
5.5	Nickel as Ni	µg/g	56.32	52.2	48.6	44.61	44.25	41.63	EPA 3050B/7520 (Extraction &Analytical Method): 1986
5.6	Copper as Cu	µg/g	36.82	37.14	35.2	36.84	35.54	36.12	EPA 3050B /7210 (Extraction &Analytical Method):1986
5.7	Zinc as Zn	µg/g	84.65	91.24	101.2	109.1	111.4	114.9	EPA 3050B/7950 (Extraction &Analytical Method): 1986
5.8	Lead as Pb	µg/g	2.81	2.76	2.65	2.44	2.25	2.39	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	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	TEST METHOD
			SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	
D	Benthic Organisms								
1	Macrobenthos	--	Sipunculids	*Polychates*	*Sipunculids*	*Gastropods*	*Isopods*	*Polychates*	APHA (23rd Ed. 2017)10500 C
			Decapods Larvae	*Decapods Larvae*	*Polychates*	*Isopods*	*Polychates*	*Gastropods*	
			Amphipods	*Amphipods*	*Gastropods*	*Amphipods*	*Sipunculids*	*Isopods*	
			Isopods	*Isopods*	*Isopods*	*Sipunculids*	*Amphipods*	*Sipunculids*	
2	MeioBenthos	--	*Turbellarians*	*Foraminiferan*	*Herpectacoids*	*Polychates*	*Polychates*	*Herpectacoids*	
			Herpectacoids	*Herpectacoids*	*Foraminiferan*	*Herpectacoids*	*Foraminiferan*	*Polychates*	
3	Population	no/m²	355	355	347	258	368	298	

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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	Apr-23		May-23		Jun-23		Jul-23		Aug-23		Sep-23		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
1.	pH	--	8.21	8.06	8.26	8.09	8.24	8.01	8.16	8.07	8.14	8.02	8.11	7.96	IS 3025 (Part11)1983
2.	Temperature	°C	30.1	30	30.2	30.1	30.1	30	29.9	29.8	30	29.9	29.8.	29.7.	IS 3025 (Part 9)1984
3.	Total Suspended Solids	mg/L	128	114	142	118	126	108	112	106	138	116	132	104	APHA 23rd Ed.,2017,2540- D
4.	BOD (3 Days @ 27°C)	mg/L	3	BDL	2.9	BDL	3.1	BDL	3.3	BDL	3.4	BDL	2.8	BDL	IS 3025(Part 4)1993Amd.01
5.	Dissolved Oxygen	mg/L	6.32	6.22	6.17	5.86	6.1	5.79	6.02	5.72	6.12	5.81	5.95	5.75	APHA 23rd Ed.,2017,4500-O, B
6.	Salinity	ppt	36.67	37.21	35.89	37.44	35.81	36.98	36.14	36.52	36.21	36.64	35.94	36.12	By Calculation
7.	Oil & Grease	mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	IS 3025(Part39) 1991, Amd.2
8.	Nitrate as NO_3	µmol/L	3.19	2.33	3.71	3.1	3.45	2.8	2.49	2.32	3.39	3.06	3.06	2.74	APHA 23rd Ed., 2017,4500 NO3-B
9.	Nitrite as NO_2	µmol/L	0.388	0.345	0.517	0.422	0.345	0.276	0.259	0.215	0.326	0.283	0.435	0.391	APHA 23rd Ed.,2017,4500NO_2B
10.	Ammonical Nitrogen as NH_3	µmol/L	3.49	3.19	3.45	2.93	3.28	3.1	2.28	2.16	3.53	3.42	3.53	3.39	APHA 23rd Ed., 2017,4500- NH3 B
11.	Phosphates as PO_4	µmol/L	0.56	0.43	0.52	BDL	0.65	BDL	1.68	1.47	1.9	1.68	2.11	1.79	APHA 23rd Ed.,2017,4500-P, D
12.	Total Nitrogen	µmol/L	7.068	5.865	7.677	6.452	7.075	6.176	5.029	4.695	7.246	6.763	7.025	6.521	APHA 23rd Ed., 2017,4500 NH3 - B
13.	Petroleum Hydrocarbon	µg/L	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	APHA 23rd ED,2017,5520 F
14.	Total Dissolved Solids	mg/L	36480	37260	36944	37486	36860	37140	36150	36890	36168	36910	36180	37102	APHA 23rd Ed.,2017, 2540- C
15.	COD	mg/L	28.08	12.04	15.98	7.99	20.16	12.1	28.36	12.16	28.31	12.13	15.95	7.98	APHA 23rd Ed.,2017, 5220-B

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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	Apr-23		May-23		Jun-23		Jul-23		Aug-23		Sep-23		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
A	Phytoplankton														
1.	Chlorophyll	mg/m³	3.41	2.74	3.02	3.26	2.66	3.26	3	3.26	2.98	3.11	3.25	3.68	APHA (23rd Ed. 2017)10200 H
2.	Phaeophytin	mg/m³	1.25	1.45	1.87	1.33	1.74	1.45	1.63	2.03	2.01	1.88	1.44	1.56	APHA (23rd Ed. 2017)10200 H
3.	Cell Count	No. x 10^3/L	101	86	142	99	132	99	99	114	120	102	109	156	APHA (23rd Ed. 2017)10200 F
4	Name of Group Number and name of group species of each group	--	*Coscinodiscus*	*Melosira*	*Coscinodiscus*	*Melosira*	*Thalassiothrix*	*Coscinodiscus*	*Thalassiothrix*	*Pinnularia*	*Cyclotella*	*Navicula*	*Coscinodiscus*	*Coscinodiscus*	APHA (23rd Ed. 2017)10200 F
			Diploneis	*Pinnularia*	*Surirella*	*Pinnularia*	*Surirella*	*Diploneis*	*Surirella*	*Biddulphia*	*Pinnularia*	*Skeletonema*	*Diploneis*	*Diploneis*	
			Rhizosolenia	*Skeletonema*	*Rhizosolenia*	*Skeletonema*	*Navicula*	*Rhizosolenia*	*Navicula*	*Navicula*	*Skeletonema*	*Rhizosolenia*	*Rhizosolenia*	*Rhizosolenia*	
			Dinophysis	*Rhizosolenia*	*Pinnularia*	*Rhizosolenia*	*Thallassiosira*	*Dinophysis*	*Thallassiosira*	*Thallassiosira*	*Thallassiosira*	*Dinophysis*	*Dinophysis*	*Dinophysis*	
			Thalassionema	*Pleurosigma*	*Thalassionema*	*Pleurosigma*	*Skeletonema*	*Thalassionema*	*Skeletonema*	*Skeletonema*	*Thalassionema*	*Thalassionema*	*Thalassionema*	*Thalassionema*	

B	Zooplankton								
1	Abudance(Population)	noX103 / 100 m3	52	48	44	38	62	48	APHA (23rd Ed. 2017)10200 G
2	Name of Group Number and name of group species of each group		*Copepods nauplii*	*Copepods nauplii*	*Egg(Fish and Shrimps)*	*Egg(Fish and Shrimps)*	*Copepods nauplii*	*Egg(Fish and Shrimps)*	
			Crustacean Larvae	*Crustacean Larvae*	*Oikoplura*	*Oikoplura*	*Crustacean Larvae*	*Oikoplura*	
			Oikoplura	*Oikoplura*	*Copepods nauplii*	*Copepods nauplii*	*Oikoplura*	*Copepods nauplii*	
			Bivalve Larvae	*Bivalve Larvae*	*Crustacean*	*Crustacean*	*Bivalve Larvae*	*Crustacean*	
			Oikoplura	*Oikoplura*	*Bivalve Larvae*	*Bivalve Larvae*	*Oikoplura*	*Bivalve Larvae*	
3	Total Biomass	ml/100 m³	15.66	14.26	16.25	18.52	17.32	17.58	

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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	Apr-23		May-23		Jun-23		Jul-23		Aug-23		Sep-23		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM			
C			Microbiological												
1	Total Bacterial Count	CFU/ml	152		234		254		240		256		250		APHA 23rd Ed.2017,9215-C
2	Total Coliform	/100ml	28		32		47		35		50		48		APHA 23rd Ed.2017,9222-B
3	E.coli	/100ml	15		21		23		20		35		30		IS :15185:2016
4	Enterococcus	/100ml	10		10		16		12		24		21		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 23rd Ed.2017,9260-E
7	Vibrio	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		IS: 5887 (Part V):1976

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

SR. NO.	TEST PARAMETERS	UNIT	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	TEST METHOD
			SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	
1.	Organic Matter	%	0.62	0.54	0.62	0.74	0.62	0.58	IS: 2720 (Part 22):1972 RA.2015, Amds.1
2.	Phosphorus as P	µg/g	555.1	574.4	582.7	680	658.5	642.6	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	%	4.01	4.12	4.08	4.16	4.05	3.96	IS3025(Part 55)2003
5.2	Total Chromium as Cr+3	µg/g	135	132.4	142.2	137.4	142.2	138.9	EPA 3050B/7190 (Extraction &Analytical Method): 1986
5.3	Manganese as Mn	µg/g	580.4	594.6	602.2	644	618	621.4	EPA 3050B/7460 (Extraction &Analytical Method): 1986
5.4	Iron as Fe	%	3.94	3.89	3.91	3.94	3.84	3.88	EPA 3050B/7380 (Extraction &Analytical Method): 1986
5.5	Nickel as Ni	µg/g	44.21	41.6	42.2	48.6	44.5	48.32	EPA 3050B/7520 (Extraction &Analytical Method): 1986
5.6	Copper as Cu	µg/g	50.54	45.62	41.6	38.9	387.6	38.25	EPA 3050B /7210 (Extraction &Analytical Method):1986
5.7	Zinc as Zn	µg/g	74.5	84.2	92.4	102.2	114.2	118.2	EPA 3050B/7950 (Extraction &Analytical Method): 1986
5.8	Lead as Pb	µg/g	2.22	2.38	2.24	2.61	2.51	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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RESULTS OF SEDIMENT ANALYSIS [M4 JUNA BANOT DETECTEDAR N 22°47'577" E 069°43'620"]

SR. NO.	TEST PARAMETERS	UNIT	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	TEST METHOD
			SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	
D	Benthic Organisms								
1	Macrobenthos	--	*Isopods*	*Amphipods*	*Foraminiferan*	*Sipunculids*	*Foraminiferan*	Foraminiferan	APHA (23rd Ed. 2017)10500 C
			Polychates	*Gastropods*	*Decapods Larvae*	*Decapods Larvae*	*Decapods Larvae*	*Gastropods*	
			Sipunculids	*Sipunculids*	*Amphipods*	*Amphipods*	*Amphipods*	*Isopods*	
			Amphipods	*Amphipods*	*Polychates*	*Isopods*	*Polychates*	*Sipunculids*	
2	MeioBenthos	--	*Polychates*	*Polychates*	*Turbellarians*	*Turbellarians*	Turbellarians	*Herpectacoids*	
			Foraminiferan	*Foraminiferan*	*Foraminiferan*	*Herpectacoids*	*Foraminiferan*	*Polychates*	
3	Population	no/m²	300	289	387	288	342	360	

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

SR. NO.	TEST PARAMETERS	UNIT	Apr-23		May-23		Jun-23		Jul-23		Aug-23		Sep-23		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
1.	pH	--	8.16	7.94	8.08	7.91	7.99	7.91	7.96	7.88	8.12	7.94	8.18	8.05	IS 3025 (Part11)1983
2.	Temperature	°C	30.1	30	30.3	30.2	30.1	30	30	29.9	29.9	28.8	29.8	29.7	IS 3025 (Part 9)1984
3.	Total Suspended Solids	mg/L	114	94	130	112	116	76	98	72	108	84	96	76	APHA 23rd Ed.,2017,2540- D
4.	BOD (3 Days @ 27°C)	mg/L	2.9	BDL	2.8	BDL	2.2	BDL	3.5	BDL	3.2	BDL	2.9	BDL	IS 3025(Part 44)1993Amd.01
5.	Dissolved Oxygen	mg/L	6.32	6.12	6.07	5.65	5.99	5.59	5.92	5.52	6.22	5.81	6.05	5.75	APHA 23rd Ed.,2017,4500-O, B
6.	Salinity	ppt	36.85	37.11	35.66	37.62	35.62	37.32	35.68	36.24	35.78	36.46	35.12	35.84	By Calculation
7.	Oil & Grease	mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	IS 3025(Part39)1991, Amd.2
8.	Nitrate as NO_3	µmol/L	2.63	2.46	2.8	2.37	2.5	2.41	2.37	2.16	2.74	2.42	2.9	2.58	APHA 23rd Ed., 2017,4500 NO3-B
9.	Nitrite as NO_2	µmol/L	0.388	0.302	0.431	0.336	0.448	0.431	0.207	0.189	0.261	0.217	0.326	0.304	APHA 23rd Ed.,2017,4500NO_2B
10.	Ammonical Nitrogen as NH_3	µmol/L	3.23	3.1	3.79	2.93	3.36	3.28	2.75	2.62	3.74	3.59	3.59	3.39	APHA 23rd Ed., 2017,4500- NH3 B
11.	Phosphates as PO_4	µmol/L	0.86	0.65	1.16	0.82	BDL	BDL	BDL	BDL	1.16	1.05	1.68	1.47	APHA 23rd Ed.,2017,4500-P, D
12.	Total Nitrogen	µmol/L	6.248	5.862	7.021	5.636	6.308	6.121	5.327	4.969	6.741	6.227	6.816	6.274	APHA 23rd Ed., 2017,4500 NH3 - B
13.	Petroleum Hydrocarbon	µg/L	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	APHA 23rd ED,2017,5520 F
14.	Total Dissolved Solids	mg/L	36650	37100	36990	37668	36670	37450	36310	37108	36324	37164	35940	36720	APHA 23rd Ed.,2017, 2540- C
15.	COD	mg/L	24.07	BDL	23.98	11.99	28.22	16.13	24.31	16.21	28.31	16.18	23.93	11.96	APHA 23rd Ed.,2017, 5220-B

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

SR. NO.	TEST PARAMETERS	UNIT	Apr-23		May-23		Jun-23		Jul-23		Aug-23		Sep-23		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
A			Phytoplankton												
1.	Chlorophyll	mg/m³	2.69	2.36	3.12	2.66	3.62	2.74	3.44	3.06	3.01	3.12	3.47	2.96	APHA (23rd Ed. 2017)10200 H
2.	Phaeophytin	mg/m³	1.34	1.85	1.23	1.63	2.01	1.25	1.85	1.98	1.57	1.87	1.63	1.75	APHA (23rd Ed. 2017)10200 H
3.	Cell Count	No. x 10³/L	123	140	111	127	156	142	132	133	88	111	100	109	APHA (23rd Ed. 2017)10200 F
4	Name of Group Number and name of group species of each group	--	*Pinnularia*	*Cyclotella*	*Rhizosolenia*	*Rhizosolenia*	*Cyclotella*	*Diploneis*	*Navicula*	*Coscinodiscus*	*Grammatophora*	*Pinnularia*	*Diploneis*	*Ceratium*	APHA (23rd Ed. 2017)10200 F
			Biddulphia	*Pinnularia*	*Biddulphia*	*Pinnularia*	*Pinnularia*	*Rhizosolenia*	*Fragillaria*	*Diploneis*	*Rhizosolenia*	*Biddulphia*	*Rhizosolenia*	*Diploneis*	
			Navicula	*Skeletonema*	*Thalassiothrix*	*Melosira*	*Skeletonema*	*Nitzschia*	*Thalassiothrix*	*Rhizosolenia*	*Nitzschia*	*Navicula*	*Nitzschia*	*Odentella*	
			Thallassiosira	*Thallassiosira*	*Thallassiosira*	*Thallassiosira*	*Thallassiosira*	*Thalassiothrix*	*Grammatophora*	*Dinophysis*	*Thalassionema*	*Thallassiosira*	*Cyclotella*	*Grammatophora*	
			Skeletonema	*Thalassionema*	*Coscinodiscus*	*Grammatophora*	*Thalassionema*	*Pleurosigma*	*Surirella*	*Thalassionema*	*Pleurosigma*	*Skeletonema*	*Pleurosigma*	*Melosira*	
B			Zooplankton												
1	Abudance(Population)	noX103 / 100 m3	51		38		50		41		54		52		APHA (23rd Ed. 2017)10200 G
2	Name of Group Number and name of group species of each group		*Egg(Fish and Shrimps)*		*Copepods nauplii*		*Oikoplura*		*Oikoplura*		*Crustacean Larvae*		*Crustacean Larvae*		
			Copepods		*Copepods*		*Copepods nauplii*		*Copepods nauplii*		*Egg(Fish and Shrimps)*		*Decapoda*		
			Crustacean Larvae		*Crustacean Larvae*		*Crustacean Larvae*		*Crustacean Larvae*		*Copepods*		*Copepods*		
			Oikoplura		*Oikoplura*		*Crustacean*		*Crustacean*		*Crustacean*		*Crustacean*		
			Bivalve Larvae		*Bivalve Larvae*		*Bivalve Larvae*		*Bivalve Larvae*		*Bivalve Larvae*		*Bivalve Larvae*		
3	Total Biomass	ml/100 m³	14.56		13.25		14.25		16.36		15.78		14.6		

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

SR. NO.	TEST PARAMETERS	UNIT	Apr-23		May-23		Jun-23		Jul-23		Aug-23		Sep-23		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM			
C			Microbiological												
1	Total Bacterial Count	CFU/ml	190		216		256		254		178		196		APHA 23rd Ed.2017,9215-C
2	Total Coliform	/100ml	36		30		65		70		56		63		APHA 23rd Ed.2017,9222-B
3	E.coli	/100ml	27		17		41		45		49		42		IS :15185:2016
4	Enterococcus	/100ml	15		10		19		21		29		22		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 23rd Ed.2017,9260-E
7	Vibrio	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		IS: 5887 (Part V):1976

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

SR. NO.	TEST PARAMETERS	UNIT	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	TEST METHOD
			SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	
1.	Organic Matter	%	0.61	0.52	0.49	0.46	0.58	0.55	IS: 2720 (Part 22):1972 RA.2015, Amds.1
2.	Phosphorus as P	µg/g	537.4	546.3	551.4	542.6	564.2	542.3	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	%	4.04	4.11	4.12	4.08	3.92	3.95	IS3025(Part 55)2003
5.2	Total Chromium as Cr+3	µg/g	91.8	102.4	112.1	118.5	127.5	130.2	EPA 3050B/7190 (Extraction &Analytical Method): 1986
5.3	Manganese as Mn	µg/g	534.1	554.2	560.8	574.2	580.5	602.2	EPA 3050B/7460 (Extraction &Analytical Method): 1986
5.4	Iron as Fe	%	4.09	3.98	4.02	3.97	4.08	4.11	EPA 3050B/7380 (Extraction &Analytical Method): 1986
5.5	Nickel as Ni	µg/g	42.64	44.38	42.31	44.12	45.38	45.31	EPA 3050B/7520 (Extraction &Analytical Method): 1986
5.6	Copper as Cu	µg/g	49.06	42.64	43.35	48.64	51.24	48.65	EPA 3050B /7210 (Extraction &Analytical Method):1986
5.7	Zinc as Zn	µg/g	88.47	95.34	101.2	104.2	111.6	114.8	EPA 3050B/7950 (Extraction &Analytical Method): 1986
5.8	Lead as Pb	µg/g	2.38	2.44	2.49	2.62	2.54	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

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

SR. NO.	TEST PARAMETERS	UNIT	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	TEST METHOD
			SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	
D			Benthic Organisms						
1	Macrobenthos	--	*Amphipods*	*Amphipods*	*Foraminiferan*	*Isopods*	*Foraminiferan*	*Amphipods*	APHA (23rd Ed. 2017)10500 C
			Decapod Larvae	*Decapod Larvae*	*Gastropods*	*Polychates*	*Gastropods*	*Polychates*	
			Isopods	*Isopods*	*Isopods*	*Sipunculids*	*Isopods*	*Isopods*	
			Gastropods	*Gastropods*	*Sipunculids*	*Amphipods*	*Sipunculids*	*Gastropods*	
2	MeioBenthos	--	Foraminiferan	Foraminiferan	Herpectacoids	Polychates	Herpectacoids	*Decapods Larvae*	
			Herpectacoids	*Turbellarians*	*Polychates*	*Foraminiferan*	*Polychates*	*Herpectacoids*	
3	Population	no/m^2	320	288	257	308	264	308	

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

SR. NO.	TEST PARAMETERS	UNIT	Apr-23		May-23		Jun-23		Jul-23		Aug-23		Sep-23		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
1.	pH	--	8.06	7.86	8.14	7.92	8.03	7.94	7.97	7.93	7.95	7.86	8.07	7.91	IS 3025 (Part11)1983
2.	Temperature	°C	30.2	30.1	30.3	30.2	30	29.9	29.9	29.8	29.9	29.8	29.8	29.7	IS 3025 (Part 9)1984
3.	Total Suspended Solids	mg/L	150	122	134	116	124	102	116	104	134	116	128	102	APHA 23rd Ed.,2017,2540- D
4.	BOD (3 Days @ 27°C)	mg/L	2.8	BDL	3.3	BDL	2.7	BDL	3.8	BDL	3.5	BDL	2.8	BDL	IS 3025(Part 44)1993Amd.01
5.	Dissolved Oxygen	mg/L	6.22	6.02	6.37	5.86	6.3	5.79	6.22	5.72	6.32	5.81	5.95	5.75	APHA 23rd Ed.,2017,4500-O, B
6.	Salinity	ppt	36.66	37.06	36.12	37.84	35.89	37.25	35.77	36.25	35.84	36.38	35.31	35.81	By Calculation
7.	Oil & Grease	mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	IS 3025(Part39)1991, Amd. 2
8.	Nitrate as NO_3	µmol/L	2.54	2.37	2.8	2.67	2.67	2.33	3.36	3.02	4.19	3.55	3.23	2.9	APHA 23rd Ed., 2017,4500 NO3-B
9.	Nitrite as NO_2	µmol/L	0.345	0.302	0.371	0.336	0.325	0.235	0.632	0.31	0.435	0.37	0.609	0.543	APHA 23rd Ed.,2017,4500NO_2B
10.	Ammonical Nitrogen as NH_3	µmol/L	3.32	3.23	4.31	3.45	2.67	2.58	3.84	3.62	3.95	3.69	3.48	3.32	APHA 23rd Ed., 2017,4500- NH3 B
11.	Phosphates as PO_4	µmol/L	1.03	0.86	1.08	0.95	0.91	0.73	1.9	1.68	2.11	1.79	2.42	2.32	APHA 23rd Ed.,2017,4500-P, D
12.	Total Nitrogen	µmol/L	6.205	5.902	7.481	6.456	5.665	5.145	7.832	6.95	8.575	7.61	7.319	6.763	APHA 23rd Ed., 2017,4500 NH3 - B
13.	Petroleum Hydrocarbon	µg/L	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	APHA 23rd ED,2017,5520 F
14.	Total Dissolved Solids	mg/L	37460	37780	37532	38060	37110	37680	36840	37060	36766	36952	36420	37070	APHA 23rd Ed.,2017, 2540- C
15.	COD	mg/L	20.06	4.01	39.96	19.98	28.22	16.13	20.26	4.05	24.26	12.13	11.96	3.99	APHA 23rd 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	Apr-23		May-23		Jun-23		Jul-23		Aug-23		Sep-23		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
A			Phytoplankton												
1.	Chlorophyll	mg/m³	2.87	2.87	2.26	3	2.55	3.21	3.21	3.65	2.47	3.05	3.02	3.48	APHA (23rd Ed. 2017)10200 H
2.	Phaeophytin	mg/m³	0.74	1.75	0.74	2.03	1.31	2.14	1.33	2.36	1.09	2.89	1.36	2.59	APHA (23rd Ed. 2017)10200 H
3.	Cell Count	No. x 10^3/L	121	126	145	117	187	108	150	145	91	158	96	168	APHA (23rd Ed. 2017)10200 F
4	Name of Group Number and name of group species of each group	--	*Coscinodiscus*	*Grammatophora*	*Coscinodiscus*	*Grammatophora*	*Coscinodiscus*	*Nitzschia*	*Ceratium*	*Thalassiothrix*	*Ceratium*	*Coscinodiscus*	*Nitzschia*	*Fragillaria*	APHA (23rd Ed. 2017)10200 F
			Diploneis	*Rhizosolenia*	*Diploneis*	*Rhizosolenia*	*Diploneis*	*Grammatophora*	*Diploneis*	*Surirella*	*Diploneis*	*Diploneis*	*Pinnularia*	*Thalassionema*	
			Rhizosolenia	*Nitzschia*	*Rhizosolenia*	*Nitzschia*	*Rhizosolenia*	*Diploneis*	*Odentella*	*Navicula*	*Odentella*	*Rhizosolenia*	*Odontella*	*Navicula*	
			Dinophysis	*Thalassionema*	*Dinophysis*	*Thalassionema*	*Dinophysis*	*Thalassiothrix*	*Grammatophora*	*Thallassiosira*	*Grammatophora*	*Dinophysis*	*Dinophysis*	*Thallassiosira*	
			Thalassionema	*Pleurosigma*	*Skeletonema*	*Pleurosigma*	*Thalassionema*	*Pleurosigma*	*Melosira*	*Skeletonema*	*Melosira*	*Thalassionema*	*Surirella*	*Skeletonema*	

B			Zooplankton												
1	Abudance(Population)	noX103 / 100 m3	40		47		55		50		39		47		APHA (23rd Ed. 2017)10200 G
2	Name of Group Number and name of group species of each group		*Oikoplura*		*Oikoplura*		*Decapoda*		*Decapoda*		*Egg(Fish and Shrimps)*		*Nitzschia*		
			Copepods nauplii		*Copepods nauplii*		*Copepods*		*Copepods*		*Oikoplura*		*Pinnularia*		
			Crustacean Larvae		*Crustacean Larvae*		*Crustacean Larvae*		*Crustacean Larvae*		*Copepods nauplii*		*Odontella*		
			Crustacean		*Egg(Fish and Shrimps)*		*Crustacean*		*Crustacean*		*Crustacean*		*Dinophysis*		
			Bivalve Larvae		*Crustacean*		*Oikoplura*		*Oikoplura*		*Bivalve Larvae*		*Surirella*		
3	Total Biomass	ml/100 m³	15.32		16.41		17.45		15.42		16.35		15.68		

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

SR. NO.	TEST PARAMETERS	UNIT	Apr-23		May-23		Jun-23		Jul-23		Aug-23		Sep-23		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM			
C			Microbiological												
1	Total Bacterial Count	CFU/ml	180		260		198		202		180		166		APHA 23rd Ed.2017,9215-C
2	Total Coliform	/100ml	42		40		52		49		45		40		APHA 23rd Ed.2017,9222-B
3	E.coli	/100ml	21		31		22		25		20		29		IS :15185:2016
4	Enterococcus	/100ml	20		22		14		19		18		22		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 23rd Ed.2017,9260-E
7	Vibrio	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		IS: 5887 (Part V):1976

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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	Apr-23		May-23		Jun-23		Jul-23		Aug-23		Sep-23		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
1.	pH	--	8.19	7.86	8.27	8.14	8.24	8.15	8.12	8.02	8.17	8.08	8.24	8.06	IS 3025 (Part11)1983
2.	Temperature	°C	30.1	30.1	30.3	30.2	30.2	30.1	30	29.9	29.9	28.8	29.8	29.7	IS 3025 (Part 9)1984
3.	Total Suspended Solids	mg/L	104	122	116	106	112	92	118	94	104	80	94	84	APHA 23rd Ed.,2017,2540- D
4.	BOD (3 Days @ 27°C)	mg/L	2.5	BDL	3.4	BDL	2.6	BDL	2.9	BDL	3.2	BDL	2.7	BDL	IS 3025(Part 44)1993Amd.01
5.	Dissolved Oxygen	mg/L	6.12	6.02	6.27	5.86	6.2	5.79	6.12	5.72	6.22	5.81	5.95	5.75	APHA 23rd Ed.,2017,4500-O, B
6.	Salinity	ppt	36.04	37.06	36.24	37.53	36.32	37.11	36.06	36.47	36.24	36.58	35.61	36.02	By Calculation
7.	Oil & Grease	mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	IS 3025(Part39) 1991, Amd. 2
8.	Nitrate as NO_3	µmol/L	2.97	2.37	4.05	3.58	3.23	2.59	3.45	2.8	4.03	3.55	3.06	2.74	APHA 23rd Ed., 2017,4500 NO3-B
9.	Nitrite as NO_2	µmol/L	0.431	0.302	0.422	0.336	0.413	0.379	0.345	0.276	0.391	0.326	0.456	0.391	APHA 23rd Ed.,2017,4500NO_2B
10.	Ammonical Nitrogen as NH_3	µmol/L	3.19	3.23	3.1	2.93	3.66	2.93	3.28	3.1	4.06	3.8	3.39	3.26	APHA 23rd Ed., 2017,4500- NH3 B
11.	Phosphates as PO_4	µmol/L	0.52	0.86	BDL	BDL	0.65	BDL	1.47	1.26	1.68	1.58	2	1.79	APHA 23rd Ed.,2017,4500-P, D
12.	Total Nitrogen	µmol/L	6.591	5.902	7.572	6.846	7.303	5.899	7.075	6.176	8.481	7.676	6.906	6.391	APHA 23rd Ed., 2017,4500 NH3 - B
13.	Petroleum Hydrocarbon	µg/L	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	APHA 23rd ED,2017,5520 F
14.	Total Dissolved Solids	mg/L	36800	37780	37224	38108	36340	37460	36090	36990	35950	36760	36144	36800	APHA 23rd Ed.,2017, 2540- C
15.	COD	mg/L	20.06	4.01	31.97	11.99	44.35	24.19	20.26	4.05	28.31	8.09	7.98	3.99	APHA 23rd Ed.,2017, 5220-B

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

SR. NO.	TEST PARAMETERS	UNIT	Apr-23		May-23		Jun-23		Jul-23		Aug-23		Sep-23		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
A			Phytoplankton												
1.	Chlorophyll	mg/m³	3.25	2.47	3.25	2.55	3.25	2.36	2.36	3.05	2.77	2.48	3.05	2.47	APHA (23rd Ed. 2017)10200 H
2.	Phaeophytin	mg/m³	1.12	0.96	1.36	1.01	1.22	1.45	0.85	2.11	1.07	2.18	1.87	1.99	APHA (23rd Ed. 2017)10200 H
3.	Cell Count	No. x 10^3/L	104	67	111	112	128	144	80	156	87	79	106	98	APHA (23rd Ed. 2017)10200 F
4	Name of Group Number and name of group species of each group	--	*Thalassiothrix*	*Skeletonema*	*Diploneis*	*Nitzschia*	*Pinnularia*	*Odentella*	*Pinnularia*	*Navicula*	*Odentella*	*Pinnularia*	*Odentella*	*Grammatophora*	APHA (23rd Ed. 2017)10200 F
			Surirella	*Grammatophora*	*Melosira*	*Grammatophora*	*Biddulphia*	*Rhizosolenia*	*Thalassionema*	*Skeletonema*	*Rhizosolenia*	*Biddulphia*	*Rhizosolenia*	*Rhizosolenia*	
			Navicula	*Nitzschia*	*Navicula*	*Odentella*	*Navicula*	*Coscinodiscus*	*Navicula*	*Rhizosolenia*	*Coscinodiscus*	*Navicula*	*Coscinodiscus*	*Nitzschia*	
			Thallassiosira	*Thalassiothrix*	*Rhizosolenia*	*Thalassiothrix*	*Thallassiosira*	*Grammatophora*	*Thallassiosira*	*Dinophysis*	*Grammatophora*	*Thallassiosira*	*Grammatophora*	*Thalassionema*	
			Skeletonema	*Pleurosigma*	*Skeletonema*	*Melosira*	*Skeletonema*	*Thallassiosira*	*Skeletonema*	*Thalassionema*	*Thallassiosira*	*Skeletonema*	*Thallassiosira*	*Pleurosigma*	
B			Zooplankton												
1	Abudance(Population)	noX103 / 100 m3	36		51		39		43		41		69		APHA (23rd Ed. 2017)10200 G
2	Name of Group Number and name of group species of each group		*Crustacean Larvae*		*Crustacean Larvae*		*Egg(Fish and Shrimps)*		*Egg(Fish and Shrimps)*		*Egg(Fish and Shrimps)*		*Copepods nauplii*		
			Decapoda		*Oikoplura*		*Oikoplura*		*Oikoplura*		*Oikoplura*		*Crustacean Larvae*		
			Copepods		*Copepods*		*Copepods nauplii*		*Copepods nauplii*		*Copepods nauplii*		*Oikoplura*		
			Crustacean		*Crustacean*		*Crustacean*		*Crustacean*		*Crustacean*		*Bivalve Larvae*		
			Bivalve Larvae		*Bivalve Larvae*		*Bivalve Larvae*		*Bivalve Larvae*		*Bivalve Larvae*		*Oikoplura*		
3	Total Biomass	ml/100 m³	16.32		17.36		14.66		17.52		15.86		17.36		

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

SR. NO.	TEST PARAMETERS	UNIT	Apr-23		May-23		Jun-23		Jul-23		Aug-23		Sep-23		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM			
C			Microbiological												
1	Total Bacterial Count	CFU/ml	262		148		166		268		220		190		APHA 23rd Ed.2017,9215-C
2	Total Coliform	/100ml	28		20		35		35		29		31		APHA 23rd Ed.2017,9222-B
3	E.coli	/100ml	20		8		15		15		16		26		IS :15185:2016
4	Enterococcus	/100ml	12		6		11		11		8		10		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 23rd Ed.2017,9260-E
7	Vibrio	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		IS: 5887 (Part V):1976

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

SR. NO.	TEST PARAMETERS	UNIT	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	TEST METHOD
			SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	
1.	Organic Matter	%	0.52	0.57	0.48	0.51	0.46	0.41	IS: 2720 (Part 22):1972 RA.2015, Amds.1
2.	Phosphorus as P	µg/g	538	544.2	562.2	546.4	580.3	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	Heavy Metals								
5.1	Aluminum as Al	%	3.81	3.92	3.96	3.89	3.95	4.03	IS3025(Part 55)2003
5.2	Total Chromium as Cr+3	µg/g	102.2	114.3	116.2	112.4	118.6	122.2	EPA 3050B/7190 (Extraction &Analytical Method): 1986
5.3	Manganese as Mn	µg/g	564.2	580.4	587.2	604.5	590.4	602.8	EPA 3050B/7460 (Extraction &Analytical Method): 1986
5.4	Iron as Fe	%	4.02	3.86	3.89	3.91	3.94	4.06	EPA 3050B/7380 (Extraction &Analytical Method): 1986
5.5	Nickel as Ni	µg/g	44.61	46.57	39.8	40.24	41.25	42.88	EPA 3050B/7520 (Extraction &Analytical Method): 1986
5.6	Copper as Cu	µg/g	43.35	40.36	42.61	44.25	42.6	44.68	EPA 3050B /7210 (Extraction &Analytical Method):1986
5.7	Zinc as Zn	µg/g	103.3	105.7	110.4	124.1	138.4	142	EPA 3050B/7950 (Extraction &Analytical Method): 1986
5.8	Lead as Pb	µg/g	2.61	2.56	2.31	2.37	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

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

SR. NO.	TEST PARAMETERS	UNIT	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	TEST METHOD
			SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	SEDIMENT	
D			Benthic Organisms						
1	Macrobenthos	--	*Sipunculids*	*Decapod Larvae*	*Sipunculids*	*Decapod Larvae*	*Polychates*	*Polychates*	APHA (23rd Ed. 2017)10500 C
			Polychates	*Polychates*	*Polychates*	*Isopods*	*Decapods Larvae*	*Decapods Larvae*	
			Gastropods	*Gastropods*	*Gastropods*	*Amphipods*	*Isopods*	*Isopods*	
			Isopods	*Isopods*	*Isopods*	*Sipunculids*	*Sipunculids*	*Sipunculids*	
2	MeioBenthos	--	*Foraminiferan*	*Foraminiferan*	*Foraminiferan*	*Polychates*	*Herpectacoids*	*Herpectacoids*	
			Polychates	*Turbellarians*	Turbellarians	Turbellarians	Turbellarians	*Turbellarians*	
3	Population	no/m²	260	303	320	358	240	290	

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

SR. NO.	TEST PARAMETERS	UNIT	Apr-23		May-23		Jun-23		Jul-23		Aug-23		Sep-23		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
1.	pH	--	8.19	7.98	8.18	7.96	8.17	7.98	8.14	7.97	8.16	8.01	8.17	8.05	IS 3025 (Part11)1983
2.	Temperature	°C	30.2	30.1	30.3	30.2	30.1	30	29.9	29.8	29.8	29.7	29.8	29.7	IS 3025 (Part 9)1984
3.	Total Suspended Solids	mg/L	124	108	118	92	106	86	114	88	154	128	142	118	APHA 23rd Ed.,2017,2540- D
4.	BOD (3 Days @ 27°C)	mg/L	3.4	BDL	3.5	BDL	3.2	BDL	2.7	BDL	3.3	BDL	2.6	BDL	IS 3025(Part 44)1993Amd.01
5.	Dissolved Oxygen	mg/L	6.12	6.02	6.07	5.76	5.99	5.69	5.92	5.62	6.12	5.81	5.85	5.75	APHA 23rd Ed.,2017,4500-O, B
6.	Salinity	ppt	35.88	36.3	35.52	37.23	35.49	36.87	36.34	36.88	36.35	36.94	35.41	35.97	By Calculation
7.	Oil & Grease	mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	IS 3025(Part39) 1991, Amd. 2
8.	Nitrate as NO_3	µmol/L	2.63	2.37	3.32	2.97	2.84	2.59	2.93	2.76	3.71	3.23	2.9	2.74	APHA 23rd Ed., 2017,4500 NO3-B
9.	Nitrite as NO_2	µmol/L	0.302	0.19	0.336	0.267	0.474	0.31	0.3	0.235	0.304	0.283	0.37	0.348	APHA 23rd Ed.,2017,4500NO_2B
10.	Ammonical Nitrogen as NH_3	µmol/L	2.93	2.8	3.1	2.67	2.41	1.89	2.54	2.45	3.59	3.42	3.42	3.23	APHA 23rd Ed., 2017,4500- NH3 B
11.	Phosphates as PO_4	µmol/L	0.47	BDL	0.6	0.52	0.78	BDL	1.79	1.47	2	1.68	2.32	2.11	APHA 23rd Ed.,2017,4500-P, D
12.	Total Nitrogen	µmol/L	5.862	5.36	6.756	5.907	5.724	4.79	5.77	5.445	7.604	6.933	6.69	6.318	APHA 23rd Ed., 2017,4500 NH3 - B
13.	Petroleum Hydrocarbon	µg/L	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	APHA 23rd ED,2017,5520 F
14.	Total Dissolved Solids	mg/L	37010	37420	37640	38020	37210	37640	36970	37124	36744	37210	36350	36988	APHA 23rd Ed.,2017, 2540- C
15.	COD	mg/L	16.05	8.02	23.98	11.99	36.29	16.13	16.21	8.1	12.13	4.04	11.96	BDL	APHA 23rd Ed.,2017, 5220-B

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

SR. NO.	TEST PARAMETERS	UNIT	Apr-23		May-23		Jun-23		Jul-23		Aug-23		Sep-23		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
A			Phytoplankton												
1.	Chlorophyll	mg/m³	3.2	2.41	2.99	3.21	3.06	2.86	2.2	1.66	2.87	2.09	2.98	2.69	APHA (23rd Ed. 2017)10200 H
2.	Phaeophytin	mg/m³	2.23	2.14	1.45	2.33	1.45	1.34	1.74	0.9	1.84	1.06	1.12	1.45	APHA (23rd Ed. 2017)10200 H
3.	Cell Count	No. x 10^3/L	100	104	98	58	124	100	109	94	110	63	111	109	APHA (23rd Ed. 2017)10200 F
4	Name of Group Number and name of group species of each group	--	*Navicula*	*Ceratium*	*Navicula*	*Ceratium*	*Navicula*	*Skeletonema*	*Rhizosolenia*	*Melosira*	*Skeletonema*	*Coscinodiscus*	*Dinophysis*	*Diploneis*	APHA (23rd Ed. 2017)10200 F
			Skeletonema	*Melosira*	*Skeletonema*	*Melosira*	*Skeletonema*	*Grammatophora*	*Pinnularia*	*Pinnularia*	*Grammatophora*	*Diploneis*	*Pinnularia*	*Rhizosolenia*	
			Rhizosolenia	*Odentella*	*Rhizosolenia*	*Odentella*	*Rhizosolenia*	*Nitzschia*	*Thalassiothrix*	*Skeletonema*	*Nitzschia*	*Rhizosolenia*	*Thalassiothrix*	*Nitzschia*	
			Dinophysis	*Dinophysis*	*Dinophysis*	*Dinophysis*	*Dinophysis*	*Thalassiothrix*	*Grammatophora*	*Thallassiosira*	*Thalassiothrix*	*Dinophysis*	*Grammatophora*	*Cyclotella*	
			Thalassionema	*Pleurosigma*	*Thalassionema*	*Fragillaria*	*Thalassionema*	*Pleurosigma*	*Ceratium*	*Thalassionema*	*Pleurosigma*	*Thalassionema*	*Ceratium*	*Pleurosigma*	

B			Zooplankton						
1	Abudance(Population)	noX103 / 100 m3	47	50	47	39	56	38	APHA (23rd Ed. 2017)10200 G
2	Name of Group Number and name of group species of each group		*Decapoda*	*Decapoda*	*Crustacean Larvae*	*Crustacean Larvae*	*Decapoda*	*Egg(Fish and Shrimps)*	
			Copepods	*Egg(Fish and Shrimps)*	*Egg(Fish and Shrimps)*	*Egg(Fish and Shrimps)*	*Copepods*	*Oikoplura*	
			Crustacean Larvae	*Crustacean Larvae*	*Copepods*	*Copepods*	*Crustacean Larvae*	*Copepods nauplii*	
			Crustacean	*Crustacean*	*Crustacean*	*Crustacean*	*Crustacean*	*Crustacean*	
			Oikoplura	*Oikoplura*	*Bivalve Larvae*	*Bivalve Larvae*	*Oikoplura*	*Bivalve Larvae*	
3	Total Biomass	ml/100 m³	14.78	16.52	17.33	18.63	17.42	14.25	

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

SR. NO.	TEST PARAMETERS	UNIT	Apr-23		May-23		Jun-23		Jul-23		Aug-23		Sep-23		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM			
C			Microbiological												
1	Total Bacterial Count	CFU/ml	190		232		278		254		296		264		APHA 23rd Ed.2017,9215-C
2	Total Coliform	/100ml	41		50		44		40		52		44		APHA 23rd Ed.2017,9222-B
3	E.coli	/100ml	26		22		23		29		32		30		IS :15185:2016
4	Enterococcus	/100ml	21		15		18		15		22		15		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 23rd Ed.2017,9260-E
7	Vibrio	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		IS: 5887 (Part V):1976

GUJARAT VAPI

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

SR. NO.	TEST PARAMETERS	UNIT	Apr-23		May-23		Jun-23		Jul-23		Aug-23		Sep-23		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
1.	pH	--	8.08	7.81	8.21	8.06	8.18	7.98	8.16	7.96	8.14	8.03	8.18	8.02	IS 3025 (Part11)1983
2.	Temperature	°C	30.2	30.1	30.2	30.1	30.1	30	29.9	29.8	30	29.9	29.9	29.8	IS 3025 (Part 9)1984
3.	Total Suspended Solids	mg/L	104	90	116	102	124	104	132	106	118	102	106	84	APHA 23rd Ed.,2017,2540- D
4.	BOD (3 Days @ 27°C)	mg/L	3.2	BDL	3.6	BDL	3.1	BDL	2.9	BDL	3.4	BDL	2.5	BDL	IS 3025(Part 44)1993Amd.01
5.	Dissolved Oxygen	mg/L	6.02	5.81	6.37	6.07	6.2	5.79	6.22	5.92	6.32	6.02	6.15	5.95	APHA 23rd Ed.,2017,4500-O, B
6.	Salinity	ppt	36.74	37.13	36.04	37.23	35.92	36.94	36.21	36.67	36.45	36.88	35.34	35.81	By Calculation
7.	Oil & Grease	mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	IS 3025(Part39) 1991, Amd. 2
8.	Nitrate as NO_3	µmol/L	3.19	2.97	3.71	3.32	2.59	2.32	2.84	2.59	3.87	3.55	3.06	2.9	APHA 23rd Ed., 2017,4500 NO3-B
9.	Nitrite as NO_2	µmol/L	0.388	0.302	0.517	0.431	0.56	0.431	0.474	0.31	0.522	0.478	0.652	0.565	APHA 23rd Ed.,2017,4500NO_2B
10.	Ammonical Nitrogen as NH_3	µmol/L	3.49	3.19	3.79	3.45	2.49	2.24	2.41	1.89	3.39	3.26	3.32	3.23	APHA 23rd Ed., 2017,4500- NH3 B
11.	Phosphates as PO_4	µmol/L	0.6	0.47	0.43	BDL	0.73	0.86	1.26	1.05	1.47	1.26	1.79	1.58	APHA 23rd Ed.,2017,4500-P, D
12.	Total Nitrogen	µmol/L	7.068	6.462	8.017	7.201	5.64	4.991	5.724	4.79	7.782	7.288	7.032	6.695	APHA 23rd Ed., 2017,4500 NH3 - B
13.	Petroleum Hydrocarbon	µg/L	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	APHA 23rd ED,2017,5520 F
14.	Total Dissolved Solids	mg/L	37120	37500	37844	38124	37520	38040	37160	37642	36980	37460	36248	36828	APHA 23rd Ed.,2017, 2540- C
15.	COD	mg/L	12.04	BDL	39.96	19.98	28.22	16.13	12.16	BDL	16.18	8.09	15.95	3.99	APHA 23rd Ed.,2017, 5220-B

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

SR. NO.	TEST PARAMETERS	UNIT	Apr-23		May-23		Jun-23		Jul-23		Aug-23		Sep-23		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	
A			Phytoplankton												
1.	Chlorophyll	mg/m³	2.21	3.1	3	2.33	2.56	3.05	2.88	2.55	2.12	1.69	2.36	2.34	APHA (23rd Ed. 2017)10200 H
2.	Phaeophytin	mg/m³	1.56	0.98	2.01	1.22	1.44	1.78	1.65	1.26	0.94	1.01	1.23	1.56	APHA (23rd Ed. 2017)10200 H
3.	Cell Count	No. x 10³/L	102	86	102	88	127	158	152	106	75	102	86	118	APHA (23rd Ed. 2017)10200 F
4	Name of Group Number and name of group species of each group	--	*Melosira*	*Biddulphia*	*Melosira*	*Biddulphia*	*Melosira*	*Ceratium*	*Coscinodiscus*	*Thallassiosira*	*Ceratium*	*Coscinodiscus*	*Ceratium*	*Thallassiosira*	APHA (23rd Ed. 2017)10200 F
			Pinnularia	*Fragillaria*	*Dinophysis*	*Fragillaria*	*Dinophysis*	*Pinnularia*	*Diploneis*	*Melosira*	*Pinnularia*	*Surirella*	*Pinnularia*	*Melosira*	
			Skeletonema	*Odontella*	*Skeletonema*	*Ceratium*	*Skeletonema*	*Odontella*	*Rhizosolenia*	*Nitzschia*	*Odontella*	*Rhizosolenia*	*Odontella*	*Nitzschia*	
			Thallassiosira	*Grammatophora*	*Thallassiosira*	*Nitzschia*	*Thallassiosira*	*Thalassiothrix*	*Dinophysis*	*Rhizosolenia*	*Thalassiothrix*	*Pinnularia*	*Thalassiothrix*	*Rhizosolenia*	
			Thalassionema	*Melosira*	*Thalassionema*	*Melosira*	*Thalassionema*	*Thallassiosira*	*Thalassionema*	*Pleurosigma*	*Thallassiosira*	*Thalassionema*	*Thallassiosira*	*Pleurosigma*	

B			Zooplankton						
1	Abudance(Population)	noX103 / 100 m3	35	43	49	40	40	25	APHA (23rd Ed. 2017)10200 G
2	Name of Group Number and name of group species of each group		*Decapoda*	*Decapoda*	*Copepods nauplii*	*Copepods nauplii*	*Egg(Fish and Shrimps)*	*Grammatophora*	
			Oikoplura	*Oikoplura*	*Copepods*	*Copepods*	*Crustacean Larvae*	*Rhizosolenia*	
			Crustacean Larvae	*Crustacean Larvae*	*Crustacean Larvae*	*Crustacean Larvae*	*Copepods nauplii*	*Nitzschia*	
			Bivalve Larvae	*Bivalve Larvae*	*Bivalve Larvae*	*Bivalve Larvae*	*Crustacean*	*Thalassionema*	
			Oikoplura	*Crustacean*	*Crustacean*	*Crustacean*	*Bivalve Larvae*	*Pleurosigma*	
3	Total Biomass	ml/100 m³	15.47	14.56	16.22	15.45	16.23	13.65	

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

SR. NO.	TEST PARAMETERS	UNIT	Apr-23		May-23		Jun-23		Jul-23		Aug-23		Sep-23		TEST METHOD
			SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM	SURFACE	BOTTOM			
C			Microbiological												
1	Total Bacterial Count	CFU/ml	214		200		144		260		274		202		APHA 23rd Ed.2017,9215-C
2	Total Coliform	/100ml	41		32		30		50		44		50		APHA 23rd Ed.2017,9222-B
3	E.coli	/100ml	25		20		12		29		30		42		IS :15185:2016
4	Enterococcus	/100ml	12		8		10		11		13		19		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 23rd Ed.2017,9260-E
7	Vibrio	/100ml	Absent		Absent		Absent		Absent		Absent		Absent		IS: 5887 (Part V):1976

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RESULTS OF ETP OUTLET WATER

SR.NO.	TEST PARAMETERS	UNIT	LIQUID TERMINAL						GPCB Limit	TEST METHOD
			Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23		
			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 23rd Ed.,2017,4500-H^+B
3.	Temperature	^{0}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 23rd Ed.,2017,2540 –D
5.	Total Dissolved Solids	mg/L	1106	732	804	810	822	840	2100	APHA 23rd 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 ^{0}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(MDL:2.0)	BDL(MDL:2.0)	BDL(MDL:2.0)	BDL(MDL:2.0)	BDL(MDL:2.0)	BDL(MDL:2.0)	10	IS 3025(Part39)1991, Amd. 2
10.	Sulphate (as SO_4)	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(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	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 23rd Ed.,2017,3111-B

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SR.NO.	TEST PARAMETERS	UNIT	LIQUID TERMINAL						GPCB Limit	TEST METHOD
			Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23		
			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(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	BDL(MDL:0.05)	2	APHA 23rd Ed.,2017,4500 S^{-2} 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 23rd Ed.,2017,3111-B
17.	Fluoride as F	mg/L	1.03	0.82	0.94	0.86	0.74	0.66	2	APHA 23rd 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 23rd 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

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Results of Ambient Air Quality Monitoring

Name of Location		CT3 RMU-2						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM_{10} µg/m³	$PM_{2.5}$ µg/m³	SO_2 µg/m³	NO_2 µg/m³	CO mg/m³	HC µg/m³	Benzene µg/m³
1.	03-04-2023	84.38	41.2	38.42	45.72	1.93	--	NOT DETECTED
2.	06-04-2023	81.26	36.18	32.54	36.92	1.47	3.58	NOT DETECTED
3.	10-04-2023	74.72	35.82	26.48	33.24	1.18	5.62	NOT DETECTED
4.	13-04-2023	78.41	39.16	29.64	36.41	1.16	2.48	NOT DETECTED
5.	17-04-2023	82.57	40.86	32.28	38.74	1.38	2.51	NOT DETECTED
6.	20-04-2023	76.38	37.55	27.94	34.19	0.97	4.87	NOT DETECTED
7.	24-04-2023	81.53	34.27	31.62	37.47	1.12	2.78	NOT DETECTED
8.	27-04-2023	75.28	36.91	28.47	34.69	0.95	3.94	NOT DETECTED
9.	01-05-2023	72.59	38.73	36.57	41.38	1.28	6.32	NOT DETECTED
10.	04-05-2023	78.42	34.65	31.48	35.63	1.16	4.76	NOT DETECTED
11.	08-05-2023	84.61	41.13	37.64	44.13	1.39	6.58	NOT DETECTED
12.	11-05-2023	86.74	31.38	30.19	33.53	1.10	4.37	NOT DETECTED
13.	15-05-2023	80.15	26.78	34.15	39.53	1.15	4.16	NOT DETECTED
14.	18-05-2023	77.58	34.71	37.14	41.95	1.17	4.85	NOT DETECTED
15.	22-05-2023	71.31	29.85	26.54	29.36	1.15	3.28	NOT DETECTED

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CIN:U73100GJ2007PTC051463

Name of Location		CT3 RMU-2						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM_{10} µg/m³	$PM_{2.5}$ µg/m³	SO_2 µg/m³	NO_2 µg/m³	CO mg/m³	HC µg/m³	Benzene µg/m³
16.	25-05-2023	75.47	37.53	34.29	39.74	1.28	4.61	NOT DETECTED
17.	29-05-2023	67.53	31.36	31.11	36.98	1.32	4.74	NOT DETECTED
18.	01-06-2023	86.95	32.73	29.58	32.56	1	4.81	NOT DETECTED
19.	05-06-2023	87.39	29.63	25.19	27.41	0.80	3.12	NOT DETECTED
20.	08-06-2023	82.47	35.38	32.46	35.71	0.5	6.02	NOT DETECTED
21.	12-06-2023	85.25	30.76	28.38	31.25	0.7	5.68	NOT DETECTED
22.	15-06-2023	75.23	28.12	16.15	22.98	0.05	4.38	NOT DETECTED
23.	19-06-2023	62.35	22.12	13.52	17.36	0.05	4.19	NOT DETECTED
24.	22-06-2023	54.23	20.18	10.44	13.48	0.1	3.45	NOT DETECTED
25.	26-06-2023	58.1	23.15	8.26	13.54	0.05	3.22	NOT DETECTED
26.	29-06-2023	52.47	20.12	7.25	12.97	0.03	3.89	NOT DETECTED
27.	03-07-2023	55.63	19.27	13.58	16.41	ND	--	NOT DETECTED
28.	06-07-2023	61.28	23.85	16.43	20.58	ND	ND	NOT DETECTED
29.	10-07-2023	58.39	20.51	13.1	17.32	ND	ND	NOT DETECTED
30.	13-07-2023	67.52	23.46	17.59	21.45	ND	1.57	NOT DETECTED
31.	17-07-2023	55.21	21.99	14.12	18.93	ND	ND	NOT DETECTED

Continue…

Name of Location		CT3 RMU-2						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM_{10} µg/m³	$PM_{2.5}$ µg/m³	SO_2 µg/m³	NO_2 µg/m³	CO mg/m³	HC µg/m³	Benzene µg/m³
32.	20-07-2023	62.48	24.51	16.53	20.71	ND	ND	NOT DETECTED
33.	24-07-2023	70.62	26.86	19.25	23.66	ND	2.31	NOT DETECTED
34.	27-07-2023	64.5	23.45	15.59	18.35	ND	1.86	NOT DETECTED
35.	31-07-2023	74.38	24.16	17.42	21.63	ND	2.74	NOT DETECTED
36.	03-08-2023	78.42	27.17	23.85	28.17	0.51	3.1	NOT DETECTED
37.	07-08-2023	83.74	29.82	24.98	30.52	0.73	3.86	NOT DETECTED
38.	10-08-2023	73.29	33.52	27.43	32.65	0.91	4.38	NOT DETECTED
39.	14-08-2023	89.54	30.79	25.14	29.67	0.84	3.95	NOT DETECTED
40.	17-08-2023	84.82	34.65	28.06	34.29	1	4.63	NOT DETECTED
41.	21-08-2023	87.57	37.25	33.96	38.11	1.1	5.82	NOT DETECTED
42.	24-08-2023	80.41	35.76	31.45	36.74	1.06	5.21	NOT DETECTED
43.	28-08-2023	88.65	31.38	28.91	32.5	0.92	3.4	NOT DETECTED
44.	31-08-2023	82.18	33.82	30.24	34.62	1	4.27	NOT DETECTED
45.	04-09-2023	80.43	30.14	25.38	29.71	0.74	3.89	NOT DETECTED
46.	07-09-2023	85.28	33.87	27.49	32.12	0.87	4.26	NOT DETECTED
47.	11-09-2023	87.36	35.81	31.57	36.79	0.96	5.36	NOT DETECTED

Continue…

Name of Location		CT3 RMU-2						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM_{10} µg/m³	$PM_{2.5}$ µg/m³	SO_2 µg/m³	NO_2 µg/m³	CO mg/m³	HC µg/m³	Benzene µg/m³
48.	14-09-2023	84.1	31.27	29.14	34.62	0.81	4.92	NOT DETECTED
49.	18-09-2023	73.79	26.94	23.41	26.63	0.65	3.24	NOT DETECTED
50.	21-09-2023	78.52	29.63	26.54	30.21	0.8	4.28	NOT DETECTED
51.	25-09-2023	75.18	28.42	25.77	29.83	0.72	3.85	NOT DETECTED
52.	28-09-2023	81.84	32.56	29.91	34.52	0.84	4.1	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)

GUJARAT VAPI

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_{10} µg/m³	$PM_{2.5}$ µg/m³	SO_2 µg/m³	NO_2 µg/m³	CO mg/m³	HC µg/m³	Benzene µg/m³
1.	03-04-2023	76.48	31.73	26.14	32.87	0.86	--	NOT DETECTED
2.	06-04-2023	89.53	38.79	29.47	35.63	0.99	3.12	NOT DETECTED
3.	10-04-2023	85.1	42.18	33.86	39.25	1.1	2.96	NOT DETECTED
4.	13-04-2023	78.46	37.67	26.24	31.63	0.89	3.63	NOT DETECTED
5.	17-04-2023	88.24	45.64	37.11	44.91	1.13	5.1	NOT DETECTED
6.	20-04-2023	81.39	40.71	33.79	36.15	1.12	3.78	NOT DETECTED
7.	24-04-2023	86.73	36.28	24.87	27.61	1	3.16	NOT DETECTED
8.	27-04-2023	89.74	39.56	27.71	31.36	1.10	4.85	NOT DETECTED
9.	01-05-2023	88.16	41.58	34.82	37.16	1.18	4.87	NOT DETECTED
10.	04-05-2023	83.84	38.47	31.98	34.64	1.15	3.68	NOT DETECTED
11.	08-05-2023	86.48	34.21	26.14	31.99	0.97	3.16	NOT DETECTED
12.	11-05-2023	77.59	39.69	36.83	40.71	1.17	4.28	NOT DETECTED
13.	15-05-2023	89.36	36.71	29.56	34.41	1	2.95	NOT DETECTED
14.	18-05-2023	83.17	31.58	24.75	28.78	0.93	3.48	NOT DETECTED
15.	22-05-2023	80.49	39.78	33.05	38.51	1.13	4.17	NOT DETECTED

Continue…

Regd. Office : 215, Royal Arcade, Near G.I.D.C.Office, Char Rasta,Vapi-396 195, Gujarat, India.
Extended Work Office : G.I.D.C., Dahej-II, Bharuch, Gujarat.
CIN:U73100GJ2007PTC051463

Name of Location		Near Fire Station						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM_{10} µg/m³	$PM_{2.5}$ µg/m³	SO_2 µg/m³	NO_2 µg/m³	CO mg/m³	HC µg/m³	Benzene µg/m³
16.	25-05-2023	87.51	35.93	25.48	31.64	1	3.57	NOT DETECTED
17.	29-05-2023	81.26	38.46	31.95	38.62	1.14	4.28	NOT DETECTED
18.	01-06-2023	87.83	36.37	27.41	30.13	0.8	3.26	NOT DETECTED
19.	05-06-2023	80.38	39.61	31.46	35.57	0.5	4.37	NOT DETECTED
20.	08-06-2023	85.27	43.58	35.82	37.42	1.00	4.94	NOT DETECTED
21.	12-06-2023	89.53	37.77	29.64	32.85	0.75	2.9	NOT DETECTED
22.	15-06-2023	80.53	28.15	17.14	21.54	0.05	3.57	NOT DETECTED
23.	19-06-2023	56.21	22.1	14.5	19.65	0.02	3.02	NOT DETECTED
24.	22-06-2023	60.55	18.54	13.56	17.48	0.10	2.35	NOT DETECTED
25.	26-06-2023	51.48	17	10.25	14.52	0.1	3.35	NOT DETECTED
26.	29-06-2023	50.28	16.25	9.85	13.25	0.5	2.56	NOT DETECTED
27.	03-07-2023	58.64	20.27	14.73	17.32	0.02	--	NOT DETECTED
28.	06-07-2023	51.39	19.64	12.75	15.43	ND	1.24	NOT DETECTED
29.	10-07-2023	62.75	23.54	16.42	19.66	ND	2.15	NOT DETECTED
30.	13-07-2023	66.34	25.61	17.47	22.92	0.04	2.57	NOT DETECTED
31.	17-07-2023	72.48	28.64	20.51	25.46	0.08	3.12	NOT DETECTED

Continue…

Regd. Office : 215, Royal Arcade, Near G.I.D.C.Office, Char Rasta,Vapi-396 195, Gujarat, India.
Extended Work Office : G.I.D.C., Dahej-II, Bharuch, Gujarat.
CIN:U73100GJ2007PTC051463

Name of Location		Near Fire Station						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM_{10} µg/m³	$PM_{2.5}$ µg/m³	SO_2 µg/m³	NO_2 µg/m³	CO mg/m³	HC µg/m³	Benzene µg/m³
32.	20-07-2023	64.96	26.13	18.37	22.45	0.02	2.84	NOT DETECTED
33.	24-07-2023	60.65	25.83	17.32	20.84	ND	3	NOT DETECTED
34.	27-07-2023	69.27	27.61	19.03	24.58	ND	3.37	NOT DETECTED
35.	31-07-2023	77.17	29.76	23.53	27.24	0.1	3.89	NOT DETECTED
36.	03-08-2023	64.97	27.61	20.13	24.86	0.91	1.59	NOT DETECTED
37.	07-08-2023	74.65	30.14	22.97	26.49	0.95	2.16	NOT DETECTED
38.	10-08-2023	71.59	28.7	21.38	23.75	0.82	1.91	NOT DETECTED
39.	14-08-2023	87.64	31.85	24.73	28.05	0.97	2.48	NOT DETECTED
40.	17-08-2023	89.62	38.61	31.28	37.82	1.13	4.73	NOT DETECTED
41.	21-08-2023	81.47	32.57	28.82	33.67	1.04	3.84	NOT DETECTED
42.	24-08-2023	76.73	35.88	30.31	36.47	1.1	4.24	NOT DETECTED
43.	28-08-2023	87.46	30.93	26.42	31.28	0.95	2.38	NOT DETECTED
44.	31-08-2023	82.15	33.73	28.28	34.65	1.00	3.55	NOT DETECTED
45.	04-09-2023	75.62	28.36	24.71	27.35	0.73	2.84	NOT DETECTED
46.	07-09-2023	78.57	31.82	25.61	29.13	0.85	3.15	NOT DETECTED
47.	11-09-2023	83.16	34.77	28.45	32.81	0.92	3.78	NOT DETECTED

Regd. Office : 215, Royal Arcade, Near G.I.D.C.Office, Char Rasta,Vapi-396 195, Gujarat, India.
Extended Work Office : G.I.D.C., Dahej-II, Bharuch, Gujarat.
CIN:U73100GJ2007PTC051463

Continue…

Name of Location		Near Fire Station						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM_{10} µg/m³	$PM_{2.5}$ µg/m³	SO_2 µg/m³	NO_2 µg/m³	CO mg/m³	HC µg/m³	Benzene µg/m³
48.	14-09-2023	80.58	32.19	27.31	31.42	0.71	3.52	NOT DETECTED
49.	18-09-2023	67.33	26.42	21.54	24.77	0.53	1.38	NOT DETECTED
50.	21-09-2023	74.92	29.71	25.64	29.13	0.75	2.04	NOT DETECTED
51.	25-09-2023	70.74	27.25	23.58	26.83	0.63	1.84	NOT DETECTED
52.	28-09-2023	77.28	31.82	26.16	30.32	0.91	3.11	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)

GUJARAT VAPI

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_{10} µg/m³	$PM_{2.5}$ µg/m³	SO_2 µg/m³	NO_2 µg/m³	CO mg/m³	HC µg/m³	Benzene µg/m³
1.	03-04-2023	80.47	37.25	29.74	34.28	1.14	--	NOT DETECTED
2.	06-04-2023	77.92	45.27	39.16	42.78	0.94	3.16	NOT DETECTED
3.	10-04-2023	86.74	35.83	31.58	38.64	0.91	2.44	NOT DETECTED
4.	13-04-2023	81.39	46.93	41.11	48.83	1.17	5.12	NOT DETECTED
5.	17-04-2023	88.26	36.34	34.26	37.56	1.12	3.73	NOT DETECTED
6.	20-04-2023	79.39	38.15	30.16	34.92	0.93	1.97	NOT DETECTED
7.	24-04-2023	84.82	44.79	36.81	39.14	1.00	4.16	NOT DETECTED
8.	27-04-2023	87.13	39.36	33.43	36.36	0.98	3.37	NOT DETECTED
9.	01-05-2023	77.48	42.53	33.48	39.64	1.17	4.62	NOT DETECTED
10.	04-05-2023	83.7	38.65	29.29	32.48	1	3.58	NOT DETECTED
11.	08-05-2023	79.46	48.49	36.82	43.76	1.23	5.95	NOT DETECTED
12.	11-05-2023	73.19	44.76	34.03	39.71	1.15	5.13	NOT DETECTED
13.	15-05-2023	86.79	41.37	27.42	33.91	1.1	3.82	NOT DETECTED
14.	18-05-2023	80.48	46.42	37.58	41.36	1.17	4.79	NOT DETECTED
15.	22-05-2023	76.51	40.51	31.49	36.15	1.15	3.67	NOT DETECTED

Continue…

Regd. Office : 215, Royal Arcade, Near G.I.D.C.Office, Char Rasta,Vapi-396 195, Gujarat, India.
Extended Work Office : G.I.D.C., Dahej-II, Bharuch, Gujarat.
CIN:U73100GJ2007PTC051463

Name of Location		ADANI PORT – TUG Berth 600 KL Pupm House						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM_{10} µg/m³	$PM_{2.5}$ µg/m³	SO_2 µg/m³	NO_2 µg/m³	CO mg/m³	HC µg/m³	Benzene µg/m³
16.	25-05-2023	81.49	38.13	28.67	33.26	1.12	4.18	NOT DETECTED
17.	29-05-2023	78.41	35.48	25.15	29.69	1	3.64	NOT DETECTED
18.	01-06-2023	87.48	44.85	31.36	38.57	1	5.23	NOT DETECTED
19.	05-06-2023	83.96	46.41	36.74	43.55	0.8	5.78	NOT DETECTED
20.	08-06-2023	87.52	40.78	29.65	36.28	0.75	4.58	NOT DETECTED
21.	12-06-2023	76.89	36.13	26.25	32.19	0.5	4.02	NOT DETECTED
22.	15-06-2023	88.56	30.15	14.56	20.98	0.05	3.67	NOT DETECTED
23.	19-06-2023	60.52	24.14	12.51	17.54	0.02	3.1	NOT DETECTED
24.	22-06-2023	62.35	21.15	11.28	15.23	0.10	2.59	NOT DETECTED
25.	26-06-2023	55.14	18.53	9.25	12.89	0.1	2.96	NOT DETECTED
26.	29-06-2023	56.23	17.55	10.25	14.56	0.5	3.14	NOT DETECTED
27.	03-07-2023	61.28	23.57	18.76	22.35	0.03	--	NOT DETECTED
28.	06-07-2023	67.42	26.78	19.32	21.57	0.06	2.97	NOT DETECTED
29.	10-07-2023	58.37	21.72	15.48	18.43	ND	1.25	NOT DETECTED
30.	13-07-2023	64.19	25.91	18.43	21.88	ND	2.36	NOT DETECTED
31.	17-07-2023	55.1	19.58	14.46	17.85	ND	1.13	NOT DETECTED

Continue…

Regd. Office : 215, Royal Arcade, Near G.I.D.C.Office, Char Rasta,Vapi-396 195, Gujarat, India.
Extended Work Office : G.I.D.C., Dahej-II, Bharuch, Gujarat.
CIN:U73100GJ2007PTC051463

Name of Location		ADANI PORT – TUG Berth 600 KL Pupm House						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM_{10} µg/m³	$PM_{2.5}$ µg/m³	SO_2 µg/m³	NO_2 µg/m³	CO mg/m³	HC µg/m³	Benzene µg/m³
32.	20-07-2023	69.52	22.47	19.93	22.41	0.02	2.7	NOT DETECTED
33.	24-07-2023	73.38	25.79	21.31	25.05	0.1	3.16	NOT DETECTED
34.	27-07-2023	78.53	28.31	20.68	23.36	0.05	3.76	NOT DETECTED
35.	31-07-2023	65.27	24.65	17.21	21.1	0.03	2.57	NOT DETECTED
36.	03-08-2023	71.36	30.18	21.57	24.16	0.93	2.96	NOT DETECTED
37.	07-08-2023	78.65	32.38	22.96	26.02	0.97	3.36	NOT DETECTED
38.	10-08-2023	86.93	36.61	25.74	27.97	1	3.85	NOT DETECTED
39.	14-08-2023	81.27	34.06	23.58	26.19	0.95	3.04	NOT DETECTED
40.	17-08-2023	70.43	37.59	28.83	31.65	1.04	4.25	NOT DETECTED
41.	21-08-2023	76.53	38.83	31.25	35.61	1.1	4.63	NOT DETECTED
42.	24-08-2023	88.61	41.41	34.64	38.45	1.12	5.12	NOT DETECTED
43.	28-08-2023	82.37	37.49	30.91	33.78	1	4.73	NOT DETECTED
44.	31-08-2023	89.52	34.31	27.88	31.94	0.97	3.62	NOT DETECTED
45.	04-09-2023	78.35	31.56	23.73	26.38	1.00	4.37	NOT DETECTED
46.	07-09-2023	81.75	33.38	26.36	30.54	1.04	5.16	NOT DETECTED
47.	11-09-2023	76.38	30.61	22.95	25.17	1	4.58	NOT DETECTED

Continue…

Regd. Office : 215, Royal Arcade, Near G.I.D.C.Office, Char Rasta,Vapi-396 195, Gujarat, India.
Extended Work Office : G.I.D.C., Dahej-II, Bharuch, Gujarat.
CIN:U73100GJ2007PTC051463

Name of Location		ADANI PORT – TUG Berth 600 KL Pupm House						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM_{10} µg/m³	$PM_{2.5}$ µg/m³	SO_2 µg/m³	NO_2 µg/m³	CO mg/m³	HC µg/m³	Benzene µg/m³
48.	14-09-2023	83.16	34.65	26.79	30.98	1.05	5.05	NOT DETECTED
49.	18-09-2023	72.48	27.89	21.56	24.35	0.92	3.13	NOT DETECTED
50.	21-09-2023	76.51	30.35	24.66	27.42	1	3.37	NOT DETECTED
51.	25-09-2023	81.49	32.78	27.9	31.67	1.05	4.26	NOT DETECTED
52.	28-09-2023	85.65	36.27	31.52	34.66	1.1	4.75	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
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GUJARAT VAPI

Jaivik S. Tandel
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Regd. Office : 215, Royal Arcade, Near G.I.D.C.Office, Char Rasta,Vapi-396 195, Gujarat, India.
Extended Work Office : G.I.D.C., Dahej-II, Bharuch, Gujarat.
CIN:U73100GJ2007PTC051463

Results of Ambient Air Quality Monitoring

Name of Location		PUB / Adani House						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM_{10} µg/m³	$PM_{2.5}$ µg/m³	SO_2 µg/m³	NO_2 µg/m³	CO mg/m³	HC µg/m³	Benzene µg/m³
1.	03-04-2023	81.59	32.37	12.74	18.52	0.47	--	NOT DETECTED
2.	06-04-2023	72.67	26.17	16.53	24.87	1.00	3.19	NOT DETECTED
3.	10-04-2023	79.71	28.64	11.77	15.14	0.69	3.47	NOT DETECTED
4.	13-04-2023	85.43	31.38	15.94	19.26	0.56	1.63	NOT DETECTED
5.	17-04-2023	74.71	24.15	10.68	14.83	0.45	1.29	NOT DETECTED
6.	20-04-2023	89.12	34.78	18.34	23.18	0.74	4.02	NOT DETECTED
7.	24-04-2023	70.88	25.12	13.28	17.85	0.38	3.27	NOT DETECTED
8.	27-04-2023	76.59	23.37	11.25	15.92	0.49	1.76	NOT DETECTED
9.	01-05-2023	89.16	32.08	14.56	18.34	1.12	2.85	NOT DETECTED
10.	04-05-2023	73.45	36.51	21.13	26.12	0.85	4.16	NOT DETECTED
11.	08-05-2023	86.54	28.12	15.76	19.58	1.00	3.31	NOT DETECTED
12.	11-05-2023	82.61	31.28	20.12	25.74	0.92	5.03	NOT DETECTED
13.	15-05-2023	85.47	38.64	23.12	27.89	1.00	4.58	NOT DETECTED
14.	18-05-2023	82.73	29.24	15.48	21.95	0.95	2.84	NOT DETECTED
15.	22-05-2023	74.91	25.10	12.46	16.32	1.07	2.36	NOT DETECTED

Continue…

Regd. Office : 215, Royal Arcade, Near G.I.D.C.Office, Char Rasta,Vapi-396 195, Gujarat, India.
Extended Work Office : G.I.D.C., Dahej-II, Bharuch, Gujarat.
CIN:U73100GJ2007PTC051463

Name of Location		PUB / Adani House						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM_{10} µg/m³	$PM_{2.5}$ µg/m³	SO_2 µg/m³	NO_2 µg/m³	CO mg/m³	HC µg/m³	Benzene µg/m³
16.	25-05-2023	69.55	22.47	14.36	17.85	0.90	2.14	NOT DETECTED
17.	29-05-2023	76.82	28.53	11.34	15.62	1.10	3.64	NOT DETECTED
18.	01-06-2023	83.49	34.61	17.32	22.92	1.00	3.70	NOT DETECTED
19.	05-06-2023	86.37	31.79	14.37	17.42	0.95	3.42	NOT DETECTED
20.	08-06-2023	81.94	27.37	12.47	16.33	0.07	3.10	NOT DETECTED
21.	12-06-2023	85.65	29.48	15.89	18.62	0.05	2.68	NOT DETECTED
22.	15-06-2023	72.56	25.14	13.21	17.25	0.02	2.55	NOT DETECTED
23.	19-06-2023	52.12	20.15	10.25	15.23	0.04	3.14	NOT DETECTED
24.	22-06-2023	54.12	17.25	9.25	14.30	0.05	2.36	NOT DETECTED
25.	26-06-2023	48.53	15.23	8.25	12.78	0.02	2.05	NOT DETECTED
26.	29-06-2023	45.25	14.28	7.60	11.21	0.05	2.54	NOT DETECTED
27.	03-07-2023	49.42	18.68	11.42	14.37	NOT DETECTED	--	NOT DETECTED
28.	06-07-2023	54.31	21.63	7.48	10.31	NOT DETECTED	NOT DETECTED	NOT DETECTED
29.	10-07-2023	46.78	17.42	6.30	8.54	NOT DETECTED	NOT DETECTED	NOT DETECTED
30.	13-07-2023	40.32	14.69	5.87	8.13	NOT DETECTED	NOT DETECTED	NOT DETECTED
31.	17-07-2023	43.25	15.74	7.53	12.74	NOT DETECTED	NOT DETECTED	NOT DETECTED

Continue…

Name of Location		PUB / Adani House						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM_{10} µg/m³	$PM_{2.5}$ µg/m³	SO_2 µg/m³	NO_2 µg/m³	CO mg/m³	HC µg/m³	Benzene µg/m³
32.	20-07-2023	51.99	17.53	10.18	13.89	NOT DETECTED	NOT DETECTED	NOT DETECTED
33.	24-07-2023	57.47	21.71	13.52	17.85	NOT DETECTED	NOT DETECTED	NOT DETECTED
34.	27-07-2023	49.74	18.63	11.57	14.38	NOT DETECTED	NOT DETECTED	NOT DETECTED
35.	31-07-2023	55.39	20.95	14.42	18.61	NOT DETECTED	NOT DETECTED	NOT DETECTED
36.	03-08-2023	57.93	22.48	14.23	19.45	NOT DETECTED	NOT DETECTED	NOT DETECTED
37.	07-08-2023	63.67	23.95	16.83	22.49	0.57	1.37	NOT DETECTED
38.	10-08-2023	69.72	25.65	19.70	25.18	0.84	1.95	NOT DETECTED
39.	14-08-2023	76.82	28.10	21.16	27.54	0.96	2.84	NOT DETECTED
40.	17-08-2023	88.54	31.79	18.28	23.93	0.73	3.16	NOT DETECTED
41.	21-08-2023	71.91	34.92	22.57	28.88	1.00	4.73	NOT DETECTED
42.	24-08-2023	76.48	37.63	25.91	31.45	1.13	5.28	NOT DETECTED
43.	28-08-2023	86.54	29.35	20.77	24.14	0.93	3.54	NOT DETECTED
44.	31-08-2023	81.38	26.59	17.24	23.45	0.81	3.12	NOT DETECTED
45.	04-09-2023	67.38	24.75	16.26	20.81	0.63	2.18	NOT DETECTED
46.	07-09-2023	73.26	27.42	18.91	23.74	0.74	2.65	NOT DETECTED
47.	11-09-2023	69.87	25.94	17.43	21.65	0.57	2.38	NOT DETECTED

Continue…

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Extended Work Office : G.I.D.C., Dahej-II, Bharuch, Gujarat.
CIN:U73100GJ2007PTC051463

Name of Location		PUB / Adani House						
Sr. No.	Date of Monitoring	Parameter with Results						
		PM_{10} µg/m³	$PM_{2.5}$ µg/m³	SO_2 µg/m³	NO_2 µg/m³	CO mg/m³	HC µg/m³	Benzene µg/m³
48.	14-09-2023	75.13	29.41	20.87	25.36	0.83	3.18	NOT DETECTED
49.	18-09-2023	63.69	21.83	14.27	18.50	0.41	1.86	NOT DETECTED
50.	21-09-2023	68.26	23.71	16.32	20.81	0.59	2.11	NOT DETECTED
51.	25-09-2023	72.47	24.60	17.91	22.53	0.80	2.87	NOT DETECTED
52.	28-09-2023	76.19	26.74	20.45	25.18	0.87	3.41	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)

GUJARAT VAPI

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					
		13-04-2023	11-05-2023	12-06-2023	13-07-2023	14-08-2023	14-09-2023
1	06:00 to 07:00	64.1	62.5	63.5	60.9	61.3	65.1
2	07:00 to 08:00	66.7	61.5	66.9	63.1	64.8	67.4
3	08:00 to 09:00	68.3	60.5	67.5	65.4	65.4	64.8
4	09:00 to 10:00	64.3	62.3	68.6	63.7	63.7	67.4
5	10:00 to 11:00	67.8	60.5	61.5	63.9	64.3	69.7
6	11:00 to 12:00	62.9	63.4	66.4	67	68.5	67.4
7	12:00 to 13:00	67.9	64.2	68.9	67.8	66.2	68.3
8	13:00 to 14:00	64.5	65.5	69.5	63.8	64.2	67.1
9	14:00 to 15:00	68.3	64.9	64.5	63.2	65.7	69.9
10	15:00 to 16:00	62.9	63.6	66.2	64.2	63.2	65.4
11	16:00 to 17:00	67.5	65.3	60.2	62.4	62.4	67.5
12	17:00 to 18:00	67.1	62.8	65.5	61.6	61.6	63.7
13	18:00 to 19:00	68.4	63.4	68.9	65.9	64.1	65.3
14	19:00 to 20:00	64.6	65.5	68.5	69.9	63.2	65.7
15	20:00 to 21:00	67.4	62.8	63.2	67.2	65.4	63.1
16	21:00 to 22:00	62.6	60.5	59.7	64.1	62.5	62.8
Day Time		<75 dB (A)					

Continue...

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Extended Work Office : G.I.D.C., Dahej-II, Bharuch, Gujarat.
CIN:U73100GJ2007PTC051463

Location Name		CT3 RMU-2					
Sr. No.	Sampling Date and Time	Noise Level Leq. dB(A) – Night Time					
		13-04-2023	11-05-2023	12-06-2023	13-07-2023	14-08-2023	14-09-2023
1	22:00 to 23:00	62.8	62.5	60.5	60.3	62.4	60.1
2	23:00 to 24:00	60.4	62.3	59.8	63.2	64.8	63.5
3	24:00 to 01:00	59.4	62.3	59.8	61.7	63.8	62.7
4	01:00 to 02:00	58.8	61.6	60.3	62.1	61.7	60.2
5	02:00 to 03:00	59.8	57.8	58.5	60.4	62.7	57.6
6	03:00 to 04:00	58.5	55.9	60.5	64.5	59.4	59.3
7	04:00 to 05:00	57.5	55.5	60.5	62.5	60.3	60.4
8	05:00 to 06:00	58.9	58.2	59.4	58.4	58.1	59.8
Night Time		<70 dB (A)					

Test Method	IS: 9989 : 1981

Nikunj D. Patel
(Chemist)

GUJARAT VAPI

Jaivik S. Tandel
(Manager - Operations)

White House
Near G.I.D.C. Office, Char Rasta,
Vapi - 396 195. Gujarat, India.
Phone : +91 260 2433966 / 2425610
Email : response@uerl.in Website : www.uerl.in

Results of Noise Level Monitoring

Location Name		Near Fire Station					
Sr. No.	Sampling Date and Time	Noise Level Leq. dB(A) - Day Time					
		06-04-2023	04-05-2023	05-06-2023	06-07-2023	07-08-2023	07-09-2023
1	06:00 to 07:00	63.8	63.4	63.5	64.3	65.1	64.2
2	07:00 to 08:00	67.4	65.2	64.2	67.5	68.4	66.8
3	08:00 to 09:00	62.1	64.2	62.5	63.2	65.3	67.5
4	09:00 to 10:00	64.2	60.7	64.5	64.9	66.8	68.1
5	10:00 to 11:00	69.7	60.5	62.9	62.1	64.3	66.8
6	11:00 to 12:00	63.2	62.7	66.7	67.5	68.1	65.3
7	12:00 to 13:00	65.8	60.6	65.3	63.8	64.9	67.7
8	13:00 to 14:00	67.3	59.7	66.7	65.9	67.1	66.9
9	14:00 to 15:00	67.1	58.5	62.9	67.1	65.2	68.5
10	15:00 to 16:00	64.9	61.2	64.2	62.4	63.5	66.4
11	16:00 to 17:00	61.9	65.3	62.5	67.5	66.8	67.5
12	17:00 to 18:00	64.1	62.8	69.2	64.8	62.9	64.3
13	18:00 to 19:00	63.6	64.2	64.5	61.2	63.6	62.6
14	19:00 to 20:00	64.8	61.8	62.3	60.9	58.6	62.9
15	20:00 to 21:00	61.2	60.5	60.6	64.7	62.4	63.7
16	21:00 to 22:00	63.6	59.5	60.1	63.4	61.5	60.6
Day Time		<75 dB (A)					

Continue…

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Extended Work Office : G.I.D.C., Dahej-II, Bharuch, Gujarat.
CIN:U73100GJ2007PTC051463

Location Name		Near Fire Station					
Sr. No.	Sampling Date and Time	Noise Level Leq. dB(A) - Night Time					
		06-04-2023	04-05-2023	05-06-2023	06-07-2023	07-08-2023	07-09-2023
1	22:00 to 23:00	58.2	61.8	60.1	60.3	61.5	55.4
2	23:00 to 24:00	56.9	64.5	59.7	61.8	59.7	59.2
3	24:00 to 01:00	57.2	63.9	60.5	62.8	61.8	63.5
4	01:00 to 02:00	60.2	64.5	54.2	60.7	62.9	62.8
5	02:00 to 03:00	57.6	57.5	64.5	61.4	60.3	60.2
6	03:00 to 04:00	55.3	59.2	57.8	63.6	62.4	57.3
7	04:00 to 05:00	55.5	60.5	56.2	64.5	60.1	55.4
8	05:00 to 06:00	57.8	62.5	58.9	62.7	59.5	59.3
Night Time		<70 dB (A)					

Test Method	IS: 9989 : 1981

GUJARAT VAPI

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					
		10-04-2023	08-05-2023	08-06-2023	10-07-2023	10-08-2023	11-09-2023
1	06:00 to 07:00	61.3	61.5	62.6	62.7	63.7	63.8
2	07:00 to 08:00	64.9	60.5	68.3	65.4	66.2	65.3
3	08:00 to 09:00	63.2	62.3	64.2	63.9	66.9	67.1
4	09:00 to 10:00	67.4	60.5	69.8	67	68.4	66.8
5	10:00 to 11:00	65.9	63.4	62.2	67.8	65.4	68.4
6	11:00 to 12:00	63.5	64.2	68.8	63.8	62.5	65.2
7	12:00 to 13:00	61.3	69.5	65.2	63.2	61.8	66.8
8	13:00 to 14:00	64.8	69.2	66.1	62.4	64.6	65.3
9	14:00 to 15:00	69.5	69.5	60.6	62.5	63.2	68.3
10	15:00 to 16:00	66.3	68.2	61.8	67.1	66.9	67.2
11	16:00 to 17:00	68.1	67.5	62.5	63.9	65.3	69.2
12	17:00 to 18:00	59.8	68.5	63.2	64.2	65.1	67.4
13	18:00 to 19:00	64.9	64.2	65.4	62.6	64.7	63.8
14	19:00 to 20:00	63.2	61.8	62.1	63.3	63.6	63.5
15	20:00 to 21:00	64.6	60.1	60.2	66.1	64.5	62.6
16	21:00 to 22:00	60.1	63.5	58.9	59.9	60.1	61.3
Day Time		<75 dB (A)					

Continue…

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Extended Work Office : G.I.D.C., Dahej-II, Bharuch, Gujarat.
CIN:U73100GJ2007PTC051463

Location Name		ADANI PORT – TUG Berth 600 KL Pump House					
Sr. No.	Sampling Date and Time	Noise Level Leq. dB(A) - Night Time					
		10-04-2023	08-05-2023	08-06-2023	10-07-2023	10-08-2023	11-09-2023
1	22:00 to 23:00	60.6	57.5	61.9	63.9	60.8	57.7
2	23:00 to 24:00	60.5	55.6	62.7	62.3	61.8	60.1
3	24:00 to 01:00	56.7	57.2	63.8	55.3	63.8	61.4
4	01:00 to 02:00	63.5	55.8	64.5	58.3	62.1	61.9
5	02:00 to 03:00	62.8	54.2	60.5	56.5	58.3	58.3
6	03:00 to 04:00	64.5	54.9	63.2	58.8	56.9	55.2
7	04:00 to 05:00	62.3	61.2	60.4	60.7	59.1	56.7
8	05:00 to 06:00	61.5	59.5	60.1	60.1	57.3	58.6
Day Time		<70 dB (A)					

Test Method	IS: 9989 : 1981

GUJARAT VAPI

Nikunj D. Patel
(Chemist)

Jaivik S. Tandel
(Manager - Operations)

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Extended Work Office : G.I.D.C., Dahej-II, Bharuch, Gujarat.
CIN:U73100GJ2007PTC051463

Results of Noise Level Monitoring

Location Name		PUB/Adani House					
Sr. No.	Sampling Date and Time	Noise Level Leq. dB(A) - Day Time					
		03-04-2023	01-05-2023	01-06-2023	03-07-2023	03-08-2023	04-09-2023
1	06:00 to 07:00	67.5	61.9	61.3	62.5	60.5	62.8
2	07:00 to 08:00	63.2	63.5	63.5	60.9	62.7	63.9
3	08:00 to 09:00	67.4	66.1	66.7	63.2	64.1	65.3
4	09:00 to 10:00	64.8	67.8	67.5	67.4	65.4	63.7
5	10:00 to 11:00	65.3	62.4	68.6	65.2	68.4	63.1
6	11:00 to 12:00	69.1	65.4	61.5	68.9	67.3	64.7
7	12:00 to 13:00	67.4	63.9	66.4	64.8	63.2	66.1
8	13:00 to 14:00	66.9	64.5	68.9	62.3	62.3	63.7
9	14:00 to 15:00	68.4	64.3	66.7	68.6	65.8	64.6
10	15:00 to 16:00	65.7	65.8	67.1	61.2	60.3	62.8
11	16:00 to 17:00	62.7	69.4	68.5	67.2	64.3	64.1
12	17:00 to 18:00	65.9	65.4	68.5	65.5	66.7	65.3
13	18:00 to 19:00	61.5	66.1	66.9	63.4	62.4	62.7
14	19:00 to 20:00	64.6	63.8	62.5	64.7	63.8	63.2
15	20:00 to 21:00	63.6	63.5	63.3	61.4	60.4	64.6
16	21:00 to 22:00	64.9	62.6	58.9	60.1	59.7	61.4
Day Time		<75 dB (A)					

Continue…

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Extended Work Office : G.I.D.C., Dahej-II, Bharuch, Gujarat.
CIN:U73100GJ2007PTC051463

Location Name		PUB/Adani House					
Sr. No.	Sampling Date and Time	Noise Level Leq. dB(A) - Night Time					
		03-04-2023	01-05-2023	01-06-2023	03-07-2023	03-08-2023	04-09-2023
1	22:00 to 23:00	58.6	58.5	60.2	56.8	58.2	56.8
2	23:00 to 24:00	57.5	58.3	62.5	59.4	60.1	56.9
3	24:00 to 01:00	58.2	57.5	60.4	60.2	60.7	58.4
4	01:00 to 02:00	56.9	57.8	60.4	57.1	58.3	61.3
5	02:00 to 03:00	58.5	55.9	60.5	57.3	57.3	59.7
6	03:00 to 04:00	57.5	55.5	59.6	62.9	59.4	55.4
7	04:00 to 05:00	56.5	58.2	58.5	60.2	61.2	58.2
8	05:00 to 06:00	57.2	57.5	59.7	59.8	57.3	56.1
Day Time		<70 dB (A)					

Test Method	IS: 9989 : 1981

Nikunj D. Patel
(Chemist)

GUJARAT VAPI

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
Apr-23								
1	Particulate Matter	mg/Nm^3	22.86	19.76	21.38	19.06	150	IS 11255 (Part - 1)
2	Sulphur Dioxide as SO_2	ppm	6.10	6.53	8.69	8.17	100	IS 11255 (Part - 2)
3	Oxides of Nitrogen as NO_X	ppm	19.34	21.84	20.17	21.35	50	IS 11255 (Part - 7)
May-23								
1	Particulate Matter	mg/Nm^3	20.15	19.14	22.85	21.35	150	IS 11255 (Part - 1)
2	Sulphur Dioxide as SO2	ppm	6.38	6.23	7.46	8.68	100	IS 11255 (Part - 2)
3	Oxides of Nitrogen as NOX	ppm	21.64	20.37	18.87	22.31	50	IS 11255 (Part - 7)
Jun-23								
1	Particulate Matter	mg/Nm^3	21.35	16.39	21.13	21.87	150	IS 11255 (Part - 1)
2	Sulphur Dioxide as SO_2	ppm	8.68	6.57	7.28	8.90	100	IS 11255 (Part - 2)
3	Oxides of Nitrogen as NO_X	ppm	22.31	19.36	19.45	21.18	50	IS 11255 (Part - 7)
Jul-23								
1	Particulate Matter	mg/Nm^3	21.87	17.68	19.52	20.75	150	IS 11255 (Part - 1)
2	Sulphur Dioxide as SO_2	ppm	8.90	5.95	5.79	7.59	100	IS 11255 (Part - 2)
3	Oxides of Nitrogen as NO_X	ppm	21.18	16.26	16.41	19.63	50	IS 11255 (Part - 7)

Continue…

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CIN:U73100GJ2007PTC051463

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
Aug-23								
1	Particulate Matter	mg/Nm^3	19.18	20.15	22.37	23.61	150	IS 11255 (Part - 1)
2	Sulphur Dioxide as SO_2	ppm	8.10	6.08	8.13	9.82	100	IS 11255 (Part - 2)
3	Oxides of Nitrogen as NO_X	ppm	22.85	18.57	20.42	22.45	50	IS 11255 (Part - 7)
Sep-23								
1	Particulate Matter	mg/Nm^3	17.84	18.93	20.47	21.11	150	IS 11255 (Part - 1)
2	Sulphur Dioxide as SO_2	ppm	7.65	6	7.28	9.20	100	IS 11255 (Part - 2)
3	Oxides of Nitrogen as NO_X	ppm	21.10	17.26	18.57	19.89	50	IS 11255 (Part - 7)

Nikunj D. Patel
(Chemist)

GUJARAT VAPI

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
			Sep-23	Aug-23				
			22-09-2023	04-08-2023	04-08-2023	04-08-2023		
1	Particulate Matter	mg/Nm^3	25.48	18.42	20.81	19.32	150	IS 11255 (Part - 1)
2	Sulphur Dioxide as SO_2	ppm	9.96	15.27	17.65	15.75	100	IS 11255 (Part - 2)
3	Oxides of Nitrogen as NO_X	ppm	19.32	27.58	29.14	22.49	50	IS 11255 (Part - 7)
4	Carbon Monoxide	mg/Nm3	4.19	4.1	3.8	3.6	--	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
			Aug-23			Dec-22		
			05-08-2023	05-08-2023	05-08-2023	06-08-2023		
1	Particulate Matter	mg/Nm^3	24.39	27.83	21.95	22.74	150	IS 11255 (Part - 1)
2	Sulphur Dioxide as SO_2	ppm	9.65	9.96	9.34	8.58	100	IS 11255 (Part - 2)
3	Oxides of Nitrogen as NO_X	ppm	21.26	23.54	19.11	28.63	50	IS 11255 (Part - 7)
4	Carbon Monoxide	mg/Nm3	3.8	5.12	4.1	3.16	--	UERL/AIR/SOP/18
5	Non Methyl Hydro Carbon	ppm	Not Detected	Not Detected	Not Detected	Not Detected	--	UERL/AIR/SOP/27

Continue…

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Extended Work Office : G.I.D.C., Dahej-II, Bharuch, Gujarat.
CIN:U73100GJ2007PTC051463

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
			Aug-23					
			06-08-2023	06-08-2023	06-08-2023	06-08-2023		
1	Particulate Matter	mg/Nm^3	26.35	23.74	28.53	22.61	150	IS 11255 (Part - 1)
2	Sulphur Dioxide as SO_2	ppm	7.26	9.89	9.48	8.48	100	IS 11255 (Part - 2)
3	Oxides of Nitrogen as NO_X	ppm	30.41	29.38	29.61	26.54	50	IS 11255 (Part - 7)
4	Carbon Monoxide	mg/Nm3	3.93	5.12	5.84	3.91	--	UERL/AIR/SOP/18
5	Non Methyl Hydro Carbon	ppm	Not Detected	Not Detected	Not Detected	Not Detected	--	UERL/AIR/SOP/27

GUJARAT VAPI

Nikunj D. Patel
(Chemist)

Jaivik S. Tandel
(Manager - Operations)

Regd. Office : 215, Royal Arcade, Near G.I.D.C.Office, Char Rasta,Vapi-396 195, Gujarat, India.
Extended Work Office : G.I.D.C., Dahej-II, Bharuch, Gujarat.
CIN:U73100GJ2007PTC051463

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
			01-09-2023	01-09-2023	01-09-2023	01-09-2023	01-09-2023	
1.	pH @ 25 ° C	--	8.37	8.08	8.48	8.49	7.67	IS 3025(Part 11)1983
2.	Salinity	ppt	2.46	0.89	0.37	0.43	5.82	APHA 23rd 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)	BDL(MDL:0.01)	BDL(MDL:0.01)	BDL(MDL:0.01)	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 23rd Ed.,2017,3114-C
7.	Nickel as Ni	mg/L	0.064	0.055	0.035	0.029	0.252	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	0.014	0.014	BDL(MDL:0.003)	0.012	0.149	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 23rd Ed.,2017, 3112-B
11.	Zinc as Zn	mg/L	0.076	0.065	0.062	0.061	0.137	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	0.369	0.946	0.178	0.146	0.457	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	1.92	2.14	1.9	2.1	2.06	--

GUJARAT VAPI

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/m3	5 µg/m3
2	Particulate Matter (PM2.5)	µg/m3	5 µg/m3
3	Sulphur Dioxide (SO2)	µg/m3	4 µg/m3
4	Nitrogen Dioxide (NO2)	µg/m3	5 µg/m3
5	Carbon Monoxide (CO)	mg/m3	0.01 mg/m3
6	Ammonia (NH3)	µg/m3	5 µg/m3
7	Ozone (O3)	µg/m3	5 µg/m3
8	Lead (Pb)	µg/m3	0.5 µg/m3
9	Nickle (Ni)	ng/m3	1 ng/m3
10	Arsenic (As)	ng/m3	1 ng/m3
11	Benzene	µg/m3	1µg/m3
12	Benzo(o)Pyrene	ng/m3	0.1 ng/m3
14	Hydro Carbon	µg/m3	1 µg/m3

Stack Emission Monitoring

Sr. No.	Test Parameter	Unit	MDL
1	Suspended particulate matter	mg/Nm3	2 mg/Nm3
2	Sulphur Dioxide SOX	mg/Nm3	4 mg/Nm3
3	Oxides of Nitrogen NOX	mg/Nm3	5 mg/Nm3

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Extended Work Office : G.I.D.C., Dahej-II, Bharuch, Gujarat.
CIN:U73100GJ2007PTC051463

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_3	µmol/L	0.4
9	Nitrite as NO_2	µmol/L	0.04
10	Ammonical Nitrogen as NH_3	µmol/L	0.8
11	Phosphates as PO_4	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

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CIN:U73100GJ2007PTC051463

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

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CIN:U73100GJ2007PTC051463

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 – 4

Annexure – 5

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
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November- 2023

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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 km2. 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^2 facilitates a rich fishery resource.

Kachchh coast supports the mangrove extent of 798.74 km^2, constituting 68% of state's mangroves (1175 km^2) 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. 15th July, 2014 & 12th 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 18th 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 tobe 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^2 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. Koylavali 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.

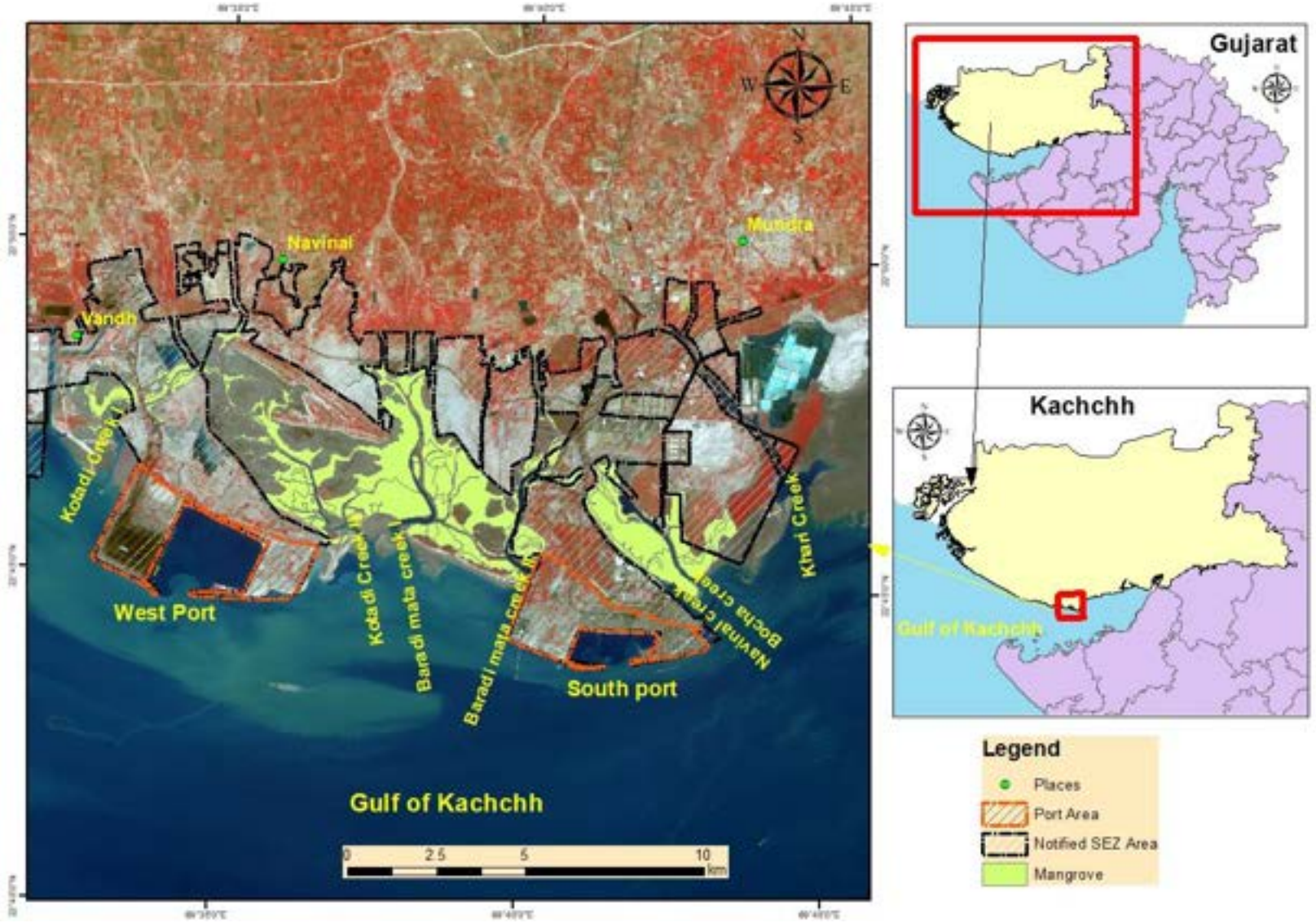

Figure 2.1: Location Map of The Study Area

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 36^0C. The dry bulb temperature goes up to 47.8^0C, 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 ^{0}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 45^0 during flood and 220^0 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^oC 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 evaloved 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 quadrate was 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 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 03rd to 07th July 2023; 11th to 16th September 2023 and 16th to 20th October 2023 for collecting ground truthing data to cover the entire APSEZ area.

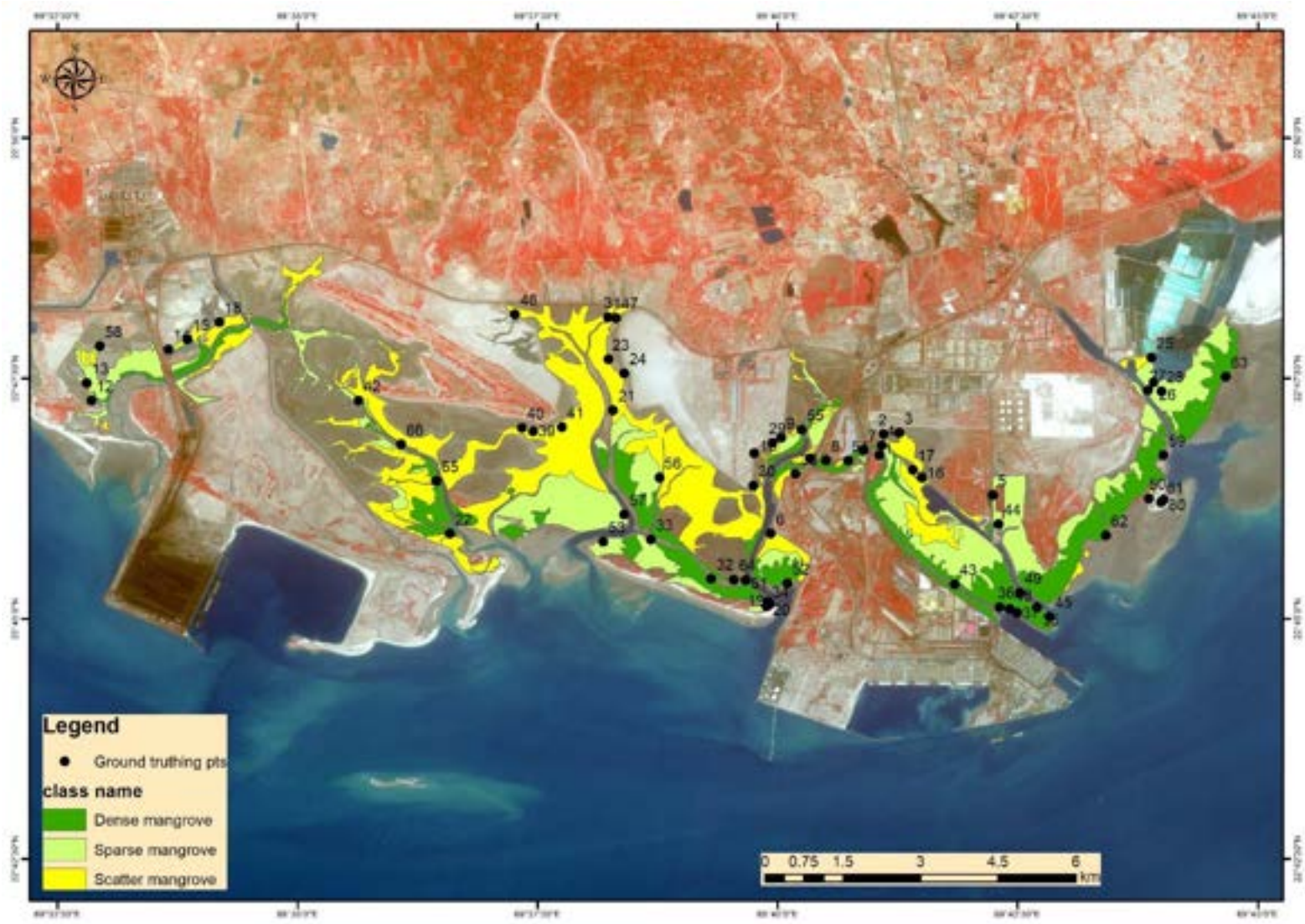

Figure 3.3: Ground Truthing Data and Mangrove Data Collection Points

Kotadi Creek Block	
Dense Mangrove	
	
Sparse Mangrove	
	
Scattered Mangrove	
	

Baradi mata Creek Block	
Dense Mangrove	
	
Sparse Mangrove	
	
Scattered Mangrove	
	

Bocha-Navinal Creek Block	
Dense Mangrove	
	
Sparse Mangrove	
	
Scattered Mangrove	
	

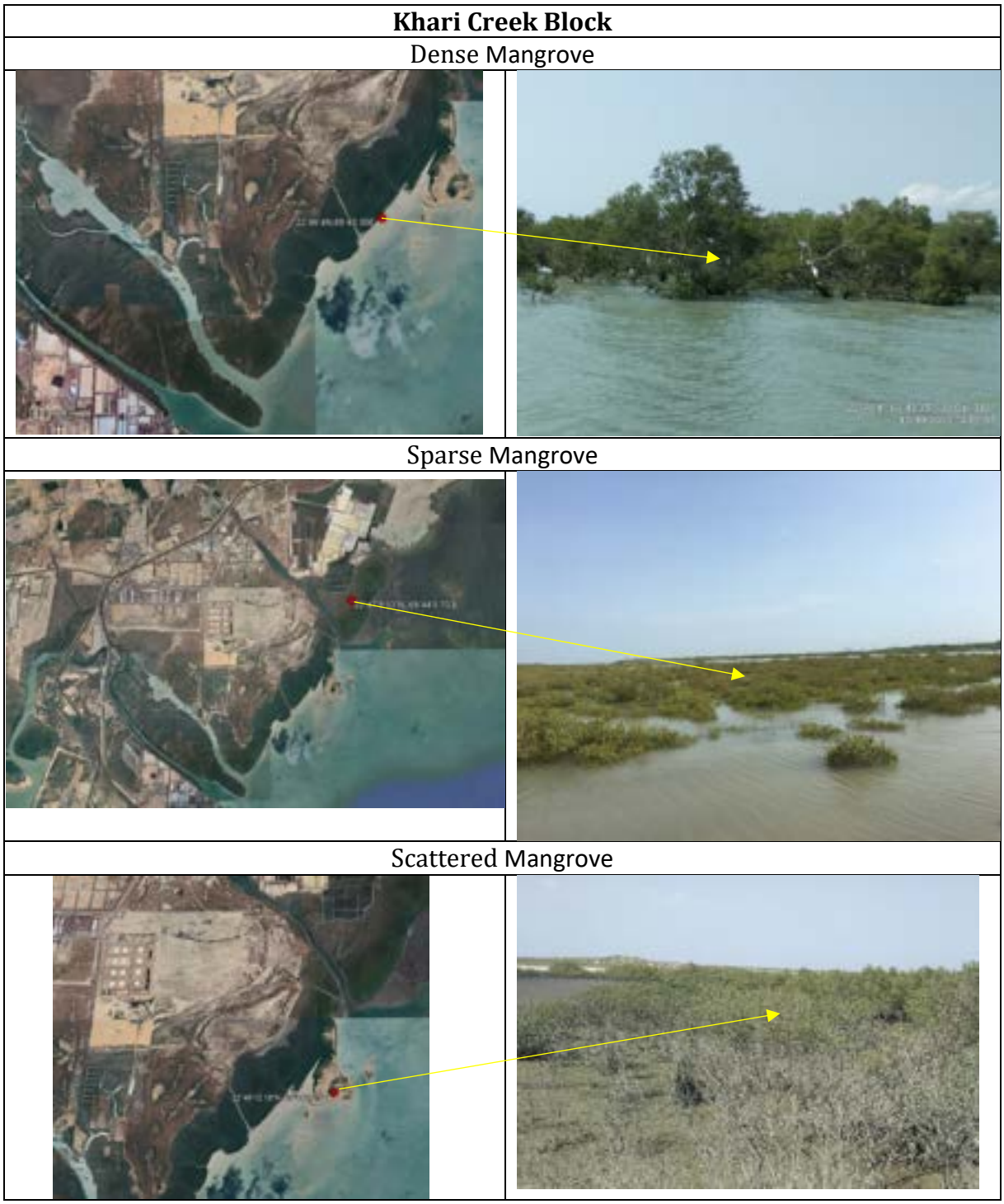

Figure 3.4: Surveyed and Collected Ground Truthing Data Various Categories of Mangroves

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 4.1and 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

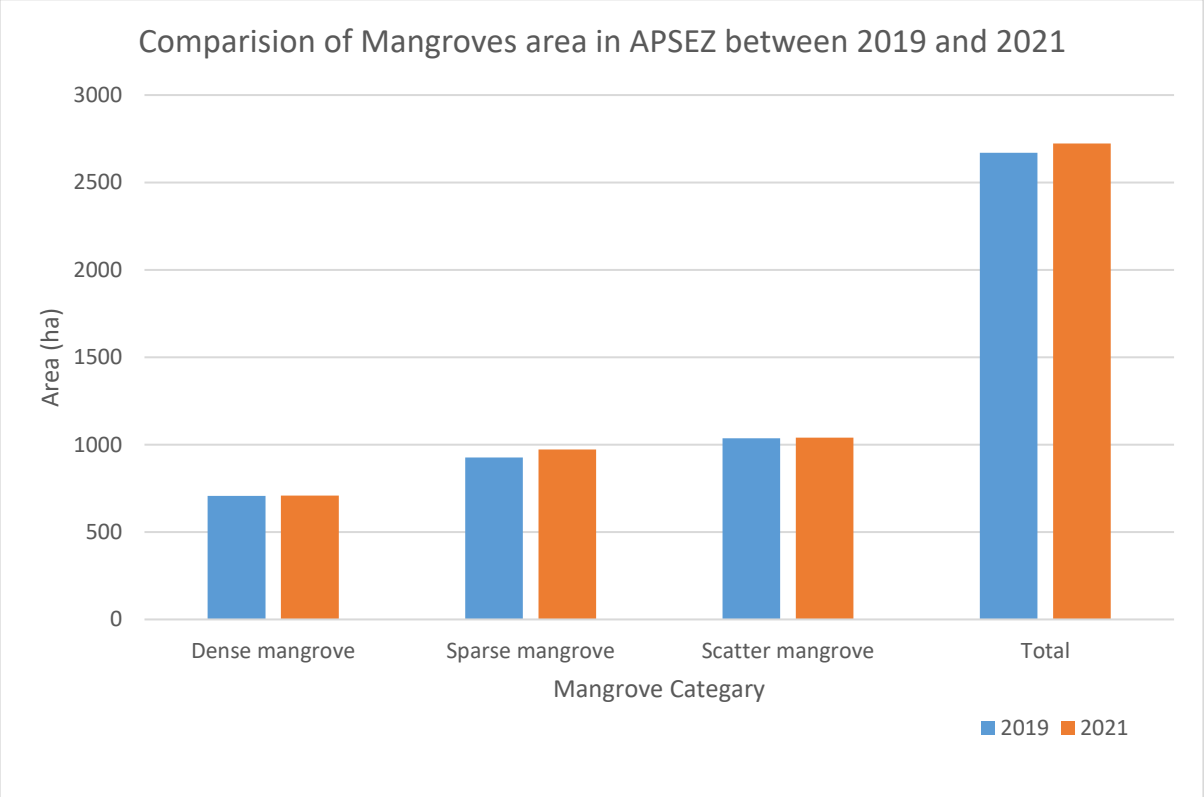

Figure 4.1: Comparison of Various Categories of Mangroves in APSEZ Between 2019 and 2021

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

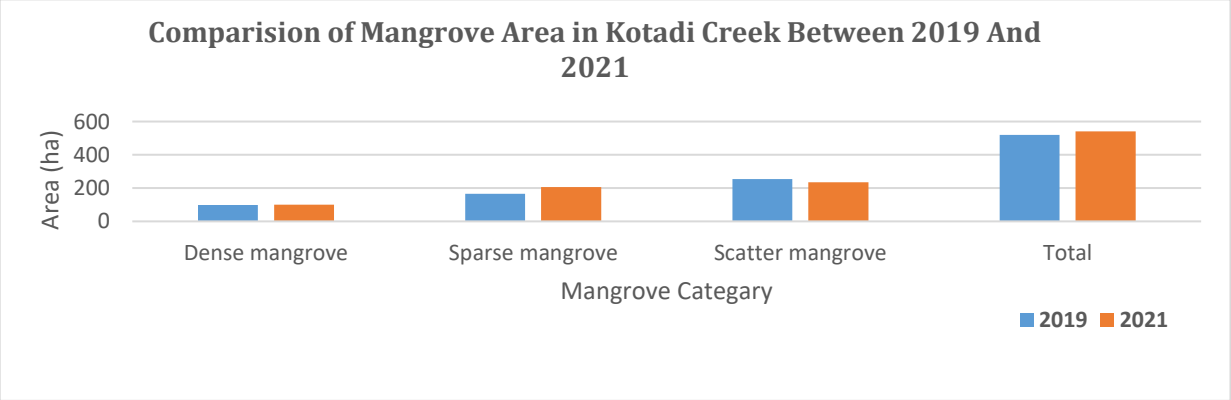

Figure 4.4: Comparison of Various Categories of Mangroves in Kotadi Creek Zone Between 2019 and 2021

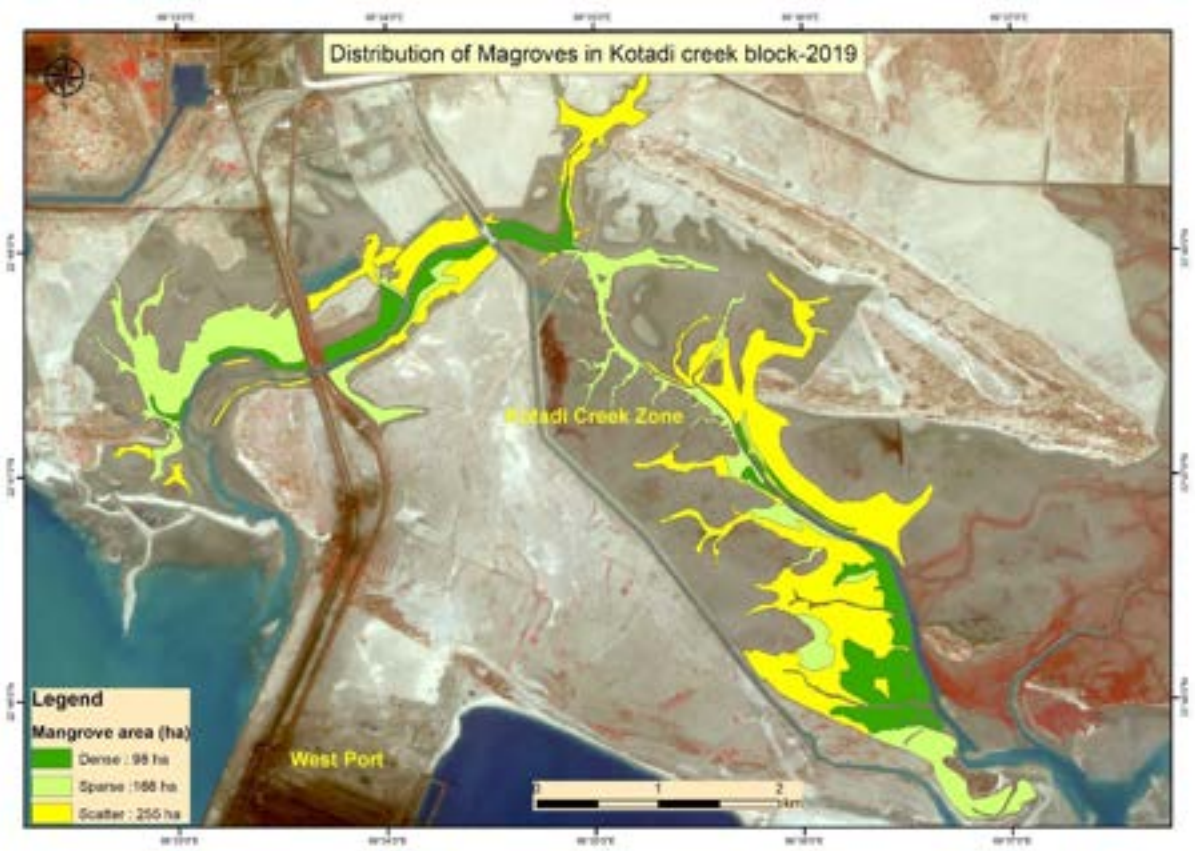

Figure 4.5: Distribution of Mangroves in 2019 in Kotdi Creek Zone System.

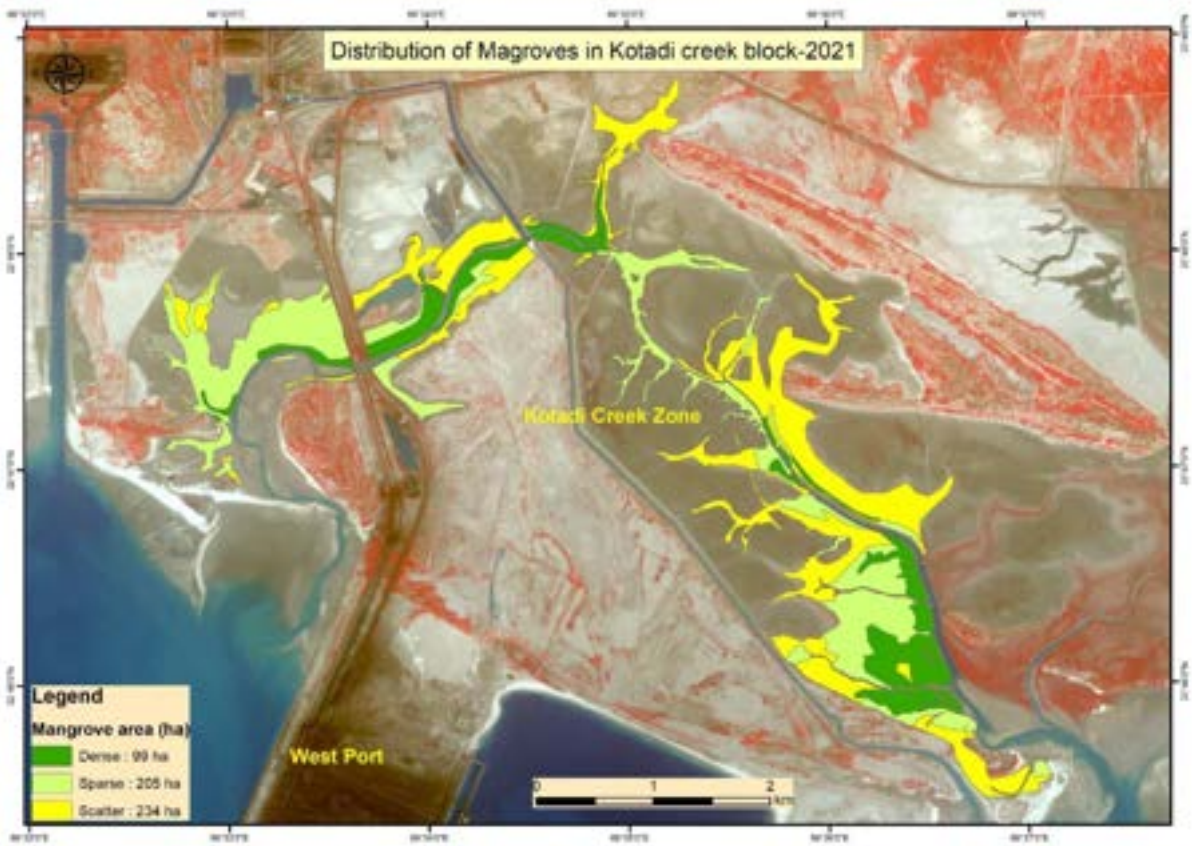

Figure 4.6: Distribution of Mangroves in 2021 in Kotdi Creek Zone System.

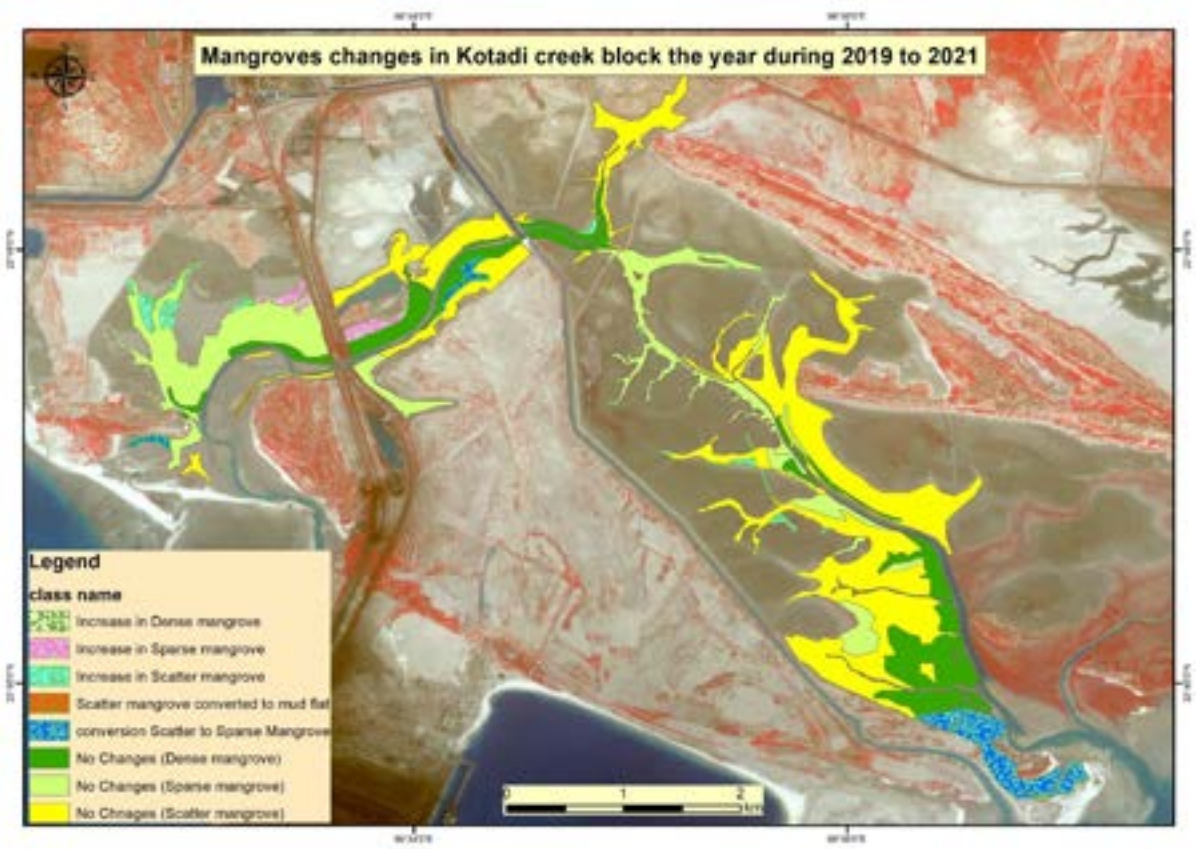

Figure 4.7: Change Analysis from 2019 to 2021 on Categories of Mangroves in Kotadi Creek System

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

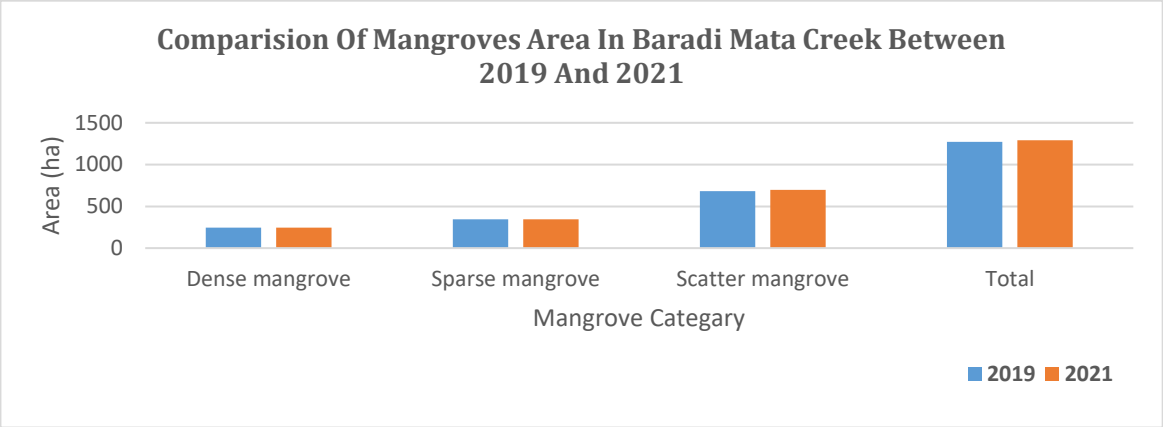

Figure 4.8: Comparison of Various Categories of Mangroves in Baradi Mata Creek Zone Between 2019 and 2021

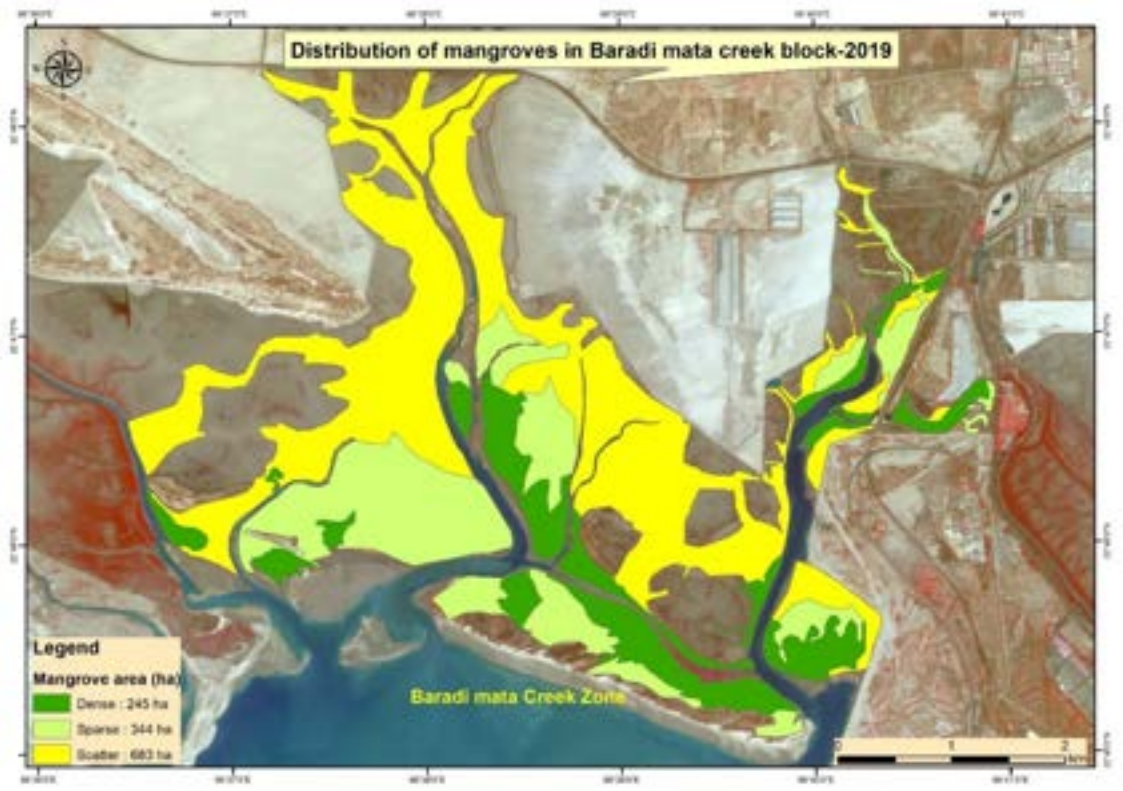

Figure 4.9: Distribution of Mangroves at Baradi Mata Creek Zone in 2019

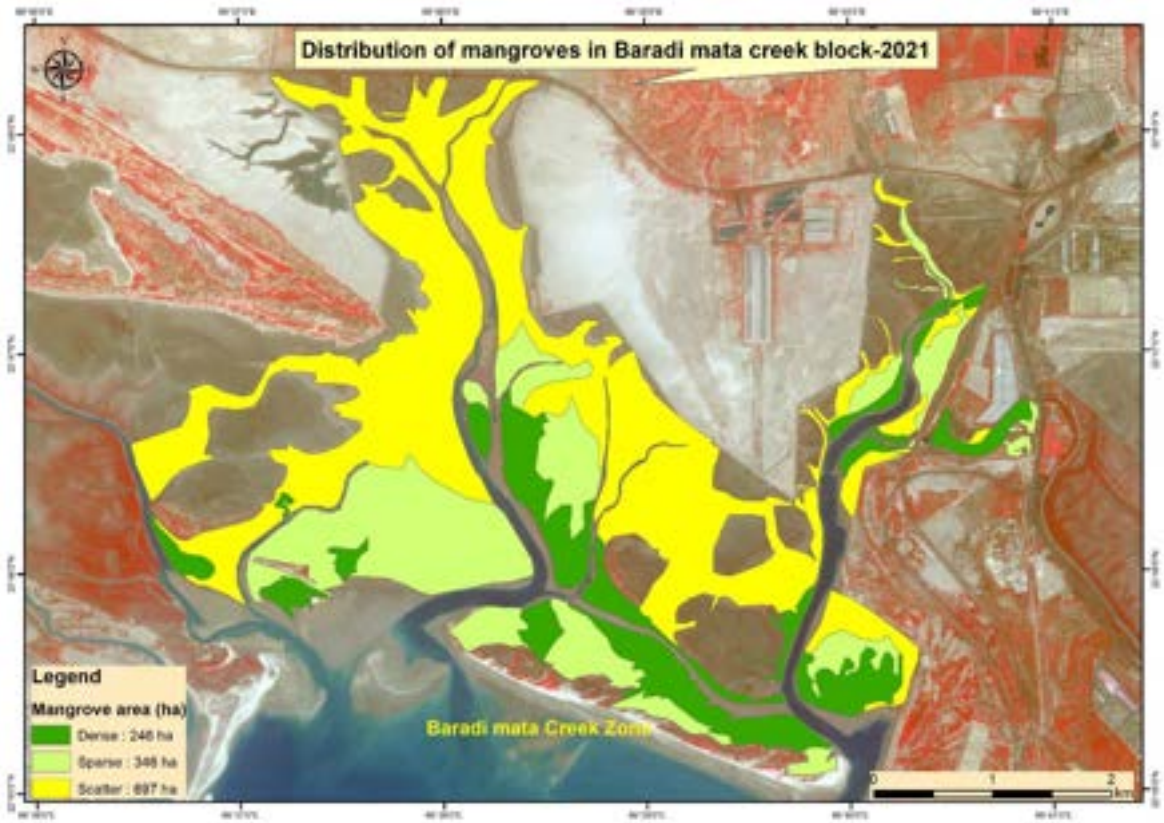

Figure 4.10: Distribution of Mangroves at Baradi mata Creek Zone in 2021

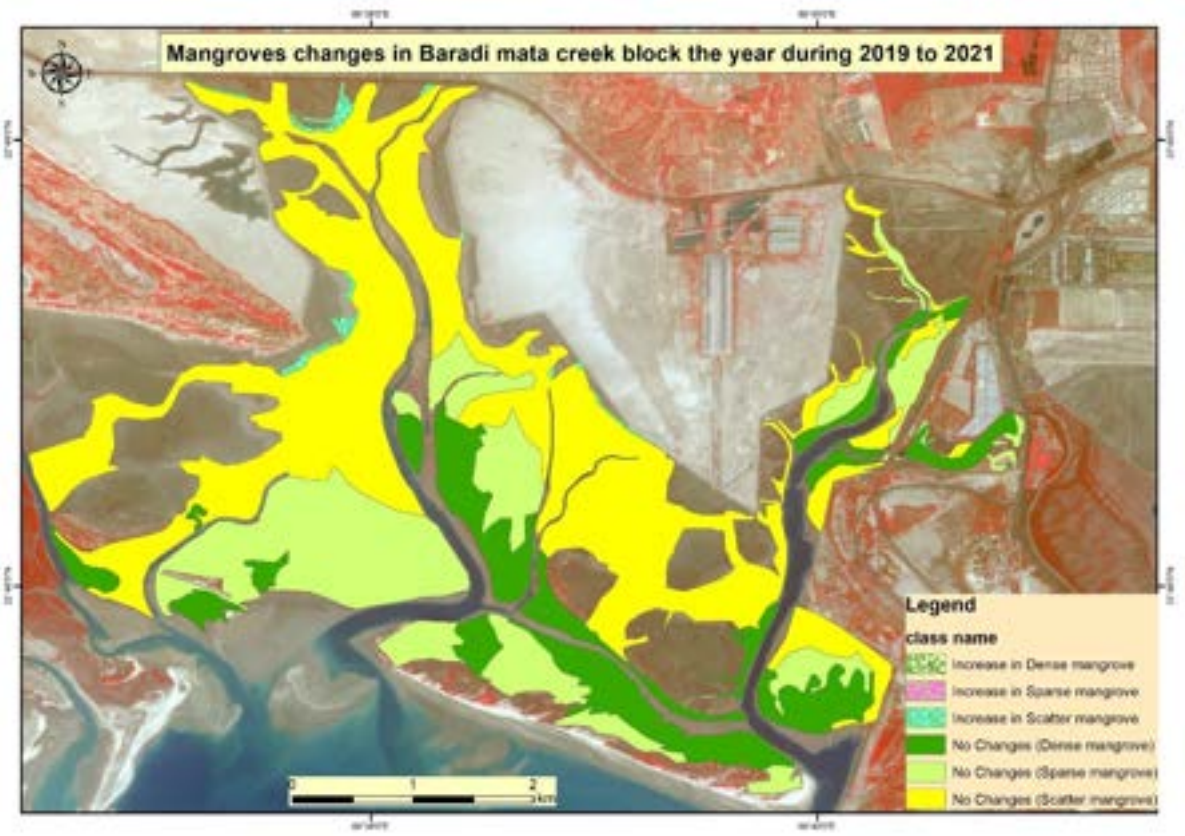

Figure 4.11: Change Analysis From 2019 To 2021 On Categories of Mangroves in Baradi Mata Creek System

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
Total	566.04	573.78	7.74

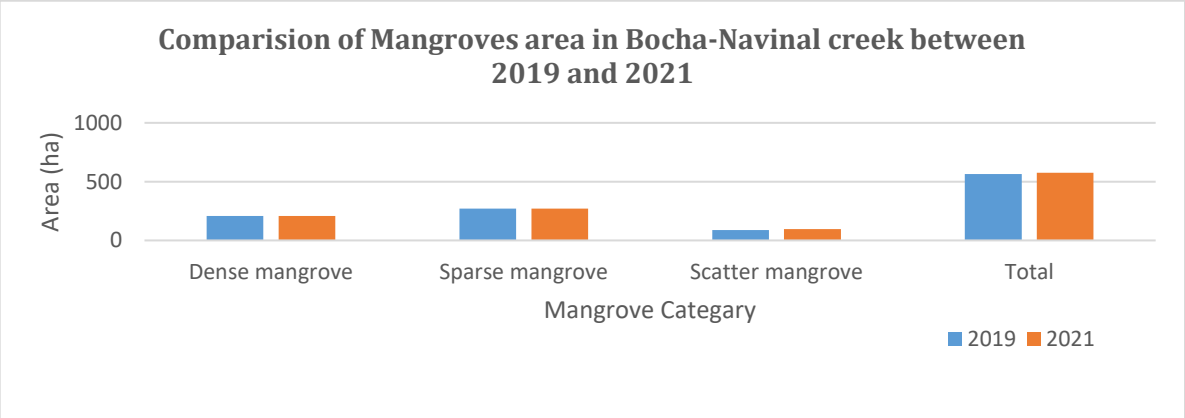

Figure 4.12: Comparison of Various Categories of Mangroves in Bocha-Navinal Creek Zone Between 2019 and 2021

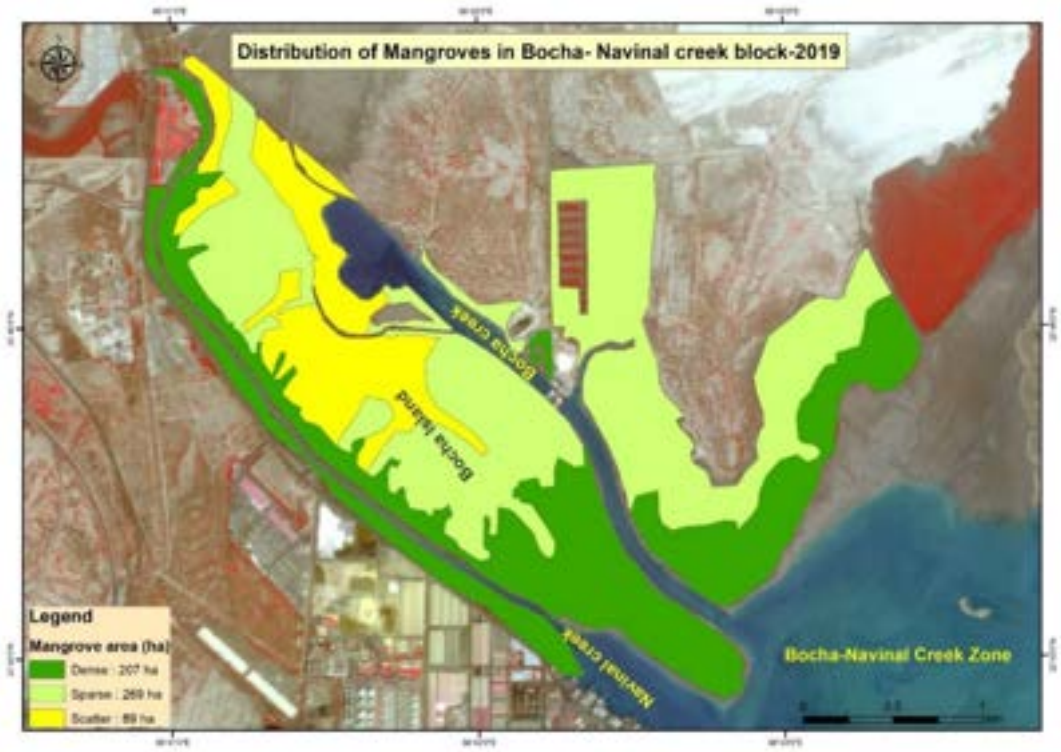

Figure 4.13: Distribution of Various Categories of Mangroves in Bocha- Navinal Creek Zone System for The Year 2019

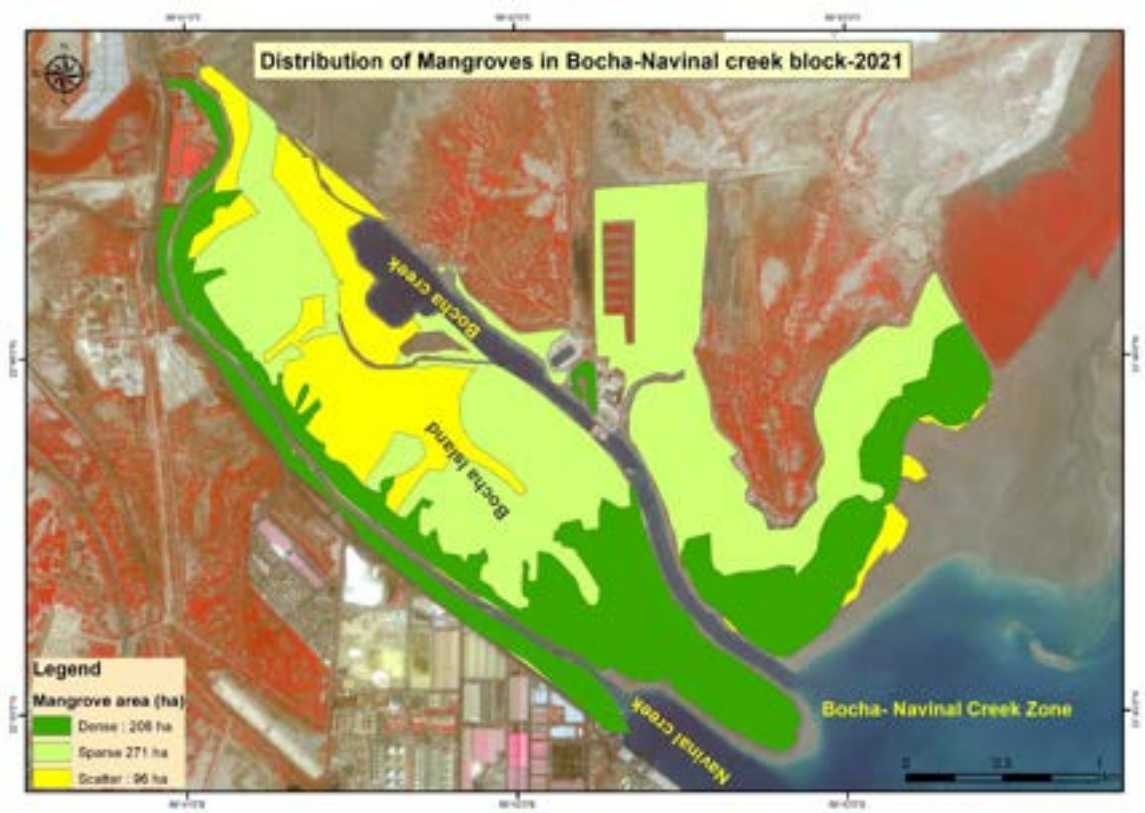

Figure 4.14: Distribution of Various Categories of Mangroves in Bocha - Navinal Creek Zone System for The Year 2021

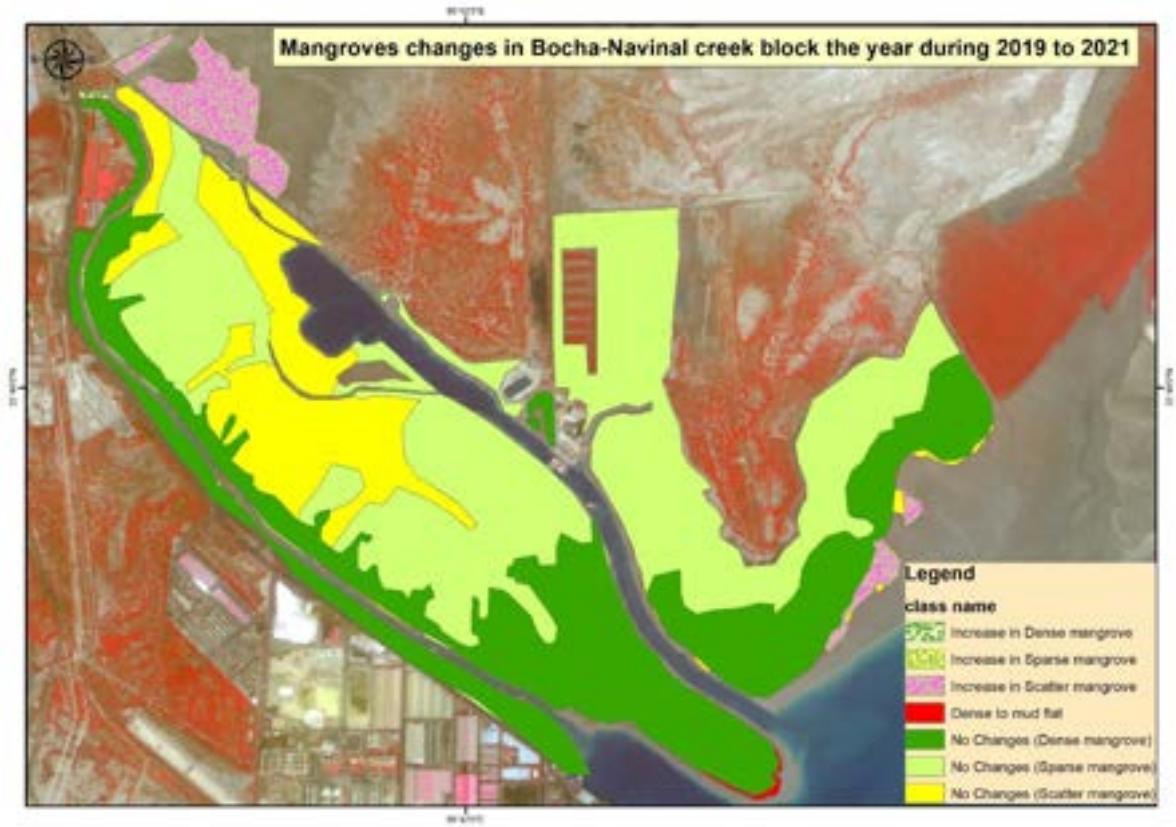

Figure 4.15: Change Analysis From 2019 To 2021 On Categories of Mangroves in Bocha- Navinal Creek System

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

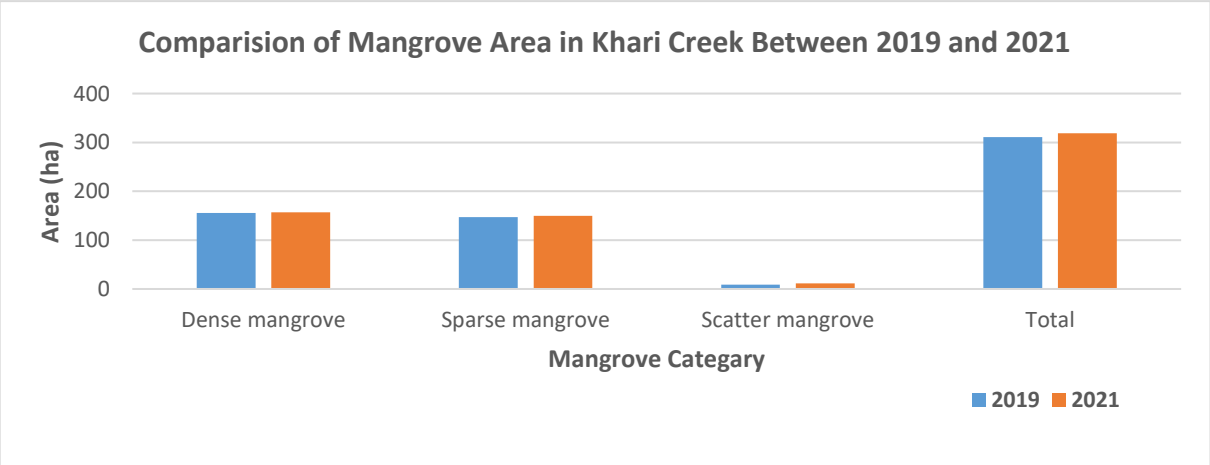

Figure 4.16 : Comparison of Various Categories of Mangroves in Khari Creek Zone Between 2019 and 2021

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

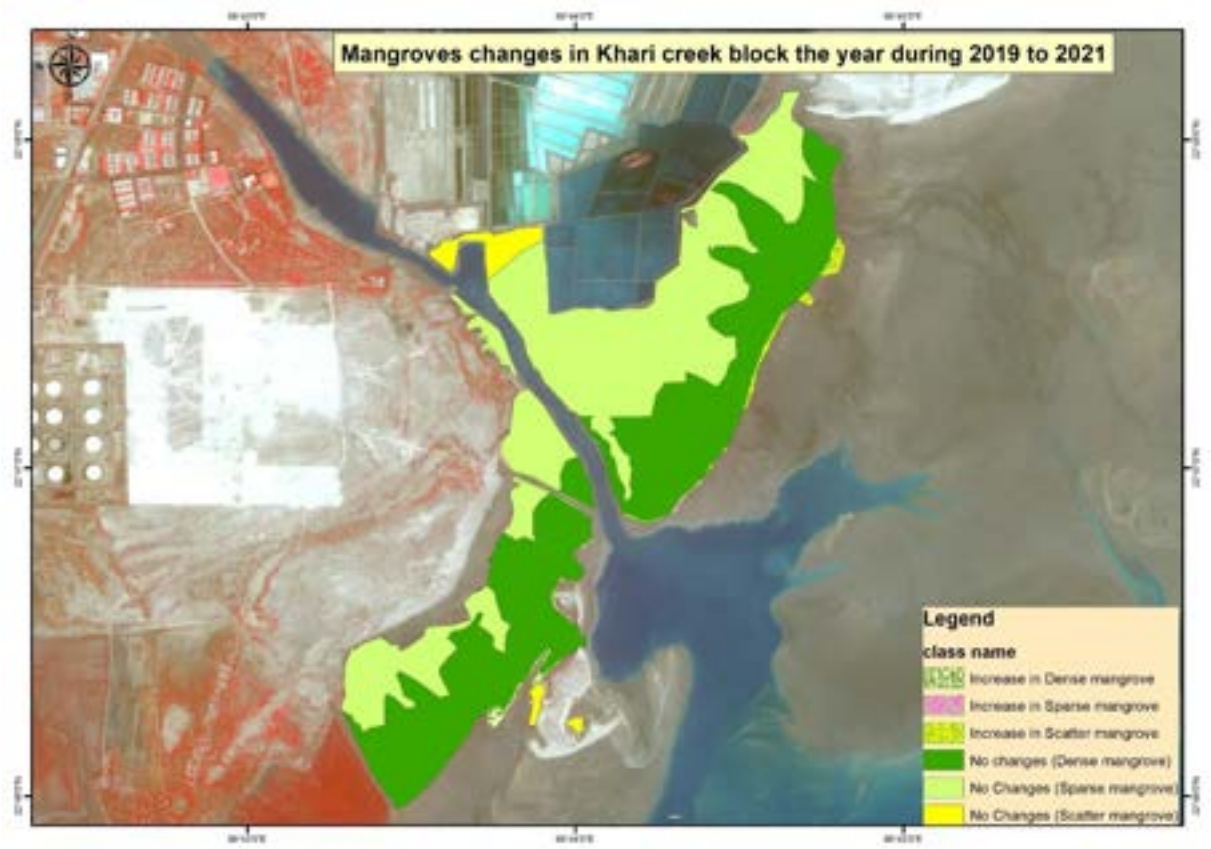

Figure 4.19: Change Analysis From 2019 To 2021 On Categories of Mangroves in Khari Creek System

4.3. Mangrove Vegetation

In India, the state of Gujarat encompasses the longest coastline (1650 km) and largest coastal area (28,000 km^2), 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	Longitude	Latitude	No of Tree Per Ha
12	69.547500	22.787778	1100
13	69.546667	22.790833	1100
14	69.560833	22.796667	500
15	69.564149	22.798420	600
18	69.569722	22.801389	0
22	69.609722	22.764722	2500
42	69.593889	22.787778	700
58	69.548977	22.797262	400
65	69.608763	22.773687	2500
66	69.601263	22.780209	1800
Average			1120

Table 4.7: Density of Trees in the Baradi mata Area

Q. Number	Longitude	Latitude	No of Tree per Ha
6	69.665460	22.764762	1200
7	69.681579	22.779167	1700
8	69.675048	22.777429	1200
9	69.667222	22.781389	1800
10	69.662609	22.778661	1200
11	69.672222	22.777778	600
19	69.665278	22.752500	2000
20	69.664964	22.752988	600
21	69.638056	22.786111	400
23	69.637289	22.795008	2400
24	69.640015	22.792505	3300
29	69.665774	22.780467	600
30	69.662420	22.773036	800
31	69.637222	22.802222	1300
32	69.655064	22.756944	1700
33	69.644627	22.763737	2300
34	69.664734	22.752103	1600
38	69.669723	22.775127	1200
39	69.624167	22.782500	2100
40	69.622222	22.783056	1400
41	69.629180	22.783226	1700
46	69.621047	22.802786	800
47	69.638582	22.802132	300
51	69.661111	22.756667	2900
52	69.668330	22.756143	2800
53	69.636389	22.763333	1900
54	69.678886	22.777405	4400
55	69.670833	22.782778	700
56	69.646111	22.774444	900
57	69.640000	22.768056	700
64	69.659048	22.756698	2000
Average			1565

Table 4.8: Density of Trees in the Bocha-Navinal Creek Area

Q. Number	Longitude	Latitude	No of Tree per Ha
1	69.684285	22.778333	200
2	69.685000	22.781944	200
3	69.687778	22.782222	1000
4	69.684722	22.780000	2100
5	69.704032	22.771389	2600
16	69.691667	22.774444	1500
17	69.690076	22.775833	1200
35	69.711667	22.751944	1800
36	69.705211	22.751960	1500
37	69.708234	22.751012	1500
43	69.697381	22.755925	1800
44	69.705000	22.766389	1100
45	69.713889	22.750278	1200
48	69.706944	22.751667	900
49	69.708669	22.754522	700
62	69.723611	22.764444	800
Average			1256

Table 4.9: Density of Trees in the Khari Creek Area

Q. Number	Longitude	Latitude	No of Tree per Ha
25	69.731567	22.795235	1800
26	69.731936	22.790986	3500
27	69.730976	22.789617	1700
28	69.733272	22.789417	1200
50	69.731111	22.770833	1800
59	69.733611	22.778333	1600
60	69.733611	22.770556	2200
61	69.733231	22.770205	2500
63	69.744444	22.791944	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 creak 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	Longitude	Latitude	Regeneration	Recruitment
1	12	69.547500	22.787778	10000	0
2	13	69.546667	22.790833	40000	10000
3	14	69.560833	22.796667	350000	10000
4	15	69.564149	22.798420	60000	15000
5	18	69.569722	22.801389	90000	17500
6	42	69.593889	22.787778	100000	32500
7	58	69.548977	22.797262	30000	10000
8	65	69.608763	22.773687	30000	15000
9	66	69.601263	22.780209	0	17500
Average				78,889	14167

Table 4.11: Density of Younger Classes in the Baradi mata Area (Plant/Ha)

Sr No	Q. Number	Longitude	Latitude	Regeneration	Recruitment
1	6	69.665460	22.764762	170000	7500
2	7	69.681579	22.779167	30000	10000
3	8	69.675048	22.777429	60000	20000
4	9	69.667222	22.781389	140000	10000
5	10	69.662609	22.778661	80000	0
6	11	69.672222	22.777778	40000	5000
7	19	69.665278	22.752500	0	7500
8	21	69.638056	22.786111	60000	17500
9	29	69.665774	22.780467	30000	2500
10	30	69.662420	22.773036	90000	12500
11	31	69.637222	22.802222	30000	10000
12	39	69.624167	22.782500	30000	5000
13	40	69.622222	22.783056	50000	7500
14	41	69.629180	22.783226	20000	7500
15	46	69.621047	22.802786	30000	20000
16	47	69.638582	22.802132	40000	37500
17	52	69.668330	22.756143	10000	0
18	53	69.636389	22.763333	20000	7500
19	54	69.678886	22.777405	10000	0
20	55	69.670833	22.782778	40000	5000
21	56	69.646111	22.774444	60000	7500
22	57	69.640000	22.768056	100000	10000
23	64	69.659048	22.756698	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	Longitude	Latitude	Regeneration	Recruitment
1	1	69.684285	22.778333	10000	5000
2	2	69.685000	22.781944	20000	7500
3	3	69.687778	22.782222	110000	10000
4	4	69.684722	22.780000	140000	12500
5	5	69.704032	22.771389	260000	5000
6	16	69.691667	22.774444	140000	10000
7	17	69.690076	22.775833	50000	17500
8	43	69.697381	22.755925	40000	15000
				96,250	10,313

Table 4.13: Density of Younger Class in Khari creek

Sr No	Q. Number	Longitude	Latitude	Regeneration	Recruitment
9	50	69.731111	22.770833	20000	2500
10	59	69.733611	22.778333	20000	10000
11	60	69.733611	22.770556	20000	0
12	61	69.733231	22.770205	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 – 6

ANNEXURES

ANNEXURE 1	**INITIAL OIL SPILL REPORT**	
Particulars of person, office reporting	Capt. Sachin Srivastava- HOD Marine Capt. Rajat Garg - HOS marine, APSEZ	
Tel No.	+91 6359883102	
Date & time of incident	19.04.2023 / 1046 hrs	
Spill location	IOCL SPM	
Likely cause of spill	Leakage from J tube flange of SPM.	Witness – Tug Victor
Initial response action	Initiated OSCRP	
Any other information	NO	

Identity of informant	Tug Victor
Time of FIR	1046
Source of spill	IOCL SPM
Cause of spill	Looseness of J-tube flange bolts.
Type of spill	Crude Oil
Color code information (from CG)	Silver
Radius of slick	10-12 m
Tail	15 m
Volume	0.5 to 0.7 cubic meter approx.
Quantity	500 to 600 L
Weather	SW’ Ly x 10-12 knots.
Tide / current	Flooding / 0.1 to 0.2 knots.
Density	0.2 to 0.86 kg/m3 approx.
Layer thickness	0.02 mm approx.
Air / Sea temp.	36 deg C / 34 deg C
Predicted slick movement	NE’ly
Size of spill classification (Tier 1, 2 or 3)	Tier 1

ANNEXURE 2 **POLREP**

In case of an oil spill, MPSEZ 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 Victor
2.	Time of information receipt	1046
3.	Source of Spill	IOCL SPM
4.	Cause of Spill	Looseness of J-tube flange bolts
5.	Type of oil	Crude Oil
6.	Colour code information	Silver
7.	Configuration	-
8.	Radius	10 to 12 m
9.	Tail	15 m
10.	Volume	0.5 to 0.7 cubic meter approx.
11.	Quantity	500 to 600 L
12.	Weathered or Fresh	Fresh
13.	Density	0.2 to 0.86 kg/m3 approx.
14.	Viscosity	53.36 CST@25 deg centigrade
15.	Wind	SW’ Ly x 10 - 812 knots.
16.	Wave Height	0.1 to 0.2 m
17.	Current	0.1 to 0.2 knots.
18.	Layer Thickness	0.2 to 0.4 mm approx.
19.	Ambient air temperature	36 deg C
20.	Ambient sea temperature	34 deg C
21.	Predicted slick movement	NE’ly
22.	Confirm Classification of spill size	Tier 1

Log Sheet of Drill

Page Number: 1 of 1	**Date**: 19 -04-2023
Name: Salim Sayyad	**Position:** Radio Officer
Contact Number: 9825228673	**Signature:**

Activity Timeline:

0948 – Dol 11 and Dol 4 casted off from RORO for SPM

1045 – Dol 11 reached at IOCL SPM

1046 - Dol 11 informed on VHF that Tug Victor reported oil coming from SPM side

1047- Informed Dol 11 to report same to SPM & Diving In charge onboard,

1048- Informed HOD Marine / HOD-Marine Technical/ HOS

1049- Diving Team started inspection & found source of leakage from J tube flange.

1050- Bolts tightening of J tube flange started by SPM diving team.

1051- Informed POC & Tech team (Mr. Jimish).

10:53- Environment dept. & Marine executives informed.

1054- Jetty Team informed for Requirement of Hydra & Manpower.

1055- Tide Flooding (LW-0730-0.88, HW- 1343- 5.76.), Wind SWly 10-12 kts

1055- Instruct Dol 2 & 15 at WB to prepare OSD boom and stand by to cast off.
(OSD ROB- Dol 2- 4.7 KL, Dol 4-0.9KL, Dol 18-3.1KL, Dol 16-4.8KL)

1056- Informed security/safety/medical/dredging by POC.

1100- Informed Corporate/Legal/Commercial by POC.

1105- Dol 11 reported commenced boom lowered.

1105- All bolts tightened by SPM diving team. Leakage stopped.

1115- Skimmer ready for deployment

1121- Dol 11 reported boom lowered 250 m, started making J formation.

1148-J Formation completed. Skimmer lowered.

1152- Oil recovery commenced.

1202- All inspection carried out found Normal.

1205-Boom recovery stated.

1244-Boom recovery completed

1310-Drill called off.

1312-Informed all concern.

Personnel & Boats Participated in Drill

Off Shore

01 Capt Girish Chandra

02 Mr. Yogesh Nandaniya

03 Mr. Sudhakar Singh

04 Mr Arpan Chowdhury

05 Mr. Ramdas Pawale

06 Mr. Upinder Samkaria

07 Mr. Shashikant Padave

08 Mr. Santosh Rasam

09 Mr. Vishwanath Chauhan

10 Mr. Dharamveer Yadav

11 Mr Bharmal Bishoni-Diver

12 Mr. Abhilash Kumar – HMEL

13 03 Members from Sea Care

14 Crew of Tug Dolphin 11

15 Crew of Tug Victor

16 Crew of Boat Al Dariyah

17 Tug Dol 4

18 ICG Mundra – 04

19 Capt Lalji Meena, Harbour Master DPA

20 Mr. Ashvin Kumar Patni

21 Mr. Bhagwat Swaroop Sharma

22 Mr Radheshyam Singh

23 Liquid Team- 08 Persons

Onshore:

1. Capt Sachin Srivastava
2. Capt Rajat Garg
3. Mr Salim Sayyad
4. Mr Bhavesh
5. Mr Anish

Drill Performance Monitoring:

Sl. 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.	35 min.
5	Time taken for J/U formation and deployment of skimmer.	27 min.

Observations:

SR. NO.	POINTS	ACTION TAKEN	TARGET DATE	RESPONSIBILITY	REMARKS
1	The communication flow between onsite, jetty and Control Room was clear and satisfactory.	NA	NA	NA	

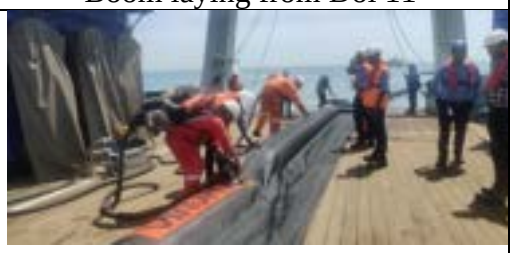
Drill snap – 18 - 19 Apr 2023

Date 18 April 2023 Tabletop Exercise	
Tabletop Exercise Team -1	Tabletop Exercise Team -2
	
Tabletop Team Participants	
	

Date 19 April 2023 OSR Drill at IOCL SPM

Pre Drill Briefing

Boom laying from Dol 11



J formtion making in progress

J formtion making in progress

Skimmer Operations

Skimmer Operations

OSR Team on Tug Dolphin -11

Annexure – 7

ADANI PORTS & SPECIAL ECONOMIC ZONE LIMITED
MOCK DRILL REPORT

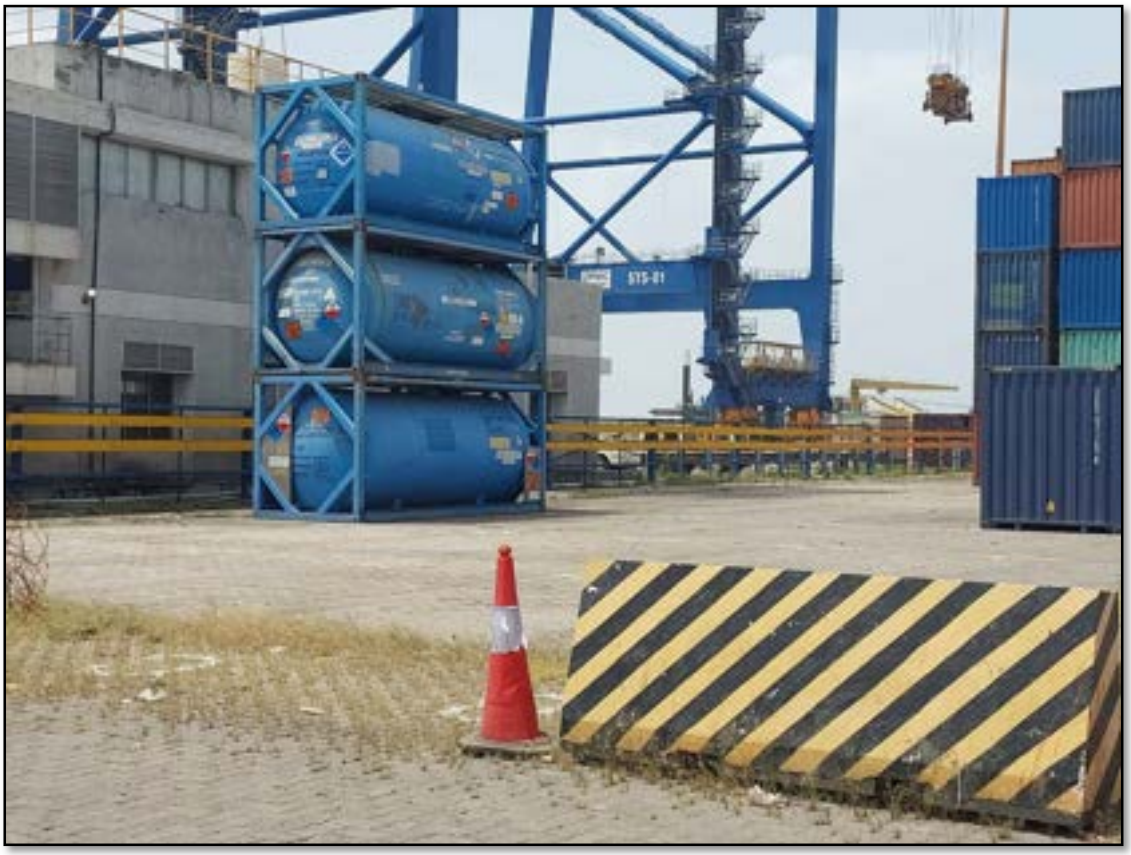
Date	:	24.08.2023
Time	:	12:10 Hrs.
Location	:	Yard 7A05G3
Type/Text of the Scenario	:	Yard supervisor observed leakage from one hazardous tank container ACNU1090875 Hazardous class 4 UN 3394, yard location 7A 05 G3.

INTRODUCTION:

yard supervisor observed leakage from one hazardous tank container ACNU1090875 Hazardous class 4 UN 3394, yard location 7A 05 G3.
Superintendent along area in charge and safety team check and declare as local emergency. Area blocked; team evacuated to assembly area. Head count taken by wharf supervisor. After inspection by Fire team, shifted the container to Hazardous bund.

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

LOCATION (WITH PHOTOGRAPH):



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MOCK DRILL REPORT

SEQUENCE OF EVENTS WITH PHOTOGRAPHS:

	
Fire tender arrived at site	Valve closed by fire fighter
	
SIC controlling incident	Container taken to leak bund by reach stacker
	
Incident briefing at assembly point	Incident briefing at assembly point

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MOCK DRILL REPORT

RESPONSE TIME:

#	Description		Exact Time
1.	Mock drill starts with yard supervisor called at channel no 8, given information about the leakage container. Tower team start act by informing to emergency team and all concerned.	:	12:10Hrs
2.	Superintendent, yard supervisor along safety team observed the leakage and declared local emergency.	:	12:12Hrs
3.	Emergency siren alarm given; team evacuation done assembled at assembly point. Area barricaded equipment's moved to safe location.	:	12:12Hrs
4.	EITV and RST standby for shift the leakage container	:	12:15Hrs
5.	Security DSO reached the site	:	12:16hrs
6.	Fire team reached; planner given details about container cargo based on UN number along emergency precautions to be taken.	:	12:18Hrs
7.	Fire team inspected with proper BA suite and confirmed container shall shift to Hazardous bund	:	12:19Hrs
8.	Medical team arrived	:	12:22Hrs
9.	Shifted the hazardous container to hazardous bund	:	12:25Hrs
10.	After verifying All clear given by superintendent.	:	12:30Hrs

COMMUNICATION & ACTIONS:

Action By	Information To / Action By	Remarks
First Responder	Information given to incident controller about situation / scenario Operated VHF	Good Response, Immediately informed to shift in charge at site.
Site Incident Controller	Assess the site and declare on-site emergency.	
Concern Department/ Area In-charge	Inform to POC, Security, Fire, Medical, Safety etc.	
Engineering Services	NA	
Corporate Affairs	NA	
HR/ Admin	Respond on call and ready for any type of HR/Admin related help	

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MOCK DRILL REPORT

Safety Team	Reached at site on time.	
OHC	OHC team response was quick. Ambulance reached on site	
Security Control Room	Barricade the incident area and ensure vehicle movement restriction inside terminal.	
Fire Control Room Inform	Fire tender reached at site in quick time and rescued the person from the incident location.	

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			
CGPL			
HMEL			

RESPONSE TIME PERFORMANCE OF ACTION

Agency	Standard Time	Performance	Rating (Max. 9/ Block)	
			+VE Marks	-VE Marks
Ambulance	8-10 Min	10 Min	**9**	
Safety	4-6 Min	2 Min	**9**	
Fire Services	8-10 Min	8 Min	**9**	

A. <u>PERFORMANCE OF OHS & F SERVICES & RESCUE SERVICES</u>

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	**3**	

	mobilisation of personnel, resources, PPE's etc.		
Firefighting at the site	NA	**3**	
Medical attention at the site	Reported to incident Controller and ensure no any causality.	**3**	
Rescue of person	NA		

B. PERFORMANCE OF MAINTENANCE DEPARTMENT

Performance	Performance	Rating (Max. 3 per Block)	
		+VE Marks	-VE Marks
Power shut down/ cut off	NA		
Immediate arrangements at the site	NA		
Mobilizing of personnel and resources	NA		
Maintenance activities being carried out at the site	NA		
Clearing debris	NA		
Other arrangement at required to meet emergency	NA		

C. PERFORMANCE OF SECURITY SERVICES

Performance	Performance Rating	Rating (Max. 3 per Block)	
		+VE Marks	-VE Marks
Turnout of Security	Security Team reached on time. Area barricading done.	**3**	
Performance of security guards	Traffic controlled inside terminal and guided fire tender and but didn't guide the ambulance	**2**	**-1**

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MOCK DRILL REPORT

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.	**3**	
Area cordoned off	Area was barricading nearby incident spot by security team.	**3**	
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.	**3**	
Closer of gates	NA		
Providing security coverage at main gate and directing concern person to the site.	Security guard was guided to emergency vehicle for scene.	**3**	

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.	**3**	
Stopping of operation / like critical operations first & on priority basis	All operations stopped by incident controller.	**3**	
Emergency response of particular department at site	Response time of concern department found adequate. Operation and security Person deputed for guided to emergency vehicle for scene.	**3**	

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MOCK DRILL REPORT

Support for evacuation of people at site and head count along with HR/ Admin	Evacuation done by Operation team and head count was done operation and Security team.	**3**	
Availability and response of emergency kit / equipment / Other.	NA		
Audibility of the scenario on PA System by Persons	NA	**0**	**-3**

Observer – Loganathan Soundappan & Vijay Chavda

Good Observations:

1. Medical team reached late due to difficult to find location and no guidance given from Security team at gate.
2. Engg team was informed, understand due to workload does not reach the site.

Observations / Area of Improvement:
Scope of improvements are many as listed below:

Incident Location

1. Security team need to guide traffic more effectively to minimize the TAT of emergency department.

Control Room

2. Engineering team must participate in mock drills to check their emergency preparedness.

Assembly point

3. An accurate head count was not available to ensure a complete and safe evacuation process.

Overall rating - 90

Marks from 96 to 100 - Excellent

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

Marks below 90 - Needs Improvement

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MOCK DRILL REPORT

VOTE OF THANKS: - Vijay Patel, Loganathan Soundappan and Vinod Rajput

SUPPORTING STAFF:

Drill Organized By	:	Vijay Patel / Vinod Rajput
Drill guided By	:	Loganathan Soundappan and Vijay Chavda
Exercise Performance Assessor	:	Loganathan Soundappan and Vijay Chavda
Site incident controller	:	Loganathan Soundappan
Report prepared By	:	Sagar Khandelwal

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MOCK DRILL REPORT

Date	23.08.2023
Time	10:40 Hrs
Location	Near In-gate, AICTPL
Type/Text of the Scenario	Assumed that one by-road trailer collided with jersey barrier while entering terminal due to over speeding and sharp turning. Security guard informed about this to DSO. Simultaneously informed to OHC, Safety, Security Control and subsequently intimated the same through message (SMS) to all concern people.

INTRODUCTION:

Mock drill was decided, and advance information given to security control, Safety Team and OHC. Scenario and execution plan was decided as per scenario.

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MOCK DRILL REPORT

LOCATION: Near In-gate, AICTPL

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MOCK DRILL REPORT

SEQUENCE OF EVENTS:

- Assuming that by-road driver rammed trailer into jersey barrier while turning towards In-gate due to over speeding and sharp turning which caused him to lose control over the trailer.
- Assumed he hit his head on steering wheel and sustained blunt injury to his head and got fainted.
- Security guard deployed at in-gate Immediately informed to DSO south gate, SO, OHC and Safety Department.

CANTEEN TEAM RESPONSE TIME

#	Description		Exact Time
1.	First responder informed to Incident Controller	:	10:40
2.	Incident controller comes on site	:	10:42
3.	Declaration of Emergency	:	10:42
4.	Ambulance reaching time at incident Point	:	10:50
5.	Maintenance/ Rescue Arrangement at site	:	Good
6.	Audibility of the scenario on PA system	:	Good
7.	Termination of Emergency	:	10:55 hrs.

RESPONSE TIME:

Description	Information Provided time	Service received
OHC	10:42	10:50
Safety	10:40	10:41
DSO	10:40	10:42

COMMUNICATION TO MUTUAL AID GROUP
(IF REQUIRED, AS AND WHEN MUTUAL AID IS CALLED)

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MOCK DRILL REPORT

To	By Whom/ Media	Standard	Performance
IOCL		Not Required	
HPCL			
JINDAL SAW			
ADANI POWER			
CGPL			
HMEL			

RESPONSE TIME PERFORMANCE OF ACTION

Agency	Standard Time	Performance	Rating (Max. 9/ Block)	
			+VE Marks	-VE Marks
Ambulance	Response was good and they reached within 10 minutes	Good	8	
Safety	Response was good and they reached within 2 minutes	Good	8	
Security	Response was good and they reached within 2 minutes	Good	8	

A. <u>PERFORMANCE OF OHS & F SERVICES & RESCUE SERVICES</u>

Performance	Performance	Rating (Max. 3 per Block)	
		+VE Marks	-VE Marks
Turn out/ response time of OHC Team	Good	3	

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MOCK DRILL REPORT

Turn out/ response time of Safety Team and in coordination with incident controller mobilisation of personnel and resources.	Good	**2**	
Medical attention at the site	Good	**2**	

B. PERFORMANCE OF OPERATION/ CONCERN DEPARTMENT

Performance	Performance Rating	Rating (Max. 3 per Block)	
		+VE Marks	-VE Marks
Immediately pass the communication message VHF / other available media to subordinates & emergency response team.	Immediately passed the information to OHC and quick response from OHC team	**3**	
Stopping of operation / like critical operations first & on priority basis	Traffic was stopped to clear the site of incident, shifted trailer to the side, then resumed the traffic.	**3**	
Emergency response of particular department at site	Response time of concern department found good.	**3**	
Support for evacuation of people at site and head count along with HR/ Admin	N.A		
Availability and response of emergency kit / equipment / Other.	First aid kit not available at security cabin.	**0**	**-2**

ADANI PORTS & SPECIAL ECONOMIC ZONE LIMITED

MOCK DRILL REPORT

Observer – I (General Observation)

- Ambulance could have come sooner if traffic was managed more efficiently on road.
- The IP was not given first aid like cleaning wound at security cabin, waited till ambulance arrived.
- Security cabins has no first aid kit.
- They made IP to shift the trailer to sideways to clear the ingate line.
- Security guards are not trained as first aider.

Observer – II NA

Overall rating

Marks from 95 to 100 - Excellent

Marks from 90 to 95 - Very Good

Marks below 90 - Needs Improvement

COMPLIANCE REPORT FOR MOCK DRILL

#	Recommendations	Department	Date of Completion
1	First aid box to be given to each security cabins.	Admin	
3	During the course of emergency, immediately imitate all security guards deployed at port to make way & prioritize emergency vehicle to go first.	Security	
2	First aid training must be given to all shift security team and shift in-charge to control the	Admin	

ADANI PORTS & SPECIAL ECONOMIC ZONE LIMITED

MOCK DRILL REPORT

	situation till ambulance or medical team arrives.		

Name & Signature of Concern HOD:

VOTE OF THANKS:

Vote of the thanks to security team, OHC team & Safety team. Special thanks to all team members of mock drill participants.

Drill Participation Staff:

Security Team: Yashpal Sinh Gohil (DSO)

QHSE Team: Mr. Sagar Khandelwal & Mr. Abdul Halim Khan

Observation Team: Mr. Sagar Khandelwal, Mr. Yashpal Sinh Gohil

Medical Team: Mr. Subhash

Drill Organized By	:	Mr Rajyavardhan & Sagar Khandelwal
Drill guided By	:	Mr. Rajyavardhan & Sagar Khandelwal
Exercise Performance Assessor	:	Mr. Yashpal Sinh Gohil
Site incident controller	:	Mr. Yashpal Sinh Gohil
Report prepared By	:	Mr. Sagar Khandelwal

Annexure – 8

adani
Ports and Logistics

Cost of Environmental Protection Measures

Sr. No.	Activity	Cost incurred (INR in Lacs)			Budgeted Cost (INR in Lacs)
		2021 – 22	2022 – 23	2023 – 24 (till Sep'23)	2023 – 24
1.	Environmental Study / Audit and Consultancy	6.82	7.32	16.19	27
2.	Legal & Statutory Expenses	10.52	12.32	00	13
3.	Environmental Monitoring Services	14.31	15.32	5.08	19.20
4.	Hazardous / Non-Hazardous Waste Management & Disposal	107.09	104.035	65.81	148.68
5.	Environment Days Celebration and Advertisement / Business development	4.04	2.53	2.30	11.50
6.	Treatment and Disposal of Bio-Medical Waste	2.14	2.29	1.14	2.28
7.	Mangrove Plantation, Monitoring & Conservation	53.6	35.0	0	15.0
8.	Other Horticulture Expenses	921	956	628	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	79.73	212.9
10.	Expenditure of Environment Dept. (Apart from above head)	149.8	90.136	25.228	182.917
	Total	**1371.79**	**1366.28**	**823.48**	**1536.48**

Annexure – 9

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Ports and Logistics

APSEZ, Mundra Celebrating the "International Day for the Conservation of the Mangrove Ecosystem" on 26th July-2023

About the Celebration:

APSEZ, Mundra has celebrated Mangrove Plantation & Awareness Programme at Luni Village coastal area for Students of Luni Govt. Villages & Adani Vidya Mandir, Bhadreswar and Online training awareness program to employees by Gujarat Institute of Desert Ecology, Bhuj on the occasion of **"International Day for the Conservation of the Mangrove Ecosystem" on 26th July 2023.**

Mangroves are extraordinary eco-systems found in coastal areas across the globe. They play a vital role in protecting our coastlines, supporting marine life, and com-bating climate change. World Mangrove Day is an annual celebration dedicated to raising awareness about the importance of mangroves and the need for their conservation.

Participant:

- Mangrove Plantation & Awareness Programme at Luni Village: 90 nos. of Students

Online training awareness program to employees: 65 nos.

PHOTOGRAPHS OF MANGROVE PLANTATION AND AWARENESS AT LUNI VILLAGE COASTAL AREA

APSEZ, Mundra Celebrating the "World Nature Conservation Day" on 28th July-2023

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About the Celebration:

APSEZ, Mundra has conducted Mangrove Plantation Programme at coastal area near Bhadreswar Village and Online Awareness Training program on Nature & Mangrove conservation by **Dr. Jayendra J. Lakhamapurkar (Dy. Director- Gujarat Ecology Society)** the occasion of **"World Nature Conservation Day Celebration" on 28th July 2023** under the theme **"Forests and Livelihoods: Sustaining People and Planet"**

Activities:

- **Mangrove Plantation:** 2000 nos. of Saplings
- **Online Training Participants:** 30 nos.

PHOTOGRAPHS OF MANGROVE PLANTATION AND AWARENESS AT BHADRESWAR COASTL AREA