



Letter No.: APPPL-EHS/MOEF RO/EC Comp (I&II)

Date: 27/05/2017

To

✓ The Additional Principal Chief Conservator of Forests (C),
Western Regional Office,
Ministry of Environment, Forest & Climate Change
E-5, Arera colony, Link Road-3,
Ravishankar Nagar, Bhopal-462016 (M.P.)
Email: rowz.bpl-mef@nic.in

Dear Sir,

Sub.:- Six Monthly Compliance Report of Environment and CRZ Clearance for the period from **October, 2016 to March, 2017.**

Ref.:- 1) Environmental and CRZ clearances granted to M/s. Adani Petronet (Dahej) Port Pvt. Ltd. for Phase-I and Phase-II vide letters dated 6th July, 2007 and 11th November, 2008 bearing F. No.: 11-37/2007-IA-III, respectively.
2) CRZ Clearance / Recommendation issued by Department of Environment & Forest, GoG vide letter dated 16th May, 2007 bearing No.: ENV-102006-71-P for Phase-I and letter dated 29th September, 2008 bearing No.: ENV-10-2007-2126-E for Phase-II.

Please find enclosed herewith point wise compliance report (Hard copy as well as in a CD) of conditions stipulated in the above referred letters.

Thank you,

Yours Faithfully,

For M/s Adani Petronet (Dahej) Port Pvt Ltd.

(Capt. A. K. Singh)
Chief Executive Officer

Copy to:

1. The Director (Monitoring-IA Division), Ministry of Environment, Forest & Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi - 110003
2. The Director, Forest and Environment Department, Block-14, 8th Floor, Sachivalaya, Gandhinagar, Gujarat- 382010
3. The Zonal Officer, Central Pollution Control Board, Zonal Office Vadodra, Parivesh Bhawan, Opposite VMC Ward office No. 10, Subhanpura, Vadodra-390023
4. The Chairman, Gujarat Pollution Control Board, Parvayaran Bhawan, Sector 10A, Gandhinagar-382010(Gujarat).
5. The Regional Officer, Gujarat Pollution Control Board, Bharuch, Gujarat

Adani Petronet (Dahej) Port Pvt Ltd
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Half yearly Compliance report for Environment and CRZ Clearance for the development of Solid Cargo Port Terminal Phase – I and Phase – II.

Sr. No.	Specific Conditions	Compliance
P2(i)	All the conditions stipulated by Ministry of Environment and Forests, Regional Office, Western Region, Bhopal vide their letter No. 6-GJ060/2006-BHO/1508, dtd., 16.6.2008 shall be strictly adhered to	Complied. All the conditions mention by Ministry of Environment and Forests, Regional Office, Western Region, Bhopal vide their letter No. 6-GJ060/2006-BHO/1508, dtd., 16.6.2008 have been complied with. Copy of the compliance status is enclosed as Annexure – 1.
P2(ii)	All the conditions stipulated by Forest and Environment Department, Govt. of Gujarat vide their letter No.- FCA-1006(10-9)SF-76-K, dated., 1.7.2008 dated 16.6.2008 shall be strictly adhered to	Complied. All the conditions mention by Forest and Environment Department, Govt. of Gujarat vide their letter No.- FCA-1006(10-9)SF-76-K, dated, 1.7.2008 dated 16.6.2008 have been complied with. Copy of the compliance status is enclosed as Annexure – 1.
P2(iii)	No reclamation will be carried out for the activity	Complied. Project (Phase I & II) has been developed within existing land without any reclamation.
P2(iv)	All the conditions stipulated by the Gujarat Coastal Zone Management Authority including Ministry of Environment and Forests clearance dated 16.6.2008 under the Forest Conservation Act shall complied.	Complied. All the condition mentioned by the Gujarat Coastal Zone Management Authority including Ministry of Environment and Forests clearance dated 16.6.2008 have been complied with. Copy of the compliance status is enclosed as Annexure – 1.
P2(v), P1(i)	Sewage Treatment Plant should be included in the project	Complied. Sewage Treatment Plant of capacity 25 M ³ / day has been installed and is in operation.
P2(vi), P1(ii)	Afforestation in 200 ha. with mangroves should be undertaken under the project, as identified by the Gujarat Forest Department	Complied. Mangrove afforestation has been carried out in an area of 400 ha. Details are given below. <ol style="list-style-type: none"> 1. 100 ha near village Dandi, Dist Surat– 2011 2. 50 ha near village Jakhau, Dist Kutch – 2011 3. 50 ha near Padri bit, Dist Bhavnagar – 2011 4. 200 ha near Malpur, Dist Jambusar – 2013-14

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Sr. No.	Specific Conditions	Compliance
		Reports of Mangrove afforestation are enclosed as Annexure – 2A, 2B, 2C and 2D.
P2(vii)	Afforestation @1:3 shall be carried out in case of any trees to be cut.	Complied. <ul style="list-style-type: none"> Afforestation on 38 ha. Land has been completed with the help of forest department during 2012-14. Land has been declared as reserve forest vide notification dated 23/12/2008. Copy enclosed as Annexure – 3
P2(viii), P1(iii)	The recommendations of the Risk Assessment Report should be incorporated	Complied. Risk Assessment Report was submitted along with compliance report dated 20/02/2008. The recommendation of risk assessment are incorporated and being followed during construction and operation phases.
P2(ix), P1(v)	The materials for the filling and pavement construction should be made available from approved quarries.	Complied. Construction of the project (Phase I & II) was completed in February 2011.
P2(x), P1(vi)	Sufficient fixed and mobile firefighting system should be provided exclusively for the terminal in consultation with the local statutory bodies.	Complied. Adequate fixed and mobile firefighting systems are provided. Details of the same are enclosed as Annexure – 4.
P2(xi), P1(x)	All development in the port should be carried out in accordance with the Coastal Regulation Zone Notification, 1991 and approved Coastal Zone Management Plan of Gujarat.	Complied. Construction of Phase I & II has been completed in February 2011 and same is carried out in accordance with CRZ Notification 1991.
P2(xii), P1(xi)	There shall be no withdrawal of ground water in CRZ area for this project. The proponent should ensure that as a result of the proposed constructions, ingress of saline water into ground water does not take place. Piezometers shall be installed for regular monitoring for this purpose at appropriate locations on the project site.	Complied. Ground water is not tapped in CRZ area for the project. Water requirement is been met through GIDC water supply. Two Piezometers has been installed at different locations inside port. Regular monitoring of ground water level & quality is being monitored through accredited laboratory. Copies of reports are enclosed as Annexure 5B.
P2(xiii), P1(xii)	The project shall not be commissioned till the requisite water supply and electricity to the project are provided by the PWD/Electricity Department.	Complied. Project is commissioned after obtaining permission from PWD and Electricity Department.

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Sr. No.	Specific Conditions	Compliance
		1. GIDC permission dtd 19.02.2013 2. Electricity Department approval dtd 18.02.2011
P2(xiv), P1(xiii)	Specific arrangements for rain water harvesting shall be made in the project design and the rain water so harvested shall be optimally utilized. Details in this regard shall be furnished to this Ministry's Regional Office at Bhopal within 3 months	Complied. The feasibility study for rain water harvesting was conducted. Based on the report it may be concluded that rain water harvesting is not advisable as the area is next to the coast. Report was submitted along with the half-yearly compliance report dated 22.05.2015.
P2(xv), P1(xv)	No land reclamation should be carried out for this project.	Complied. Project (Phase I & II) has been developed within existing land without any reclamation.
P2(xvi), P1(xvi)	Green buffer zone should be provided all around the project area in consultation with local forest department and report submitted to this Ministry's Regional Office at Bhopal.	Complying with. Considering the expansion plan, Green belt is being developed on periphery of the project boundary. So far 8.0 ha of Green belt is developed which mainly includes casuarina, wasigtonia palm, cassia samiea, _peltoforum, delonix regia, ficus sps.
P2(xvii), P1(xiv)	The facilities to be constructed in the CRZ area as part of this project should be strictly in conformity with the provisions of the CRZ Notification, 1991 as amended subsequently.	Complied. Construction of the project (Phase I & II) was completed in February 2011 and same is in conformity with the provisions of the CRZ Notification 1991.
P2(xviii), P1(xvii)	No product other than those permissible in the Coastal Regulation Zone Notification, 1991 should be stored in the Coastal Regulation Zone area.	Complied. APDPPL is handling dry cargo mainly coal and other bulk cargos at designated storage areas in compliance to the CRZ Notification 1991 and 2011 and as per approval received.
P1(iv)	Location of general cargo berth should be taken in to considerations with regard to location of LNG terminal	Complied. General cargo berth (Solid Cargo Port Terminal jetty) is approx. 500 m away from the LNG jetty of Petronet LNG Ltd.
P1(vii)	The wave tranquility study and the ship maneuvering studies carried out should be taken in to account while operating the Port.	Complied. Ship mooring study and wave tranquility studies were carried out to understand the wind wave and swell wave conditions. The recommendations are being regularly followed during port operations.
P1(viii)	The project proponent should ensure that during construction and operation	Complied. There is no commercial fishing in the area.

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Sr. No.	Specific Conditions	Compliance
	of the port there will be no impact on the livelihood of the fisherman. The fisherman should be provided free access to carry out the fishing activity.	Free access to the "Pagadiya" fishermen is available. They are continuing with their activities without any impact from project.
P1(ix)	All necessary precaution while undertaking construction and operation of the port should be taken keeping in view the bathymetric changes caused due to cyclones.	Complied. Construction (Phase I & II) activities are completed in February, 2011. APDPPL has a well-defined DMP (covering natural disasters including cyclones) and regular mock drills are being conducted. DMP is also reviewed at regular interval Last Mock drill was conducted on 28.02.2017. Last revision in the DMP was done on 15.12.2016.
General Conditions		
P2(i), P1(i)	Construction of proposed structures shall be undertaken meticulously conforming to the existing Central/local rules and regulations including Coastal Regulation Zone Notification 1991 & its amendments. All the construction designs/drawings relating to the proposed construction activities must have approvals of the concerned state Government Departments/Agencies.	Complied. <ul style="list-style-type: none"> All the development activities are being taken up in accordance with the CRZ notification, 1991 & its subsequent amendments. The approval for the project has been obtained from concern government department that is GMB as per their NOC date 23/02/2006. Necessary approval has been obtained from GIDC for the setting of the project.
P2(ii), P1(ii)	Adequate provision for infrastructure facilities such as water supply, fuel, sanitation etc. should be ensured for construction workers during the construction phase of the project so as to avoid felling of trees/mangroves and pollution of water and the surrounding.	Complied. Construction of the project (Phase I & II) was completed on February 2011. During construction all facilities such as water supply, fuel, sanitation etc. was provided.
P2(iii), P1(iii)	The project authorities must make necessary arrangements for disposal of solid waste and for the treatment of effluents by providing a proper wastewater treatment plant outside the CRZ area. The quality of treated effluents, solid wastes and noise level etc. must conform to the standards laid down by the competent authorities including the Central/State Pollution	Complied. <ul style="list-style-type: none"> The Project (Phase I & II) activities are not generating any trade effluent. Only domestic effluent is being generated which was treated in the STP outside CRZ area and used for horticulture within the premises. The noise monitoring results for the period from October, 16 to March, 17 are enclosed as Annexure – 5G

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Solid Cargo Port Terminal Phase – I and Phase – II.**

Sr. No.	Specific Conditions	Compliance
	Control Board and the Union Ministry of Environment and Forest under the Environmental (Protection) Act, 1986, whichever are more stringent.	<ul style="list-style-type: none"> Quality of treated domestic effluent is also being monitored by M/s Pollucon Laboratories, a NABL accredited and MoEF recognised. Please refer Annexure – 5F. Both reports for confirm compliance with applicable standards.
P2(iv), P1(iv)	The proponent shall obtain the requisite consents for discharge of effluents and emission under the Water (Prevention and Control of Pollution) Act, 1974 and the Air (Prevention and Control of Pollution) Act, 1981 from the Gujarat State Pollution Control Board before commissioning of the project and a copy of each of these shall be sent to this Ministry.	Complied. APDPPL has obtained renewal of CC&A under the Water (Prevention and Control of Pollution) Act, 1974 and the Air (Prevention and Control of Pollution) Act, 1981 from the Gujarat State Pollution Control Board AWH 73359 from GPCB which is valid up to 16/7/2020.
P2(v), P1(v)	The proponent shall provide for a regular monitoring mechanism so as to ensure that the treated effluents conform to the prescribed standards. The record of analysis reports must be properly maintained and made available for inspection to the concerned State/Central officials during their visits.	Complied. <ul style="list-style-type: none"> Domestic effluent is being treated in STPs. The treated water confirming to the norms is being used for horticulture purpose. The monitoring results of the treated wastewater from STP for the period from October 2016 – March 2017 are enclosed as Annexure – 5F. Reports are available at site for the inspection and APDPPL regularly submits report to GPCB.
P2(vi), P1(vi)	In order to carry out the environmental monitoring during the operational phase of the project, the project authorities should provide an environmental laboratory well equipped with standard equipment and facilities and qualified manpower to carry out the testing of various environmental parameters.	Complied. <ul style="list-style-type: none"> APDPPL has engaged M/s Pollucon Laboratories, a NABL accredited and MoEF recognised laboratory for environmental monitoring. The monitoring results for the period from October 2016 – March 2017 are enclosed as Annexure – 5A to 5H.
P2(vii), P1(vii)	The sand dunes and mangroves, if any on the site should not be disturbed in any way.	Complied. <ul style="list-style-type: none"> There are no sand dunes in project area. Free flow to the mangroves near the jetty approach is maintained.
P2(viii), P1(viii)	A copy of the clearance letter will be marked to the concern Panchayat/local NGO, if any, from whom any suggestion/representation has been	Complied. Copy of the letter submitted to local panchayat is enclosed as Annexure -6 .

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Sr. No.	Specific Conditions	Compliance
	received while processing the proposal.	
P2(ix), P1(ix)	The Gujarat State Pollution Control Board should display a copy of the clearance letter at the Regional Office, District Industries Centre and Collector's Office/Tehsildar's Office for 30 days.	This condition does not belong to the project proponent.
P2(x), P1(x)	The fund earmarked for environment protection measures should be maintained in a separate 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's Regional Office at Bhopal and the State Pollution Control Board.	Complied. Separate budget is allocated for Environmental Management. Key components of environment budget are environmental Monitoring, STP's (Operations and Maintenance), Closed Conveyor System Maintenance etc. The allocation of revenue budget for Environment Cell for the FY 2016-17 was approx. Rs. 172.77 lacs. Details of the environmental budget and expenditure for the FY 2016-17 is enclosed as Annexure – 7
P2(xi), P1(xi)	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.	Complying with. <ul style="list-style-type: none"> • APDPPL is regularly submit six monthly compliance reports which comprises Compliance to the conditions stipulated in Environment and CRZ clearance, environment monitoring reports etc. • Whenever any authorities such as MoEF&CC, GPCB and GMB etc. visit the AHPPL full support is extended and AHPPL provides all additional information seek by them during the inspection • Recent visit of Gujarat Pollution Control Board was on 27.03.2017.
P2(xii), P1(xii)	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.	Noted and complied with. There is no change in the Phase I & II development.
P2(xiii), P1(xiii)	This Ministry reserves the right to revoke this clearance, if any of the conditions stipulated are not complied with to the satisfaction of the Ministry.	Noted & agreed.

**Half yearly Compliance report for Environment and CRZ Clearance for the development of
Solid Cargo Port Terminal Phase – I and Phase – II.**

Sr. No.	Specific Conditions	Compliance
P2(xiv), P1(xiv)	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.	Noted & Agreed
P2(xv), P1(xv)	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 & Forest at http://www.envfor.nic.in . The advertisement should be made within 7 days from the date of issue of the clearance letter and a copy of the same should be forwarded to the Regional Office of this Ministry at Bhopal.	Complied. <ul style="list-style-type: none"> Advertisement of phase 1 approval was published in Gujarati language in "Sandesh" newspaper dated 01/09/2007 and in English language in "GUJARAT SAMACHAR" newspaper dated 11.9.2007. Advertisement of phase 2 approval was published in Gujarati language in "Divya Bhaskar" newspaper and in English language in "The Times of India" dated 19/11/2008. Copies of the advertisements were submitted to MoEF&CC vide compliance report dated 27/11/2013.
P2(xvi), P1(xvi)	The Project proponents should inform the Regional Office at Bhopal as well as the Ministry the date of financial closure and final approval of the project by the concerned authorities and the date of start of Land Development Work.	Complied. <ul style="list-style-type: none"> Financial closure date of Project was 31st July 2007. Existing Facility – construction started date July 2007. Land development work for phase II started in Jan. 2009. The permission to construct of Solid Cargo Beth at Dahej port has been obtained from GMB vide letter dated 23 Feb 2006 bearing no GMB/N/PVT/264(10)/1910/11201
P2(xvii)	Any appeal against this environment clearance shall lie with the National Environment Appellate Authority, if preferred, within a period of 30 days as prescribed under Section 11 of the National Appellate Act, 1997	Noted.

	Adani Petronet (Dahej) Port Private Limited	From : Oct., 2016 To : Mar., 2017
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Compliance to the conditions stipulated in CRZ clearance/ recommendation for proposed cargo port terminal phase I, II

Half yearly Compliance report for CRZ Clearance/recommendation for development of Solid Cargo Port Terminal Phase – I and Phase – II

Sr. no.	Conditions	Status/Action taken
P2(1), P1(1)	The provisions of the CRZ notification of 1991 and subsequent amendments issued from time to time shall be strictly adhered to by the APPL. No activity in contradiction to the provisions of the CRZ Notification shall be carried out by the APPL.	Complied. All the activities are being complying with the provisions of the CRZ notification and subsequent amendments.
P2(2), P1(2)	All necessary permissions from different Government Departments / agencies shall be obtained by the APPL before commencing the expansion activities.	Complied. <ul style="list-style-type: none"> All the necessary permissions have been obtained by M/s. APDPPL. Environment Clearance for phase I & Phase II obtained vide letters dated 6th July, 2007 11th November 2008 and bearing F. No. 11-37/2007-IA-III respectively CC&A is obtained from Gujarat Pollution Control Board is obtained vide letter no AWH-73359 dated 28.10.2015
P2(3), P1(5)	The APPL shall carry out the construction activities either in the CRZ area or into the sea / estuary only after having the detailed study with respect to chances of erosion / accretion due to the proposed activities conducted through the NIO and vetted through the CWPRS and shall implement all necessary steps / actions as may be suggested by these institutes for mitigating the potential negative impacts including the checking of erosion and/or accretion in the region. Further, the company shall have to have the construction drawings approved for this purpose through a competent agency before undertaking any construction and/or enabling activities at the site	Complied. Construction (Phase I & II) of the port was completed in February 2011.
P2(4), P1(7)	The APPL shall have to face the consequences whatsoever due to implementation of the Kalpsar Project proposed by the Government of Gujarat and shall have to take all necessary actions as may be desired by the Government, from time to time.	Noted and agreed to comply.
P2(5), P1(10)	No dredging and/or reclamation activity shall be carried out in the CRZ area	Complied. <ul style="list-style-type: none"> No dredging/reclamation have

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Sr. no.	Conditions	Status/Action taken
	categorized as CRZ I (i) and it shall have to be ensured that the mangrove habitats and other ecologically important and significant areas are not affected due to any of the project activities.	<p>been done in CRZ I (i).</p> <ul style="list-style-type: none"> There is no notified ecologically important and significant area present in the project vicinity.
P2(6), P1(11)	No effluent or sewage shall be discharged into the sea / creek or in the CRZ area and shall be treated to conform to the norms prescribed by the Gujarat Pollution Control Board and would be reused / recycled within the plant premises to the extent possible.	<p>Complied.</p> <ul style="list-style-type: none"> Domestic effluent is being treated in STPs. The treated water conforming to the norms is being used for horticulture purpose. The monitoring results of the treated wastewater from STP for the period from October 2016 – March 2017 are enclosed as Annexure – 5F. Reports are available at site for the inspection and APDPPL regularly submits report to GPCB.
P2(7), P1(12)	All the recommendations and suggestions given by the NIO in the Comprehensive Environment Impact Assessment report for conservation / protection and betterment of environment shall be implemented strictly by the APPL.	<p>Complying with.</p> <p>A Separate EIA has been prepared for phase III development which includes EMP for the current scenario. All the recommendations and suggestions given by M/s Cholanmandalam in the EMP are being complied. Copy of the status of EMP recommendations is enclosed as Annexure 8.</p>
P2(8), P1(13)	The construction and operational activities shall be carried out in such a way that there is no negative impact on mangroves and other coastal/marine habitat. The construction activities shall be carried out only under the constant supervision of the NIO.	<p>Complied.</p> <ul style="list-style-type: none"> Construction (Phase I & II) of the project was completed on February 2011. Free flow to the mangroves near the jetty approach is maintained.
P2(9), P1(14)	The APPL shall strictly ensure that no creeks are blocked due to any activity at port and the mangroves habitat are neither disturbed nor destroyed due to any activity.	<p>Complied.</p> <ul style="list-style-type: none"> No creeks are blocked due to port activity. Free flow to the mangroves near the jetty approach is maintained.
P2(10), P1(15)	The APPL shall participate financially for any common facility that may be established or any common study that may be carried out for the Gulf of Khambhat region for environmental protection and/or	<p>Noted and agreed to comply. APDPPL is committed for the environment protection.</p>

Half yearly Compliance report for CRZ Clearance/recommendation for development of Solid Cargo Port Terminal Phase – I and Phase – II

Sr. no.	Conditions	Status/Action taken
	management purpose.	
P2(11), P1(16)	The construction debris and/or any other type of waste shall not be disposed into the sea, creek or in the CRZ areas. The debris shall be removed from the construction site immediately after the construction is over.	Complied. Construction of the project was completed on February 2011. All the debris has been removed.
P2(12), P1(17)	The construction camps shall be located outside the CRZ area and the construction labour shall be provided the necessary amenities, including sanitation, water supply and fuel and it shall be ensure that the environmental conditions are not deteriorated by the construction labours.	Complied. <ul style="list-style-type: none"> Construction of the project was completed on February 2011. No labour camps were located in Coastal Regulation Zone area. Labours are managed through contractors and they are from surrounding villages and have been provided residential facilities in the surrounding villages.
P2(13), P1(18)	The APPL shall prepare and regularly update their Local Oil Spill Contingency and Disaster Management Plan in consonance with the National Oil Spill and Disaster Contingency plan and shall submit the same to this Department after having it vetted through the India Coast Guard.	Complied <ul style="list-style-type: none"> Oil Spill Contingency Plan is submitted to Coast Guard, Gandhinagar for verification vide letter dated. 10/10/2012. APDPPL has a well-defined DMP and regular mock drills are being conducted. DMP is also reviewed at regular interval Last Mock drill was conducted on 28.02.2017. Last revision in the DMP was done on 15.12.2016
P2(14), P1(19)	The APPL shall bear the cost of the external agency that may be appointed by this Department for supervision/monitoring of proposed activities and the environmental impacts of the proposed activities.	Noted and agreed to comply.
P2 (15)	The mangrove plantation in 50 ha. of area on Gujarat cost line shall be carried out by the applicant in a phased manner in five years	Complied. Mangrove afforestation has been carried out in an area of 400 ha. Details are given below. <ol style="list-style-type: none"> 100 ha near village Dandi, Dist Surat– 2011 50 ha near village Jakhau, Dist Kutch – 2011 50 ha near Padri bit, Dist Bhavnagar – 2011

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Half yearly Compliance report for CRZ Clearance/recommendation for development of Solid Cargo Port Terminal Phase – I and Phase – II		
Sr. no.	Conditions	Status/Action taken
		4. 200 ha near Malpur, Dist Jambusar – 2013-14 Reports of Mangrove afforestation are enclosed as Annexure – 2A to 2D .
P2 (16)	The construction activities in the Forest land and the Gauchar land shall be carried out as per the permission accorded by the concerned Authority for the said purpose	Complied. Construction of the project was completed on February 2011.
P1(3)	The APPL shall take up massive mangrove plantation in 200 ha of area in and around the project site or at an alternative site to be selected in consultation with this Department.	Complied. Mangrove afforestation has been carried out in an area of 400 ha. Details are given below. 1. 100 ha near village Dandi, Dist Surat– 2011 2. 50 ha near village Jakhau, Dist Kutch – 2011 3. 50 ha near Padri bit, Dist Bhavnagar – 2011 4. 200 ha near Malpur, Dist Jambusar – 2013-14 Reports of Mangrove afforestation are enclosed as Annexure – 2A to 2D .
P1(4)	The approach road and trestle passing through the forestland shall be constructed only after obtaining necessary permissions under the relevant forest laws including the forest (Conservation) Act. further, no activity shall be carried out in the forestland or in the area having natural plantation / forest till all mandatory clearances under various Forest Acts including the Forests Conservation Act obtained.	Complied. <ul style="list-style-type: none"> All the activities on forest land have been started only after obtaining forest land clearance. Forest land clearance obtained vide letter no A-1006(10-9)SF-76-K dated 1st July 2008 from DOEF. Clarence from MOEF was obtained vide letter no 6-GJC060/2006-BHO/1508 dated 16th June 2008.
P1(6)	The project proponent shall have to make a separate application and shall have to obtain prior clearance under the CRZ Notification for any activities other than those proposed and got approved as part of this phase I activities.	Complied. APDPPL had obtained Environmental & CRZ Clearance on Nov 11, 2008 for phase 2.
P1(8)	The project proponents shall ensure that the local people shall be provided with an alternative access to the sea in case the existing access to Rock-Bund could not be made available to them.	Complied. Alternative access to the sea is available adjoining to the project site.

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Half yearly Compliance report for CRZ Clearance/recommendation for development of Solid Cargo Port Terminal Phase – I and Phase – II		
Sr. no.	Conditions	Status/Action taken
P1(9)	The project proponents shall ensure that the construction period shall be reduced by proper planning and executing the construction program in time-bound manner to avoid any time over-run.	Complied. Construction of the project was completed in February 2011.
P1(20)	The jetty and most of the approach would be supported on piles allowing adequate flow of water without significant obstruction.	Complied. The jetty and most of the approach of 1270 meter is supported on piles allowing adequate flow of water without significant obstruction.
	General Conditions	
P2(17), P1(21)	The groundwater shall not be tapped by the APPPL to meet with the water requirements in any case.	Complied. No ground water is being tapped by APDPPL and water demand is met through GIDC
P2(18), P1(22)	The APPL shall take up massive green belt development activities in consultation with the Gujarat Institute of Desert Ecology/Forest Department. A comprehensive plan for this purpose has to be submitted to the Forests and Environment Department.	Complying with. Green belt is being developed in an area of 8.0 ha including periphery of the project boundary.
P2(19), P1(23)	The APPL shall have to be contributing financially for taking up the socio-economic up-liftment activities in this region in consultation with the Forests and Environment Department and the District Collector/District Development Officer.	Complied. The CSR activities are executed at group level by Adani Foundation. Adani Foundation is taking care of Social-economic establishment activities and details of the same are enclosed as Annexure – 9
P2(20), P1(24)	A separate budget shall be earmarked for environmental management and socio – economic activities and details thereof shall be furnished to this department as well as the MoEF, GOI. The details with respect to the expenditure from this budget head shall also be furnished.	Complied. Separate budget is allocated for Environmental Management and Socio Economic activities. <ul style="list-style-type: none"> • Key components of environment budget are environmental Monitoring, STP's (O&M), Closed Conveyor System Maintenance and etc. The allocation of revenue budget for Environment Cell for the FY 2016-17 was approx. Rs. 172.77 lacs. Details of the environmental budget and expenditure for the Oct, 16 to Mar, 17 is enclosed as Annexure – 7

	Adani Petronet (Dahej) Port Private Limited	From : Oct., 2016 To : Mar., 2017
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Half yearly Compliance report for CRZ Clearance/recommendation for development of Solid Cargo Port Terminal Phase – I and Phase – II		
Sr. no.	Conditions	Status/Action taken
		<ul style="list-style-type: none"> Socio Economic activities funds are taken up in Education, Community Health and Sustainable livelihood development, Rural Infrastructure development etc. Details are enclosed as Annexure – 9
P2(21), P1(25)	A separate environmental management cell with qualified personnel shall be created for environmental monitoring and management during construction and operational phases of the project.	Complied. APDPPL has a well structured Environment Management Cell with qualified manpower for implementation of the Environment Management Plan. Detail of the Environment cell is enclosed as Annexure – 10
P2(22), P1(26)	Environmental Audit report indicating the changes, if any, with respect to the baseline environmental quality in the coastal and marine environment shall be submitted every year by the APPL to this Department as well as to the MoEF, GOI.	Complied. Sea water and sediment is being monitored through NABL accredited agency. Monitoring Report for the period October'16 to March '17 is enclosed in Annexure 5C and 5D . No significant changes observed.
P2(23), P1(28)	A six monthly report on compliance of the condition mentioned in this letter shall have to be furnished by the APPL on regular basis to this Department.	Complying with <ul style="list-style-type: none"> APDPPL is regularly submit six monthly compliance reports which comprises Compliance to the conditions stipulated in Environment and CRZ clearance, environment monitoring reports. Last compliance report was submitted vide letter dated 22.11.2016.
P2(24), P1(29)	Any other condition that may be stipulated by this Department from time to time for environmental protection/management purpose shall also have to be complied by the APPL.	Noted and agreed to comply.
P1(27)	The APPL shall have to contribute financially to support the National Green Corps scheme being implemented in Gujarat by GEER Foundation, Gandhinagar, in consultation with Forests and Environment Department.	Complied. A request in this regard for asking for the terms of Financial Contribution submitted to the GEER Foundation vide letter dated 17th April, 2009.

Annexure 1: Compliance status of the Forest Clearances

Annexure – 1: Compliance status of the conditions by Forest and Environment Department, Govt. of Gujarat vide their letter No.-FCA-1006(10-9)SF-76-K, dated., 1.7.2008 and by Ministry of Environment and Forests, Regional Office, Western Region, Bhopal vide their letter No. 6-GJO6O/2006-BHO/1508, dated 16.6.2008

Compliance: Both above mentioned letters have the same conditions; Compliance of the same is given in table below:

S. No.	Condition	Compliance
1	The legal status of the forest land shall remain unchanged	Noted.
2(a)	Compensatory afforestation shall be taken up by the forest department over 38.00 Ha non forest land (Survey No.2, Village-Pingot, Ta. Valiya, Dist. Bharuch at the cost of the project authority.	Complied. <ul style="list-style-type: none"> • APDPPL has transferred equivalent non forest land of 38 ha. Area of village Pingot, S.No. 2 paiki, Ta. Valiya, Dist. Bharuch in favour of Forest Department • APDPPL has deposited Rs. 33,06,000/- towards the cost of compensatory afforestation • Compensatory plantation was taken up by Forest Department, Govt. of Gujarat.
2(b)	This CA land shall be notified as Reserved Forest.	Complied. The CA land has been notified as Reserved Forest vide notification dated 23/12/2008.
2(c)	The copy of the Notification issued under section 4 of the Indian Forest Act, 1927 shall be sent to this office within six months from the date of handing over of this forest land to the project authority.	Copy of the notification is enclosed as Annexure 3.
3	Penal compensatory afforestation shall be raised over 4.00 ha. Degraded forest land in (Survey No. – 572) Village mirapur, Ta. Valia, Dist. Bharuch	Complied. <ul style="list-style-type: none"> • APDPPL has deposited Rs. 3,48,000/- towards the cost of penal compensatory afforestation. • Compensatory plantation was taken up by Forest Department, Govt. of Gujarat.
4	All the funds received from the user agency under the project shall be transferred to the Ad-hoc Compensatory Afforestation Fund management & planning Agency (CAMPFA) in A/c No. CA-1583 of Corporation bank Block 11, CGO Complex, Phase – I, Lodhi Road, New Delhi – 110003.	Complied. <ul style="list-style-type: none"> • All the funds received from user agency under project have been transferred to CAMPFA by Forest Department, Govt. of Gujarat.
5	The forest land shall not be used for any purpose other than that specified in the project proposal.	Complied. Forest land is being used as per the proposal for which clearance has been obtained.



Gujarat Ecology Commission

Government of Gujarat

Block No.18, First Floor, Udyog Bhavan, Sector-11, Gandhinagar - 382011
Phone : 23257656-58-59, Fax : 079-23257657

No. GEC/Adani/T-4/1490/2011

Date : 30-06-2011

To
Shri Kinnar Bhatt
Project Manager,
Adani Petronet (Dahej) Port Pvt. Ltd.
Plot No. 604, Nr. Lakhbaba Temple
Lakhi Gam, Dahej

Sub : Progress report for the Mangrove Plantation Project in Dandi Village,
Surat District for the year 2010-11.

Ref : MoU No. APPL/Mangrove Plantation/2222, dtd. 27.07.10

Dear Sir,

Kindly refer to above mentioned work order. In this regard, please find enclosed herewith, the progress report for Mangrove Plantation activity at Dandi village, Ta. Olpad, Dist. Surat for the year 2010-11.

It is requested to release the amount due at the earliest.

Thanking You,

Yours sincerely

Director

Gujarat Ecology Commission
Gandhinagar



INITIATIVES FOR COASTAL ENVIRONMENTAL
INTEGRITY BY
ADANI PETRONET (DAHEJ) PORT PVT.LTD
THROUGH
**PLANTATION, RESTORATION AND
CONSERVATION OF MANGROVES**

A Project carried out
Under
Public Private Partnership Model

ACHIEVEMENT REPORT TILL MARCH-11

PROJECT PARTNERS

ADANI PETRONET (DAHEJ) PORT PVT.LTD
(A Corporate Partner)

Gujarat Ecology Commission, Gandhinagar
(A Govt. organisation)

Dandi Kantha Tavar Vikas Samiti
(A Village level CBO)

MANGROVE Plantation year-2010-11

Project Background

Mangroves are salt tolerant plants growing on the coastal zone in the tidal area, and in estuaries of rivers. These plants occur in tropical and subtropical regions around the world. In India, mangroves are found in the States of West Bengal, Orissa, Andhra Pradesh, Tamil Nadu, Andaman and Nicobar Islands, Kerala, Goa, Maharashtra, and Gujarat. The mangroves in Gujarat are second only to the Mangroves in the West Bengal on the East Coast in terms of area, occurring in about 1046 sq. km (FSI 2009). Mangroves play a very significant role in maintaining the coastal environment, reducing the impact of wave action and erosion in the coastal areas, preventing salinity and seawater ingress into the inland agricultural areas, and also providing protection to the coastline from the impact of cyclones. Apart from these ecological functions, mangroves play a very significant economic role in the lives of the coastal village communities. The villagers are dependent on mangroves mainly for fodder, fuel-wood and fishing activities. There has been considerable degradation of the mangroves in Gujarat over the years. The reasons for this are many, like the dependency of the local and nomadic pastoralist communities on the mangroves for fodder, fuel, diversion of mangrove areas to industries, salt pans, and construction of ports, jetties, reduction in natural regeneration and dying off of the rich mangroves because of decreased influx of fresh water into the mangrove areas, due to construction of dams, both small and big in upstream areas.

Mangrove is one of the important ecosystems along the coast line of the Gujarat state. Considering importance of mangroves and its surrounding environment State Government has taken up mangrove plantation as one of the major activities in recent time. State Government has collaborated with various corporate houses under Public Private Partnership model to restore and conserve one of the important ecosystems in the state.

ADANI PETRONET (DAHEJ) PORT PVT.LTD, is located in the Dahej region of the state of Gujarat at a distance of about 80 km from Bharuch. ADANI PETRONET (DAHEJ) PORT PVT.LTD, project identified mangrove as a one of the key ecosystems, which leads to the better management of coastal zone. Considering all above factors the company has decided to take measures and initiatives for maintaining coastal environmental integrity and also to fulfill compensatory eco-restoration with coastal

community, a "time phased Mangrove plantation program" at Village Dandi, ta: Olpad, Dist: Surat.

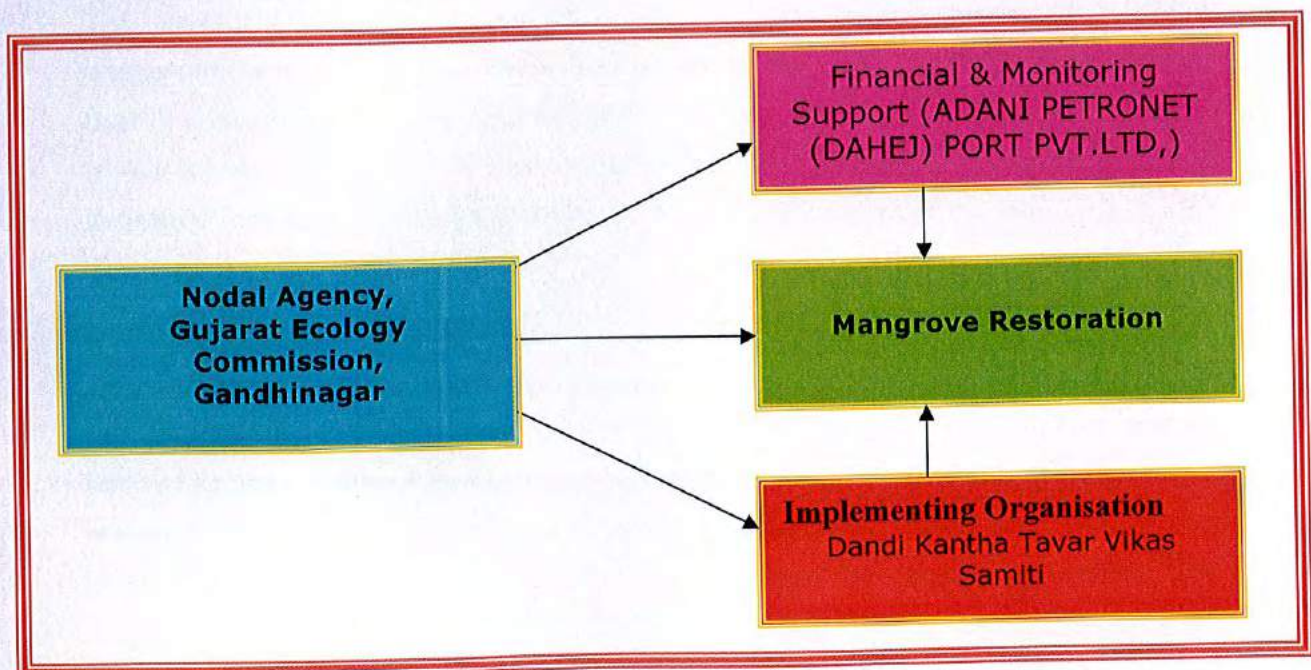
Project Objectives

As a part of this agreement, Commission along with company representative selected area in Dandi village of Olpad taluka of Surat district with following objectives

Within the overall objective of mangrove plantation in the mudflats of ports and nearby area, the following activity-wise objectives are envisaged.

- To assess the technical suitability of the proposed land for mangrove regeneration, including physico-chemical properties of soil and water and tidal pattern.
- To Identify and select the potential native mangrove and associated species for plantation keeping in view the ecological suitability.
- To formulate site specific plantation strategy and execute it with the active involvement of local CBO adopting appropriate techniques.
- To prepare a plan for long term conservation and monitoring of the developed mangrove forests.

PROJECT PARTNERS



Progress

Description of Site

Based on the land availability and joint site visit, it was jointly decided that place located at intertidal area of Dandi Village of Olpad taluka, of Surat district should be selected to carry out plantation for an area of 100 ha. The village Dandi is located around 15 km away from Taluka headquarter while 26 km away from Surat. The selected site falls under the revenues boundary of Dandi village. The ecological status of the plantation site such as coastal vegetation, physico-chemical characteristics of water and soil, presence/absence of mangrove patch in the vicinity and its density was gathered through a rapid survey of area. This helped in understanding the general ecological situations of the plantation sites which played a crucial role to formulate the project implementation strategy. The area falls near the Tapi estuary and receives good amount of sedimentation, which increases the nutritional value of the soil. The average salinity is observed to be around 35 ppt at the selected site.

The Site was jointly selected by the representative of GEC along with Members of CBO- Dandi Kantha Tavar Vikas Samiti, before initiation of plantation activity.

Selection of Species

The present coastal environmental conditions and climatic factors like rainfall, annual ambient temperature range and aridity of the zone have clearly established that in coastal Gujarat, the best candidate mangrove species for plantation activity is *Avicennia marina* which is already present in the proposed site as scrubby and degraded formations, thus being selected for the plantations at the site.

Community Based Organization

Gujarat Ecology Commission has formed, Dandi Kantha Tavar Vikas Samiti, a Community based Organization in past to carryout mangrove plantation activity which has been selected for the execution of the said project. Group discussion and meetings were held with the community members for discussing the project objectives and outcomes. In order to strengthen the local organization GEC organized meetings every month during the execution of the project.

ACTIVITY PROGRESS DURING YEAR 2010-11

NURSERY DEVELOPMENT

Nursery Development activity was started in the month of September-10 to plant 50 ha area; with a total of 1,50,000 saplings being developed at the selected site for this project. The saplings of *Avicennia marina* were raised in the nursery by the village level CBO through deployment of local level village labour. In all, total 150 nursery beds of 10*1mt were prepared. An average 1000 plants were raised in each nursery bed. The Nursery operation was completed in the month of December-10, after which a regular joint monitoring of the same was carried out by village CBO representatives, GEC officials, ADANI PORT representatives and third party CEE. Growth and survival rate of the saplings was found satisfactory as observed by the CBO and GEC official and ADANI PORT representatives and third party through inspecting the plantation area. The sapling attained a height of 20-25 cm in nursery, which is considered to be a good growth. The plants were kept in the nursery for two and half months on-site and then later transplanted in soil. The seeds were collected from the nearby natural mangroves areas.

The entire nursery operation was carried out by the members of community based organisation. Majority of women members had worked to raise mangrove nursery. In all total more than 1500 man-days were generated to raise 1,50,000 plants in nursery.

Transplantation of Nursery Raised Saplings

Dandi Kantha Tavar Vikas Samiti Dandi transplanted all saplings raised in nursery to ground. The saplings were transplanted at the distance of 2.0 mt*2.0 mt, which comes to 3000 plants per ha. In all, 1,50,000 plants have been transplanted. The total area covered through plantation is 30 ha. The nursery raised saplings transplantation was initiated in the middle of the month of January -11 and completed within 50 days' time frame. More than 1,700 man days were utilized to achieve the task. After the transplantation 73% survival rate was recorded in the field by GEC officers, representatives of the CBO and third party company-CEE authorized by Adani. In all, more than 1,00,000 plants with an average height of 40 cm are surviving as per the observations.

Earthen Mound Plantation

As per the micro plan developed by village CBO in an area of 20 ha earthen mounds (a 1mt elevated mound of 1mt*1mt size) were created to increase plant density. In all total 8000 earthen mound were created at the selected site. The distance kept between two earthen mound is 1.5 mt*1.5mt. The result in this technique was remarkable which accounts 70% success rate of the prepared earthen mounds. Around 30% mounds do not show good results in terms of survival of plants. The *Avicennia marina* was planted on earthen mounds, with around 100 seeds of *A. marina* planted in each mound.

Out of total 100 ha Mangrove plantation entrusted to Gujarat Ecology Commission, Gandhinagar during year 2010-11, 70 ha area has been brought under mangroves by January-2010. Remaining 30 ha area was completed during the April-May-2011 through propagules plantation of *Ceriops spp.* to increase biodiversity in the region.

Propagules Plantation

During the month of April-2011 a plantation of *Ceriops tagal*, a mangrove species were carried out in an area of 30 ha at selected site, by Dandi CBO. The site had been visited by company representative and a GEC official in the month of May-2011, after plantation had been completed. The survival rate had been verified by authorized persons of company and GEC had formed satisfactory. A total of more than 90,000 saplings were planted at site.

Figure 1 Nursery Plantation

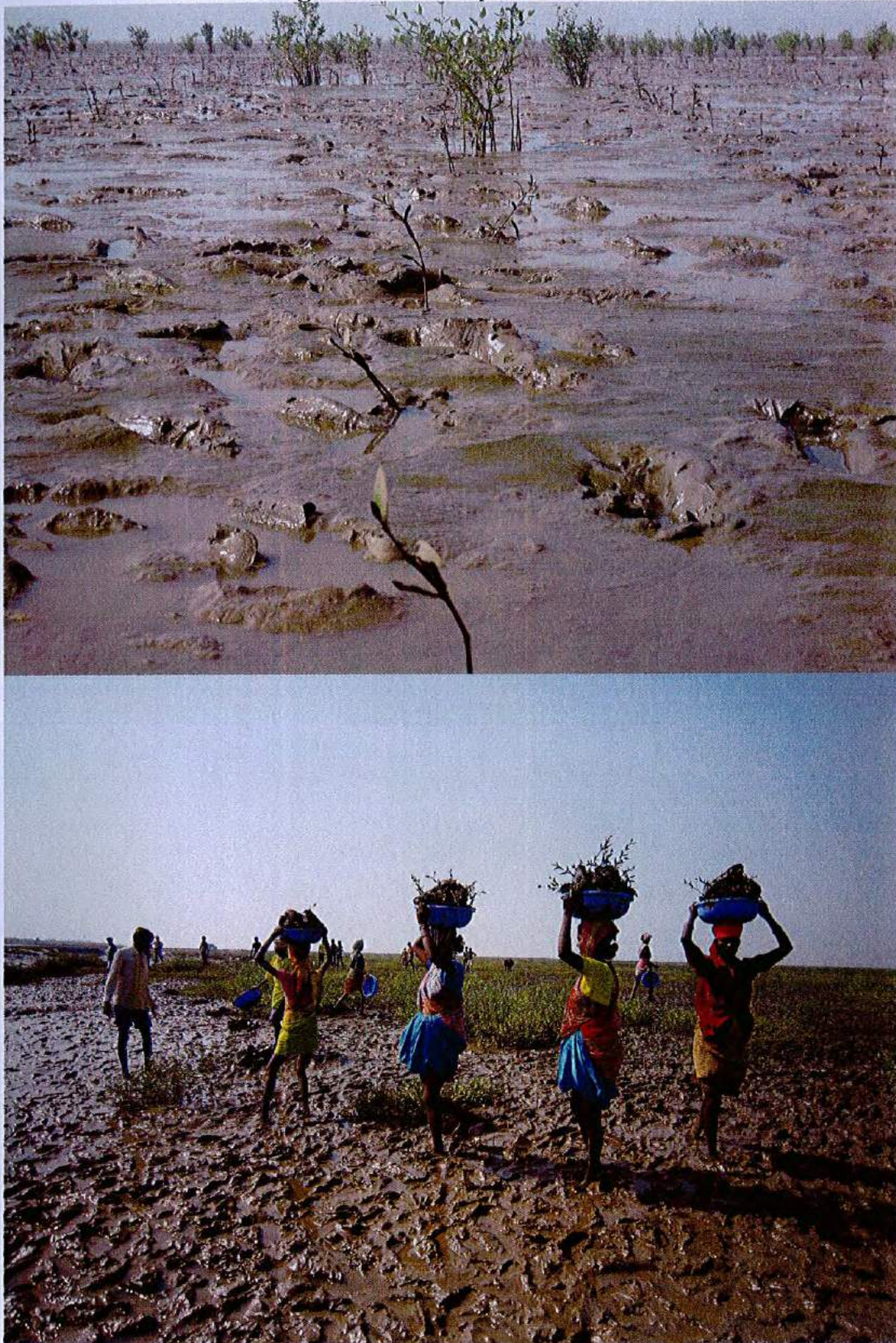


Figure 2 Nursery Plantation

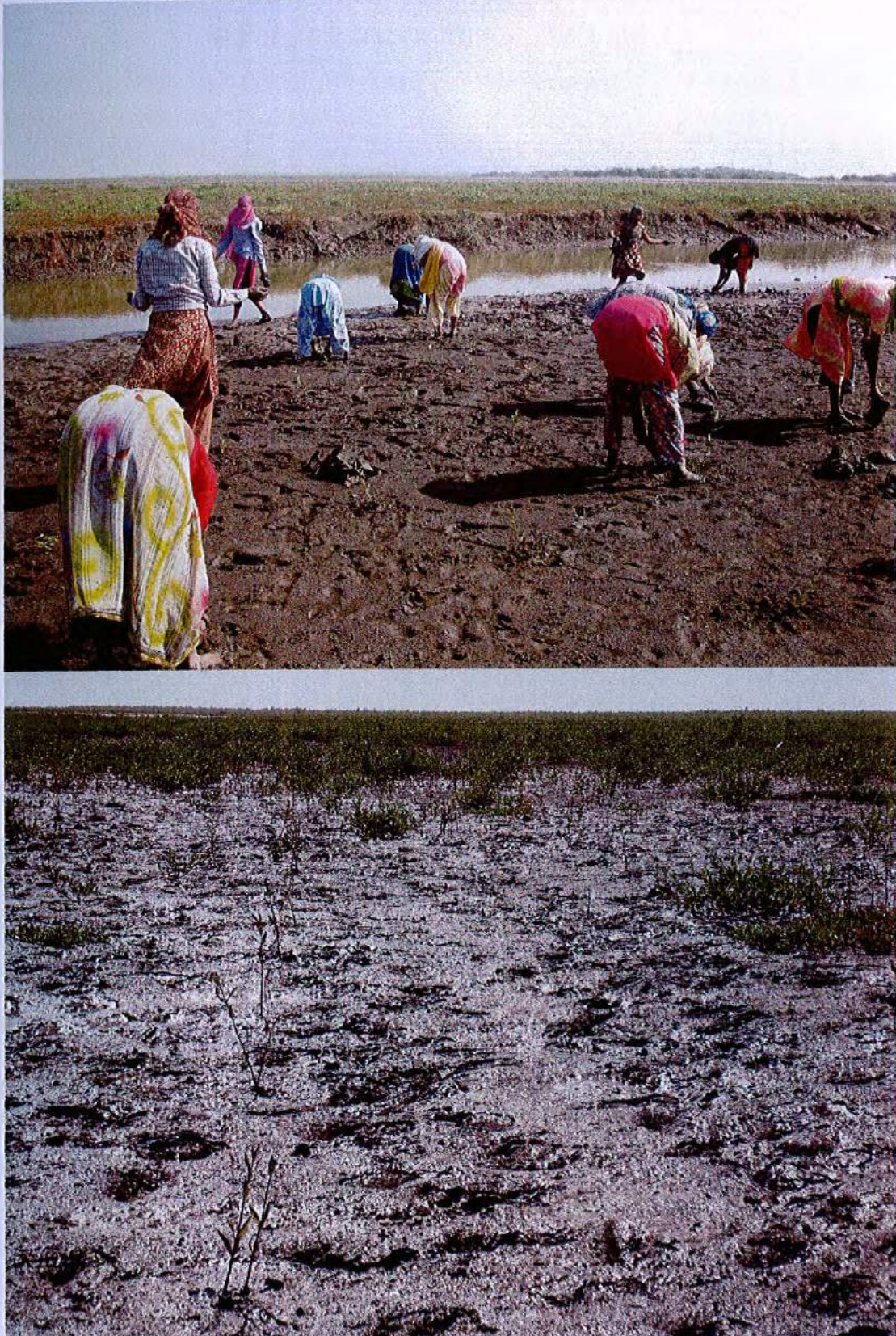


Figure 3 Earthen Mound Techniques



Figure 4 Ceriops Plantation

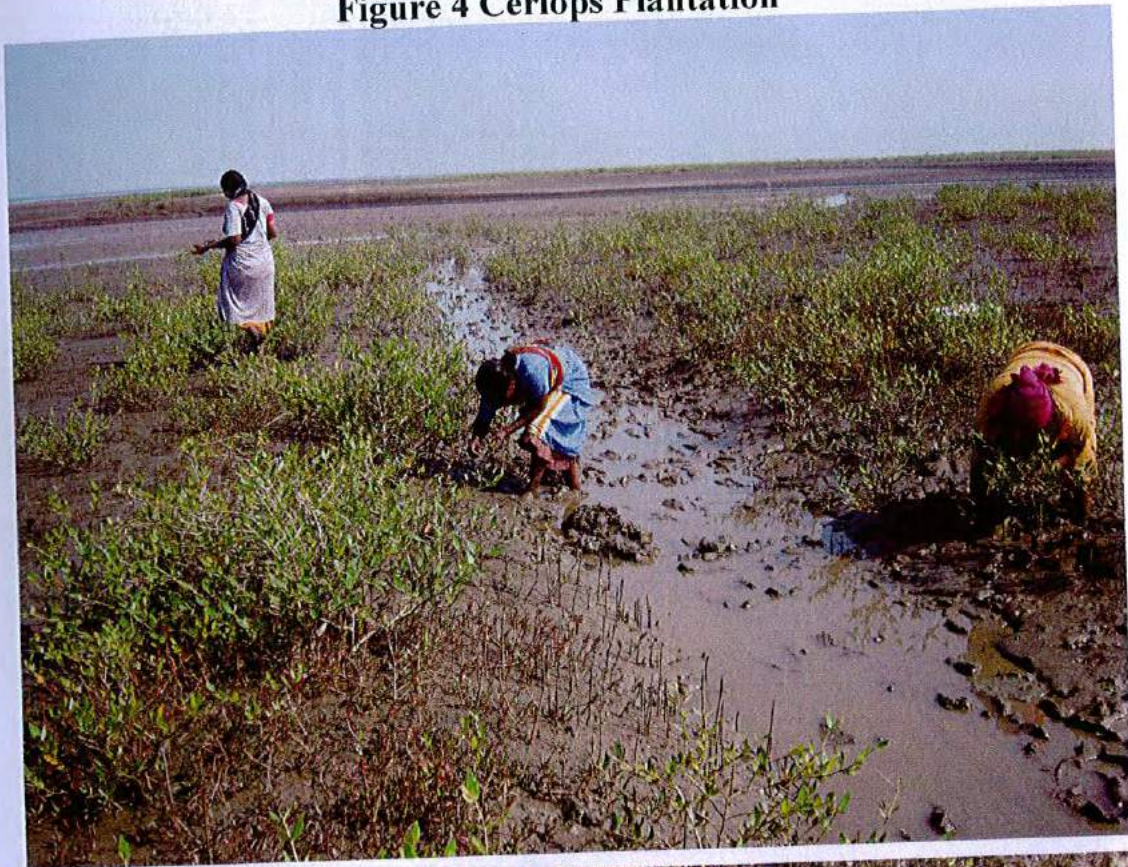


Figure 5 Monitoring by Adani APPL & CEE Officers

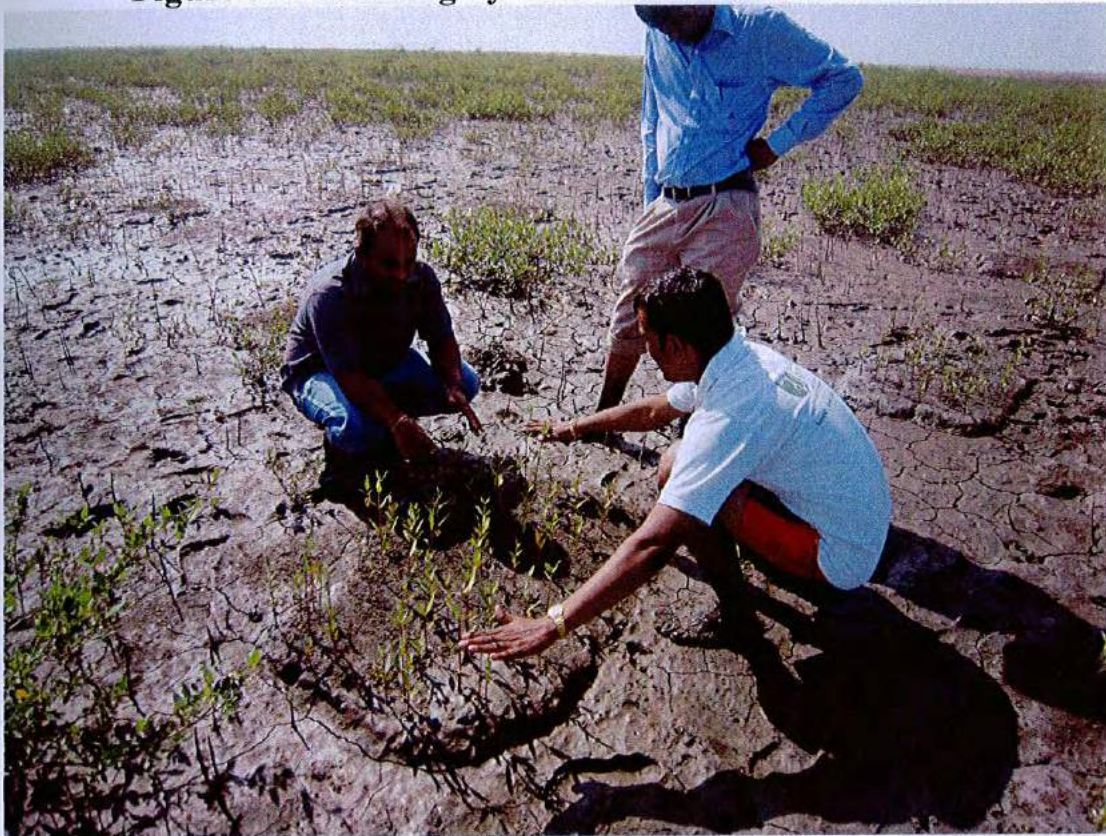
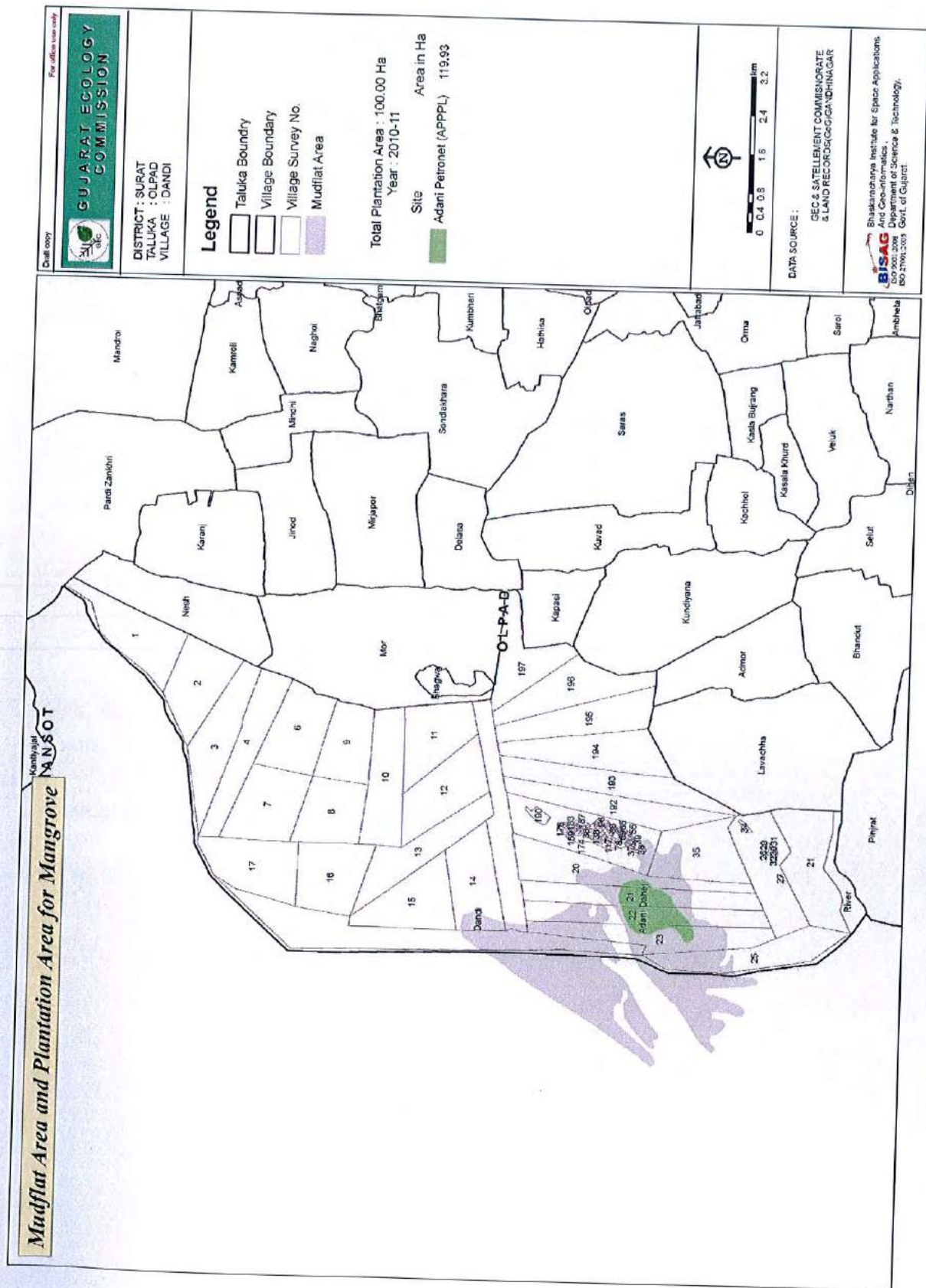


Figure 6 Monitoring by Adani APPL & CEE Officers



Adani Dahej APPLProject Dandi, Olpad, Surat Year 2010-11	
Area : 100 ha. plantation	
Sr. No.	GPS Location
1	21 18 53.20
	72 36 14.79
2	21 19 4.93
	72 36 25.07
3	21 19 25.45
	72 36 20.94
4	21 19 37.62
	72 36 42.63
5	21 19 33.73
	72 36 57.43
6	21 19 20.55
	72 36 59.46
7	21 19 2.75
	72 36 48.27
8	21 18 46.95
	72 36 16.47



Mrs. T. Jayanthi Thivakar

Staff quarters No.B-2
Gujarat Institute of Desert Ecology
Mundra Road
Bhuj-Kachchh-Gujarat-370001

5.03.2013

To
Shri Dinesh Kanpara
Adani Petronet (Dehej) Port Pvt.Ltd.
PO: Lakhigam, Taluka: Vagra
Via-Dahej
District Bharuch- 392 130
Gujarat

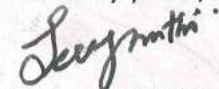
Dear Sir,

Sub: Status of Jakhau Petronet Mangrove Plantation at Jakhau Bandar-Reg.
Ref: Your SO 5700046148 dated 13.10.2011

Kindly find attached the status report of the mangrove plantation carried out during 2012 for Adani Petronet Ltd., at Jakhau Bandar.

In case of query please contact me.

Thanking you,
Sincerely yours,



(T. Jayanthi Thivakar)

MRS. T. JAYANTHI THIVAKAR
Staff Quarters No. B-2,
Gujarat Institute of Desert Ecology
PB. No. 83, Mundra Road,
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STATUS REPORT ON MANGROVE PLANTATION AT JAKHAU BANDER –ADANI PETRONET LTD., - DECEMBER 2012

1. Introduction

Adani Petronet Ltd., located at Dehej, south Gujarat has carried out mangrove plantation to the extent of 50 ha mangrove plantation during the monsoon months of 2011. Availability of suitable site at Jakhau has enabled Adani Petronet Ltd., to carry out this plantation. This plantation was part of the ongoing mangrove afforestation program of Adani group of companies. In addition, the plantation was created to meet the legal stipulation of Ministry of Environment and Forests (MoEF) and to maintain a viable and ecologically functional mangrove forests in Kachchh. In order to ascertain the present status and health of the mangrove plantation created during 2011, a survey was carried out with the following objectives.

1. Assess the survival, mortality, density of the mangrove plantation in the present condition.
2. Analyze the cause for mortality and suggest appropriate remedial measures.
3. Assess growth of planted mangrove saplings in terms of height gained during the post one year.
4. Record associated macrofaunal population dynamics as an indicator of the stand health through faunal density and diversity studies.
5. Study relevant chemical characteristics like salinity, nutrients in the soil in order to assess the growth prospects
6. Find out natural (algal encrustation, shift in substrate nature) and anthropogenic threats (cattle grazing, cutting) to the plantation and suggest measures to ward it off.

This report presents the finding of the monitoring study carried out at Jakhau mangrove plantation during December 2012.

2. Location of the Plantation

The plantation site is located in the northwestern part of Kachchh district at Jakhau Bander opposite to the Jakhau fishing harbor on the outer rim of Gulf of Kachchh. Jakhau is around 22 km west of Naliya, the head quarter of Abdasa taluka of Kachchh district. Jakhau Bander is a major fish landing centre in Kachchh. The chosen plantaton site is located on the Bubber Island which is opposite to Jakhau fishing landing centre separated by Sindhodi creek which is the main tidal source that

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flushes the mangrove plantation. Tidal amplitude of Jakhau is around 4.5 m. Bubber Island where the present plantation was carried out has natural mangroves to the extent of 200 ha. The plantation site is located in the adjacent land mass of the natural mangrove formation. The land is gently sloping with muddy-clayey substratum suitable for mangrove plantation. The plantation site is around 300 m from the lowest low tide mark and tidal water flushes the site for about 15 days in a month. Jakhau experiences rainfall of ~350 mm and annual temperature fluctuation is wide, ranging from 3 to 48°C. Tides are mixed semi-diurnal type with large inequality. The present plantation sites on east and south is surrounded by earlier plantation carried out by Adani Port and Special Economic Zone Ltd., forming a continuous stretch of mangrove plantation.

Mangrove saplings of the species *Avicennia marina* was planted in the chosen site during rainy months of 2011. The total target was to plant around 1,25,000 saplings in an area of 50 ha which will have a final density of around 2500 mangrove saplings/hectare. Both nursery raised saplings and direct dibbling in raised mount (Vodla method) was used for plantation.

3. Survey method

In order to assess the present status of the plantation random surveys in the plantation were carried out wherein six random 10 x 10 m quadrates were taken for assessing the mangrove species density which was later pooled to density per hectare. Mangrove associated species was recorded both qualitatively and quantitatively through quadrate method. As the plantation is not yet fully grown, GBH measurement could not be recorded and only average height of the sapling was considered.

In case of faunal sampling, 1 X 1 m quadrates were laid randomly at plantation blocks and the macrofauna as in all and major groups were recorded.

Physico-chemical parameters were studied on site where ever possible and water and sediment samples were carried to laboratory for further evaluation.

4. Results

4.1 Plantation Status

Mangrove plantation was carried out in Jakhau Bundar during 2011 as a single stretch and all the 50 ha of plantation is present as a continuous stretch. The plantation site is shown in Fig. 1.

Plantation was carried out with only one species namely *Avicennia marina* in 50 ha. The total area covered was around 60 ha. Plantation density maintained for all the species was 2500 plants/ha and the distance maintained was 2x2 m.

MRS. T. JAYANTHI THIVAKAR
Staff Quarters No. B-2,
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Saplings have now attained an average height of 60 cm with a range of 47 cm to 72 cm. The density in different quadrates ranges from minimum of 1657 saplings/ha to a maximum of 2435 saplings/ha with an average density of 1910 saplings/ha. Overall mean survival rate in terms of the studied quadrates indicates around 67% and a total area of around 50 ha have been covered. The survival rate recorded at the end of plantation activities was almost similar with 69% showing that no major mortality of planted saplings has taken place during this past one year. Density of the planted saplings recorded in 10 quadrates is presented in Table. 1.

Table 1. Density of mangrove plantation

S. No	Location	saplings/ha	Remarks
1	23°12'56.67"N; 68° 36' 42.77"E	1657	Low survival due to grazing and poor tidal flushing
2	23°12'56.79"N; 68° 36' 57.39"E	1490	Poor tidal flushing and grazing
3	23°12'52.80"N; 68° 37' 04.91"E	1820	Moderate tidal flushing
4	23°12'58.54"N; 68° 37' 02.32"E	2200	Good tidal flushing but high grazing
5	23°12'44.65"N; 68° 37' 10.03"E	1665	Low tidal flushing
6	23°12'53.49"N; 68° 37' 10.72"E	1450	Low tidal flushing
7	23°12'50.10"N; 68° 36' 42.14"E	1930	Moderate tidal flushing, lot of associated species seen
8	23°13'06.25"N; 68° 36' 56.18"E	2435	Good tidal flushing, ideal sites
9	23°12'41.60"N; 68° 37' 09.98"E	2250	Good tidal flushing
10	23°12'41.60"N; 68° 37' 09.98"E	2200	Good tidal flushing
Average		1910/ha	

4.2 Threats to the Plantation

Jakhau mangrove plantation including that created by Adani Petronet faces the following threats. Following are some of the probable reasons for mortality and low survival rate of the plantation;

- Heavy Livestock grazing** – High dependency of the local livestock on mangroves render mangroves of Jakhau highly vulnerable to grazing. The site showed high livestock grazing pressure by camel and other livestock which belong to local communities. These livestock usually feeds on the tender leaves and branches of the mangroves limiting their regular growth which leads to increased mortality and less survival.
- Poor tidal flushing during high tide** - Certain area of the plantation lacks proper tidal flushing. Lack of proper site in other coastal stretch and nearby areas forced plantation in this area. The infrequent tidal flushing can be one of the causes of low survival rate.

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- iii. **Sediment texture:** It is one of the governing factors of mangrove growth. High bulk density and tough basal ground deprives the stabilization and penetration of roots after certain level which in turn is reflected in stunted growth of plantation.
- iv. **Other causatives:** Apart from above mentioned lapses during plantation time, harsh temperature without long tidal flush etc. can have impact on the mangrove plantation.

4.3 Mangrove Associated Fauna

Associated fauna in mangrove ecosystem is a reliable indicator for its full ecological functioning, health and stability. During present study, evaluation of mangrove associated macrofauna was carried out by studying their diversity and density. A total of 4 species were recorded from the mangrove plantation site. The average density of each species is presented in Table 2. *Cerithidea* sp. was the dominant form seen utilizing the habitat followed by the crustacean, *Balanus* sp. Moreover, quadrates at defined locations were also taken for macrobenthic population which is presented in Table 3. The densities recorded were comparatively lower ranging from 11 to 31 individuals/m² indicating that the plantation is still young and in developing stage and has not reached the threshold level of providing ecosystem services and harboring its best diversity and density.

Table 2. Average associated species wise density in the mangrove plantation site.

S.No	Genera/Major Group	Density-No/m ²
1	Balanus - Crustacean	31
2	<i>Cerithidia</i> sp. - Gastropod	43
3	<i>Solen kemp</i> - Bivalve	11
4	<i>Donax</i> sp.- Bivalve	23

Table 3. Overall macrobenthos density at defined location in mangrove plantation

S.No.	G.P.S. Location	Population	Major Genera
1	21°18'30.6"N;72°36'5.1"E	11/m ²	Molluscs
2	21°18'32.6"N;72°36'06.5"E	18/m ²	Molluscs, Crustaceans
3	21°18'32.7"N;72°36'04.7"E	12/m ²	Bivalves
4	21°18'36.1"N;72°36'11.2"E	16/m ²	Molluscs
5	21°19'01.9"N;72°36'28.9"E	Nil	--
6	21°19'04.4"N;72°36'29.0"E	13/m ²	Gastropods, Crustaceans

4.4 Physico-chemical parameters

Analysis of chemical studies of water and sediments was also carried out along with biotic parameters. Parameters like surface water salinity, sediment texture along with pore water salinity,

nitrate, nitrite and phosphate were carried out. Overall surface water salinity ranged from 39-41 ppt which is well within the tolerance range of *A. marina* and other planted mangroves. Temperature also showed a normal data with more or less same levels at different locations. The details of the same are presented in Table 4. Sediment composition showed higher proportion of sand while that of silt and clay was lesser. No significant change in composition was seen at any location.

Pore water analysis was an important aspect having an impact on mangroves. Levels of pH in most of the places were alkaline and in only one place pore water recorded acidic pH of 6.8 (Table 4). In general, range of pH was between 6.6 to 7.9 in all the locations. Pore water salinity in the studied locations ranged from 46 ppt to 50 ppt and as a rule pore water salinity was always higher than creek water salinity. Lower to moderate levels nutrients like Nitrate, nitrite and phosphate suggests lower nutrient supply to young and growing plantation. The details are presented in Table 4.

Table 4. Pore water Nature at sampling locations.

GPS Location	pH	Salinity (ppt)	Phosphate (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)
21°18'30.6"N;72°36'5.1"E	6.6	46	.018	0.3	.02
21°18'32.6"N;72°36'06.5"E	7.6	48	.021	0.2	.01
21°18'32.7"N;72°36'04.7"E	7.7	50	.014	0.3	.03
21°18'36.1"N;72°36'11.2"E	7.7	49	.023	0.6	.06
21°19'01.9"N;72°36'28.9"E	7.9	49	.021	0.4	.08
21°19'04.4"N;72°36'29.0"E	7.9	46	.011	0.4	.09

Overall a normal pattern of water and sediment parameters was seen in the plantation site and do not show any abnormal situations. The salinity fluctuation is normal in accordance with the Gulf of Kachchh waters and suitable for *A. marina* and associated mangrove species. Being a sturdy species *A. marina* can manage range of salinity levels and suits to the local sediment composition.

5 Summary

- Plantation was carried out in 50 ha in a single block at Jakhau Bundar (Bubber Island).
- *A. marina*, was the candidate species and a total area covered was 50 ha. Density of 2500 plants/ ha was followed with a gap of 2 × 2 m.
- An overall survival rate of 67% was estimated in the present study. Present density in different plantation sites ranged from 1657 to 2435 saplings/ha with an average density of 1910 saplings/ha.
- As per the survey, saplings have attained an average height of 60 cm.

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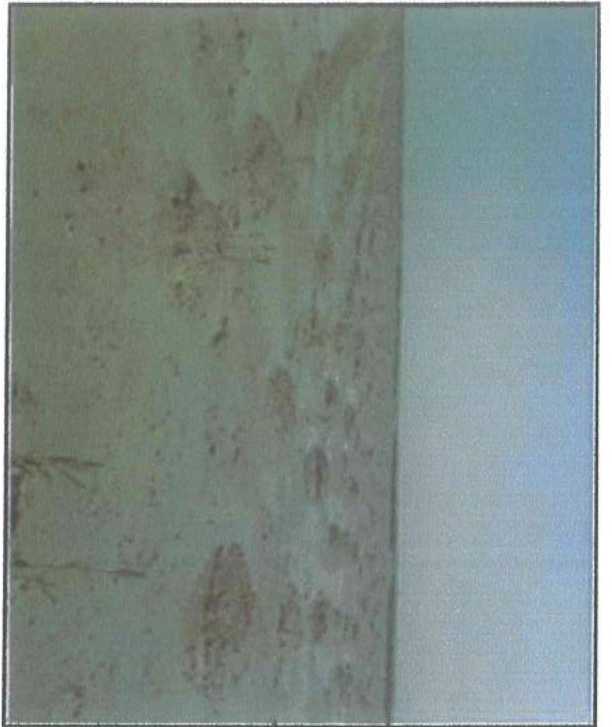
- Gradual succession in macrobenthic community is observed which will serve as a good indicator of plantation success.
- Physico chemical parameters of water and sediment showed a normal nature with salinity ranging from 39 to 41 ppt.
- Apart from environmental factors for low survival, pressure from cattle grazing can be taken as causative of high mortality, low growth and stunted nature of planted mangroves.

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Figure 1. Adani Petronet Mangrove Plantation site at Jakhau-Kachchh



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Mount Method adapted



Mount Method adapted



Nursery saplings to be transplanted

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:: વાવેતર આયોજન ::

સ્થળ : પાદરી-૧ વર્કીંગ સર્કલ :

ફેલીંગ સીરીઝ : કુપ નંબર :

યોજના : ચેર વાવેતર (અદાણી) કુપનો કુલ વિસ્તાર :

મોડેલ : ચેર વાવેતર સર્વે નંબર :

વાવેતર વિસ્તાર : 50 હેક્ટર સર્વે નંબર કુલ વિસ્તાર :

વાવેતર વર્ષ : 2011-12

વર્તુળ : જુનાગઢ વન વર્તુળ જુનાગઢ

વિભાગ : ભાવનગર વન વિભાગ ભાવનગર

રેન્જ : નોર્મલ રેન્જ, મહુવા

રાઉન્ડ : તળાજા રાઉન્ડ તળાજા

બીટ : પાદરી બીટ

તૈયાર કરનાર

રેન્જ ફોરેસ્ટ ઓફીસર
નોર્મલ રેન્જ
મહુવા

ચકાસણી કરનાર

મદદનીશ વન સંરક્ષક
(મોબાઈલ સ્કવોડ)
ભાવનગર વન વિભાગ,
ભાવનગર

મંજૂર કરનાર

નાયબ વન સંરક્ષક
ભાવનગર વન વિભાગ,
ભાવનગર

ટ્રીટમેન્ટ મેપ : નાયબ વન સંરક્ષક ભાવનગર વન વિભાગ,
ભાવનગર તરફ સાદર કર્યા પત્રકમાંક: અ/પવવ/ ૬૭૩ /૨૦૧૧-૧૨ તા: ૨૫/૧૦/૨૦૧૧

ટ્રીટમેન્ટ મેપ : નાયબ વન સંરક્ષક ભાવનગર વન વિભાગ,
ભાવનગર તરફથી મંજૂર કર્યા પત્રકમાંક: બ/પવવ/ ૭૪૨ /૨૦૧૧-૧૨, તા: ૧૪/૧૨/૨૦૧૧

(અ) ટ્રીટમેન્ટ મેપ
[અલગથી નકશો સામેલ છે]

(બ) પ્લોટની સામાન્ય માહિતી

- (૧) વર્કીંગ સર્કલ :
- (૨) ફેલીંગસીરીઝ :
- (૩) કુપ નંબર :
- (૪) વિસ્તારનો સરેરાશ વરસાદ : 425 MM
- (૫) વરસાદના સરેરાશ દિવસો: 44
- (૬) જમીન પૃથ્થકરણની વિગત : જમીનના નમુના એકત્ર કરી પૃથ્થકરણ માટેની કાર્યવાહી શરૂ કરેલ છે.

(૭) સર્વે નંબર વાઈઝ જંગલનો કુલ વિસ્તાર સર્વેનંબર વિસ્તાર(હે.)

(૮) અન્ય: (સ્થળને અનુરૂપ વર્કીંગ પ્લાનની જોગવાઈ મુજબ અન્ય કામગીરીઓ બાબતે ટુંકી વિગત:

સદરહુ સ્થળે જુના ચેરવાવેતરોના રોપાઓ હાલ હયાત છુટા છવાયા જીવંત સ્થિતિમાં સારા જોવા મળે છે. અને દરીયાઈ કાદવ કીચડ, મડવાળો વિસ્તાર હોય, જેથી આ પ્લાન્ટેશનમાં ચેર વાવેતરની કામગીરી લેવાથી સફળતા મળે તેમ છે.

બ્લોકવાર રોપવાના થતા રોપાઓની જાત, સીપીટી નંબર તથા સંખ્યા વર્કીગપ્લાનની જોગવાઈ મુજબ નક્કી કરવાના ધોરણ

.....

કુલ રોપવાના થતા રોપની સંખ્યા: ૫,૫૫,૫૦

(૧) સ્થાનિક પ્રતિનિધિત્વ ધરાવતા સ્થાનિક સીપીટીના વૃક્ષમાંથી એકત્ર કરેલ બીજના ૯૦% ની મર્યાદામાં :

અ.નં.	જાત	સીપીટી નંબર	રોપાની સંખ્યા	શેરો
(૧)	ચેર વાવેતર		૫,૫૫,૫૦	
(૨)				
(૩)				
(૪)				
(૫)				
(૬)				
(૭)				

(૨) સંશોધન વિભાગમાંથી સ્થળને અનુરૂપ (કુલ રોપાના ૫% ની મર્યાદામાં) :

અ.નં.	જાત	સીપીટી નંબર	રોપાની સંખ્યા	શેરો
(૧)				
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(૮)				

(૩) ઔષધીય અને ગૌણ વન પેદાશ આપતા સીપીટીમાંથી તૈયાર કરેલ રોપની સંખ્યા (કુલ રોપના ૫% ની મર્યાદામાં) :

અ.નં.	જાત	સીપીટી નંબર	રોપાની સંખ્યા	શેરો
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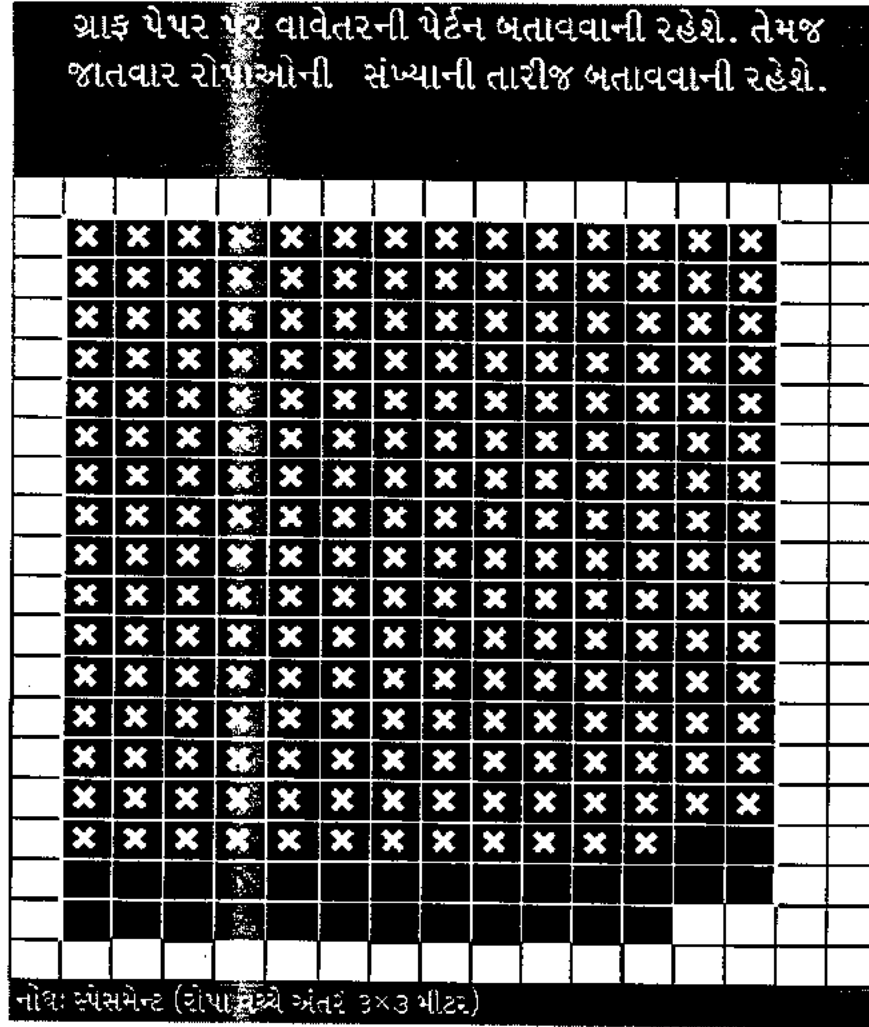
નોંધ: ઉપર મુજબના વાવેતરમાં લેવાના થતા રોપાઓ પૈકી સંશોધન, ઔષધીય અને ગૌણ વન પેદાશના રોપના

બ્લોક સ્થળ સ્થિતિ-મુજબ એક જ બ્લોકમાં સમાવેશ કરવો તથા નકશામાં અલગ ક્લરથી બ્લોક દર્શાવવો.

(ક) બ્લોકવાર પ્લોટના તાંત્રીક માપદંડો

અ.નં.	તાંત્રીક માપદંડ	બ્લોક નં. ૧	બ્લોક નં. ૨	બ્લોક નં. ૩	બ્લોક નં. ૪	બ્લોક નં. ૫	શેરો
૧	૨	૩	૪	૫	૬	૭	૮
(૧)	જમીનનો પ્રકાર	દરિયાઈ કાદવ	દરિયાઈ કાદવ				
(૨)	માટીની ઉંડાઈ	૧. મી. થી વધુ	૧. મી. થી વધુ				
(૩)	માટી ધોવાણની પરિસ્થિતિ	સંવેદનશીલ	સંવેદનશીલ				
(૪)	જમીનનો ઢાળ	નહીવત	નહીવત				
(૫)	વનસ્પતિ / ઝાડની જાતો	—	—				
(૬)	ઝાડીની ઘનતા	૦	૦				
(૭)	હાલની પરિસ્થિતિ	ખુલ્લો વિસ્તાર	ખુલ્લો વિસ્તાર				
(૮)	રક્ષણની સમસ્યા:						
	(અ) ચરિયાણ	સંવેદનશીલ	નથી				
	(બ) ગેર કાયદેસર કપાણ	નથી	નથી				
	(ક) ગેર કાયદેસર ખેડાણ	નથી	નથી				
	(ડ) દવ	—	—				
	(ઈ) અન્ય	—	—				
(૯)	વિસ્તાર (હેક્ટર)	૨૫/૦૦ હેક્ટર	૨૫/૦૦ હેક્ટર				
(૧૦)	બ્લોક વિભાજન સ્થળ	—	—				
(૧૧)	ખુલ્લો ભાગ	—	—				

નોંધ : સ્થળ સ્થિતિને ધ્યાનમાં લઈ આખા પ્લોટમાં સરખી ટ્રીટમેન્ટ શક્ય ન હોય તો પેટા બ્લોક પાડવા અને બ્લોકવાર માહિતી દર્શાવવી.



અ.નં.	રોપાની જાત	સંખ્યા	સંજ્ઞા
1	ચેર	55550	x

વાવેતરનું સ્થળ: પાદરી (પ્લોટ-૧)

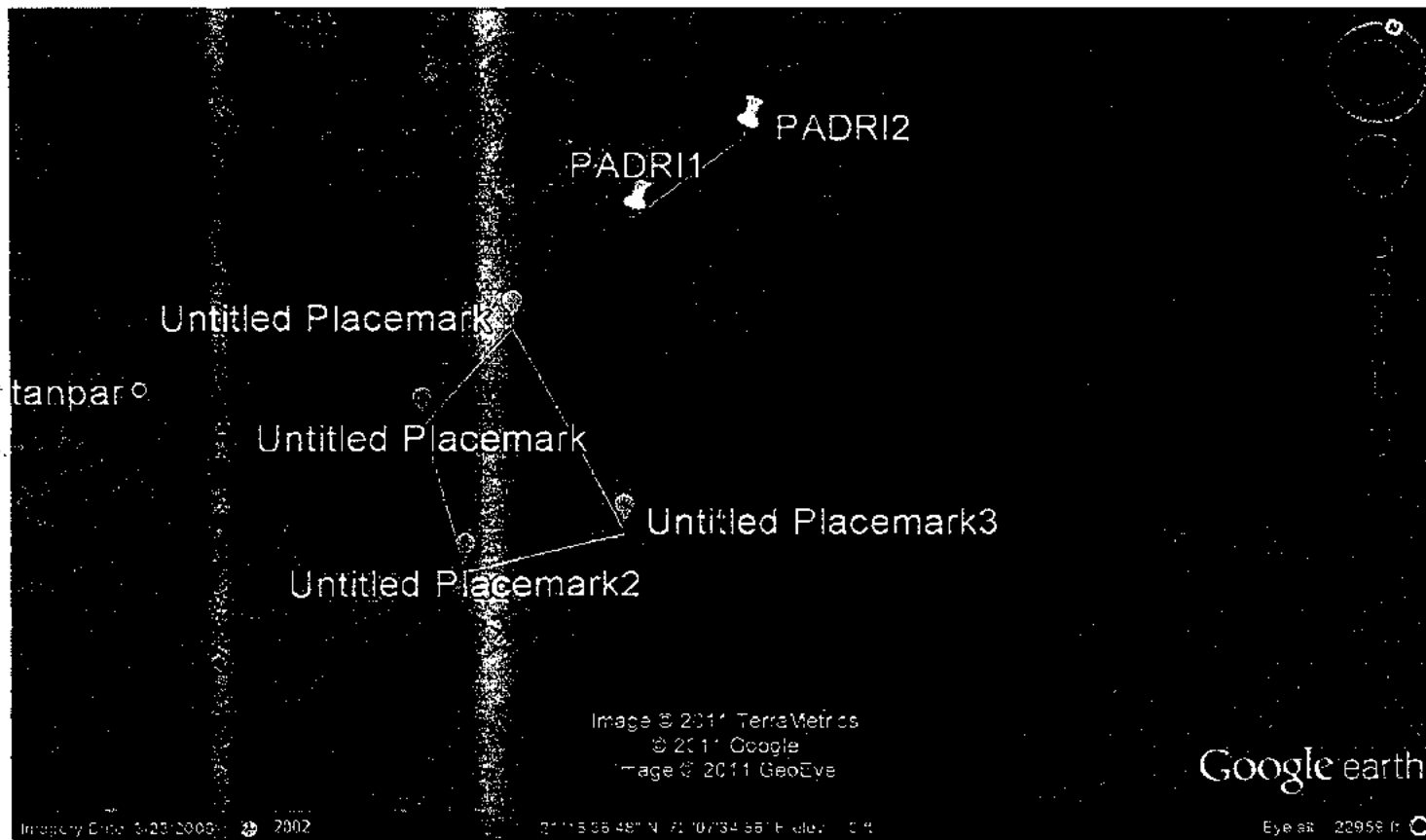
યોજના: ચેર વાવેતર (અદાણી)

મોડેલ: Cher Plantation (Adani)

વાવેતર વિસ્તાર: 50 HA.

વાવેતર વર્ષ: 2011-12

આર ખુલાના જી.પી.એસ.રીડીંગ		
સં.નં.	રેખાંશ	અક્ષાંશ
1	21180584	72070328
2	21191744	72071101
3	21185879	72074845
4	21184765	72074121



↓ પાદરી (અંક-1)

પાદરી-૧ હરીયા કિનારો

ઉત્તર

**Cher Plantation.-
2011-12**

50 Ha.

425
Mt.

425
Mt.

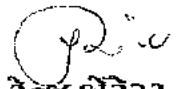
Mt. 1225

દક્ષિણ

હરીયાળો બાગ

પૂર્વ

પાદરી-૧ કિનારો
ભાવનગર


રેન્જ ફોરેસ્ટ ઓફીસર
નોર્મલ રેન્જ
મહુવા

Mangrove plantation project
at Village Malpur, Taluka Jambusar, District Bharuch, Gujarat
Completion Report 2012 to 2015



Name of the Client
Adani Petronet (Dahej) Port Private Limited (APPPL)
At. Po. Lakhigam, Near Dahej,
Taluka Vagra, District Bharuch

Implementing Agency
Saline Area Vitalization Enterprise LTD. – SAVE
Ishavasyam, Opp. Lajpatnagar Society,
Eeshita towers Road, Navrangpura, Ahmedabad
Contact No. –079-26404263
Email-saveltd1995@gmail.com
Website: www.divadandi.com

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Executive Summary

Government of Gujarat has articulated and demonstrated its resolve in establishment and conservation of Mangroves along the coast of Gujarat. The government is encouraging industries and community based organisations to carry out large-scale plantation of mangroves in different parts of the coastal belt. The current project was carried out as part of the drive by the corporate aimed at contributing to the process.

Adani Petronet (Dahej) Port Private Limited assigned SAVE - Saline Area Vitalization enterprise Limited, a technical service organization to identifying suitable locations and carryout mangrove plantation in 200 hectares of coastal land.

The project initiated in 2012 and completed in 2015 was divided in three phases:

1. Identification of suitable sites along the coast of Gujarat.
2. Carry out mangrove plantation in selected location covering 100 hectares.
3. Carry out gap filling in already planted area and mangrove plantation in additional 100 hectares of land as well as set up community based maintenance system to ensure conservation and long-term sustainability.

This is a completion report on the project implemented in Malpur village of Jambusar taluka of Bharuch district.

The report contains complete journey of the project from identification of the project site, community mobilization and participation, setting up village level institution, participatory planning of the project, implementation of various activities and setting up of post project maintenance system. The project was extensively documented both through written as well as visual mediums.

The project on one hand has established and regenerated mangroves in 200 hectares and on the other provided wage employment, help build capabilities and skills of the local people and community based organisations in planning and implementation of large projects, created greater awareness about importance and need of mangroves for both livelihood and environmental reasons.

Following successful implementation of the project, livelihood initiative on shallow sea fishing has been initiated. An initiative of collecting and marketing of fish from shallow sea, a traditional livelihood activity was encouraged and scaled up by providing financial and non financial inputs. An activity initiated with 16 persons has grown to include 100 families from eight coastal villages.

Hence along with regenerating and revitalizing natural resource through mangrove plantation it has also created positive impacts on livelihoods of local marginalized communities.

The project has been a rewarding experience for the local people, members of Janshakti Parishad (local community based organization of rural poor) & SAVE.

Introduction

The English Oxford Dictionary defines Mangrove as a tree or shrub, which grows in tidal, mainly tropical, coastal swamps, having numerous tangled roots that grow above ground and form dense thickets. Mangroves are salt-tolerant plants that mainly grow in tropical and subtropical intertidal regions of the world. The area in which these plants grow is called 'mangrove ecosystem'. Mangroves are considered to be very productive but at the same time these plants are extremely sensitive and fragile. The mangrove ecosystem also nurtures other plant and animal species.

Mangroves flourish where oceans, freshwater, and land realms meet. They are among the most productive and complex ecosystems on the planet, growing under environmental conditions that would kill ordinary plants very quickly.

Mangrove forests are particularly found in regions within 30° of the equator. These tidal areas, such as estuaries and marine shorelines, are frequently inundated with salt water. Strongly in decline, mangrove forests occupy about 15.2 million hectares of tropical coast worldwide: across Africa, Australia, Asia and America



(UNEht)Figure 1 Distribution of Mangroves in the world

The scientific community traces the origin of mangroves in the Indo-Malayan region. This is on account of the fact that this area has more mangrove species as compared to any other place in the world. Today, mangroves are observed in about 30 countries in tropical & subtropical regions covering an area of about 99,300 sq. km.

Despite increasing awareness regarding value and importance, the destruction of mangrove forest continues to take place in many parts of the world under a variety of economic as-well-as political motives.

Mangroves in India

Mangroves in India, as estimated by states, cover an area of 6,740 Sq. Km. or approximately 7% of the total mangrove area in the world. The actual coverage of mangroves, as per the Forest Survey of India (FSI), is much less, about 4,481 Sq. Km.

(2001). The highest mangrove area is in West Bengal in Sundarbans (2,155 Sq. Km.), followed by Gujarat (1058 Sq. Km.), Andaman-Nicobar (617 Sq. Km.), Andhra Pradesh (352 Sq. Km.) and Orissa (222 Sq. Km.). About 12 states and union territories in the country have mangroves in their coastal regions.

Mangrove cover has been categorized into very dense (canopy density of more than 70%), moderately dense (canopy density between 40-70%) and open mangrove cover (canopy density between 10-40%). Distribution of mangroves along the Indian coast is presented in Table 1. Gradual topography along the east coast is said to have an extensive intertidal expanse, which favors major formation of mangroves in the deltaic regions. (Komarpant 2003)

The mangrove ecosystem is basically of three types, the first being the deltaic mangroves located along the mouth of major estuaries on east coast and Gulf of Kachchh and Khambatt Gulf on the west coast. These cover up to 53% of the total Indian mangroves out of which Sunderbans cover about 78%. Second types are the coastal mangroves which are found along the intertidal coastlines, minor river mouths, sheltered bays, and backwater areas of the west coast this constitute 12% of the mangrove area of India and lastly the island mangroves which are found along shallow protected intertidal zones of bay islands such as Lakshadweep and Andamans. They are approximately 16% of the total mangrove area. (Ingole 2009)

India with a long coastline of about 7516.6 km, including the island territories (Anonymous, 1984), has the fourth largest mangrove area in the world (Mandal 1999). These mangrove habitats (69°E-89.5°E longitude and 7°N-23°N latitude) comprise three distinct zones: East coast habitats having a coast line of about 2700 km, facing Bay of Bengal, West coast habitats with a coast line of about 3000 km, facing Arabian sea, and Island Territories. In India, the states like West Bengal, Orissa, Andhra Pradesh, Tamil Nadu, Andaman and Nicobar Islands, Kerala, Goa, Maharashtra, and Gujarat occupy vast area of Mangroves.

The area under mangroves in Gujarat is the second largest along the Indian coast, after Sunderbans.

Gujarat has about 23% of India's estimated mangrove cover of 4.88 lakh ha. Of the total mangrove cover in the state, the coastal district of Kachchh covers almost 74%.

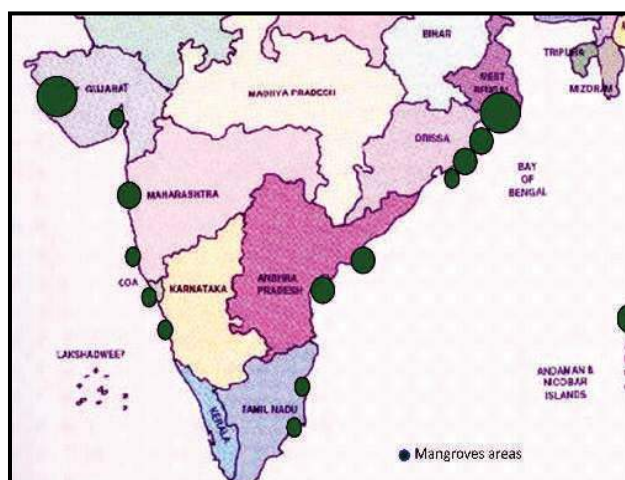


Figure 2 Distribution of Mangroves in India

Table 1 Distribution of Mangroves in India (Area Sq. Km)

No	State/UT	Very Dense mangrove	Moderately Dense mangrove	Open Mangrove	Total
1	Andhra Pradesh	0	126	226	352
2	Goa	0	20	2	22
3	Gujarat	0	182	876	1,058
4	Karnataka	0	3	0	3
5	Kerala	0	3	3	6
6	Maharashtra	0	69	117	186
7	Orissa	82	97	43	222
8	Tamil Nadu	0	16	23	39
9	West Bengal	1,038	881	236	2,155
10	Andaman & Nicobar islands	283	261	73	617
11	Daman & Diu	0	0.12	1.44	1.56
12	Pondicherry	0	0	1	1
	Total	1,403	1,658.12	1,601.44	4,662.56

(FSI)**Gujarat**

With 1600 km long coastline, Gujarat has the distinction of having highest coastline among all the maritime states of India. Gujarat coast lies between 20.00' – 24.45' N latitudes and 68.00' – 73.30' E longitudes. The Gujarat coast is having two gulfs, namely, Gulf of Kachchh and Gulf of Khambatt. Total seven estuaries exist in Gulf of Khambatt and delivering large amount of water and sediments, whereas in Gulf of Kachchh riverine inputs are very small. Gujarat coast provides a wide variety of coastal features due to its varied physiographic, geomorphology and coastal processes. It has distinct variation in the wetland landform categories due to climate substrate constituent and topography. Large industrial and infrastructure investment all along the coast is altering the coastal land use and land cover.

Gulf of Khambatt and Coastal Southern Gujarat

The coast around Gulf of Khambatt is indented by estuaries and consisting of extensive mudflats, dunes and sporadic presence of sandy beaches. All these landforms are the result of high-tidal range in the Gulf of Khambatt. The South Gujarat coast is comparatively uniform and broken by few indentions. Narrow sandy beach is present between Mindhola and Purna rivers and extends up to Daman. Heavy minerals, quartz and mica make up the beach sand. Along the estuaries of the Mindhola, the Purna, the Ambica, the Auranga and the Damanganga mudflats are with marsh and mangrove vegetation. Numerous small tidal creeks also occur along the coast. South of Auranga estuary, the coast is rocky.

Total area covered by Mudflat is 5504.41 sq km. Industrial development along the coast is very fast and it occupies 192.21 sq km. Gujarat is a major salt producer in India and salt pan occupies 1115.60 sq km. Below table provides the coastal land use pattern of Gujarat state.

Annexure 2D - Mangrove Plantationby SAVE at Village Malpur, Gujarat

Completion Report
Mangrove Plantation Project, Malpur, Bharuch District, Gujarat
Adani Petronet (Dahej) Port Private Limited

Land-use pattern in Gujarat

No	Class	Area in Sq. Km	No	Class	Area in Sq. Km
1	Dense Mangrove	732.20	26	Mining Areas/Dumps	7.53
2	Agricultural Land	13,906.08	27	Moderately Dense Salt-Marsh Vegetation	234.20
3	Airport	9.68	28	Mud With Vegetation	164.43
4	Aquaculture Ponds	64.45	29	Oxbow Lake	0.01
5	Beach/Patch	85.87	30	Pond/Lake	104.71
6	Bridge	0.25	31	Port/Harbour/Jetty	1.54
7	Canal	13.73	32	Reservoir/Tank	150.14
8	Cooling Pond	2.88	33	River Sand	10.96
9	Creek	1,779.87	34	River/Stream	297.87
10	Degraded Mangrove	29.78	35	Rock Exposure	0.07
11	Degraded Scrub	563.52	36	Rock Outcrops/Gullied/Eroded /Barren Land	178.25
12	Dense Salt-Marsh Vegetation	18.25	37	Rocky Coast	8.09
13	Dense Scrub	588.95	38	Saline Area	1226.87
14	Dune With Vegetation	0.49	39	Salt Pans	1,115.6041
15	Dune Without Vegetation	69.70	40	Sand With Vegetation	8.66
16	Estuary	9.66	41	Sandy Area	40.60
17	Forest(Non-Tidal)/Plantation	816.39	42	Seawall/Embankment	0.21
18	Habitation	256.57	43	Sparse Mangrove	634.83
19	Habitation With Vegetation	316.72	44	Sparse Salt-Marsh Vegetation	111.86
20	High Tidal Mudflat	947.11	45	Sparse Scrub	2,214.89
21	High Tidal Mudflat With Salt Encrustation	235.85	46	Sub Tidal Mudflat	1,732.97
22	Industrial Area	192.21	47	Very Dense Mangrove	248.41
23	Inter Tidal Mudflat	2588.48	48	Water Treatment Plant	0.68
24	Island	2.12	49	Waterlogged	241.13
25	Lagoon	0.01	50	Total Area	32,593.1

Mangroves in Gujarat

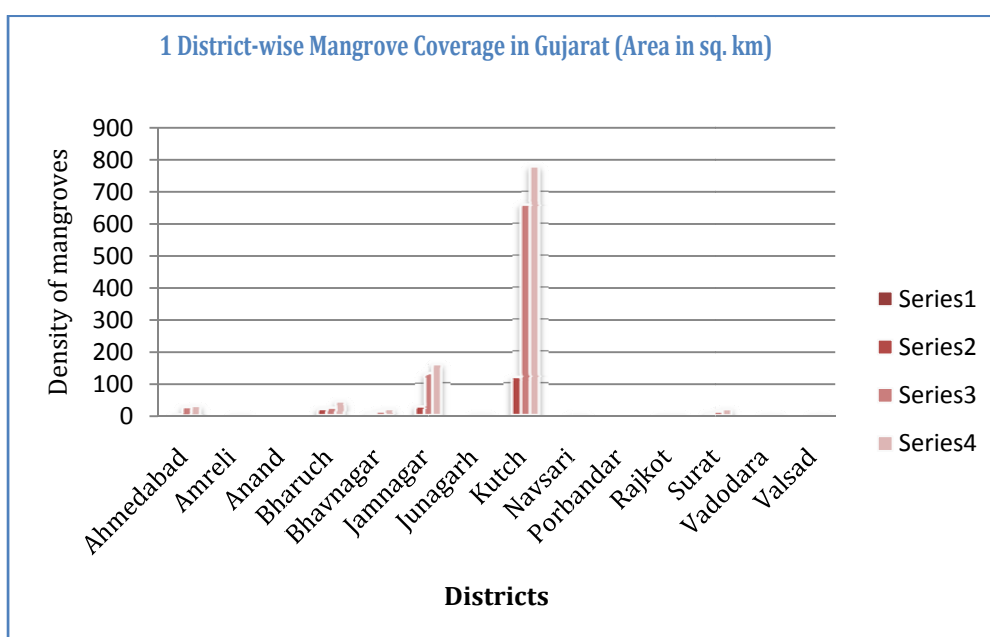
The State has mangroves spread over an area of 1,058 sq. km. Kachchh with mangroves spread over 778 sq. km has almost 74% of the State's mangrove spread. Beside Kachchh, mangroves are largely found in Jamnagar, Bharuch and Surat.

As the table shows, only about 20% of mangroves in the state are dense and the rest are sparse or degraded. Even in Kachchh and Jamnagar districts the percentage of dense mangroves ranges between 20% and 24.5 %

Table 2 District-wise Mangrove Coverage in Gujarat (Area in sq. km)

Sr. No.	District	Very Dense Mangrove	Moderately Dense Mangrove	Open Mangrove	Total
1	Ahmedabad	0	1	29	30
2	Amreli	0	0	1	1
3	Anand	0	0	0	0
4	Bharuch	0	21	22	43
5	Bhavnagar	0	6	13	19
6	Jamnagar	0	28	131	159
7	Junagarh	0	0	1	1
8	Kachchh	0	118	660	778
9	Navsari	0	0	1	1
10	Porbandar	0	0	0	0
11	Rajkot	0	1	1	2
12	Surat	0	7	13	20
13	Vadodara	0	0	2	2
14	Valsad	0	0	2	2
	Total	0	182	876	1,058

(2011)



Characteristics of Mangroves

Mangroves are notably different from other halophytic and mesophytic plant species, as they survive in a hostile environment, an interface between land and sea marked with fluctuations in salinity, storms and tidal surges and recently human induced biotic pressures like pollution. The biota exhibits a wide variety of adaptations in terms of morphology, anatomy, physiology, development of seed and seedlings, physiognomy and succession mechanisms. Prop roots, knee roots, plank buttresses and pneumatophores, sclerophyllous leaves with sunken stomata, and vivipary are some of the common adaptations. The roots possess pneumatopores or lenticels for the purpose of gaseous exchange. The control of tissue water potential through specialized leaves and stems, exclusion of salt through rhizo-filtration, excretion of salts through salt glands, and the ability to deposit salt in older leaves, barks and pneumatophores help the plants to acquire high level of salt tolerance ([Tomlinson n.d.]

Importance of mangroves

The mangrove ecosystem has important direct and indirect economic, ecological and social values to man. Mangrove ecosystems have consistently been undervalued, usually because only their direct goods and services have been included in economic calculations (e.g. forestry resources), but this represents only a minor part of the total value of mangroves. By undervaluing mangrove ecosystems, “development” has too often favoured their rapid conversion and loss. Mangrove conversion usually leads to short-term economic gain at the expense of greater, but longer-term, ecological benefits and off-site values. The non-market values, for example species biodiversity and off-site functions such as nutrient export are not easily quantified, but have been shown to be significant. The total economic value of mangroves must be calculated in order to provide decision-makers with the real cost of converting mangroves to other apparently more profitable uses. In particular, long-term ecological benefits and off-site values should be included in valuations for mangroves. Mangroves play an important role in the functioning of adjacent ecosystems, including terrestrial wetlands, peat swamps, salt marshes, sea grass beds and coral reefs. The beneficial effects mangroves have on the marine ecology are summarized as follows:

- Basis of a complex marine food chain.
- Creation of breeding habitat.
- Establishment of restrictive impounds that offer protection for maturing offspring.
- Filtering and assimilating pollutants from upland run-off.
- Stabilization of bottom sediments.
- Water quality improvements.
- Protection of shorelines from erosion.

Threat to Mangroves in Gujarat

Natural and anthropogenic factors pose severe threats to the marine ecosystems on the coast. However, the damage caused by human activities is much higher than the damage caused by natural calamities like cyclones, storms and earthquakes. Varied human activities like run offs and sedimentation from development activities, eutrophication from sewage and agriculture, physical impact of maritime activities, dredging,

destructive fishing practices, pollution from industrial sources and oil refineries etc. are some of the major threats to the fragile marine environment.

Gujarat is one of the most industrialized states in India. The major industries located around the coast include cement, chemicals, petroleum and oil refineries, shipping, power plants, fertilizers, fishing, etc. The increasing untreated effluents waste discharged into the marine environment severely hamper the marine flora and fauna. Due to major refineries established on the coastline, ship and heavy vessel traffic has also increased. Accidental oil spills from various vessels ferrying is a matter of serious concern as it may also be a potential threat to the coastal flora and fauna. Destructive agricultural practices using chemicals and pesticides like DDT have caused a lot of damage to the marine ecosystem. Many of the state's rich fishing grounds, are directly or indirectly dependent on mangroves for their sustained yield. Degradation of mangroves poses a serious threat to this resource and to the dependent fishing community. It also leads to increased soil erosion in the coastal areas, as the protective barrier between the sea and the land is lost. The natural barrier to the salt laden winds is also lost due to destruction of mangroves leading to increased spread of soil salinity adversely affecting agricultural production. This leads to declining employment opportunities among agricultural laborers and marginal workers of villages.

The broad causes of degradation of mangroves can be described as below:

Natural Hazards

Natural calamities like cyclones, droughts, higher intertidal currents, and low rainfall affect mangroves. Algae affect the early stage growth of plants during certain periods of the year. Higher currents cause phenomena such as shifting sand and erosion, which uproot older trees. *There is also degradation of mangroves in the Gulf of Khambatt by erosion of the shoreline due to violent sea actions.*

Over exploitation of mangroves for fodder and fuel-wood by local communities

Over exploitation of mangroves for fodder and fuel wood by local communities and *Maldharis* is a complex problem with a variety of inter-related causes. Unproductive village commons with frequent droughts due to arid and semi arid character of the area accentuates the problem by increasing the pressures on mangroves for fodder and fuel-wood. Mangrove leaves are rich in protein and are usually preferred over other grasses as fodder and are collected and carried by the local people to feed their cattle. Migrating populations of *Maldharis*, with large hordes of cattle, including camels, also cause severe damage to the mangroves. Free grazing by camels in the mangrove areas causing trampling of seedlings and over-exploitation of seeds and twigs by the local communities also lead to the reduced natural regeneration of mangroves. The problem is aggravated by the repeated droughts. Lack of knowledge and awareness of the ecological functions of mangroves in the local communities is also often responsible for the indiscriminate exploitation of mangroves by these communities.

Reduced Natural Regeneration

One of the factors for reduced natural regeneration of mangroves has been the reduction in fresh water inflow, which has led to increased salinity. No major rivers, except Indus with its reduced annual flows, pour fresh water in the Gulf of Kachchh. As a result, only hardy species like *Avicennia Marina*, with high salt tolerance, have survived. Similarly, in the Gulf of Khambatt, fresh water inflows from some of the major rivers like Sabarmati and Mahi have reduced due to construction of dams for irrigation in the upstream areas.

Diversion of mangrove land for other use like saltpans & industries:

Another important reason for the degradation of mangroves in the state is the diversion of mangrove lands for construction of saltpans, industries, ports, etc. Insufficient understanding of the ecological functions of the mangroves is largely responsible for such diversions. Location of ports and industries in the vicinity of mangrove areas also cause damage to the mangroves due to dredging and bunding activities as well as construction of roads and other infrastructure. Often, it also brings in a large population of migrant laborers, increasing the anthropogenic pressures on the existing mangroves.

Background of the Project

Over the last few years, Government of Gujarat has made concerted efforts to restore the fragile mangrove ecosystem in the state. The Government initiated the Community Based Mangrove Plantations (A Joint Mangrove Management) concept for the first time in which, the local communities were involved as active partner in mangrove conservation and management.

From 2002 to 2007, GoG actively took up mangrove plantations along the Gulf of Kachchh and Gulf of Khambatt with financial assistance from the India Canada Environment Facility. In order to achieve the goal of covering 5,000 hectares of area government collaborated with civil society organisations and community based groups. SAVE, its sister organizations VIKAS Centre for Development & Janshakti Parishad were pioneer in facilitating this plantation. Almost 700 hectares of mangroves were planted along the coast of south Gujarat by VIKAS.

In fact, in a first of its kind initiative, in the country, the state succeeded in involving both the corporate and public sector in mangrove plantation through a unique Public Private Partnership (PPP) model.

Corporate funds were mobilized and they were given the responsibility for the conservation of this fragile ecosystem. Under this partnership, native as well as newly introduced species of Mangroves have been planted on more than 5,000 hectares till date on the State's coastline; all this with the active participation of the local coastal communities. Through this unique PPP model over the last four years as many as 5090 hectares have been restored. (htt4)

As part of the above initiative, Adani Petronet (Dahej) port private Limited- APPPL assigned the project of mangrove plantation covering 200 hectares.



Figure 3 Panoramic view of Mangrove plantation at Malpur village

Adani Group of Industries:

Adani Group is an Indian multinational conglomerate company headquartered in Ahmedabad, Gujarat, India. Its diversified businesses include resources, logistics, agribusiness and energy sectors.^[1] The Group is the largest port developer and operator in India with Mundra being the country's largest commercial port. It owns Fortune, India's largest edible oil brand through a joint venture with Willmar in Singapore.^[2] The Flagship Company of the Adani group is Adani Enterprises Limited. In April 2014, it added the 4th units of 660 MW at its Tiroda power plant, making Adani power the largest private power producer of the country.

The company was founded in 1988 as a commodity trading business. First generation entrepreneur Mr. Gautam Adani is the founder & chairman of Adani Group. According to Mr. Gautam Adani, The Group was created with a vision of 'Nation Building' by developing assets of national economic significance. This reflects in the choice of businesses the group has entered and developed over the years.^{[3][4]} The corporate headquarters of the company is situated in the city of Ahmedabad.

SAVE – Saline Area Vitalisation Enterprise Limited

SAVE is a technical service organization working since last 20 years. It has been working with the coastal community of Gujarat for natural resource management, livelihood enhancement, mainly with primary producers like small & marginal farmers, salt pan workers, fishermen etc and agricultural laborers. SAVE has worked extensively on mangrove plantation, wasteland development, to arrest the issues of soil erosion, soil salinity. It has worked to improve the lives of all coastal communities like fishermen, farmers, salt pan workers, charcoal workers bonded laborers. Over a period of last one decade, SAVE along with VIKAS (NGO) has carried out mangrove plantation in 1180 hectares of area.

SAVE carried out the project in following three phases

- I. Identification of suitable sites for mangrove plantation.
- II. Plantation & Maintenance in 100 hectares of coastal land in Malpur, Jambusar Bharuch district.
- III. Carry out mangrove Plantation & Maintenance in additional 100 hectares of coastal land in the same location.

Identification of probable sites for mangrove plantation

During this phase – March to May 2012, SAVE identified fourteen sites along the coast of southern Gujarat.

Procedure followed

- Identification and Mapping of fourteen (14) locations along South Gujarat coast.
- Meeting with local communities and representatives of village Panchayati Raj Institutions.
- Collection and processing of soil samples.
- Preparation of Report.

Identification of Sites

Sites were identified considering their suitability in terms of

- Available area for plantation
- Soil quality
- Cooperation of local communities
- Proximity to Dahej, location of APPPL

The coastal locations in Jambusar, Amod, and Vagra, Hansot taluka of Bharuch district and Olpad taluka of Surat district of Gujarat were studied.

Phase -1 Identification of suitable sites for mangrove plantation.

Following are the details of all fourteen (14) locations

1. Nada-Devla site:

This site is 02 kilometers from Nada village of Jambusar taluka. There are mudflats making this region perfect for mangrove plantation. Estimated land is about 100 hectares suitable for mangrove plantation. This site is near Jambusar town. It is well connected by road and hence will be easily commutable. Below are the coordinates taken for the same site.

No	Taluka	Village	Location	Coordinates	Remarks
1	Jambusar	Nada	Entering point at the site	N-21° 56'18.7" E-72°30.2' 7.7"	There is an approximate 100 hectares of area for mangrove plantation.
2	Jambusar	Nada	End Point towards coast	N-21°56'15.7" E -72°23.0'16.1"	

2. Malpur Site:

This site is on the coast connecting Malpur and Zamdi/Isanpur villages of Jambusar taluka in Bharuch district. There is a long stretch of coastline with mangrove patches. The area suitable for mangrove plantation is estimated at 100 ha. Out of this 50% of the area has naturally grown mangroves. The remaining area can be utilized for plantation. There are three CBOs who can be involved in the plantation process.

No	Taluka	Village	Location	Coordinates	Remarks
1	Jambusar	Malpur	Entry point	N 22°025'5.5" E 072°47'35.3'	The area is having mangrove growth and also approximate of 100 hectares of land for future plantation
2	Jambusar	Malpur	Near the coast	N 22°045'3.1" E 072°31'40.5"	
3	Jambusar	Malpur	Maximum point	N 22°045'3.1" E 072°31'37.7"	
4	Jambusar	Malpur	Maximum point	N 22°0.34'3.3" E 072°313'7.3"	

3. Isanpur site:

Approximately 100 hectares of mangrove favorable land is found near Isanpur. It is almost three kilometers from Jhmdadi village towards malpur. The locals are also supportive and will help in mangrove plantation.

No	Taluka	Village	Location	Coordinates	Remarks
1	Jambusar	Zamdi/ Isanpur	Entering point at the site	N- 22°065'0.4" E-072°23.2'14.7"	There is an approximate 100 hectares of area for mangrove plantation.

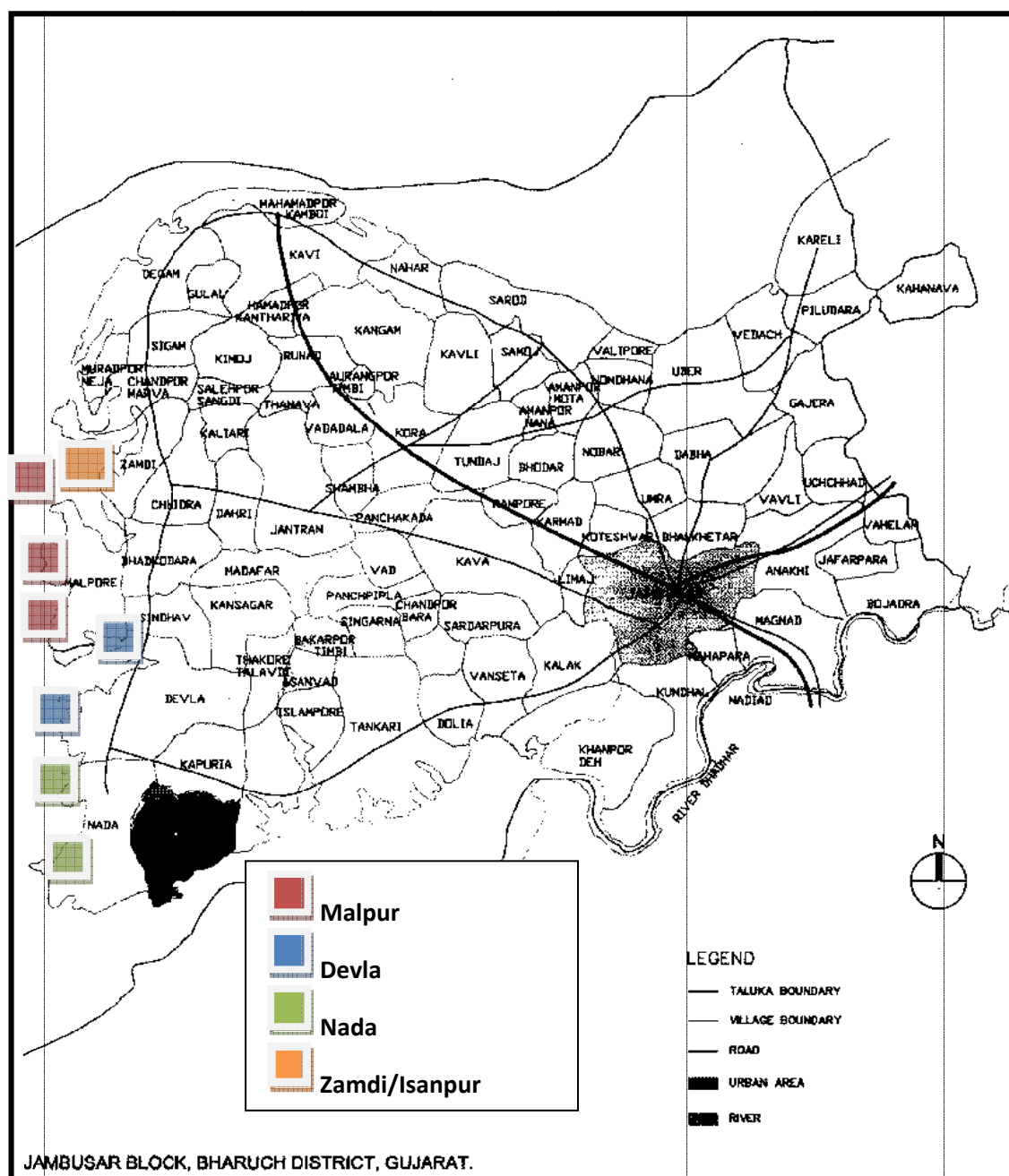


Figure 4 Proposed Sites in Jambusar Taluka

4. Denva-Gandhar Site:

Denva and Gandhar villages are located on the mouth of river Dhadhar. The river has changed its course leaving a long stretch of mudflats suitable for mangrove plantation.

No	Taluka	Village	Location	Coordinates	Remarks
1	Amod	Denva	Entering point at the site	N-21°56'13.0" E-072°42'31.2"	There is an approximate 100 hectares of area for mangrove plantation.

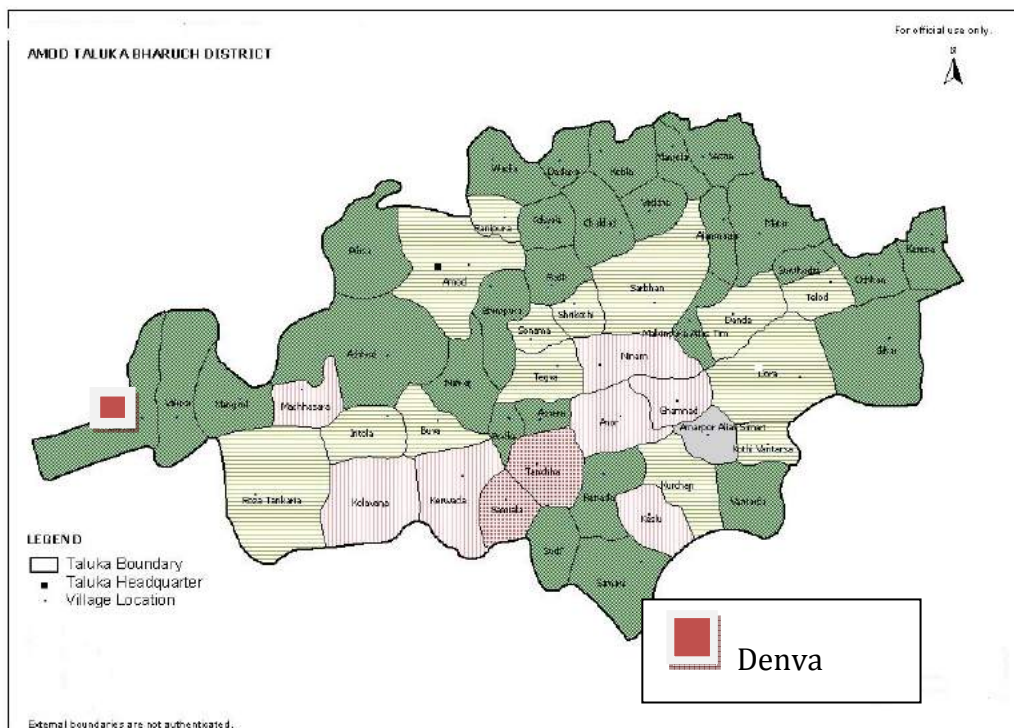


Figure 5 Proposed site in Amod Taluka, in Bharuch district

5. Gandhar (Vagra Taluka) Site:

Gandhar is on the opposite side of Nada village of Jambusar taluka. Gandhar is also on mouth of river Dhadhar. There is approximately 100 hectares of land area suitable for mangrove plantation. The area has necessary mudflats.

No	Taluka	Village	Location	Coordinates	Remarks
1	Vagra	Gandhar	Towards the coast	N-21°55'46.4" E-072°36.5'2.4"	There is an approximate 100 hectares of area for mangrove plantation.
2	Vagra	Gandhar	Possible site	N21° 55.5'55.1" E 072°37.2'2.4"	
3	Vagra	Gandhar	Possible site	N 21°55.5'6.3" E 072°37.4 7.7"	
4	Vagra	Gandhar	Possible site	N21°55.5'44.6" E 072°38.0'4.8"	
5	Vagra	Paniyadra	Possible site	N21°55.5'44.6" E 072°38.0'4.8"	

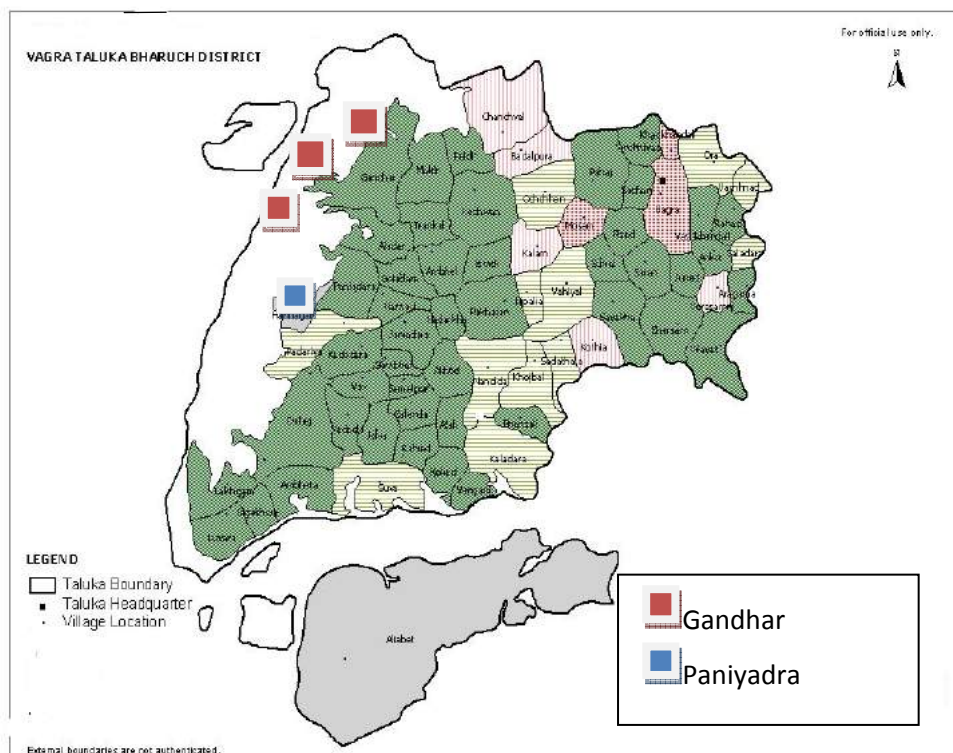


Figure 6 Proposed site at Vagra Taluka, Bharuch District

4. Kanthiyajal (Hansot taluka) Site:

Kanthiyajal is in Hansot Taluka of Bharuch district. Mangroves grow in abundance here. At present GEC is working in certain parts. There is a possibility of 150 hectares of land for mangrove plantation.

No	Taluka	Village	Location	Coordinates	Remarks
1	Hansot	Kanthiyajal	Entering point at the site	N-220650.4	There is an approximate 100 hectares of area for mangrove plantation.
				E-07314.6	

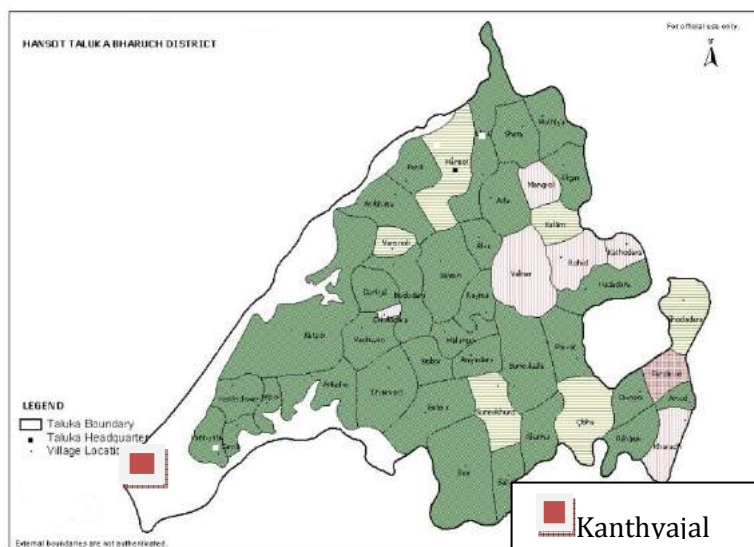


Figure 7 Proposed site at Hansot Taluka, Kanthiyajal

5 Surat –Mor, Bhagva, Olpad Site:

An area of almost 100 hectares is found around Surat in Olpad, Bhagva and Mor villages. There is a patch of existing mangroves suggesting a favorable condition for future mangrove plantation.

No	Taluka	Village	Location	Coordinates	Remarks
1	Dandi	Mor	Entering point at the site	N-22°06.50'0.4'	There is an approximate 100 hectares of area for mangrove plantation.



Figure 8 Proposed Site at Olpad taluka



Coordinates and Land Description

No.	Taluka	Village	Coordinates	Approximate Hectares
1	Jambusar	Nada	N-21° 56'18.7"	100 hectares
			E-72°30.2' 7.7"	
2	Jambusar	Nada	N-21°56'15.7"	100 hectares
			E- 72°23.0'16.1"	
3	Jambusar	Malpur	N 22°25'5.5"	100 hectares
			E -0.72°47.3'5.3"	
4	Jambusar	Malpur	N 22°45'3.1"	100 hectares
			E 072°31'40.5"	
5	Jambusar	Malpur	N 22°045'3.1"	100 hectares
			E 072°31'37.7"	
6	Jambusar	Malpur	N 22°0.34'3.3"	100 hectares
			E 072°313'7.3"	
7	Jambusar	Zamdi/Isanpur	N-22°0.65'0.4"	100 hectares
			E - 072°23.2'14.7"	
8	Amod	Denva	N-21°56'13.0"	100 hectares
			E-0.72°42'31.2"	
9	Vagra	Gandhar	N 21°56.5'2.5"	100 hectares
			E-072°36.5'2.4"	
10	Vagra	Gandhar	N21° 55.5'55.1"	100 hectares
			E 072°37.2'2.4"	
11	Vagra	Gandhar	N 21°55.5'6.3"	100 hectares
			E 072°37.4 7.7"	
12	Vagra	Gandhar	N21°55.5'44.6"	100 hectares
			E 072°38.0'4.8"	
13	Hansot	Kantiyajal	N-22°0.65'0.4"	150 hectares
			E-073°14'.6"	
14	Dandi	Mor	N-22°06.50'0.4'	100 hectares
			E-072°23.2'14.7"	

Out of the above- mentioned sites suitable for mangrove plantation coastal belt of Village Malpur at taluka Jambusar district Bharuch was finalized in consultation with officials of APPPL (Dahej).

The Project

The Project Location

Malpur is a small coastal village in taluka Jambusar of Bharuch district. The population is mainly fisher folk, small and marginal farmers and saltpan workers.

As per the Census 2011 India, Malpur has total population of 2,642 persons of which 1,399 are males while 1,243 are females. The village has total of 527 families.

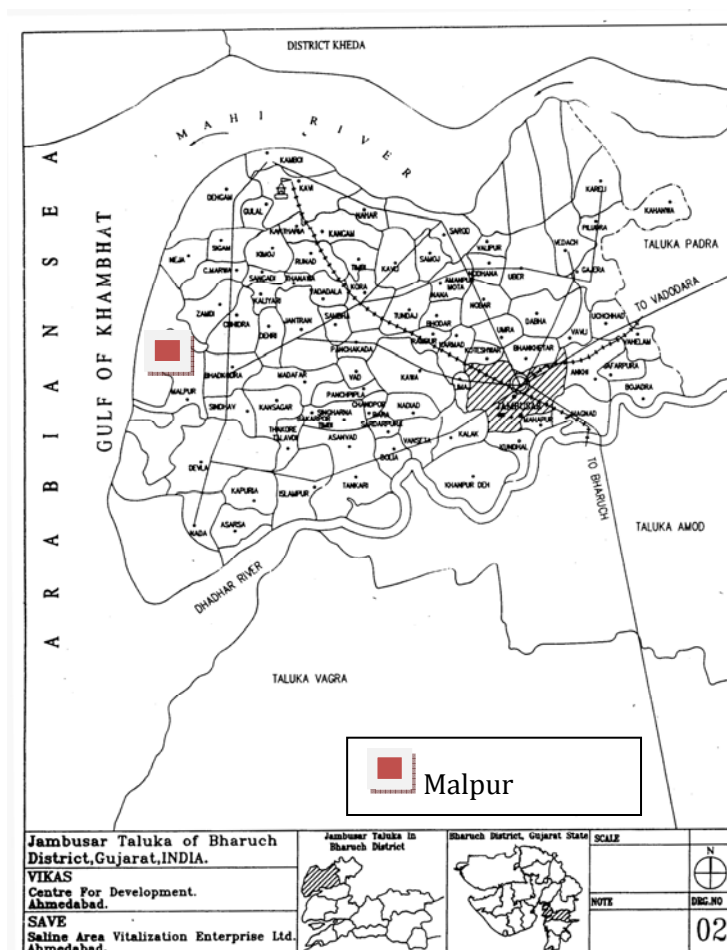


Figure 9 Map showing Village Malpur Mangrove Plantation site

Table 3 Census data of Malpur village 2011

Village	Total No. of HHs	Total Population	BPL Population	% BPL Population	Total Male Population	Total Female Population	Male Female Ratio	Population Age < 6 Years	Population SC	Population ST	Population Literate	% Literacy	Total Working Population	% Working Population
Malpur	325	1777	537	30.22	617	560	0.91	NA	4	258	1200	68	643	36

Geographical Description

Malpur is located along the Gulf of Khambhat. The Gulf of Khambhat is a south to north penetration of the Arabian Sea on the western shelf of India between the Saurashtra peninsula and mainland Gujarat. It is located approximately between 20°30' to 22°20' N latitude and 71°45' to 72°53' E longitude.

At its northern end between the Sabarmati and Mahi mouths, the Gulf is barely 5 km wide and it opens out southwards like a funnel, reaching its maximum width south of Gopnath point. Its north-south length is approximately 115 km. It covers an extent of about 3120 Sq.km mainly of mudflats with some rocky (sandstone) intertidal area and a volume of 62400 cubic million. The rocky beaches are common from Mahuva to Gopnath, reducing towards Ghogha and Bhavnagar. A few sandy patches are also observed intermittently.

The Gulf is intercepted by several inlets of sea and creeks formed by confluence of major rivers such as Narmada, Tapi, Mahi, Sabarmati and many minor rivers. All the major rivers form estuaries and their inflow carries heavy load of suspended sediments into the Gulf. A medium sized delta is present near Shetrunji between Gopnath and Ghogha. The ecosystems of the Gulf comprising mangroves, estuaries, creeks and vast intertidal mud flats are known to have rich biodiversity and a number of endemic flora and fauna.

The Gulf receives rains during the southwest monsoon (from June to September), the average annual rainfall varies from 600 mm on the western side to 800 mm on the eastern side. The Gulf has a positive water balance, mainly due to the high volume of river runoff. The relative humidity ranges between 65% and 86% thus offering semi-arid to sub-humid climatic conditions. Temperature in the Gulf is extreme, the lowest being 8.4 °C during January and highest of 43.7 °C during May.

Ecology of the Area

This site is at the confluence of the Sabarmati and Mahi rivers at the Arabian Sea, at the very end of the Gulf of Khambhat. Because of the confluence of these two mighty rivers and heavy sedimentation, a large area of dynamic mudflats has been formed. The climate is dry, and there is sparse terrestrial vegetation, dominated by grass and thorn scrub. The most important edaphic factor influencing the region is the high tidal amplitude. The monospecific mangrove and the salt-tolerant marsh vegetation are the important floral components, and the foraging wetland birds, food-supplying molluscs and crustaceans, *Bonellia* and fishes are the significant fauna of this habitat. Fishing and salt production are the main socio-economic activities around this region. However, croplands are being maintained for seasonal production, but many of these are defunct because of salt ingress. There is no direct access to this site, and it is not possible to reach some parts near the waterfront.

The dynamic mudflats restrict the exploitation, and thus there is no need for protection measures. The entire site has not been afforded any legal protection, but the mangrove plantations are monitored by the local people. As mentioned previously, access to certain areas of this candidate site is impossible because of the tidal influence and soft, murky mudflats. Occasional bird hunting has been locally reported, but this is not routine. The site is almost free of threats except for point source pollutants from the river discharge. The large flocks of foraging wetland birds, mudskippers and commercially important molluscs of this mudflat habitat are the important fauna of

conservation significance. The vast mudflat is an ecological asset to this region, serving as aquifers. The site has been designated a community reserve involving the local people dependent on seasonal agriculture, with monitoring by the forest department

In the Gulf of Khambatt, the area has suffered severe degradation in a short span of 25-30 years, with a rapid rate of 32.3 sq. km per decade at places (Ashwini Kumar, 1996). Mangroves were present even 30 years ago near villages Sigam, Zamdi, Malpur and Nada. Presently, only Nada has some sparse and scrubby mangroves. The patchy records of mangrove cover by various agencies during the period from 1875 to 1983 show that there was a marked decline in the mangrove cover from 438 sq. km. in 1970 to 13 sq. km. in 1983 in most parts of the Gulf of Khambatt.

This mangrove plantation sites are located in Gulf of Khambatt of the Arabian Sea. The Gulf is characterized by a number of large and small estuaries. Many rivers, like Sabarmati, Mahi, Narmada and Tapti, have their mouth in the Gulf of Khambatt.

The Golden Chemical Corridor of Gujarat is located along the Gulf of Khambatt and thus poses environmental hazards. Over the past three decades the Gulf ecosystem has been conspicuously influenced by developmental activities, therefore, this area was selected to evaluate the pollution status of mangrove ecosystem.

Details of the Project Area

Location	Village Malpur, Taluka Jambusar, District Bharuch
Coordinates	21°56'57.62"N 72°35'34.75" E
Area	200 hectares
Topography	Mudflats
Soil Ph	8.4
Average rainfall	605.42 mm
Salinity	Alkaline
Land elevation	Flat plain 6 Mt
Sedimentation	5-7 cm/annum
Dominant species	Avicenna marina
Source of propagules	Available within 05 km of mangrove plantation site
Available propagules	Avicenna marina
Project Period	2012-2015
Community Based Organization	JSP - Jan Shakti Parishad
Implementing agency	Saline Area Vitalization enterprise limited

Gram Panchayat Approval letter

After finalizing the site, SAVE conducted a meeting with the village Sarpanch and the panchayat members of Malpur. SAVE and its sister organization an NGO VIKAS Centre for Development have been working with this coastal community since past 38 years. Hence the organization has good community support and share cordial relationship with them. VIKAS & SAVE have extensively worked on mangrove plantation and its importance to the coast with this community in the past years because of which it became a lot easier to implement the project.

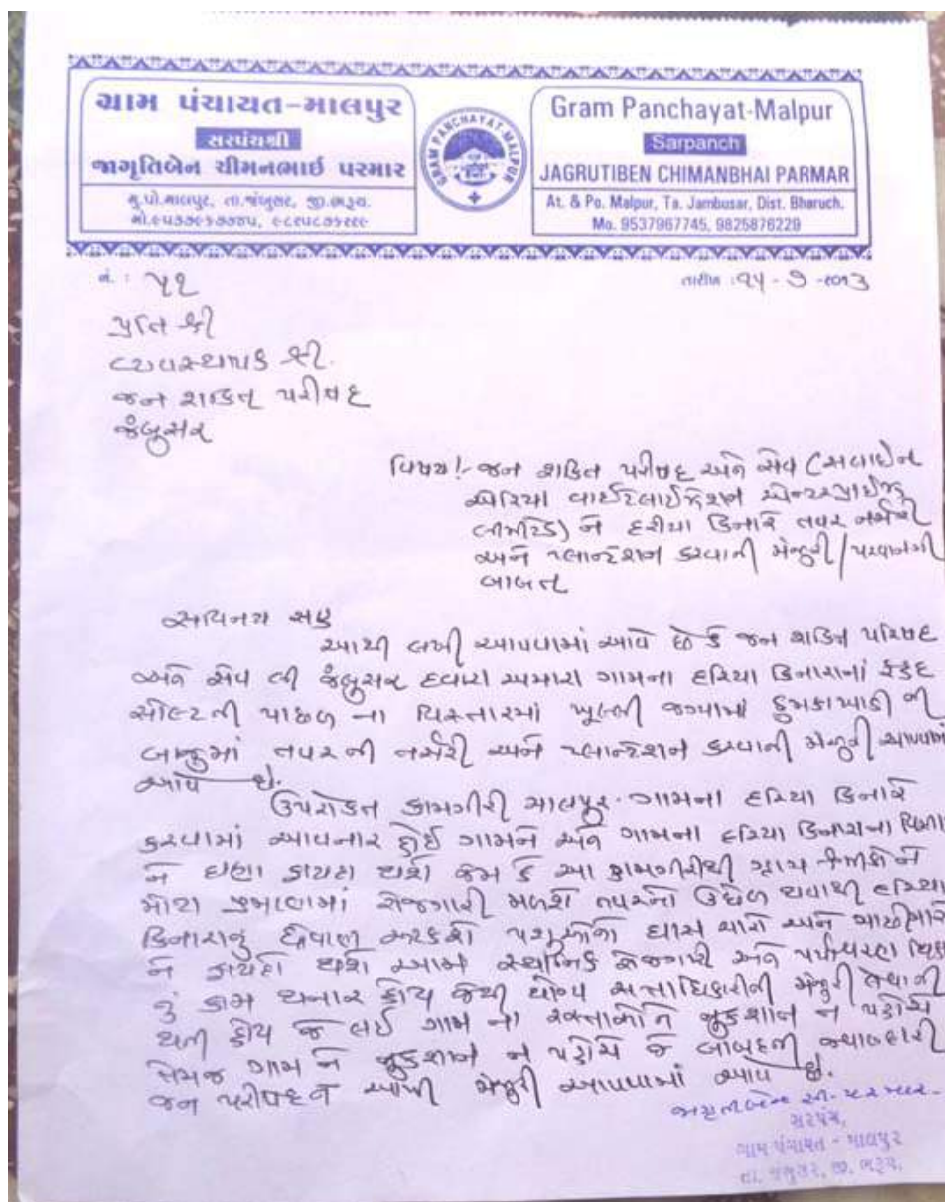


Figure 10 Letter from the Panchayat - Malpur Village

Community Based Organization

SAVE & VIKAS have been working with an understanding to bring primary producers, agriculture laborers, salt pan workers, fishermen etc. in to the mainstream of the economy by alleviating their economic condition through aggregation and linking communities with technology, credit and markets.


For accomplishing this, we use different mode of organizations such as NGO, CBO, for profit organization, Enterprise etc. One such organization is Janshakti Parishad, which is a membership-based organization of Rathod community in Jambusar taluka, Bharuch district. This organization works for entitlements, advocacy and employment generation for its members. This community is one of the most backward and underprivileged schedule tribe in this area. All Natural Resource development related activities are carried out in association with this organization. The members are trained and educated to carry out the plantation.

Water and Soil Report


Water and soil samples were taken of the mudflats to ensure good plantation growth. Soil properties have a major impact on mangrove nutrition and growth. Soil composition and grain size determines porosity of the soil, which ultimately influences soil salinity, water content and amount of nutrients contained in the soil. Mangroves tend to grow well in mud and very fine sand. (Botero 1998) High Salinity decreases the rate of photosynthesis. So with lower salinity and more light the net photosynthesis per unit area increases and growth rate of the mangrove increases (Lopez- Hoffman 2007)

Sulfide is a characteristic feature of mangrove sediments that influences mangrove distributions. High sulfide levels can damage mangrove seedlings, causing stomatal closure, reduced gas exchange, reduced growth and high mortality (Wakushima 1994) It has been found that mangroves achieve maximum root growth at an acidic pH of 6 and maximum shoot growth at an alkaline pH of 10. Anything lower than 6 retards mangrove seedling growth and is a cause of mangrove death (Thangam 1990) Nutrients such as Nitrogen, Phosphorous and Potassium are important in mangrove growth.

Mudflats at village Malpur show pH of 8.2, which is favorable for mangrove growth. Nitrogen, Phosphorous and Potassium are present in good numbers, favoring mangrove growth.



केन्द्रीय मृदा लवणता अनुसंधान संस्थान
क्षेत्रीय अनुसंधान केन्द्र भारुच (गुजरात)
CENTRAL SOIL SALINITY RESEARCH INSTITUTE
Regional Research Station, Maktampur P.O.
Bharuch 392 012 (Gujarat)
Tele: Off: 91-2642-225673, 225688 Fax: 91-2642-225673 E-mail: salinityguj@gmail.com



No: RSQ/Consultancy 2013-14/
Date: 28th January 2014

To
JANASHAKI PARISHAD
5, SAHIL PARK SOCIETY
OPPOSITE LAL SAHID MOSQUE
NEAR S.T. DEPOT
JAMBUSAR-392150

Sub: Results of the Sample analysis

Dear Sir,

With reference to the six soil samples given in our laboratory please find enclosed here with the results of the same

Sr.No	Sample I.D	pH _e	EC _e DSM	N Kg/ha	Na	K	Ca+Mg meq/lit	Cl	CO ₃ +HCO ₃
1.	Sea shore Mangrove Village Kantiyal	8.02	20	257.12	162.1	2.8	37.5	130	11.5
2.	Sea shore Mangrove Village Malpur	8.02	17	351.5	139.5	2.4	33.0	135	12
3.	Sea Shore Mangrove Village Nada	7.92	17.3	445.31	130.3	2.3	45.5	135	17
4.	Sea Shore Plantation Site Village Asaresa	7.98	24	376.32	193.6	2.6	45.5	210	18
5.	Sea Shore Plantation Site Kjaljygal	7.92	27	326.14	246.3	2.9	55.5	240	12
6.	Jagni Khedi Sahakani Mandali Limited Village Kalak	7.84	2.12	382.59	13.6	0.3	9.3	24	23

The results are exclusively for the agricultural purposes. and have no legal validity.

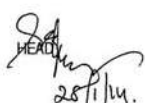

 28/1/14.

Table 4 Soil Report

Coordinates

Malpur Coordinates Year 2012-13					
No.	Longitude	Latitude	No.	Longitude	Latitude
1	22° 4'16.10"N	72°31'45.30"E	14	22° 4'21.50"N	72°31'33.50"E
2	22° 3'57.40"N	72°31'41.20"E	15	22° 4'28.50"N	72°31'34.80"E
3	22° 3'47.30"N	72°31'41.30"E	16	22° 4'40.20"N	72°31'37.30"E
4	22° 3'35.20"N	72°31'39.90"E	17	22° 4'46.80"N	72°31'38.90"E
5	22° 3'27.30"N	72°31'36.50"E	18	22° 4'45.70"N	72°31'47.10"E
6	22° 3'15.20"N	72°31'35.30"E	19	22° 4'36.67"N	72°31'48.50"E
7	22° 3'17.40"N	72°31'32.10"E	20	22° 4'23.90"N	72°31'46.80"E
8	22° 3'17.20"N	72°31'24.40"E	21	22° 4'20.60"N	72°31'46.40"E
9	22° 3'20.80"N	72°31'24.80"E	22	22° 4'55.33"N	72°31'41.65"E
10	22° 3'29.30"N	72°31'26.00"E	23	22° 4'54.76"N	72°31'51.71"E
11	22° 3'39.00"N	72°31'27.90"E	24	22° 3'10.98"N	72°31'31.98"E
12	22° 3'45.20"N	72°31'29.10"E	25	22° 3'10.57"N	72°31'23.44"E
13	22° 3'57.70"N	72°31'31.80"E	26	22° 3'10.96"N	72°31'34.21"E
			27	22° 3'10.59"N	72°31'25.14"E



Figure 11 Google Image showing 100 hectares 2012-13

Malpur Coordinates Year 2013-14					
No.	Longitude	Latitude	No.	Longitude	Latitude
1	22° 03'00.5"N	72°31'20.9"E	14	22° 02'16.1"N	72°31'26.7"E
2	22° 02'53.2"N	72°31'19.2"E	15	22° 02'20.1"N	72°31'25.80"E
3	22° 2'41.8"N	72°31'17.2"E	16	22° 2'32.4"N	72°31'25.6"E
4	22° 2'33.7"N	72°31'14.9"E	17	22° 02'54.3"N	72°31'29.2"E
5	22° 2'27.2"N	72°31'11.6"E	18	22° 03'03.8"N	72°31'31.0"E
6	22° 02'13.7"N	72°31'06.4"E	19	22° 03'13.8"N	72°31'36.50"E
7	22° 01'52.7"N	72°31'02.2"E	20	22° 03'16.8"N	72°31'32.5"E
8	22° 01'30.0"N	72°30'56.6"E	21	22° 03'17.9"N	72°31'24.0"E
9	22° 01'28.6"N	72°31'01.1"E			
10	22° 01'32.5"N	72°31'12.3"E			
11	22° 01'45.8"N	72°31'20.0"E			
12	22° 01'49.5"N	72°31'23.8"E			
13	22° 01'52.2"N	72°31'19.5"E			

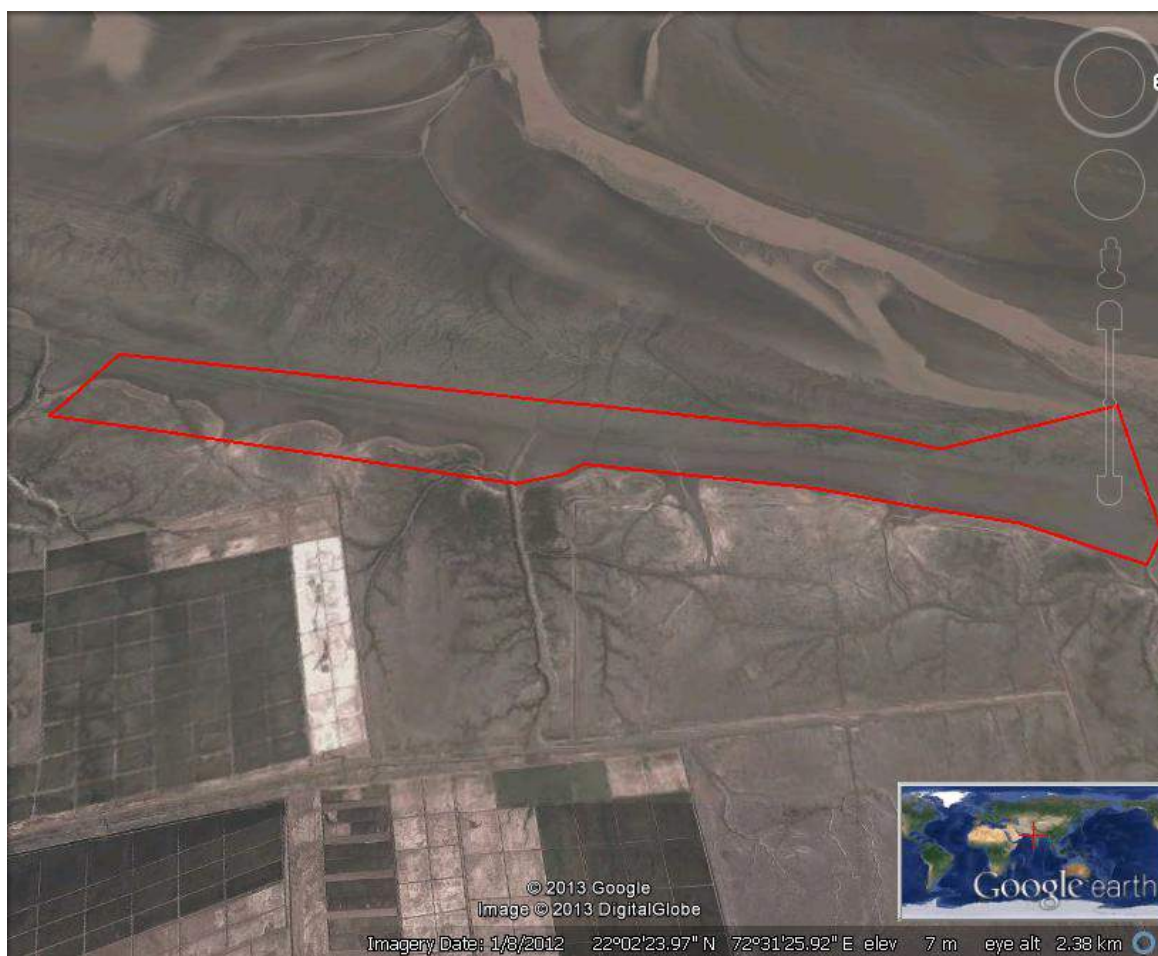


Figure 12 Google Image showing 100 hectares 2013-14

Selection of Species

Village Malpur had naturally grown mangroves along the coast. The species are *Avicenna marina*. Hence it was a natural decision to plant these species at the site.

Efforts were made to add some biodiversity by planting other mangrove species like *Rizophora*, which did not, give desired results.

Details of *Avicenna marina*

- **Scientific Nomenclature:** *Avicenna marina*.
- **Common name:** Grey mangrove.
- **Status:** Sparse growth along the coast line of village Malpur.
- **Description:** An evergreen shrub or tree 2 to 10 m tall with pencil-sized peg type aboveground roots, which are commonly called as pneumatophores or breathing roots. Bark is whitish to greyish or yellow-green in colour, smooth, often powdery and scaly. Leaves are single, opposite in arrangement, leathery, yellowish-green and hairless above and silver-grey below with pointed apex. Underside of the leaf has special glands for secreting excess salt. Flowers are small, 0.3 to 0.5 cm across, sessile, fragrant, pale-yellow in colour in condensed terminal flower head. Fruit is heart shaped, rounded or sometimes shortly beaked; outer skin is grayish with fine hairs and inside is radiant green or russet brown or dark green.
- **Uses:** Leaves are considered as one of the best fodder for camel and other bovines. Cattle also feed on shoots and leaves during the rainy season when the salt content is low in the leaves. Wood is considered as excellent firewood. Roots and bark are used as stimulant.
- **Ecology, propagation and management:** *Avicenna marina* grows luxuriantly in any position in the intertidal regions of estuaries, lagoons backwater etc. Though it is capable of growing in sandy soils and rocks it prefers fine clay and Mudflats for better performance. It is highly saline tolerant and tolerates widest range of soil salinity. Its tolerance to aridity is also high. It can be easily propagated by propagules and the position where it should be planted can be decided on the basis of the distribution of species (zonation pattern). Propagules of *Avicenna*



marina do not look like typical spindle-shaped propagules of some other mangrove species because embryonic axis (hypocotyl) of the developing embryo does not penetrate the seed coat. Hence, propagules of grey mangrove look more or less like normal seeds in appearance and they are called crypto viviparous propagules. It is produced in large numbers and matured propagules float freely in water and can be easily collected by hand or by a scoop net. They can also be collected from trees. Collected propagules are soaked in brackish water for a day to facilitate shedding of outer coat. These naked propagules are used for plantation. While sowing, radical (the part of plant embryo that develops into a root) side of the propagules is lightly pushed into wet soil. Nursery raised seedlings of about 30 cm can also be used for out planting.

Different Mangroves Activity

After the site selection and finalizing the mangrove species for plantation, remaining mangrove activities were planned and carried out in sequence as follows:

1. Forming a mangrove committee – TAVAR VIKAS COMMITTEE
2. Mapping and Bordering the site
3. Seed Collection
4. Planning of Nursery and Direct Dibbling Areas.
5. Nursery formation & Direct Dibbling
6. Nursery Plantation.
7. Gap filling & maintenance

1. Forming a mangrove committee – tavar vikas committee

While SAVE works with a local Community Based Organization Jan Shakti Parishad, we also formed a local mangrove restoration and protection committee for every site, which ensures smooth plantation and restoration activity throughout the period of the project.

Number of meetings were organised with the members of the committee. The subject ranged from creating awareness about the mangrove ecosystem, training for nursery formation, plantation, direct dibbling and to other plantation related activities.

2. Mapping and Bordering the site

The site was than mapped and bordered. The mapping was done with the help of GPS – Gramin Trex, Initially in the first year 100 hectares were mapped and bordered and planted. These 100 hectares were distributed in to nursery plantation and direct dibbling plantation.

Similar exercise was carried out for another 100 hectares in the next mangrove season.

3. Planning of Nursery and Direct Dibbling Areas

While planning for nursery plantation and direct dibbling number of factors like available water flow, soil condition, mean tide level etc were considered. A standard plan for both the sites was prepared. Nursery plantation was planned in 70 ha. and direct dibbling in 30 ha. for each site.

Seventy hectares in nursery plantation was planned to ensure maximum survival at the site.

4. Seed Collection

Seed collection is a major activity and important to the plantation procedure. Care is taken as to how to pluck seeds. The quantity of seeds required is planned and then plucked accordingly. For both the sites seeds for *Avicenna marina* were gathered from neighboring mangrove plantation site.

- Process Followed**

The whole activity was planned during the implementation stage each year. The committee members were trained into systematic gathering of the seeds, their protection and storage.

Statistics for seed collection:

No	Seed per Kg in No	Seeds required per hectare in kg	For 100 hectare in kg
1	250-300	25	2500

Mortality rate: 10 %

These seeds were stored in a pond of brackish water till they propagated and then used in to nursery formation and direct dibbling.

5. Nursery formation & Direct Dibbling

After a systematic and planned seed collection activity next procedure was to plan for nursery formation, plantation of nursery based saplings and direct dibbling.

- Nursery Formation**

Initially blocks are formed for nursery plantation. Every hectare has individual blocks of definite calculated nursery beds.

The procedure started with procurement of plastic bags for filling of the earth. These bags were then punched at the bottom and filled with earth.

Bag required per hectare:

No	Bags per kg	Bags required per hectare
1	300-315	12 kg

While filling the bags, simultaneously beds were formed in each block per hectare. Depressions were formed in the earth measuring 1mt X 6 mt. Each bed consists of 1000 bags. Every block had 3750 bags. Germinated seeds of *Avicenna marina* were sowed in to these bags. Sometimes this activity was carried out number of times, as the tide water washes off the planted seeds.

No	No of bags per hectare	Number of plants per hectare
1	3,750	3,000

Mortality rate per Nursery: 10 %

Every year same procedure is followed to form nurseries at the site.

During the initial year, seventy hectares were planted through nursery plantation and thirty hectares through direct dibbling. In the next year same procedure was followed.

- **Direct Dibbling Plantation**

Each year almost 30 to 40 hectares of area was planted through direct dibbling. The seeds were first germinated in brackish water and then sowed directly in to the earth. Before sowing of these seeds blocks were formed per hectare. Blocks measuring 1 mt X 1 mt horizontally and 1 mt X 2 mt vertically were measured and seeds planted with the help of a measuring tape. These seeds were then covered with a net, to protect them from sea water. In spite of this protective measure gap filling was carried out number of times as Gulf of Khambatt experiences violent sea action.

- **Earthen – Mound plantation**

Direct dibbling was also carried out through earthen mound plantation in the first year. Bed of earth was raised to a height so as to protect the seeds from tidal water. This system did not work due to violent sea action in Gulf of Khambhatt.

6. Nursery Plantation:

The beds were prepared during the monsoon season, when the seeds were available in good quantity & quality. These beds were then nurtured through winter. During the winter months when the saplings reached a certain height of 1 ½ to 2 feet, they were planted at the site. The plants were transported and planted at the site by forming blocks of 1 mt X 1 mt horizontally and 1 mt X 2 mt vertically. This is the standard measurement accepted for mangrove plantation across Gujarat. Hence number of plants per hectare are 3,000.

7. Gap filling & maintenance

Gap filling was a continuous process throughout the project period. During each season the area was mapped and measured, and remaining area was then planted through nursery plantation. These nurseries were formed separately, from the planned nursery. The saplings were planted during the winter. Maintenance of the site was a daily activity carried out by two supervisors who were retained through the length of the project.

Progress :

The project served as a catalyst in changing the socio economic status of the local community as well as bringing ecological and environmental changes to the coastal ecosystem of the area.

1. Socio Economic progress

As natural conditions of these coastal areas are hostile and they have low water availability for agriculture with erratic rainfall, the returns from agriculture are very small. With more than 50 percent of workforce engaged in agriculture and related labour work, the availability of work is also less. The landowners usually engage them at very low wages and labour is easily available. The wages used to be much lower than minimum wages prescribed by the State. This had forced them to borrow, and the inability to pay back the debts forced them to work on annual contract as a bonded labour known as 'Chakar', wherein the meager wage is paid annually. A Chakar is paid about Rs. 1000 to Rs. 1500/- per month on a yearly basis. Also, in such circumstances, their wives are forced to become 'Panihari' – maidservant with the family of the employer, who is supposed to work for the family from six in the morning till late night. Most of the Panihari women are not paid at all or are paid a meager amount of Rs. 50 to Rs.100/- per month. Chakars and Paniharis are not granted any days off, paid on the basis of 'no work no pay'. Thus, the net amount received by them is reduced from their meager wages. This debt and thus, bondages passes on to next generation.

A survey carried out by VIKAS in 1978 mentions that Jambusar taluka had 15,000 such families working as bonded labourers. A recent survey points that their number stands at 1,485 families. The situation in village Malpur is as shown in the year 2012. (palrecha n.d.)

Table 5: Families Working as Chakar and Panihari in Study Villages

No.	Village	Total No. of HHs	Total Population	Chakar	Panihari
1	Malpur	325	1777	12	1

Source: Survey done by SAVE and VIKAS, 2012

SAVE along with the local CBO Janshakti Parishad generated sustainable employment through mangrove plantation and maintenance. Almost 80 % of the project amount went in to labor amounting to Rs. 5, 260,800/-

Because of the infusion of such a large amount in this small coastal village, the community was able to pay off its debt and also invest in to house, marriage, live stock etc. we can proudly say that this activity was instrumental in reducing number of Chakar and Paniharis to 04 and 00 respectively.

Further because of increase in aqua life the same community benefited from marketing of fish. SAVE and JSP (Jan Shakti Parisahd) formed a fishermen organization called Sagar Khedu which aggregated these fishermen and created direct market linkages for

their catch. These fishermen generated business of approximately Rs. 20,00,000/- in the past three years.

Wealth generation and inclusion in to mainstream also helped this community socially and they are able to ascertain their rights with more confidence.

2. Ecological & Environmental Progress

Apart from the above mentioned major changes this plantation is also instrumental in addressing ecological and environmental issues like arresting land erosion, retention of soil, protection to agriculture from Impacts of Saline Winds and Wind Speed, providing Fodder and Fuel with systematic management, Protection from Storm Surge, Tsunami and Cyclones, Protection and Propagation of Biodiversity, Carbon Sequestration.

Mangrove associated Fauna

Mangroves provide nursery grounds for fish, prawns and crabs, different types of mollusks and support fisheries production in coastal waters. Young fish, shrimp, crabs and other aquatic fauna requires a protected environment to grow and breed, away from large predators. Only those young aquatic life forms that find refuge, survive to grow to full size. Mangroves are good nurseries because they provide hiding places for young aquatic organisms. Finger-like roots of mangroves act as protection from these predators allowing them to grow and survive. Mangroves provide sufficient food to these organisms encouraging healthy and rapid growth.

Mangroves once mature also provide shelter for migratory birds and serve as roosting and foraging grounds. Thus, they have the potential of serving as recreational ground for bird watching and observation of other wildlife.

Village Malpur experienced increase in existing fauna and also inclusion of increase in other aquatic species like crab & Bombay duck (Bumla). Mudskippers which were available only during winter are now fished all year round. Mangrove roots trap fine particles, creating soft soils ideal for mudskippers, crabs and different species of mollusks and crustaceans to burrow in.

Sr. No.	Name of Village	Earlier Catch of Fishes	Current Catch of Fishes
1	Malpur	Mudskipper, Boi	Mudskipper, Prawn, Boi, Crab, Bumla

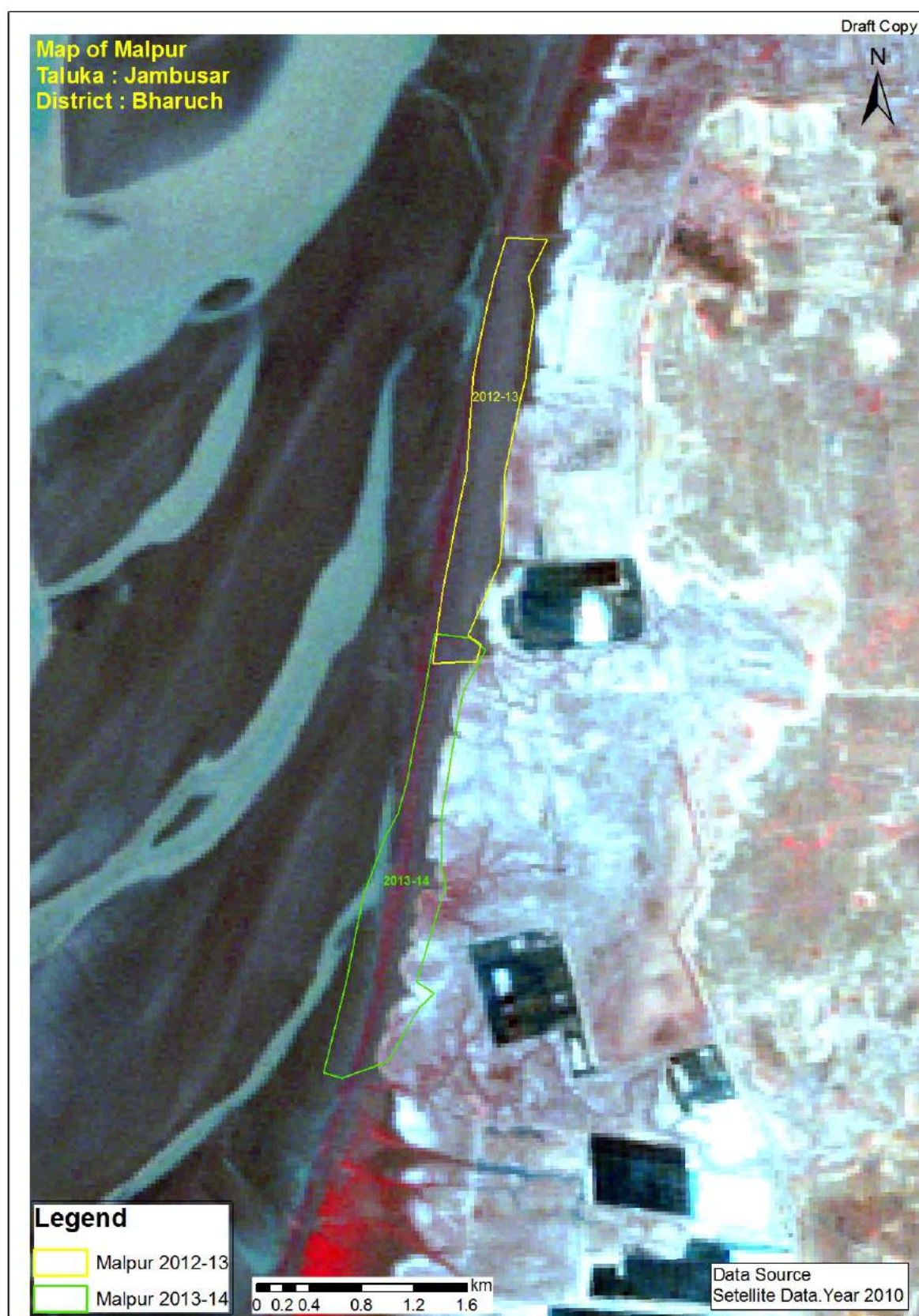
Source: Discussions with Key People, 2015

Status Report

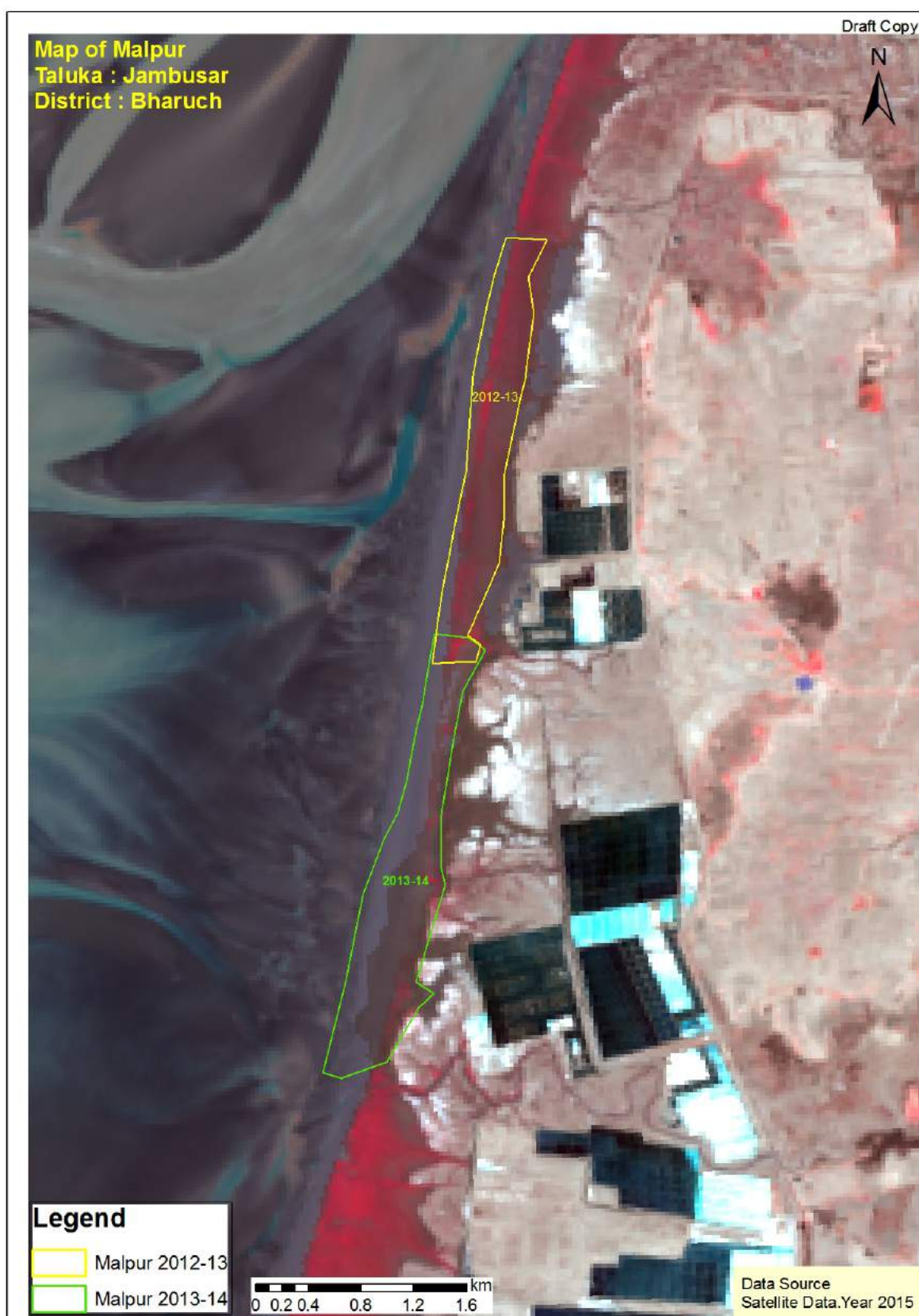
At the completion of the project, the plantation has grown in to dense forest, specially the plantation carried out during the first year i.e. 2012-13. The Mangroves have grown vertically to the height of almost 2.5 to 3.5 feet and diametrically almost 3 to 6 feet.

The mangrove plantation, which started in February 2012 through September 2015 saw a range of activities, right from identification of site to the last plantation. Both the sites have prospered as seen in the satellite images.

Before and After Land Sat images



Land sat images of the site - 2010



Land sat images of the site - 2015

PHOTO GALLERY

Joint site visit by APPPL & SAVE representatives - June 21 2012



Seed collection, Nursery formation, Direct dibbling



Seed collection, Nursery formation, Direct dibbling



Mangrove day celebration



Nursery Plantation



Mangrove Plantation



Mangrove Plantation



Annexure 3 - Notification of CAland as Reserved Forest Land

ગુજરાત સરકાર

વન અને પર્યાવરણ વિભાગ

સચિવાલય, ગાંધીનગર.

તારીખ:

12 3 DEC 2008

- જાહેરનામું -

સને ૧૯૨૭ ના ભારતના જંગલો બાબતના (સને ૧૯૨૭ નો ૧૬ માં) અધિનિયમ અન્વયે, ક્રમાંક: ગવન-૨૦૦૮-(૬૭) જજમ-૧૦૦૮-એસએફ-૪૪-એફ ગુજરાત રાજ્યને લાગુ હોય એટલે સુધી સને ૧૯૨૭ ના ભારતના જંગલો બાબતના (સને ૧૯૨૭ ના ૧૬ માં) અધિનિયમ જેનો આમા હવે પછી " ઉક્ત અધિનિયમ " તરીકે ઉલ્લેખ કર્યો છે. તેની કલમો (૪) અને (૧૭) એ મળેલા અધિકારો અન્વયે ગુજરાત સરકાર આથી

(૧)(અ) જાહેર કરે છે કે, આ સાથે જોડેલી અનુસૂચિમાં નિર્દિષ્ટ કરેલ ભરૂચ જિલ્લાના વાલિયા તાલુકાના મોજે પીગોટ ગામની જમીનને અનામત જંગલ તરીકે ઠરાવવાનું નક્કી કરવામાં આવ્યું છે, અને.....

(બ) જંગલ નિયામક અધિકારી (ફોરેસ્ટ સેટલમેન્ટ ઓફિસર) સુરતને જેનો આમા હવે પછી ઉક્ત ફોરેસ્ટ સેટલમેન્ટ ઓફિસર તરીકે ઉલ્લેખ કર્યો છે તેની કલમ-૪ ની પેટા કલમ-૧ ની કલમ - ૬ ના હેતુઓ સારૂ અધિકારી તરીકે નિયુક્ત કરવામાં આવે છે.

૨. ઉક્ત અધિનિયમની કલમો ૧૧, ૧૨, ૧૫ અને ૧૬ અન્વયે ઉક્ત ફોરેસ્ટ સેટલમેન્ટ ઓફિસરે પસાર કરેલ કોઈ પણ આદેશો પર અપીલ સાંભળવા રાજકોટ જિલ્લાના કલેક્ટરશ્રીને નિયુક્ત કરવામાં આવે છે.

અનુસૂચિ

તાલુકો: વાલિયા

જિલ્લો: ભરૂચ

૧	ગામનું નામ	સર્વે નંબર	વિસ્તાર	ચર્તુ સીમા	
			હે.આર ચો.મી		
૧	પીગોટ	૨ પૈકી	૩૮-૦૦-૦૦	ઉત્તર	સ.નં. ૨ પૈકી, ૮, ૧૬, ૧૭ તથા મોજે માંડવીનો સિમાડો
				પૂર્વ	સર્વે નં. ૨ પૈકી, ૮, ૧૨, ૧૩, ૧૫, ૧૬, ૧૭, ૧૮, ૨૦, ૩૦, ૩૧
				દક્ષિણ	સર્વે નં. ૨ પૈકી, ૮, ૮, ૧૨, ૧૪ અને ૧૬
				પશ્ચિમ	સર્વે નં. ૨ પૈકી, ૮, ૮, ૧૦, ૧૨, ૧૪, ૧૬ તથા મોજે મોઝાનો સીમાડો

ગુજરાતના રાજ્યપાલશ્રીના હુકમદો અને તેના નામે,

(સી. બી. ભગત)

ઉપ સચિવ

વન અને પર્યાવરણ વિભાગ

Annexure 3 - Notification of CA land as Reserved Forest Land

ગામ/મોજે: પીગોટ
ખાતા નંબર: ૧૭૭
કબજેદારોનાં નામ:

જીલ્લો: ભરૂચ
તાલુકો: વાલીયા

જંગલ નંબર: ૦૧૮

નમુના ક્રમી નોંધ નંબર	ખાતા/મોજ નંબર તથા કિસ્મો	ક્ષેત્રફળ હે. ચારે. ચોમી.	આકાર જુડી બી. ખે. વિ	લોકલ સેસ	શિક્ષણ ઉપ-કર	અન્ય કર	અન્ય વિગત
૦૧૮	૨-બ	૩૮-૦૦-૦૦	૦.૦૦				જંગલ
૩૧૧	૧	૩૮-૦૦-૦૦	૦.૦૦				

Annexure 3 - Notification of G.A. land as Reserved Forest Land

સરકારી નંબર : ૨-બ
મત્તા ક્રમાંક : સરકારી પડાવ
અન્ય વિગતો :

મોજ : પીંગોટ
તાલુકો : વાલીયા
જિલ્લો : ભરૂચ

લાયક જમીન	ક્ષેત્રફળ કે. આર. ચોમી.	ખાતા નંબર/ક્ષેત્રફળ/આકાર કે. આર. ચોમી.	નોંધ નંબરો અને કબજેદારો ના નામ
પો.ખ. ખ	૩૮.૦૦-૦૦		૬૮૭,૭૩૩,૮૮૮,૮૧૬,૮૧૮,
કુલ જમીન	૩૮.૦૦-૦૦	૧૭૭ ૩૮-૦૦-૦૦ ૦.૦૦	અનામત જંગલ(૮૧૮)
આકાર કુ.	૦.૦૦		
જુડી તથા વિશેષધારો કુ.	૦.૦૦		
પાણીગળા કુ.	૦.૦૦		
ગણતીયાની વિગતો		બીજા ફકો અને બીજાની વિગતો ૮૮૮,૮૧૮,	
		નવી અને અવિભાજ્ય અને વિકીયાદિત નિયત્રીત શરતે વનીકરણ માટે ફાળવી.<૮૮૮> તા.૧૦/૦૪/૦૮ થી નાયબ વન સંરક્ષકશ્રી (પશ્ચિમ) રાજપીપલાને<૮૮૮> ફે.૩૮-૦૦-૦૦ આરે જમીન મે.કલેક્ટર સાહેબ ભરૂચનાં ફુકમ ક્રમાંક:ભુમી/વશી/૨૫૯૭૮	

ગામ નમુનો નંબર ૧૨

વર્ષ	ખેડૂતનું નામ	મોસમ	પાક	ક્ષેત્રફળ કે. આર. ચોમી.	ખેડની રીત	સિંચાઈનાં સ્ત્રોત/સાધનો	વૃક્ષો અને તેની સંખ્યા
૨૦૧૦-૨૦૧૧	માહિતી નથી.						
૨૦૦૯-૨૦૧૦	માહિતી નથી.						
૨૦૦૮-૨૦૦૯	માહિતી નથી.						

#નામંજુર ૬-તકરારી -૨૨૬

૦૬/૧૨/૨૦૧૦ ૦૭:૦૬ pm ની સ્થિતિએ

વહીવટીય નકલ / Administrative Copy

સોજન્ય : રાષ્ટ્રીય સૂચના-વિજ્ઞાન કેન્દ્ર ગુજરાત રાજ્ય

૩૧/૦૩/૨૦૧૧ ૧૧:૩૦:૫૭ am

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ગામ નમુનો નંબર ૬ - હક પત્રક

જલ્લો: ભરુચ

તાલુકો: વાલીયા

મોજો: પીંગોટ

નોંધ નં : તારીખ : ફેરફાર નો પ્રકાર:	નોંધની વિગત	ફેરફારને સંબંધિત સરવે/બ્લોક નંબર અને પેટા હિસ્સો તથા તેનો ખાતા નંબર	અગાઉની નામંજુર નોંધનો ક્રમાંક/તારીખ	તપાસણી કરનાર અધિકારી નો શેરો અને સહી/તારીખ તથા નામ/ હોદ્દો
૯૧૬ 13/11/2009 હકમણી	કોલમ નં.૩ માં જણાવેલ જમીનો ભારત સરકારશ્રીના જંગલો બાબતના અધિનિયમ ૧૯૨૭થી કલમ ૪ હેઠળ સરકારશ્રીના જારે રનાર ક્રમાંક ગવન ૨૦૦૮ (૬૭) જજ૩૧૦૦૮એસ.એફ.૪૪ એફ તા.૨૩ ૧૨-૦૮ તથા સુધારા હુકમ નં.૨ ગવન-૨૦૦૮ (૨૭) જજ૩૧૦૦૮એસ.એફ.૪૪.એફ તા.૧૩ ૦૫-૦૮ થી અવગીકૃત જંગલ તરીકે જાહેર કરેલ છે. જે અંગેનાયબવન સંરક્ષકશ્રીની કચેરી રાજપીપયા પશ્ચિમ વિભાગના પત્ર ક્રમાંક બ-સર્વે.૧૮૮૨૭૧/૦૮-૧૦તા.૧૪-૧૦-૦૮ આધારે નોંધ કરી.	૨(૧૬૮),		૨૬ હુકમ પ્રમાણે નોંધ નથી. જેથી "૨૬" સામેલ મુસદ્દા પ્રમાણે નવી નોંધ પાડવી "૨૬" (એચ.એસ.મોંઢ) મામલતદાર વાલીયા

Annexure 4: Details of the Fixed and Mobile Fire Fighting System

Annexure-4: Details of the Fixed and Mobile Fire Fighting System:

Fire Fighting Systems	Details
Fire Hydrant	131 Nos.
Fire Monitor	65 Nos.
Risers	13 Nos.
Total Fire Extinguisher	284 Nos.
Smoke Detector	53 Nos.
Fire Bucket	60 Nos.
Emergency Siren	3 Nos.
Port Water Reservoir Pump House	5040 KL
Silo Water Reservoir Pump House	1905 KL
Fire Vehicles Detail	
Multi-Purpose Fire Tender - Water	10 KL
Multi-Purpose Fire Tender - Foam	1.5 KL
Dry Chemical Powder @ 50 Kgs. (MFT)	2 Nos.
CO ₂ @ 4.5 Kgs. (MFT)	2 Nos.
Fire Tender (01 No.)	12 KL
Fire Water Bowser (01 No.)	7.5 KL
Trailer Pump (01 No.)	1800 LPM

Annexure 5: Environment Monitoring Report from Oct,16 to Mar,17

Annexure – 5 Environment Monitoring Report for the period from Oct,16 to Mar,17

5A. AMBIENT AIR QUALITY MONITORING: -

Table No.: 1.1 - Ambient Air Quality Monitoring Results At Near Marine Building

Date of Sampling	Location-1: Near Marine Building											
	PM ₁₀	PM _{2.5}	Pb	BaP	As	Ni	CO	C ₆ H ₆	NH ₃	SO ₂	NO _x	O ₃
	µg/m ³	µg/m ³	µg/m ³	ng/m ³	ng/m ³	ng/m ³	mg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³
04-10-2016	70.21	36.14	BDL*	BDL*	BDL*	BDL*	0.88	BDL*	34.00	9.50	30.61	25.57
07-10-2016	82.51	41.19	BDL*	BDL*	BDL*	BDL*	1.26	BDL*	23.77	17.50	21.36	27.23
11-10-2016	63.22	31.52	BDL*	BDL*	BDL*	BDL*	0.66	BDL*	45.43	19.58	18.28	16.61
14-10-2016	57.81	29.00	BDL*	BDL*	BDL*	BDL*	0.60	BDL*	36.10	15.42	32.15	19.15
18-10-2016	87.24	43.74	BDL*	BDL*	BDL*	BDL*	0.78	BDL*	16.25	9.17	28.62	26.31
21-10-2016	91.42	45.82	BDL*	BDL*	BDL*	BDL*	0.76	BDL*	39.41	18.33	23.34	28.38
25-10-2016	52.36	26.24	BDL*	BDL*	BDL*	BDL*	0.37	BDL*	27.08	12.50	16.51	20.54
28-10-2016	76.32	38.33	BDL*	BDL*	BDL*	BDL*	0.63	BDL*	21.06	5.42	25.32	30.46
01-11-2016	67.19	33.62	BDL*	BDL*	BDL*	BDL*	0.97	BDL*	41.07	28.42	44.38	21.55
04-11-2016	71.25	35.72	BDL*	BDL*	BDL*	BDL*	0.63	BDL*	35.16	22.44	35.28	25.27
08-11-2016	84.18	42.03	BDL*	BDL*	BDL*	BDL*	0.81	BDL*	24.23	27.01	42.08	31.19
11-11-2016	77.85	39.09	BDL*	BDL*	BDL*	BDL*	0.71	BDL*	28.96	9.97	26.19	19.81
15-11-2016	89.25	44.57	BDL*	BDL*	BDL*	BDL*	1.05	BDL*	36.35	29.08	40.54	16.85
18-11-2016	94.11	51.24	BDL*	BDL*	BDL*	BDL*	1.07	BDL*	31.32	15.37	48.98	24.59
22-11-2016	80.11	42.49	BDL*	BDL*	BDL*	BDL*	0.47	BDL*	43.14	9.56	32.65	28.91
25-11-2016	59.36	29.99	BDL*	BDL*	BDL*	BDL*	0.83	BDL*	44.62	11.22	30.57	24.13
29-11-2016	63.11	35.30	BDL*	BDL*	BDL*	BDL*	0.76	BDL*	33.69	28.42	50.19	18.80
02-12-2016	75.23	34.04	BDL*	BDL*	BDL*	BDL*	0.94	BDL*	43.14	18.95	35.28	20.18
03-12-2016	81.47	40.77	BDL*	BDL*	BDL*	BDL*	0.72	BDL*	41.07	24.10	41.20	23.68
04-12-2016	63.25	27.32	BDL*	BDL*	BDL*	BDL*	0.89	BDL*	28.66	20.36	28.93	26.18
05-12-2016	96.32	48.33	0.50	BDL*	2.20	12.21	1.11	BDL*	55.26	32.41	52.16	32.56
06-12-2016	58.14	24.16	BDL*	BDL*	BDL*	BDL*	0.77	BDL*	25.41	13.30	24.66	30.51
07-12-2016	70.11	34.99	BDL*	BDL*	BDL*	BDL*	1.17	BDL*	33.39	14.96	31.12	17.30
08-12-2016	86.41	43.32	BDL*	BDL*	BDL*	BDL*	1.07	BDL*	45.21	17.45	33.20	24.13
09-12-2016	51.24	25.83	BDL*	BDL*	BDL*	BDL*	1.25	BDL*	26.30	6.23	24.55	21.40
30-12-2016	90.42	45.39	BDL*	BDL*	BDL*	BDL*	0.52	BDL*	45.51	28.42	48.11	16.51
03-01-2017	91.53	48.49	BDL*	BDL*	BDL*	BDL*	0.53	BDL*	33.25	14.56	29.38	22.37
06-01-2017	78.50	34.70	BDL*	BDL*	BDL*	BDL*	0.34	BDL*	20.44	21.53	42.46	19.47
10-01-2017	94.32	56.44	0.61	BDL*	2.32	10.68	0.72	BDL*	47.28	11.77	33.77	24.88
13-01-2017	89.28	45.57	BDL*	BDL*	BDL*	BDL*	0.93	BDL*	56.43	18.48	28.27	28.69
17-01-2017	72.62	32.75	BDL*	BDL*	BDL*	BDL*	0.78	BDL*	62.23	16.44	36.69	26.11
20-01-2017	95.32	49.75	0.64	BDL*	2.42	10.31	0.80	BDL*	30.50	23.49	30.25	20.53
24-01-2017	79.62	44.73	BDL*	BDL*	BDL*	BDL*	0.73	BDL*	49.72	13.35	38.32	23.28
27-01-2017	82.67	37.62	BDL*	BDL*	BDL*	BDL*	0.55	BDL*	54.30	19.61	41.22	27.40
31-01-2017	93.41	54.35	BDL*	BDL*	BDL*	BDL*	0.49	BDL*	45.76	22.66	27.52	30.42
03-02-2017	73.42	35.12	BDL*	BDL*	BDL*	BDL*	0.50	BDL*	41.31	11.44	29.65	19.58
07-02-2017	96.41	49.75	0.56	BDL*	2.20	11.58	0.56	BDL*	25.60	23.29	45.25	20.04
10-02-2017	78.26	40.13	BDL*	BDL*	BDL*	BDL*	0.79	BDL*	36.65	13.13	33.28	21.20

Annexure 5: Environment Monitoring Report from Oct,16 to Mar,17

14-02-2017	82.16	37.62	BDL*	BDL*	BDL*	BDL*	0.94	BDL*	52.07	20.33	26.36	30.18
17-02-2017	90.25	53.32	0.60	BDL*	2.30	13.25	0.80	BDL*	63.12	15.25	32.18	27.88
21-02-2017	66.11	31.24	BDL*	BDL*	BDL*	BDL*	0.60	BDL*	32.58	21.18	27.13	18.43
24-02-2017	71.24	44.57	BDL*	BDL*	BDL*	BDL*	0.72	BDL*	51.20	11.01	40.20	18.20
28-02-2017	85.21	47.07	BDL*	BDL*	BDL*	BDL*	0.60	BDL*	44.21	14.40	44.48	23.50
02-03-2017	90.52	42.23	BDL*	BDL*	BDL*	BDL*	1.10	BDL*	48.91	28.86	44.30	19.71
06-03-2017	74.15	37.21	BDL*	BDL*	2.50	13.17	1.72	BDL*	32.32	18.99	36.19	23.50
09-03-2017	95.66	52.68	BDL*	BDL*	BDL*	BDL*	0.70	BDL*	52.05	28.69	50.18	31.49
13-03-2017	51.42	26.76	BDL*	BDL*	BDL*	BDL*	0.94	BDL*	27.46	8.02	24.54	17.11
16-03-2017	85.36	45.41	0.60	BDL*	BDL*	BDL*	1.05	BDL*	35.18	22.78	39.86	18.94
20-03-2017	69.22	34.99	BDL*	BDL*	BDL*	BDL*	1.32	BDL*	33.46	14.77	25.42	27.61
23-03-2017	58.21	31.24	BDL*	BDL*	BDL*	BDL*	0.72	BDL*	44.33	6.33	23.43	22.36
27-03-2017	80.41	42.07	BDL*	BDL*	BDL*	BDL*	0.81	BDL*	36.90	19.41	28.98	18.48
30-03-2017	63.41	28.85	BDL*	BDL*	BDL*	BDL*	1.07	BDL*	24.60	9.62	36.86	21.55

Note: -

BDL*: Below Detection Limit: Ozone as O₃ (µg/m³): 10
 BDL*: Below Detection Limit - Lead as Pb (µg/m³): 0.5
 BDL*: Below Detection Limit - Carbon Monoxide as CO (mg/m³): 0.01
 BDL*: Below Detection Limit - Ammonia NH₃ (µg/m³): 10
 BDL*: Below Detection Limit - Benzene as C₆H₆ (µg/m³): 2
 BDL*: Below Detection Limit - Benzo (a) Pyrene (BaP) - Particulate Phase only (ng/m³): 0.5
 BDL*: Below Detection Limit - Arsenic as As (ng/m³): 2
 BDL*: Below Detection Limit - Nickel as Ni (ng/m³): 10

Annexure 5: Environment Monitoring Report from Oct,16 to Mar,17

Table No.: 1.2 - Ambient Air Quality Monitoring Results At Near PMC Building

Date of Sampling	Location-2: Near PMC Building											
	PM ₁₀	PM _{2.5}	Pb	BaP	As	Ni	CO	C ₆ H ₆	NH ₃	SO ₂	NO _x	O ₃
	µg/m ³	µg/m ³	µg/m ³	ng/m ³	ng/m ³	ng/m ³	mg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³
04-10-2016	78.52	40.42	BDL*	BDL*	BDL*	BDL*	0.97	BDL*	28.83	14.46	17.47	18.31
07-10-2016	60.41	30.01	BDL*	BDL*	BDL*	BDL*	1.37	BDL*	33.64	8.26	30.44	20.37
11-10-2016	92.11	23.34	BDL*	BDL*	BDL*	BDL*	0.74	BDL*	26.13	10.33	25.50	28.37
14-10-2016	82.44	41.26	BDL*	BDL*	BDL*	BDL*	0.76	BDL*	25.53	13.63	18.57	22.65
18-10-2016	71.42	35.83	BDL*	BDL*	BDL*	BDL*	0.64	BDL*	21.32	15.29	32.42	21.05
21-10-2016	55.64	27.91	BDL*	BDL*	BDL*	BDL*	0.85	BDL*	29.43	12.39	28.68	26.32
25-10-2016	87.36	43.74	BDL*	BDL*	BDL*	BDL*	0.62	BDL*	15.62	7.44	19.23	24.71
28-10-2016	96.41	25.00	BDL*	BDL*	BDL*	10.39	0.72	BDL*	36.34	19.83	31.43	25.86
01-11-2016	72.16	36.26	BDL*	BDL*	BDL*	BDL*	1.03	BDL*	35.40	22.13	31.50	16.47
04-11-2016	82.11	41.26	BDL*	BDL*	BDL*	BDL*	1.72	BDL*	28.32	18.37	26.80	14.64
08-11-2016	96.34	50.84	BDL*	BDL*	BDL*	10.28	0.96	BDL*	34.22	29.22	35.77	21.05
11-11-2016	61.11	30.42	BDL*	BDL*	BDL*	BDL*	0.90	BDL*	31.56	13.36	35.66	23.56
15-11-2016	78.11	39.16	BDL*	BDL*	BDL*	BDL*	0.84	BDL*	41.00	10.44	25.60	19.22
18-11-2016	87.41	43.74	BDL*	BDL*	BDL*	BDL*	0.82	BDL*	25.66	20.04	34.46	22.42
22-11-2016	91.11	45.41	BDL*	BDL*	BDL*	BDL*	0.81	BDL*	37.76	30.48	38.94	15.33
25-11-2016	65.15	32.49	BDL*	BDL*	BDL*	BDL*	0.95	BDL*	29.20	9.60	34.57	26.99
29-11-2016	55.18	27.51	BDL*	BDL*	BDL*	BDL*	1.43	BDL*	32.15	15.03	44.30	20.13
02-12-2016	85.41	42.51	BDL*	BDL*	BDL*	BDL*	1.49	BDL*	38.05	29.22	37.19	17.39
03-12-2016	95.77	50.01	BDL*	BDL*	BDL*	10.17	1.13	BDL*	47.78	34.23	52.07	24.25
04-12-2016	79.67	38.34	BDL*	BDL*	BDL*	BDL*	1.32	BDL*	35.10	26.30	34.13	19.90
05-12-2016	53.16	26.26	BDL*	BDL*	BDL*	BDL*	0.97	BDL*	28.61	15.45	26.14	17.39
06-12-2016	73.51	36.66	BDL*	BDL*	BDL*	BDL*	0.82	BDL*	32.15	22.54	45.83	21.96
07-12-2016	87.66	43.74	BDL*	BDL*	BDL*	BDL*	1.60	BDL*	50.14	25.47	51.41	27.91
08-12-2016	90.12	46.24	BDL*	BDL*	BDL*	BDL*	1.21	BDL*	53.39	31.31	40.69	19.44
09-12-2016	60.24	29.16	BDL*	BDL*	BDL*	BDL*	1.20	BDL*	32.45	14.19	29.42	30.65
30-12-2016	67.14	33.76	BDL*	BDL*	BDL*	BDL*	0.50	BDL*	26.25	16.70	35.11	24.48
03-01-2017	63.72	39.71	BDL*	BDL*	BDL*	BDL*	0.42	BDL*	25.41	9.38	23.08	18.55
06-01-2017	70.41	31.35	BDL*	BDL*	BDL*	BDL*	0.58	BDL*	18.37	13.48	30.42	20.84
10-01-2017	64.31	36.37	BDL*	BDL*	BDL*	BDL*	0.62	BDL*	20.82	5.48	25.84	30.72
13-01-2017	58.60	21.74	BDL*	BDL*	BDL*	BDL*	0.79	BDL*	39.19	7.57	21.56	24.25
17-01-2017	46.30	15.47	BDL*	BDL*	BDL*	BDL*	0.44	BDL*	10.41	11.59	28.44	17.79
20-01-2017	67.62	30.52	BDL*	BDL*	BDL*	BDL*	0.56	BDL*	27.86	19.71	36.25	26.09
24-01-2017	87.32	35.53	BDL*	BDL*	BDL*	BDL*	0.63	BDL*	36.44	16.58	20.76	21.30
27-01-2017	62.37	26.34	BDL*	BDL*	BDL*	BDL*	0.84	BDL*	22.66	12.58	15.50	29.57
31-01-2017	80.31	46.40	BDL*	BDL*	BDL*	BDL*	0.21	BDL*	31.84	18.75	33.68	27.45
03-02-2017	68.41	33.62	BDL*	BDL*	BDL*	BDL*	0.64	BDL*	24.39	9.61	25.21	20.31
07-02-2017	74.11	36.14	BDL*	BDL*	BDL*	BDL*	0.46	BDL*	22.06	14.75	33.76	21.54
10-02-2017	83.26	43.71	BDL*	BDL*	BDL*	BDL*	0.82	BDL*	23.51	23.17	26.42	24.06
14-02-2017	50.23	24.38	BDL*	BDL*	BDL*	BDL*	1.04	BDL*	27.29	7.16	24.11	26.35
17-02-2017	65.23	29.16	BDL*	BDL*	BDL*	BDL*	0.50	BDL*	19.45	12.22	30.47	16.96
21-02-2017	78.16	42.07	BDL*	BDL*	BDL*	BDL*	0.76	BDL*	27.00	16.43	32.23	25.67
24-02-2017	55.24	26.24	BDL*	BDL*	BDL*	BDL*	0.52	BDL*	34.26	19.80	27.29	24.06
28-02-2017	60.38	29.99	BDL*	BDL*	BDL*	BDL*	0.93	BDL*	27.00	10.53	29.59	30.25
02-03-2017	75.29	30.57	BDL*	BDL*	BDL*	BDL*	1.28	BDL*	39.61	20.05	32.41	16.04
06-03-2017	53.41	28.45	BDL*	BDL*	BDL*	BDL*	1.83	BDL*	29.64	13.36	26.99	26.42
09-03-2017	69.36	32.27	BDL*	BDL*	BDL*	BDL*	0.98	BDL*	29.07	21.30	38.72	20.10
13-03-2017	92.41	47.56	BDL*	BDL*	BDL*	BDL*	1.13	BDL*	49.59	24.22	40.27	23.04
16-03-2017	63.47	31.24	BDL*	BDL*	BDL*	BDL*	0.84	BDL*	40.18	17.12	25.22	21.68

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20-03-2017	87.44	44.57	BDL*	BDL*	BDL*	BDL*	0.79	BDL*	24.22	26.31	37.94	29.36
23-03-2017	79.28	42.49	BDL*	BDL*	BDL*	BDL*	0.90	BDL*	28.50	22.55	42.15	17.62
27-03-2017	59.42	28.74	BDL*	BDL*	BDL*	BDL*	1.02	BDL*	20.23	9.61	26.33	26.42
30-03-2017	82.16	45.16	BDL*	BDL*	BDL*	BDL*	1.39	BDL*	31.18	21.52	45.63	24.19

Note: -

BDL*: Below Detection Limit: Ozone as O₃ (µg/m³): 10

BDL*: Below Detection Limit - Lead as Pb (µg/m³): 0.5

BDL*: Below Detection Limit - Carbon Monoxide as CO (mg/m³): 0.01

BDL*: Below Detection Limit - Ammonia NH₃ (µg/m³): 10

BDL*: Below Detection Limit - Benzene as C₆H₆ (µg/m³): 2

BDL*: Below Detection Limit - Benzo (a) Pyrene (BaP) - Particulate Phase only (ng/m³): 0.5

BDL*: Below Detection Limit - Arsenic as As (ng/m³): 2

BDL*: Below Detection Limit - Nickel as Ni (ng/m³): 10

Annexure 5: Environment Monitoring Report from Oct,16 to Mar,17

Table No.: 1.3 - Ambient Air Quality Monitoring Results At Sub-Station-7B Building

Date of Sampling	Location-3: Sub-Station-7B Building											
	PM ₁₀	PM _{2.5}	Pb	BaP	As	Ni	CO	C ₆ H ₆	NH ₃	SO ₂	NO _x	O ₃
	µg/m ³	µg/m ³	µg/m ³	ng/m ³	ng/m ³	ng/m ³	mg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³
04-10-2016	86.11	43.06	BDL*	BDL*	2.20	10.38	0.74	BDL*	38.89	18.43	39.49	30.62
07-10-2016	77.25	38.46	BDL*	BDL*	BDL*	BDL*	1.02	BDL*	44.31	21.36	35.30	18.79
11-10-2016	97.85	47.66	0.56	BDL*	2.15	10.86	1.26	BDL*	35.27	25.55	32.54	20.41
14-10-2016	90.24	44.31	BDL*	BDL*	BDL*	BDL*	0.55	BDL*	31.35	17.59	36.62	27.37
18-10-2016	62.11	31.24	BDL*	BDL*	BDL*	BDL*	0.55	BDL*	42.20	20.52	41.37	23.43
21-10-2016	72.14	36.24	0.72	BDL*	BDL*	BDL*	1.26	BDL*	52.45	23.46	25.59	18.56
25-10-2016	80.41	40.41	BDL*	BDL*	BDL*	BDL*	0.86	BDL*	22.91	19.27	33.09	28.30
28-10-2016	68.50	34.16	BDL*	2.39	2.39	BDL*	2.06	BDL*	49.14	14.66	42.58	24.13
01-11-2016	86.35	43.06	BDL*	BDL*	BDL*	BDL*	0.86	BDL*	29.02	16.29	34.92	14.19
04-11-2016	91.10	49.75	BDL*	BDL*	2.30	11.10	1.49	BDL*	44.12	25.48	39.64	19.91
08-11-2016	64.21	32.19	BDL*	BDL*	BDL*	BDL*	1.15	BDL*	29.31	15.04	31.29	21.06
11-11-2016	82.36	41.39	BDL*	BDL*	BDL*	BDL*	0.73	BDL*	40.27	22.97	48.97	27.92
15-11-2016	70.21	34.99	BDL*	BDL*	BDL*	BDL*	0.72	BDL*	32.27	20.47	37.88	18.08
18-11-2016	74.52	37.08	BDL*	BDL*	BDL*	BDL*	1.83	BDL*	46.48	31.33	40.19	26.32
22-11-2016	60.24	29.58	BDL*	BDL*	BDL*	BDL*	1.13	BDL*	35.53	18.80	31.18	20.14
25-11-2016	78.88	39.58	BDL*	BDL*	BDL*	BDL*	1.60	BDL*	25.76	21.30	32.17	19.68
29-11-2016	94.52	47.24	BDL*	BDL*	2.00	10.41	0.79	BDL*	39.38	24.64	35.25	22.43
02-12-2016	60.38	30.10	BDL*	BDL*	BDL*	BDL*	0.86	BDL*	30.50	13.37	25.36	37.31
03-12-2016	51.48	25.92	BDL*	BDL*	BDL*	BDL*	1.00	BDL*	38.49	8.35	22.62	17.85
04-12-2016	87.19	43.48	BDL*	BDL*	BDL*	BDL*	1.41	BDL*	48.85	24.23	31.18	25.18
05-12-2016	73.28	36.79	BDL*	BDL*	BDL*	BDL*	0.81	BDL*	36.42	26.31	45.68	22.66
06-12-2016	92.18	46.24	BDL*	BDL*	BDL*	10.26	0.90	BDL*	53.29	29.66	50.07	31.58
07-12-2016	66.15	32.91	BDL*	BDL*	BDL*	BDL*	0.88	BDL*	29.61	10.44	34.15	25.40
08-12-2016	56.99	28.33	BDL*	BDL*	BDL*	BDL*	1.39	BDL*	33.16	12.11	28.66	19.00
09-12-2016	96.39	52.49	BDL*	BDL*	BDL*	BDL*	1.05	BDL*	42.04	32.16	49.74	23.57
30-12-2016	88.11	44.31	BDL*	BDL*	BDL*	10.41	1.23	BDL*	34.35	27.57	43.15	26.55
03-01-2017	69.29	41.68	BDL*	BDL*	BDL*	BDL*	1.04	BDL*	15.88	11.62	19.29	20.25
06-01-2017	58.61	23.49	BDL*	BDL*	BDL*	BDL*	0.82	BDL*	27.48	17.73	26.27	24.14
10-01-2017	91.49	50.46	0.55	BDL*	2.18	10.40	0.68	BDL*	10.08	13.76	21.73	28.24
13-01-2017	64.28	34.38	BDL*	BDL*	BDL*	BDL*	0.90	BDL*	45.19	20.49	32.43	19.70
17-01-2017	52.40	19.71	BDL*	BDL*	BDL*	BDL*	0.74	BDL*	14.35	9.64	18.61	21.70
20-01-2017	83.41	36.52	BDL*	BDL*	BDL*	BDL*	1.10	BDL*	12.52	16.58	23.83	23.68
24-01-2017	72.42	31.76	BDL*	BDL*	BDL*	BDL*	0.89	BDL*	41.53	10.52	15.31	30.17
27-01-2017	89.62	42.63	BDL*	BDL*	BDL*	BDL*	0.48	BDL*	58.32	6.67	22.66	22.30
31-01-2017	74.58	38.67	BDL*	BDL*	BDL*	BDL*	0.36	BDL*	26.87	14.70	37.22	25.81
03-02-2017	84.66	42.51	BDL*	BDL*	BDL*	BDL*	1.15	BDL*	18.84	13.79	17.40	22.73
07-02-2017	60.36	31.26	BDL*	BDL*	BDL*	BDL*	0.50	BDL*	30.14	18.80	30.64	19.32
10-02-2017	68.14	34.17	BDL*	BDL*	BDL*	BDL*	0.78	BDL*	15.65	14.62	24.51	27.50
14-02-2017	79.11	43.34	BDL*	BDL*	BDL*	BDL*	0.77	BDL*	19.71	21.31	33.26	21.36
17-02-2017	87.15	50.41	BDL*	BDL*	BDL*	BDL*	0.85	BDL*	22.60	7.52	17.83	24.09
21-02-2017	90.12	46.24	BDL*	BDL*	BDL*	BDL*	1.00	BDL*	51.29	23.81	27.46	22.73
24-02-2017	65.24	29.58	BDL*	BDL*	BDL*	BDL*	0.41	BDL*	42.31	12.12	16.96	29.77
28-02-2017	76.23	39.58	BDL*	BDL*	BDL*	BDL*	0.49	BDL*	40.28	7.10	31.51	25.91
02-03-2017	48.11	25.79	BDL*	BDL*	BDL*	BDL*	0.97	BDL*	28.53	15.35	34.22	23.52
06-03-2017	87.41	44.93	BDL*	BDL*	BDL*	BDL*	1.40	BDL*	40.05	23.46	44.74	18.68
09-03-2017	58.47	28.29	BDL*	BDL*	BDL*	BDL*	0.56	BDL*	47.25	15.35	32.44	19.37
13-03-2017	70.11	36.61	BDL*	BDL*	BDL*	BDL*	0.69	BDL*	35.15	21.32	39.59	20.76
16-03-2017	92.36	50.41	BDL*	BDL*	BDL*	11.21	0.72	BDL*	49.85	27.72	37.36	17.07

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20-03-2017	64.77	32.08	BDL*	BDL*	BDL*	BDL*	1.01	BDL*	38.03	19.62	42.39	18.68
23-03-2017	82.12	39.58	BDL*	BDL*	BDL*	BDL*	1.20	BDL*	33.42	29.00	46.42	21.45
27-03-2017	76.32	40.41	BDL*	BDL*	BDL*	BDL*	1.94	BDL*	26.80	20.47	30.20	20.29
30-03-2017	54.44	26.34	BDL*	BDL*	BDL*	BDL*	0.47	BDL*	26.31	17.72	27.09	15.29

Note: -

BDL*: Below Detection Limit: Ozone as O₃ (µg/m³): 10

BDL*: Below Detection Limit - Lead as Pb (µg/m³): 0.5

BDL*: Below Detection Limit - Carbon Monoxide as CO (mg/m³): 0.01

BDL*: Below Detection Limit - Ammonia NH₃ (µg/m³): 10

BDL*: Below Detection Limit - Benzene as C₆H₆ (µg/m³): 2

BDL*: Below Detection Limit - Benzo (a) Pyrene (BaP) - Particulate Phase only (ng/m³): 0.5

BDL*: Below Detection Limit - Arsenic as As (ng/m³): 2

BDL*: Below Detection Limit - Nickel as Ni (ng/m³): 10

Annexure 5: Environment Monitoring Report from Oct,16 to Mar,17

Table No.: 1.4 - Ambient Air Quality Monitoring Results At GCPTL Gate

Date of Sampling	Location-4: GCPTL Gate											
	PM ₁₀	PM _{2.5}	Pb	BaP	As	Ni	CO	C ₆ H ₆	NH ₃	SO ₂	NO _x	O ₃
	µg/m ³	µg/m ³	µg/m ³	ng/m ³	ng/m ³	ng/m ³	mg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³
04-10-2016	61.52	30.90	BDL*	BDL*	BDL*	BDL*	1.00	BDL*	24.05	25.48	35.64	22.67
07-10-2016	73.65	35.91	0.59	2.24	2.24	10.20	0.71	BDL*	50.20	19.50	38.50	29.19
11-10-2016	84.23	40.50	BDL*	BDL*	BDL*	BDL*	1.37	BDL*	58.32	29.46	31.13	27.58
14-10-2016	79.36	23.38	0.64	2.46	2.46	10.44	0.71	BDL*	46.60	9.54	40.26	30.34
18-10-2016	67.48	34.16	BDL*	BDL*	BDL*	BDL*	1.26	BDL*	32.47	17.54	37.40	28.45
21-10-2016	95.48	24.16	BDL*	BDL*	BDL*	BDL*	0.63	BDL*	22.25	15.40	44.22	25.36
25-10-2016	57.41	28.74	BDL*	2.18	2.18	10.44	1.12	BDL*	35.47	9.58	36.52	26.75
28-10-2016	91.18	45.41	BDL*	BDL*	BDL*	BDL*	0.89	BDL*	45.39	12.53	26.84	18.97
01-11-2016	58.52	29.23	BDL*	BDL*	BDL*	BDL*	1.40	BDL*	30.41	17.44	42.59	19.34
04-11-2016	64.15	32.15	BDL*	BDL*	BDL*	BDL*	0.84	BDL*	49.01	30.31	47.85	21.61
08-11-2016	70.75	35.49	BDL*	BDL*	BDL*	BDL*	1.37	BDL*	44.58	17.02	28.91	18.88
11-11-2016	88.25	44.26	BDL*	BDL*	BDL*	BDL*	0.80	BDL*	26.87	9.55	29.02	20.25
15-11-2016	93.15	46.66	BDL*	BDL*	2.60	11.28	1.56	BDL*	50.19	24.08	45.55	23.66
18-11-2016	51.12	25.41	BDL*	BDL*	BDL*	BDL*	0.66	BDL*	24.21	7.89	26.39	17.52
22-11-2016	74.18	37.08	BDL*	BDL*	BDL*	BDL*	1.47	BDL*	38.68	19.51	49.49	25.25
25-11-2016	83.22	41.66	BDL*	BDL*	BDL*	BDL*	1.13	BDL*	40.15	28.23	49.60	22.29
29-11-2016	78.96	39.67	BDL*	BDL*	BDL*	BDL*	0.88	BDL*	26.57	31.14	51.24	24.57
02-12-2016	90.36	45.09	BDL*	BDL*	BDL*	BDL*	1.15	BDL*	26.28	29.06	49.16	20.02
03-12-2016	72.15	35.91	BDL*	BDL*	BDL*	BDL*	1.03	BDL*	36.32	22.42	46.32	23.20
04-12-2016	53.15	26.72	BDL*	BDL*	BDL*	BDL*	1.63	BDL*	30.12	17.44	24.09	19.56
05-12-2016	84.24	42.17	BDL*	BDL*	BDL*	BDL*	0.71	BDL*	51.08	23.25	31.42	18.20
06-12-2016	63.28	31.24	BDL*	BDL*	BDL*	BDL*	0.63	BDL*	29.23	10.38	39.09	26.39
07-12-2016	80.67	39.99	BDL*	BDL*	BDL*	BDL*	0.55	BDL*	41.04	22.00	47.52	16.38
08-12-2016	68.19	34.16	BDL*	BDL*	BDL*	BDL*	1.65	BDL*	28.94	7.47	41.17	21.16
09-12-2016	76.22	38.33	BDL*	BDL*	BDL*	BDL*	1.24	BDL*	35.14	24.49	39.64	26.39
30-12-2016	97.15	48.44	0.54	BDL*	2.50	13.48	1.42	BDL*	49.31	31.97	53.65	31.16
03-01-2017	56.77	30.73	BDL*	BDL*	BDL*	BDL*	0.69	BDL*	40.43	5.46	15.57	17.70
06-01-2017	83.42	38.36	BDL*	BDL*	BDL*	BDL*	0.94	BDL*	11.33	7.57	21.34	26.40
10-01-2017	76.80	41.53	BDL*	BDL*	BDL*	BDL*	1.08	BDL*	17.46	9.42	30.43	22.73
13-01-2017	52.38	29.48	BDL*	BDL*	BDL*	BDL*	0.50	BDL*	28.18	6.75	19.55	29.54
17-01-2017	69.53	24.50	BDL*	BDL*	BDL*	BDL*	0.27	BDL*	36.45	13.44	22.38	24.40
20-01-2017	58.71	26.58	BDL*	BDL*	BDL*	BDL*	0.87	BDL*	42.88	10.66	17.60	21.79
24-01-2017	60.29	27.52	BDL*	BDL*	BDL*	BDL*	0.95	BDL*	24.20	15.59	25.65	19.70
27-01-2017	71.09	33.64	BDL*	BDL*	BDL*	BDL*	0.23	BDL*	38.29	8.41	32.76	27.68
31-01-2017	68.72	37.37	BDL*	BDL*	BDL*	BDL*	0.19	BDL*	21.13	11.39	29.71	23.30
03-02-2017	49.63	27.05	BDL*	BDL*	BDL*	BDL*	0.82	BDL*	36.52	9.62	29.33	18.06
07-02-2017	81.26	42.27	BDL*	BDL*	BDL*	BDL*	0.97	BDL*	26.09	10.13	24.08	25.71
10-02-2017	55.16	25.79	BDL*	BDL*	BDL*	BDL*	0.76	BDL*	19.71	8.86	36.44	26.40
14-02-2017	70.22	35.09	BDL*	BDL*	BDL*	BDL*	0.58	BDL*	32.46	14.35	20.14	29.15
17-02-2017	76.24	33.33	BDL*	BDL*	BDL*	BDL*	0.41	BDL*	37.97	12.24	27.80	29.61
21-02-2017	60.28	29.58	BDL*	BDL*	BDL*	BDL*	0.97	BDL*	43.19	8.44	18.93	17.22
24-02-2017	73.66	37.08	BDL*	BDL*	BDL*	BDL*	0.33	BDL*	28.98	16.04	28.45	24.10
28-02-2017	69.36	32.49	BDL*	BDL*	BDL*	BDL*	0.30	BDL*	35.07	9.71	32.72	28.92
02-03-2017	83.12	45.65	BDL*	BDL*	BDL*	BDL*	1.41	BDL*	26.98	25.33	48.98	17.18
06-03-2017	78.63	38.11	BDL*	BDL*	BDL*	BDL*	0.87	BDL*	38.00	21.33	38.51	15.45
09-03-2017	62.41	35.18	BDL*	BDL*	BDL*	BDL*	1.15	BDL*	35.10	11.09	42.23	20.30
13-03-2017	88.14	43.98	BDL*	BDL*	BDL*	BDL*	0.93	BDL*	41.19	29.86	33.44	24.22
16-03-2017	55.41	29.99	BDL*	BDL*	BDL*	BDL*	1.56	BDL*	29.88	15.46	30.06	21.59

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20-03-2017	91.24	48.74	BDL*	BDL*	BDL*	10.09	0.71	BDL*	50.18	30.38	46.39	15.04
23-03-2017	67.52	35.41	BDL*	BDL*	BDL*	BDL*	1.52	BDL*	25.24	16.69	34.12	20.83
27-03-2017	94.23	50.41	BDL*	BDL*	2.60	12.58	1.29	BDL*	37.42	32.20	48.42	24.15
30-03-2017	71.24	38.05	BDL*	BDL*	BDL*	BDL*	0.77	BDL*	30.60	23.21	44.30	16.88

Note: -

BDL*: Below Detection Limit: Ozone as O₃ (µg/m³): 10

BDL*: Below Detection Limit - Lead as Pb (µg/m³): 0.5

BDL*: Below Detection Limit - Carbon Monoxide as CO (mg/m³): 0.01

BDL*: Below Detection Limit - Ammonia NH₃ (µg/m³): 10

BDL*: Below Detection Limit - Benzene as C₆H₆ (µg/m³): 2

BDL*: Below Detection Limit - Benzo (a) Pyrene (BaP) - Particulate Phase only (ng/m³): 0.5

BDL*: Below Detection Limit - Arsenic as As (ng/m³): 2

BDL*: Below Detection Limit - Nickel as Ni (ng/m³): 10

Annexure 5: Environment Monitoring Report from Oct,16 to Mar,17

Table No.: 1.5 - Ambient Air Quality Monitoring Results At Near Silo Porta Cabin

Date of Sampling	Location-5: Near Silo Porta Cabin											
	PM ₁₀	PM _{2.5}	Pb	BaP	As	Ni	CO	C ₆ H ₆	NH ₃	SO ₂	NO _x	O ₃
	µg/m ³	µg/m ³	µg/m ³	ng/m ³	ng/m ³	ng/m ³	mg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³
04-10-2016	94.11	47.01	BDL*	BDL*	BDL*	BDL*	0.76	BDL*	20.51	19.29	23.72	19.78
07-10-2016	67.18	31.06	BDL*	BDL*	BDL*	BDL*	0.50	BDL*	18.39	14.81	37.63	23.67
11-10-2016	72.33	36.09	BDL*	BDL*	BDL*	BDL*	0.76	BDL*	24.43	7.62	29.46	25.07
14-10-2016	60.21	30.22	BDL*	BDL*	BDL*	BDL*	0.66	BDL*	17.49	10.58	20.52	18.28
18-10-2016	49.33	24.58	BDL*	BDL*	BDL*	BDL*	0.72	BDL*	11.46	13.54	25.71	22.50
21-10-2016	84.22	42.07	BDL*	BDL*	BDL*	BDL*	0.56	BDL*	31.36	9.73	38.62	30.23
25-10-2016	76.24	39.58	BDL*	BDL*	BDL*	BDL*	0.72	BDL*	30.76	12.27	33.43	19.45
28-10-2016	54.11	27.08	BDL*	BDL*	BDL*	BDL*	0.32	BDL*	23.22	6.77	18.54	24.37
01-11-2016	90.14	44.91	BDL*	BDL*	BDL*	BDL*	1.00	BDL*	36.43	28.77	45.80	22.70
04-11-2016	55.45	27.70	BDL*	BDL*	BDL*	BDL*	0.56	BDL*	41.17	15.14	32.18	19.59
08-11-2016	78.24	39.03	BDL*	BDL*	BDL*	BDL*	1.10	BDL*	29.62	20.19	32.84	24.20
11-11-2016	91.20	45.75	BDL*	BDL*	BDL*	BDL*	0.72	BDL*	32.58	15.98	32.95	15.21
15-11-2016	66.17	32.91	BDL*	BDL*	BDL*	BDL*	0.89	BDL*	21.32	10.51	27.90	19.13
18-11-2016	81.41	40.83	BDL*	BDL*	BDL*	BDL*	0.64	BDL*	44.13	25.23	39.10	26.27
22-11-2016	85.66	42.91	BDL*	BDL*	BDL*	BDL*	0.85	BDL*	26.36	20.61	32.29	17.74
25-11-2016	72.18	36.24	BDL*	BDL*	BDL*	BDL*	0.45	BDL*	31.39	18.51	37.12	21.43
29-11-2016	88.19	44.16	BDL*	BDL*	BDL*	BDL*	1.26	BDL*	19.55	26.92	48.55	16.59
02-12-2016	52.16	26.02	BDL*	BDL*	BDL*	BDL*	1.26	BDL*	32.28	19.18	34.93	22.23
03-12-2016	63.41	31.06	BDL*	BDL*	BDL*	BDL*	0.56	BDL*	29.62	17.24	38.22	28.81
04-12-2016	68.17	44.49	BDL*	BDL*	BDL*	BDL*	0.73	BDL*	48.28	26.50	40.09	26.27
05-12-2016	59.18	28.12	BDL*	BDL*	BDL*	BDL*	0.76	BDL*	26.06	10.09	28.23	24.20
06-12-2016	82.15	43.32	BDL*	BDL*	BDL*	BDL*	1.10	BDL*	44.13	18.93	29.76	17.51
07-12-2016	77.85	38.74	BDL*	BDL*	BDL*	BDL*	0.68	BDL*	38.21	21.03	40.31	22.81
08-12-2016	95.21	50.41	BDL*	BDL*	BDL*	BDL*	0.63	BDL*	51.53	28.60	49.42	30.65
09-12-2016	89.41	48.32	BDL*	BDL*	BDL*	BDL*	0.58	BDL*	29.02	11.36	28.23	25.58
30-12-2016	72.63	36.24	BDL*	BDL*	BDL*	BDL*	1.51	BDL*	24.29	9.25	38.99	20.05
03-01-2017	75.50	45.75	BDL*	BDL*	BDL*	BDL*	0.39	BDL*	18.61	16.50	31.58	19.99
06-01-2017	64.31	29.38	BDL*	BDL*	BDL*	BDL*	0.41	BDL*	14.34	10.66	36.35	23.48
10-01-2017	57.58	26.44	BDL*	BDL*	BDL*	BDL*	0.54	BDL*	26.85	15.58	28.69	25.69
13-01-2017	71.61	41.55	BDL*	BDL*	BDL*	BDL*	0.37	BDL*	21.66	9.32	25.20	17.71
17-01-2017	59.58	21.40	BDL*	BDL*	BDL*	BDL*	0.38	BDL*	42.71	5.31	15.79	28.62
20-01-2017	78.28	39.45	BDL*	BDL*	BDL*	BDL*	0.57	BDL*	23.49	12.69	21.23	24.55
24-01-2017	69.40	23.50	BDL*	BDL*	BDL*	BDL*	0.40	BDL*	11.90	8.37	19.25	29.31
27-01-2017	56.40	19.73	BDL*	BDL*	BDL*	BDL*	0.17	BDL*	44.55	17.44	26.25	18.81
31-01-2017	61.62	30.64	BDL*	BDL*	BDL*	BDL*	0.33	BDL*	15.26	7.59	23.55	21.11
03-02-2017	78.96	39.45	BDL*	BDL*	BDL*	BDL*	0.74	BDL*	20.08	19.51	32.63	18.71
07-02-2017	64.19	33.99	BDL*	BDL*	BDL*	BDL*	0.41	BDL*	18.91	12.41	28.45	26.76
10-02-2017	71.22	31.06	BDL*	BDL*	BDL*	BDL*	0.89	BDL*	27.93	17.11	29.77	20.71
14-02-2017	59.41	29.38	BDL*	BDL*	BDL*	BDL*	0.52	BDL*	22.40	10.27	27.03	19.55
17-02-2017	48.96	24.58	BDL*	BDL*	BDL*	BDL*	0.47	BDL*	44.23	6.42	19.66	31.19
21-02-2017	53.26	26.24	BDL*	BDL*	BDL*	BDL*	0.85	BDL*	28.22	9.41	23.51	23.74
24-02-2017	85.26	41.24	BDL*	BDL*	BDL*	BDL*	0.45	BDL*	13.38	17.97	27.90	30.49
28-02-2017	90.23	52.49	BDL*	BDL*	BDL*	BDL*	0.22	BDL*	47.14	15.40	29.00	20.25
02-03-2017	61.87	34.06	BDL*	BDL*	BDL*	BDL*	1.04	BDL*	32.39	9.86	29.41	21.83
06-03-2017	91.41	46.40	BDL*	BDL*	BDL*	BDL*	0.48	BDL*	44.83	26.37	41.20	19.40
09-03-2017	83.21	41.29	BDL*	BDL*	BDL*	BDL*	0.89	BDL*	30.37	25.07	49.62	23.84
13-03-2017	77.41	34.91	BDL*	BDL*	BDL*	BDL*	0.82	BDL*	38.18	15.13	30.65	16.36
16-03-2017	45.27	25.41	BDL*	BDL*	BDL*	BDL*	0.86	BDL*	29.50	8.65	27.84	18.23

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20-03-2017	71.45	34.16	BDL*	BDL*	BDL*	BDL*	0.49	BDL*	37.31	17.72	31.43	16.36
23-03-2017	50.11	28.74	BDL*	BDL*	BDL*	BDL*	1.03	BDL*	22.27	10.37	25.37	15.66
27-03-2017	68.88	32.08	BDL*	BDL*	BDL*	BDL*	0.50	BDL*	32.10	17.72	33.23	19.64
30-03-2017	86.33	44.99	BDL*	BDL*	BDL*	BDL*	1.17	BDL*	27.46	29.96	50.29	20.31

Note: -

BDL*: Below Detection Limit: Ozone as O₃ (µg/m³): 10

BDL*: Below Detection Limit - Lead as Pb (µg/m³): 0.5

BDL*: Below Detection Limit - Carbon Monoxide as CO (mg/m³): 0.01

BDL*: Below Detection Limit - Ammonia NH₃ (µg/m³): 10

BDL*: Below Detection Limit - Benzene as C₆H₆ (µg/m³): 2

BDL*: Below Detection Limit - Benzo (a) Pyrene (BaP) - Particulate Phase only (ng/m³): 0.5

BDL*: Below Detection Limit - Arsenic as As (ng/m³): 2

BDL*: Below Detection Limit - Nickel as Ni (ng/m³): 10

Annexure 5: Environment Monitoring Report from Oct,16 to Mar,17

Table No.: 1.6 - Ambient Air Quality Monitoring Results At S&S Entry Gate

Date of Sampling	Location-6: S&S Entry Gate											
	PM ₁₀	PM _{2.5}	Pb	BaP	As	Ni	CO	C ₆ H ₆	NH ₃	SO ₂	NO _x	O ₃
	µg/m ³	µg/m ³	µg/m ³	ng/m ³	ng/m ³	ng/m ³	mg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³
04-10-2016	53.09	26.63	BDL*	BDL*	BDL*	BDL*	0.48	BDL*	31.54	9.52	24.07	27.52
07-10-2016	49.41	24.52	BDL*	BDL*	BDL*	BDL*	1.10	BDL*	29.74	12.52	19.79	26.81
11-10-2016	89.24	44.81	BDL*	BDL*	BDL*	BDL*	0.87	BDL*	40.55	14.61	34.62	22.42
14-10-2016	71.11	35.51	BDL*	BDL*	BDL*	BDL*	0.49	BDL*	21.63	19.62	26.60	25.20
18-10-2016	59.17	29.58	BDL*	BDL*	BDL*	BDL*	0.72	BDL*	26.13	11.69	18.58	17.57
21-10-2016	78.41	30.41	BDL*	BDL*	BDL*	BDL*	0.66	BDL*	16.82	5.43	32.32	19.65
25-10-2016	65.27	32.49	BDL*	BDL*	BDL*	BDL*	0.57	BDL*	28.54	15.44	23.52	21.73
28-10-2016	83.62	41.66	BDL*	BDL*	BDL*	BDL*	0.41	BDL*	18.32	13.36	35.72	18.49
01-11-2016	79.63	39.73	BDL*	BDL*	BDL*	BDL*	0.62	BDL*	29.50	9.55	32.49	20.38
04-11-2016	87.18	43.54	BDL*	BDL*	BDL*	BDL*	0.95	BDL*	31.27	20.11	34.13	26.63
08-11-2016	68.11	34.24	BDL*	BDL*	BDL*	BDL*	1.11	BDL*	42.48	24.72	44.20	21.12
11-11-2016	57.41	28.74	BDL*	BDL*	BDL*	BDL*	1.01	BDL*	32.45	26.39	43.22	20.20
15-11-2016	82.15	41.24	BDL*	BDL*	BDL*	BDL*	0.60	BDL*	48.38	6.70	35.12	28.92
18-11-2016	64.47	32.08	BDL*	BDL*	BDL*	BDL*	0.48	BDL*	34.22	12.57	41.14	26.17
22-11-2016	78.19	39.16	BDL*	BDL*	BDL*	BDL*	0.75	BDL*	45.14	25.56	40.15	25.94
25-11-2016	90.11	44.99	BDL*	BDL*	BDL*	BDL*	0.54	BDL*	24.78	23.04	42.67	20.20
29-11-2016	69.41	34.58	BDL*	BDL*	BDL*	BDL*	0.99	BDL*	28.62	13.36	36.98	24.02
02-12-2016	79.47	36.35	BDL*	BDL*	BDL*	BDL*	0.74	BDL*	23.31	19.10	30.09	17.60
03-12-2016	90.24	42.27	BDL*	BDL*	BDL*	BDL*	1.37	BDL*	45.14	28.49	47.59	30.07
04-12-2016	81.11	40.58	BDL*	BDL*	BDL*	BDL*	0.66	BDL*	40.12	31.00	45.29	21.12
05-12-2016	66.18	32.97	BDL*	BDL*	BDL*	BDL*	1.01	BDL*	30.39	15.08	27.13	23.64
06-12-2016	56.27	28.33	BDL*	BDL*	BDL*	BDL*	0.78	BDL*	32.16	8.80	36.10	25.25
07-12-2016	94.51	47.07	BDL*	BDL*	BDL*	BDL*	0.57	BDL*	46.32	28.49	44.86	30.07
08-12-2016	51.10	25.41	BDL*	BDL*	BDL*	BDL*	1.02	BDL*	24.19	7.12	31.29	21.12
09-12-2016	71.12	36.66	BDL*	BDL*	BDL*	BDL*	0.61	BDL*	38.35	20.53	44.09	19.74
30-12-2016	61.48	40.41	BDL*	BDL*	BDL*	BDL*	0.69	BDL*	22.42	24.22	49.89	24.02
03-01-2017	82.58	52.42	BDL*	BDL*	BDL*	BDL*	0.61	BDL*	21.36	8.37	36.75	24.55
06-01-2017	91.38	56.64	BDL*	BDL*	BDL*	BDL*	0.88	BDL*	36.92	15.55	33.45	28.99
10-01-2017	87.22	47.77	BDL*	BDL*	BDL*	BDL*	0.98	BDL*	52.17	20.60	38.44	26.80
13-01-2017	78.33	37.62	BDL*	BDL*	BDL*	BDL*	0.60	BDL*	64.09	23.70	42.62	30.55
17-01-2017	63.68	26.63	BDL*	BDL*	BDL*	BDL*	0.32	BDL*	30.92	18.36	31.24	20.65
20-01-2017	88.59	44.38	0.56	BDL*	2.18	10.59	0.52	BDL*	48.21	21.74	45.33	29.75
24-01-2017	94.18	36.35	BDL*	BDL*	BDL*	BDL*	0.66	BDL*	28.07	17.68	27.62	22.52
27-01-2017	79.28	29.59	BDL*	BDL*	BDL*	BDL*	0.97	BDL*	62.55	10.47	35.65	27.41
31-01-2017	86.32	49.46	BDL*	BDL*	BDL*	BDL*	0.71	BDL*	39.97	25.71	30.59	25.19
03-02-2017	90.26	50.11	BDL*	BDL*	BDL*	BDL*	0.76	BDL*	51.34	10.14	30.45	24.35
07-02-2017	85.16	45.09	BDL*	BDL*	BDL*	BDL*	0.90	BDL*	37.42	18.04	37.24	25.11
10-02-2017	93.62	53.86	BDL*	BDL*	BDL*	BDL*	1.03	BDL*	49.60	20.98	49.39	18.72
14-02-2017	78.33	40.08	BDL*	BDL*	BDL*	BDL*	0.45	BDL*	68.17	24.34	34.17	27.16
17-02-2017	69.35	30.83	BDL*	BDL*	BDL*	BDL*	0.33	BDL*	31.33	14.78	29.68	23.66
21-02-2017	94.66	54.16	0.62	2.50	2.50	10.20	0.65	BDL*	49.89	26.94	43.15	28.39
24-02-2017	80.26	48.32	BDL*	BDL*	BDL*	BDL*	0.69	BDL*	31.04	6.31	32.20	18.78
28-02-2017	72.66	37.08	BDL*	BDL*	BDL*	BDL*	1.00	BDL*	36.84	8.45	35.27	31.48
02-03-2017	57.41	30.53	BDL*	BDL*	BDL*	BDL*	0.68	BDL*	29.66	9.72	24.15	18.86
06-03-2017	63.25	34.30	BDL*	BDL*	BDL*	BDL*	1.26	BDL*	27.07	17.48	34.21	24.43
09-03-2017	90.63	45.17	BDL*	BDL*	BDL*	BDL*	1.37	BDL*	43.20	32.82	53.21	28.35
13-03-2017	81.56	41.41	BDL*	BDL*	BDL*	BDL*	0.65	BDL*	31.10	28.13	38.79	28.58
16-03-2017	78.36	38.74	BDL*	BDL*	BDL*	BDL*	0.54	BDL*	44.35	12.36	36.56	26.51

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20-03-2017	49.11	25.83	BDL*	BDL*	BDL*	BDL*	0.58	BDL*	27.36	7.67	29.62	24.20
23-03-2017	86.41	39.99	BDL*	BDL*	BDL*	BDL*	0.88	BDL*	42.91	26.43	32.08	21.44
27-03-2017	72.44	37.49	BDL*	BDL*	BDL*	BDL*	0.60	BDL*	40.32	20.46	41.14	16.37
30-03-2017	93.32	51.24	BDL*	BDL*	BDL*	BDL*	0.99	BDL*	42.33	31.22	55.40	22.36

Note: -

BDL*: Below Detection Limit: Ozone as O₃ (µg/m³): 10

BDL*: Below Detection Limit - Lead as Pb (µg/m³): 0.5

BDL*: Below Detection Limit - Carbon Monoxide as CO (mg/m³): 0.01

BDL*: Below Detection Limit - Ammonia NH₃ (µg/m³): 10

BDL*: Below Detection Limit - Benzene as C₆H₆ (µg/m³): 2

BDL*: Below Detection Limit - Benzo (a) Pyrene (BaP) - Particulate Phase only (ng/m³): 0.5

BDL*: Below Detection Limit - Arsenic as As (ng/m³): 2

BDL*: Below Detection Limit - Nickel as Ni (ng/m³): 10

Annexure 5: Environment Monitoring Report from Oct,16 to Mar,17

5B. GROUND WATER LEVEL & QUALITY ANALYSIS (PIEZOMETERS) MONITORING: -

Table - Ground Water Level & Quality Analysis (Piezometers) Results for the period: October, 2016 to March, 2017:-

S. No.	Parameter	Unit	Near Sub Station-7B	Near QHSE Office	Near Sub Station-7B	Near QHSE Office	Near Sub Station-7B	Near QHSE Office	Near Sub Station-7B	Near QHSE Office	Near Sub Station-7B	Near QHSE Office	Near Sub Station-7B	Near QHSE Office
			Oct-16	Oct-16	Nov-16	Nov-16	Dec-16	Dec-16	Jan-17	Jan-17	Feb-17	Feb-17	Mar-17	Mar-17
1	Temperature	°C	29	30	31	30	28	28	28	29	29	30	29	30
2	pH	--	7.27	7.61	8.57	8.55	8.68	8.70	7.88	7.96	8.28	8.49	8.30	8.56
3	Total Dissolved Solids	mg/L	1214.0	1154.0	1240.0	1210.0	1482.0	1394.0	1190.0	1058.0	1354.0	997.0	1438.0	1039.0
4	Salinity	ppt	0.26	0.51	0.33	0.32	0.46	0.42	0.43	0.37	0.32	0.38	0.37	0.43
5	Chloride as Cl	mg/L	141.0	278.0	184.0	174.0	253.0	231.0	237.0	207.0	174.0	209.0	204.0	240.0
6	Depth of Water Level from Ground Level	meter	2.80	2.20	3.00	2.40	3.00	3.00	3.00	2.50	2.50	2.00	3.00	2.50
7	Status of Tide**	--	High Tide	High Tide	Low Tide	Low Tide	Low Tide	Low Tide	High Tide	High Tide	Low Tide	Low Tide	High Tide	High Tide

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5C. SEA WATER (SURFACE & BOTTOM) QUALITY ANALYSIS MONITORING: -

Table - Sea Water (Surface & Bottom) Quality Analysis Results for the period: October, 2016 to March, 2017:-

S. No.	Parameters	Unit	Sea Water South Side		Sea Water North Side		Sea Water South Side		Sea Water North Side		Sea Water South Side		Sea Water North Side		Sea Water South Side		Sea Water North Side		Sea Water South Side		Sea Water North Side		Sea Water South Side		Sea Water North Side		Sea Water South Side		Sea Water North Side	
			18-10-2016		18-10-2016		11-11-2016		11-11-2016		06-12-2016		06-12-2016		13-01-2017		13-01-2017		14-02-2017		14-02-2017		24-03-2017		24-03-2017		24-03-2017		24-03-2017	
			Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom
1	pH	--	8.23	8.38	8.13	8.2	8.4	8.48	8.21	8.45	7.81	8.01	8.12	8.18	8.17	8.23	8.12	8.23	8.26	8.36	8.14	8.6	7.53	7.94	7.63	7.84				
2	Temperature	°C	30	29	30	29	28	27	28	27	29	28	29	28	29	28	30	29	28	30	32	30	30	29	31	30				
3	Total Suspended Solids	mg/L	380	470	226	284	410	480	312	348	270	350	2.28	2.9	308	400	290	340	378	472	228	286	260	350	252	328				
4	BOD (3 Days @ 27 °C)	mg/L	6	3	7	4	5	3	8	5	6	4	8	6	8	4	6	3	8	4	8	6	9	5	8	5				
5	Dissolved Oxygen	mg/L	5.74	4.66	5.4	4.6	5.5	4.8	5.6	4.2	5.3	4.7	5.2	4.8	5.3	4.6	5.6	4.8	5.78	4.68	5.6	4.8	5.4	5	4.8	4.4				
6	Salinity	ppt	38.4	39.2	37.46	38.52	37.4	38.8	38.1	39.3	36.8	37.8	38.06	39.24	39.9	40.8	36.6	37.8	38.8	39.4	37.48	38.54	38.2	39.4	36.68	38.94				
7	Oil & Grease	mg/L	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*				
8	Nitrate as NO ₃	mg/L	0.51	0.696	0.433	0.6	0.382	0.459	0.275	0.336	0.426	0.6	0.505	0.584	0.271	0.317	0.558	0.74	0.53	0.7	0.43	0.79	0.047	0.053	0.048	0.06				
9	Nitrite as NO ₂	mg/L	0.027	0.044	0.027	0.013	0.021	0.032	0.016	0.021	0.024	0.013	0.023	0.011	0.03	0.018	0.036	0.023	0.02	0.04	0.02	0.01	BDL*	BDL*	BDL*	BDL*				
10	Ammonical Nitrogen as NH ₃	mg/L	0.299	0.616	0.56	0.72	0.317	0.392	0.298	0.355	0.581	0.487	0.097	0.712	0.499	0.633	0.422	0.479	0.29	0.62	0.58	0.73	1.76	2.02	4.62	3.1				
11	Phosphates as PO ₄	mg/L	0.593	0.643	0.094	0.116	0.479	0.556	0.108	0.117	0.404	0.497	1.071	0.102	0.06	0.065	0.303	0.331	0.59	0.64	0.09	0.11	0.83	0.9	0.44	0.29				
12	Total Nitrogen	mg/L	0.836	1.356	1.02	1.342	0.72	0.883	0.589	0.712	1.031	1.1	1.071	1.307	0.8	0.963	1.016	1.242	0.85	1.37	1.04	1.53	1.8	2.07	4.66	3.16				
13	Petroleum Hydrocarbon	µg/L	10.6	BDL*	10.4	BDL*	12.4	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*	11.8	BDL*	10.8	BDL*	10.8	BDL*	10.6	BDL*	11.2	BDL*	11.6	BDL*				
14	Total Dissolved Solids	mg/L	44480	45020	43710	44510	43800	45610	48400	49600	37840	39180	42580	43450	46370	47110	36910	38420	44460	45040	43720	44520	41330	41880	44420	44920				
15	COD	mg/L	20	14	20	13	20	13	21	13	22	18	22	14	24	14	22	12	24	18	22	16	20	24	24	18				
16	Oxidisable Particular Organic Carbon	%	0.48	0.18	0.51	0.17	0.26	0.12	0.44	0.26	0.55	0.24	0.49	0.18	0.23	0.13	0.44	0.21	0.46	0.16	0.52	0.16	0.78	0.5	1.06	0.9				
A	Flora and Fauna																													
17.1	Primary Productivity	mgC/L/day	1.71	0.675	1.8	0.56	1.82	0.9	1.71	0.563	1.08	0.09	1.23	0.225	1.08	0.09	1.238	0.225	1.57	0.54	1.46	0.67	1.19	0.63	1.463	0.45				
B	Phytoplankton																													
18.1	Chlorophyll	mg/m ³	1.49	0.561	2.27	0.401	1.89	0.668	1.73	0.561	1.2	0.454	1.3	0.748	1.2	0.454	1.3	0.748	1.28	0.18	1.22	0.29	1.282	0.587	1.202	0.641				
18.2	Phaeophytin	mg/m ³	0.45	1.27	BDL*	1.54	0.05	1.16	0.19	1.38	0.74	1.38	0.62	1.2	0.74	1.38	0.62	1.2	0.66	1.64	0.7	1.65	0.66	1.24	0.72	1.3				
18.3	Cell Count	Unit x 10 ³ /L	190	80	170	30	176	42	169	35	162	11	174	8	162	11	174	8	125	8	132	6	158	12	184	10				

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Annexure 5: Environment Monitoring Report from Oct,16 to Mar,17

5D. SEA SEDIMENT QUALITY ANALYSIS MONITORING: -

Table - Sea Sediment Quality Analysis Results for the period: October, 2016 to March, 2017:-

S. No.	PARAMETERS	UNIT	Sea Water South Side	Sea Water North Side	Sea Water South Side	Sea Water North Side	Sea Water South Side	Sea Water North Side	Sea Water South Side	Sea Water North Side	Sea Water South Side	Sea Water North Side	Sea Water South Side	Sea Water North Side
			18-10-16	18-10-16	11-11-16	11-11-16	06-12-16	06-12-16	13-01-17	13-01-17	14-02-17	14-02-17	24-03-17	24-03-17
1	Organic Matter	%	0.645	0.761	0.563	0.518	0.625	0.553	0.627	0.818	0.618	0.74	0.555	0.532
2	Phosphorus as P	mg/kg	172	192	184	178	195	159	204	175	178	194	186	166
3	Texture	--	Sandy Silt	Sandy Silt	Sandy Silt	Sandy	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt
4	Petroleum Hydrocarbon	mg/kg	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*
5	Heavy Metals													
5.1	Aluminum as Al	%	5.31	5.54	5.09	5.11	5.16	5.22	5.28	5.58	5.31	5.55	5.46	5.22
5.2	Total Chromium as Cr ⁺³	mg/kg	105	109	97.99	117	117	121	107	88.91	106	107	94.8	104
5.3	Manganese as Mn	mg/kg	757	627	639	709	671	665	593	659	757	627	610	618
5.4	Iron as Fe	%	2	2.41	2.39	2.62	2.15	2.32	2.25	1.91	3.99	2.41	2.5	2.34
5.5	Nickel as Ni	mg/kg	44.67	48.54	32.78	56.37	52.53	44.37	50.11	48.3	44.66	48.51	70.8	62
5.6	Copper as Cu	mg/kg	50.72	42.93	56.16	31.39	54.85	48.53	41.7	39.01	50.73	42.94	51.2	48
5.7	Zinc as Zn	mg/kg	197	153	217	207	205	182	1.71	155	197	153	202	204
5.8	Lead as Pb	mg/kg	1.75	1.91	1.78	1.52	1.59	1.53	1.65	1.82	1.75	1.9	1.4	1.47
5.9	Mercury as Hg	mg/kg	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*	BDL*
6	Benthic Organisms													
6.1	Macrobenthos (No and name of groups present, No and name of species of each group present)	-	Echinoderms Decapods Anthozoans	Polychaete worms Mysids Krill	Bivalves Isopods Echinoderms		Polychaetes Mysids --	Polychaete worms Decapods Anthozoans	Bivalves Mysids Echinoderms	Polychaete worms Bivalves krill	Decapods Isopods	Decapods Ostracods	Polychaete worms Bivalves	Echinoderms Corals Bivalves
6.2	MeioBenthos (No and name of groups present, No and name of species of each group present)	--	Nematodes Foraminiferans	Nematodes Gastrotrophic	Nematodes Hydrozoa		Nematodes Foraminiferans	Hydrozoans Copepods	Copepods Hydrozoa	Nematodes Foraminiferans	Nematodes Foraminiferans	Foraminiferans Nematodes	Nematodes Foraminiferans Gastropods	Nematodes Gastropods Copepods
6.3	Population	no/m ²	385	433	317		385	443	385	443	317	357	337	481

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5E. DUMP POND WATER QUALITY ANALYSIS MONITORING: -

Table - Dump Pond Water Quality Analysis Results for the period: Oct., 2016 to Mar., 2017:-

Location: - Dump Pond - Near R. Gandhi Statue			
S. No	Test Parameters	Unit	Results
1.	pH	--	7.1
2.	Total Suspended Solids	mg/L	84
3.	Total Dissolved Solids	mg/L	415
4.	Turbidity	NTU	0.21
5.	BOD (3 Days @ 27 °C)	mg/L	4
6.	COD	mg/L	20
7.	Dissolved Oxygen	mg/L	5.8
8.	Salinity	ppt	0.024
9.	Oil & Grease	mg/L	BDL*
10.	Zinc as Zn	mg/L	0.022
11.	Cadmium as Cd	mg/L	BDL*
12.	Lead as Pb	mg/L	BDL*
13.	Mercury as Hg	mg/L	BDL*
14.	Total Hardness as CaCO ₃	mg/L	289
15.	Fluoride as F	mg/L	0.02
16.	Chloride as Cl	mg/L	13.49

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5F. STP TREATED WATER QUALITY ANALYSIS MONITORING: -

Table - STP Treated Water Quality Analysis Results for the period: Oct., 2016 to Mar., 2017:-

S. No.	Parameters	Unit	STP Treated Water Quality Analysis Results					
			Oct-16	Nov-16	Dec-16	Jaan-17	Feb-17	Mar-17
1.	pH	--	7.43	7.76	7.5	7.27	8.49	8.49
2.	Total Suspended Solids	mg/L	26	26	24	26	22	22
3.	BOD (3 Days @ 27 °C)	mg/L	17	14	10	17	17	12
4.	Residual Free Chlorine	mg/L	0.7	0.8	0.8	0.6	0.5	0.5

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5G. AMBIENT NOISE LEVEL MONITORING: -

Tables - Ambient Noise Level Monitoring Results during the Day Time and Night Time in Leq. dB (A) for the period: October, 2016 to March, 2017:

Sampling Location	1 - Behind QHSE Office					
	During Day Time - Unit in dB (A)					
Date of Monitoring	01-10-2016	01-11-2016	01-12-2016	03-01-2017	01-02-2017	01-03-2017
6:00-7:00	41.8	40.9	40.9	42.7	42.1	42.4
7:00-8:00	40.6	41.0	38.0	49.3	54.3	54.3
8:00-9:00	43.3	46.5	44.9	44.0	43.3	42.9
9:00-10:00	49.3	46.0	42.9	40.9	45.3	42.2
10:00-11:00	53.0	49.8	52.3	50.9	52.9	53.6
11:00-12:00	42.8	44.3	40.8	48.1	55.3	57.2
12:00-13:00	42.1	44.4	44.2	44.1	52.3	51.1
13:00-14:00	44.4	46.3	44.5	43.8	48.3	48.2
14:00-15:00	43.0	41.0	40.7	43.7	49.7	52.2
15:00-16:00	50.0	51.4	52.5	51.3	52.6	56.0
16:00-17:00	41.7	40.6	41.0	42.8	44.3	41.2
17:00-18:00	46.1	43.3	42.6	41.5	40.5	40.5
18:00-19:00	55.2	57.9	59.7	62.5	69.3	67.2
19:00-20:00	40.5	41.9	42.3	49.3	48.9	50.8
20:00-21:00	49.9	52.4	54.1	57.1	61.9	61.3
21:00-22:00	47.7	49.9	49.4	52.1	57.8	57.5

Sampling Location	1 - Behind QHSE Office					
	During Night Time - Unit in dB (A)					
Date of Monitoring	01 & 02/10/2016	01 & 02/11/2016	01 & 02/12/2016	03 & 04/01/2017	01 & 02/02/2017	01 & 02/03/2017
22:00-23:00	50.3	52.2	53.9	55.6	57.9	55.7
23:00-00:00	44.2	42.9	40.1	37.6	41.4	40.8
00:00-01:00	44.5	45.1	45.5	43.5	46.2	47.7
01:00-02:00	40.0	38.2	40.9	41.7	44.7	46.2
02:00-03:00	42.7	44.7	45.2	43.6	44.2	47.1
03:00-04:00	40.1	38.3	38.9	39.0	45.5	43.7
04:00-05:00	40.4	41.6	42.0	43.9	44.7	49.0
05:00-06:00	45.9	43.7	40.9	40.1	41.3	43.1

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Sampling Location	2 - PMC Office Back Side					
	During Day Time - Unit in dB (A)					
Date of Monitoring	03-10-2016	02-11-2016	02-12-2016	04-01-2017	02-02-2017	02-03-2017
6:00-7:00	46.8	43.9	46.4	45.2	48.8	49.7
7:00-8:00	40.7	42.5	42.0	44.6	51.9	56.1
8:00-9:00	42.6	40.8	43.5	42.3	49.3	49.4
9:00-10:00	45.9	48.8	50.9	50.8	57.8	59.1
10:00-11:00	44.1	44.6	44.8	46.0	54.5	54.1
11:00-12:00	44.7	42.8	44.2	42.4	46.9	50.9
12:00-13:00	47.6	45.3	42.9	43.1	45.7	43.4
13:00-14:00	47.2	48.6	50.2	51.7	56.7	58.6
14:00-15:00	49.8	46.5	44.3	42.3	47.5	46.6
15:00-16:00	46.8	47.5	46.0	45.3	45.1	41.6
16:00-17:00	42.1	40.1	36.9	46.7	44.8	43.5
17:00-18:00	46.7	49.9	50.1	49.7	51.6	54.5
18:00-19:00	52.4	51.8	53.0	52.9	50.7	54.7
19:00-20:00	44.5	41.3	44.2	41.6	51.4	48.7
20:00-21:00	47.2	48.9	46.9	45.0	52.0	52.7
21:00-22:00	44.3	46.1	47.5	47.1	46.2	45.0

Sampling Location	2 - PMC Office Back Side					
	During Night Time - Unit in dB (A)					
Date of Monitoring	03 & 04/10/2016	02 & 03/11/2016	02 & 03/12/2016	04 & 05/01/2017	02 & 03/02/2017	02 & 03/03/2017
22:00-23:00	40.1	36.9	33.4	41.4	39.8	40.5
23:00-00:00	42.4	43.9	41.7	42.9	48.5	48.9
00:00-01:00	38.6	39.8	38.2	37.0	38.2	41.3
01:00-02:00	39.8	43.3	44.1	45.0	46.8	47.4
02:00-03:00	40.1	40.7	37.5	36.8	43.3	47.5
03:00-04:00	41.7	44.2	45.8	44.2	45.8	42.4
04:00-05:00	45.9	43.9	42.5	42.5	44.3	45.4
05:00-06:00	41.3	37.8	40.4	37.6	37.8	42.4

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Sampling Location	3 - Sub Station - 6 Back Side					
	During Day Time - Unit in dB (A)					
Date of Monitoring	04-10-2016	03-11-2016	03-12-2016	05-01-2017	03-02-2017	03-03-2017
6:00-7:00	41.3	43.2	40.3	42.2	48.0	50.1
7:00-8:00	42.4	43.9	44.3	43.7	50.0	48.9
8:00-9:00	51.4	52.1	50.8	49.7	55.4	53.2
9:00-10:00	49.8	50.0	49.2	48.0	50.7	53.7
10:00-11:00	42.6	44.9	44.7	47.4	52.9	56.3
11:00-12:00	51.0	51.0	49.1	47.4	53.9	52.1
12:00-13:00	44.5	45.6	43.6	40.7	44.6	44.2
13:00-14:00	48.3	51.3	53.3	53.1	55.9	54.9
14:00-15:00	50.4	47.5	46.0	48.0	53.1	53.0
15:00-16:00	50.8	49.5	48.8	49.0	50.7	53.2
16:00-17:00	48.7	49.3	45.8	45.9	50.2	54.6
17:00-18:00	52.9	51.3	48.1	46.1	47.3	47.7
18:00-19:00	42.9	40.0	37.9	40.1	46.9	44.9
19:00-20:00	47.2	44.8	46.6	46.0	49.1	47.2
20:00-21:00	48.9	45.9	47.7	47.0	53.0	52.7
21:00-22:00	47.9	44.8	47.7	45.3	52.1	50.8

Sampling Location	3 - Sub Station - 6 Back Side					
	During Night Time - Unit in dB (A)					
Date of Monitoring	04 & 05/10/2016	03 & 04/11/2016	03 & 04/12/2016	05 & 06/01/2017	03 & 04/02/2017	03 & 04/03/2017
22:00-23:00	40.5	38.3	39.1	37.4	42.3	39.4
23:00-00:00	45.3	42.3	44.1	42.8	46.1	45.7
00:00-01:00	42.8	46.1	43.8	41.1	38.5	38.5
01:00-02:00	40.7	38.4	40.6	38.7	47.2	45.6
02:00-03:00	41.5	39.5	41.8	44.1	44.1	42.2
03:00-04:00	45.9	46.3	43.1	43.2	42.1	45.6
04:00-05:00	41.7	44.8	46.9	47.9	48.0	47.3
05:00-06:00	44.2	47.5	44.3	43.7	45.4	42.0

Annexure 5: Environment Monitoring Report from Oct,16 to Mar,17

Sampling Location	4 -Sub Station - 8 (Marine Building)					
	During Day Time - Unit in dB (A)					
Date of Monitoring	05-10-2016	04-11-2016	05-12-2016	06-01-2017	04-02-2017	04-03-2017
6:00-7:00	47.4	46.5	43.7	42.2	46.9	47.9
7:00-8:00	40.0	41.0	38.5	41.1	50.0	53.9
8:00-9:00	42.7	43.9	41.9	49.8	57.5	56.6
9:00-10:00	49.8	49.7	47.5	47.0	53.4	56.4
10:00-11:00	59.4	57.2	59.0	57.8	61.6	64.7
11:00-12:00	60.7	58.5	58.8	57.2	56.0	56.5
12:00-13:00	43.7	40.2	40.0	41.8	44.4	41.3
13:00-14:00	45.2	44.7	43.9	43.4	49.9	47.1
14:00-15:00	42.2	41.8	40.7	49.1	52.2	51.1
15:00-16:00	46.8	46.4	44.8	45.7	54.1	56.0
16:00-17:00	52.9	49.5	50.4	49.1	53.0	51.9
17:00-18:00	52.9	55.9	55.4	57.3	61.7	59.3
18:00-19:00	47.4	45.3	43.3	43.2	43.8	43.3
19:00-20:00	53.7	55.8	53.7	55.6	59.2	59.6
20:00-21:00	41.5	41.1	37.9	45.2	48.7	53.7
21:00-22:00	49.6	52.9	50.8	52.7	58.8	59.0

Sampling Location	4 -Sub Station - 8 (Marine Building)					
	During Night Time - Unit in dB (A)					
Date of Monitoring	05 & 06/10/2016	04 & 05/11/2016	05 & 06/12/2016	06 & 07/01/2017	04 & 05/02/2017	04 & 05/03/2017
22:00-23:00	39.3	36.1	34.8	35.0	38.3	39.5
23:00-00:00	37.9	39.5	40.7	41.8	39.3	40.9
00:00-01:00	42.4	42.6	45.4	46.0	49.2	50.0
01:00-02:00	40.5	42.1	39.2	40.5	40.5	39.4
02:00-03:00	35.2	41.2	39.0	41.1	43.9	47.4
03:00-04:00	44.9	42.4	43.8	41.1	48.8	53.2
04:00-05:00	40.3	39.3	35.8	37.9	47.7	52.7
05:00-06:00	43.7	41.0	43.7	41.6	46.1	50.8

Annexure 5: Environment Monitoring Report from Oct,16 to Mar,17

Sampling Location	5 - Near Sub Station-7B					
	During Day Time - Unit in dB (A)					
Date of Monitoring	06-10-2016	05-11-2016	06-12-2016	07-01-2017	06-02-2017	06-03-2017
6:00-7:00	40.2	40.0	39.6	41.4	44.2	41.9
7:00-8:00	47.3	49.3	49.1	48.3	54.3	51.9
8:00-9:00	50.2	53.4	53.3	55.6	60.9	60.1
9:00-10:00	52.4	55.5	55.4	55.3	53.0	50.9
10:00-11:00	52.3	52.6	53.1	55.3	61.0	66.0
11:00-12:00	50.6	50.9	50.8	49.8	53.0	55.4
12:00-13:00	47.7	50.3	53.2	56.0	64.9	69.9
13:00-14:00	42.2	44.3	40.8	48.6	51.5	52.8
14:00-15:00	42.3	45.7	44.7	45.2	43.1	44.6
15:00-16:00	45.7	42.4	40.7	41.4	49.6	49.7
16:00-17:00	42.8	41.9	43.9	43.7	45.5	47.5
17:00-18:00	53.0	50.4	51.5	50.3	54.7	54.6
18:00-19:00	48.6	46.6	46.3	46.4	55.2	53.9
19:00-20:00	48.3	45.3	48.0	47.1	50.8	53.7
20:00-21:00	49.2	51.5	50.1	48.9	50.6	47.9
21:00-22:00	43.9	45.4	47.9	47.6	47.9	46.7

Sampling Location	5 - Near Sub Station-7B					
	During Night Time - Unit in dB (A)					
Date of Monitoring	06 & 07/10/2016	05 & 06/11/2016	06 & 07/12/2016	07 & 08/01/2017	06 & 07/02/2017	06 & 07/03/2017
22:00-23:00	47.5	44.9	42.7	44.6	46.4	45.2
23:00-00:00	42.6	39.4	37.4	37.6	39.1	42.5
00:00-01:00	39.4	41.0	38.3	36.6	41.1	45.1
01:00-02:00	48.7	48.5	48.4	49.2	50.0	54.9
02:00-03:00	45.7	45.1	48.1	47.7	54.9	53.8
03:00-04:00	34.9	37.1	33.6	35.2	39.6	42.7
04:00-05:00	43.0	42.5	41.9	40.2	39.4	36.2
05:00-06:00	41.3	38.5	39.1	41.4	44.7	46.3

Annexure 5: Environment Monitoring Report from Oct,16 to Mar,17

Sampling Location	6 - JS - 1 (Nr. Lakhigam)					
	During Day Time - Unit in dB (A)					
Date of Monitoring	07-10-2016	07-11-2016	07-12-2016	09-01-2017	07-02-2017	07-03-2017
6:00-7:00	44.4	41.0	38.1	45.4	52.3	49.0
7:00-8:00	43.1	40.0	41.3	49.7	52.3	51.8
8:00-9:00	46.2	44.0	42.9	41.0	43.5	48.0
9:00-10:00	45.9	46.9	49.0	48.1	49.8	50.9
10:00-11:00	51.0	48.2	45.8	47.0	52.4	52.0
11:00-12:00	65.2	65.5	63.8	61.6	60.5	59.8
12:00-13:00	53.3	55.4	57.3	54.3	59.7	62.2
13:00-14:00	47.3	49.9	46.6	48.5	53.9	53.3
14:00-15:00	49.6	51.4	53.1	53.2	57.6	59.8
15:00-16:00	42.8	48.5	49.1	47.9	48.8	48.5
16:00-17:00	53.2	52.2	52.4	50.8	55.2	56.6
17:00-18:00	52.5	51.6	53.1	50.4	56.4	55.9
18:00-19:00	45.1	45.0	46.9	44.9	41.6	41.3
19:00-20:00	47.9	49.3	46.7	44.6	48.1	50.6
20:00-21:00	43.1	43.4	42.5	45.1	48.6	51.2
21:00-22:00	46.1	47.2	44.5	47.5	51.1	53.8

Sampling Location	6 - JS - 1 (Nr. Lakhigam)					
	During Night Time - Unit in dB (A)					
Date of Monitoring	07 & 08/10/2016	07 & 08/11/2016	07 & 08/12/2016	09 & 10/01/2017	07 & 08/02/2017	07 & 08/03/2017
22:00-23:00	48.3	49.9	48.6	50.7	48.9	52.7
23:00-00:00	46.7	45.2	47.2	49.8	49.1	46.1
00:00-01:00	42.3	40.0	37.3	38.6	44.0	43.5
01:00-02:00	42.3	42.1	42.5	44.5	48.0	51.8
02:00-03:00	40.5	39.7	39.3	36.9	44.7	41.6
03:00-04:00	38.7	40.2	40.1	37.2	38.9	36.2
04:00-05:00	40.6	43.1	43.7	42.3	42.9	43.6
05:00-06:00	48.3	48.2	50.2	52.6	59.9	57.1

Annexure 5: Environment Monitoring Report from Oct,16 to Mar,17

Sampling Location	7 - Behind S.S. - 11 (Silo)					
	During Day Time - Unit in dB (A)					
Date of Monitoring	08-10-2016	08-11-2016	08-12-2016	10-01-2017	08-02-2017	08-03-2017
6:00-7:00	43.8	41.9	39.5	46.5	54.2	54.1
7:00-8:00	42.6	40.6	39.8	42.6	46.2	43.0
8:00-9:00	45.6	47.4	46.1	45.7	47.1	43.7
9:00-10:00	49.7	52.9	53.6	51.3	52.5	56.8
10:00-11:00	52.0	49.5	50.8	53.5	57.6	61.1
11:00-12:00	61.3	59.8	59.0	61.2	62.0	59.2
12:00-13:00	56.4	57.7	60.4	62.0	63.2	61.5
13:00-14:00	54.2	54.7	56.6	58.4	60.0	63.8
14:00-15:00	55.6	56.5	56.7	54.8	60.9	65.4
15:00-16:00	57.0	58.6	60.3	59.4	63.3	59.8
16:00-17:00	55.0	56.9	59.1	60.8	63.3	59.8
17:00-18:00	58.4	61.3	64.2	63.4	72.8	73.3
18:00-19:00	60.9	57.9	54.5	56.7	63.2	60.0
19:00-20:00	50.1	46.7	44.0	41.9	42.1	44.6
20:00-21:00	48.2	47.7	46.7	49.3	47.5	44.1
21:00-22:00	53.9	55.8	55.6	56.0	59.4	59.3

Sampling Location	7 - Behind S.S. - 11 (Silo)					
	During Night Time - Unit in dB (A)					
Date of Monitoring	08 & 09/10/2016	08 & 09/11/2016	08 & 09/12/2016	10 & 11/01/2017	08 & 09/02/2017	08 & 09/03/2017
22:00-23:00	44.3	41.6	42.6	40.1	39.4	38.1
23:00-00:00	44.7	44.5	41.9	42.3	45.6	42.3
00:00-01:00	39.6	36.2	35.9	37.7	36.5	40.4
01:00-02:00	46.0	47.7	45.1	42.8	42.6	43.9
02:00-03:00	42.3	42.8	41.0	43.8	50.6	54.1
03:00-04:00	42.8	42.4	40.9	39.3	41.9	45.5
04:00-05:00	42.2	39.8	40.1	41.4	47.9	46.5
05:00-06:00	41.5	44.0	43.1	43.6	48.4	52.1

Annexure 5: Environment Monitoring Report from Oct,16 to Mar,17

Sampling Location	8 - Near S & S Entry Gate (Dahej Road)					
	During Day Time - Unit in dB (A)					
Date of Monitoring	10-10-2016	09-11-2016	09-12-2016	11-01-2017	09-02-2017	09-03-2017
6:00-7:00	41.1	41.0	40.6	41.2	48.3	48.8
7:00-8:00	40.8	40.6	41.4	48.4	52.9	54.0
8:00-9:00	44.3	40.9	39.0	49.5	51.0	51.4
9:00-10:00	44.4	41.0	42.4	43.8	47.3	49.0
10:00-11:00	53.9	51.6	51.7	49.6	46.4	46.2
11:00-12:00	57.2	56.7	54.5	55.1	59.3	59.4
12:00-13:00	47.2	50.4	52.7	52.1	50.7	52.7
13:00-14:00	47.7	47.5	44.1	46.8	53.6	52.6
14:00-15:00	43.2	42.3	43.0	41.8	49.3	50.8
15:00-16:00	55.7	58.7	58.9	60.5	62.2	60.8
16:00-17:00	58.8	61.7	61.3	59.8	58.8	61.7
17:00-18:00	50.5	51.0	48.5	48.3	46.8	43.7
18:00-19:00	47.9	47.4	44.0	43.2	45.8	50.1
19:00-20:00	55.3	52.3	54.3	53.4	57.6	62.1
20:00-21:00	54.1	57.0	58.7	57.2	60.4	57.4
21:00-22:00	47.7	49.2	47.8	47.4	54.0	56.2

Sampling Location	8 - Near S & S Entry Gate (Dahej Road)					
	During Night Time - Unit in dB (A)					
Date of Monitoring	10 & 11/10/2016	09 & 10/11/2016	09 & 10/12/2016	11 & 12/01/2017	09 & 10/02/2017	09 & 10/03/2017
22:00-23:00	39.2	40.2	37.9	40.7	43.5	47.7
23:00-00:00	39.1	42.5	43.6	45.8	49.9	51.5
00:00-01:00	41.6	39.3	38.5	38.9	45.5	45.5
01:00-02:00	40.8	42.6	41.4	44.2	52.9	52.5
02:00-03:00	43.5	42.9	41.4	41.7	44.3	44.9
03:00-04:00	45.5	46.7	47.6	45.5	54.3	52.4
04:00-05:00	40.9	38.3	38.2	38.2	44.1	40.8
05:00-06:00	43.5	44.1	43.5	44.8	49.0	47.4

Annexure 5: Environment Monitoring Report from Oct,16 to Mar,17

Sampling Location	9 - GCPTL Gate					
	During Day Time - Unit in dB (A)					
Date of Monitoring	11-10-2016	10-11-2016	10-12-2016	12-01-2017	10-02-2017	10-03-2017
6:00-7:00	43.5	45.3	42.9	45.2	42.7	47.5
7:00-8:00	48.8	49.2	46.5	43.6	41.4	43.7
8:00-9:00	43.0	46.5	43.5	42.9	49.3	46.5
9:00-10:00	45.0	44.5	46.4	48.9	47.5	44.9
10:00-11:00	46.2	47.2	49.2	46.3	51.4	56.3
11:00-12:00	44.3	47.1	49.4	49.0	53.1	51.6
12:00-13:00	42.3	42.7	42.0	41.1	44.3	42.7
13:00-14:00	46.1	44.8	46.5	44.8	53.0	54.4
14:00-15:00	49.5	52.3	50.9	51.0	60.1	62.3
15:00-16:00	53.9	52.4	53.1	50.3	54.3	56.3
16:00-17:00	45.2	44.3	40.8	43.6	47.3	50.4
17:00-18:00	45.6	42.5	41.8	42.0	46.3	45.9
18:00-19:00	51.2	54.3	51.0	49.3	55.5	58.1
19:00-20:00	48.6	50.0	50.3	49.5	53.1	51.4
20:00-21:00	55.7	53.6	56.0	57.8	56.4	54.1
21:00-22:00	53.4	56.4	54.7	54.7	56.1	57.2

Sampling Location	9 - GCPTL Gate					
	During Night Time - Unit in dB (A)					
Date of Monitoring	11 & 12/10/2016	10 & 11/11/2016	10 & 11/12/2016	12 & 13/01/2017	10 & 11/02/2017	10 & 11/03/2017
22:00-23:00	35.7	34.1	34.6	34.1	35.9	37.8
23:00-00:00	48.4	47.6	45.5	43.7	40.2	39.6
00:00-01:00	38.4	39.5	36.3	37.8	40.5	37.2
01:00-02:00	43.1	43.8	43.0	40.9	41.6	43.4
02:00-03:00	41.6	39.9	38.2	39.0	35.5	40.3
03:00-04:00	44.2	42.9	40.3	41.4	49.5	49.5
04:00-05:00	42.6	42.5	39.6	41.1	42.6	43.0
05:00-06:00	41.8	41.9	44.1	41.3	48.4	46.9

Annexure 5: Environment Monitoring Report from Oct,16 to Mar,17

Sampling Location	10 - Lakhi Village (Primary School)					
	During Day Time - Unit in dB (A)					
Date of Monitoring	12-10-2016	11-11-2016	12-12-2016	13-01-2017	11-02-2017	11-03-2017
6:00-7:00	47.5	49.1	48.0	48.5	47.0	51.0
7:00-8:00	51.1	51.8	54.7	55.1	55.7	55.1
8:00-9:00	53.2	56.5	59.2	60.8	65.4	67.0
9:00-10:00	55.8	58.0	57.1	54.1	60.5	60.1
10:00-11:00	62.1	61.0	61.8	62.6	63.3	60.7
11:00-12:00	57.8	57.0	57.6	57.5	55.3	55.4
12:00-13:00	52.9	55.1	52.2	50.0	52.3	52.3
13:00-14:00	61.3	61.8	59.2	61.9	60.8	64.9
14:00-15:00	51.2	52.3	54.5	54.9	53.2	53.7
15:00-16:00	50.4	48.4	46.8	46.2	46.4	49.3
16:00-17:00	48.6	45.2	43.4	43.8	47.6	51.0
17:00-18:00	53.3	53.1	54.6	56.3	58.4	57.7
18:00-19:00	58.9	58.4	55.1	56.0	60.0	57.5
19:00-20:00	58.1	60.7	59.0	58.8	64.3	68.7
20:00-21:00	60.0	59.8	59.7	61.3	63.6	64.1
21:00-22:00	49.8	50.3	51.2	53.9	56.1	55.1

Sampling Location	10 - Lakhi Village (Primary School)					
	During Night Time - Unit in dB (A)					
Date of Monitoring	12 & 13/10/2016	11 & 12/11/2016	12 & 13/12/2016	13 & 14/01/2017	11 & 12/02/2017	11 & 12/03/2017
22:00-23:00	40.3	37.4	38.9	36.1	41.0	39.0
23:00-00:00	44.6	44.8	47.6	44.8	44.0	47.8
00:00-01:00	39.0	36.0	34.3	35.8	49.8	53.2
01:00-02:00	43.1	46.4	48.8	50.3	55.0	58.5
02:00-03:00	44.0	40.8	38.0	35.8	40.8	38.1
03:00-04:00	42.5	44.0	42.9	43.8	40.1	40.8
04:00-05:00	41.7	42.6	42.9	41.1	49.8	47.2
05:00-06:00	48.1	46.5	45.4	48.0	54.0	50.8

Annexure 5: Environment Monitoring Report from Oct,16 to Mar,17

Sampling Location	11 - ERMS Workshop					
	During Day Time - Unit in dB (A)					
Date of Monitoring	13-10-2016	12-11-2016	13-12-2016	16-01-2017	13-02-2017	13-03-2017
6:00-7:00	44.4	43.7	41.8	42.8	43.3	47.4
7:00-8:00	45.7	45.5	44.0	45.9	53.4	58.4
8:00-9:00	45.4	43.8	46.3	45.7	46.1	42.6
9:00-10:00	49.0	48.9	49.4	49.0	51.9	56.1
10:00-11:00	45.7	48.3	46.6	45.5	49.1	48.0
11:00-12:00	48.8	46.8	45.3	45.8	53.2	53.9
12:00-13:00	42.6	43.7	42.7	42.0	40.5	42.7
13:00-14:00	50.6	49.0	48.3	47.3	47.6	51.1
14:00-15:00	41.5	42.3	41.3	42.3	46.6	49.2
15:00-16:00	53.4	50.5	48.4	45.4	48.6	47.4
16:00-17:00	41.3	40.7	37.4	47.8	52.1	56.4
17:00-18:00	41.1	41.6	39.8	42.7	45.2	44.5
18:00-19:00	47.5	49.6	47.7	47.9	50.4	47.6
19:00-20:00	49.7	52.3	50.1	47.4	53.3	52.4
20:00-21:00	53.4	54.2	54.1	52.0	54.2	57.4
21:00-22:00	40.4	52.3	52.7	54.4	56.9	55.7

Sampling Location	11 - ERMS Workshop					
	During Night Time - Unit in dB (A)					
Date of Monitoring	13 & 14/10/2016	12 & 13/11/2016	13 & 14/12/2016	16 & 17/01/2017	13 & 14/02/2017	13 & 14/03/2017
22:00-23:00	44.0	45.5	44.3	42.3	44.8	45.8
23:00-00:00	45.7	47.5	46.1	47.6	52.5	53.8
00:00-01:00	47.4	49.8	46.6	43.9	48.2	51.1
01:00-02:00	39.7	41.8	44.7	45.7	49.9	46.6
02:00-03:00	43.8	44.7	46.2	44.0	48.8	47.2
03:00-04:00	40.5	40.3	42.5	41.3	43.4	46.7
04:00-05:00	42.0	40.1	39.5	37.6	39.8	44.8
05:00-06:00	38.3	38.2	40.2	41.5	47.8	51.0

Annexure 5: Environment Monitoring Report from Oct,16 to Mar,17

Sampling Location	12 - Behind Pump House					
	During Day Time - Unit in dB (A)					
Date of Monitoring	14-10-2016	14-11-2016	14-12-2016	17-01-2017	14-02-2017	14-03-2017
6:00-7:00	42.5	42.7	41.9	44.3	42.9	45.8
7:00-8:00	44.3	41.7	38.4	45.8	49.9	47.3
8:00-9:00	40.7	41.6	43.0	40.3	48.5	50.6
9:00-10:00	41.1	40.8	38.1	45.2	51.1	51.1
10:00-11:00	42.0	40.0	40.5	40.7	40.4	48.4
11:00-12:00	56.0	57.5	54.1	54.5	57.6	57.1
12:00-13:00	51.2	54.3	55.6	56.7	61.9	61.3
13:00-14:00	50.7	49.9	50.2	51.4	55.8	57.7
14:00-15:00	49.7	47.5	49.8	50.1	53.2	52.4
15:00-16:00	51.5	51.1	52.0	49.8	53.0	55.3
16:00-17:00	55.3	57.6	60.5	58.4	63.7	60.8
17:00-18:00	52.7	54.3	52.1	53.0	52.9	55.1
18:00-19:00	48.7	46.6	49.1	46.9	50.0	54.1
19:00-20:00	47.3	47.1	47.7	46.6	44.2	45.3
20:00-21:00	48.0	46.7	47.6	49.9	57.4	58.1
21:00-22:00	48.7	50.9	51.1	54.1	55.4	59.0

Sampling Location	12 - Behind Pump House					
	During Night Time - Unit in dB (A)					
Date of Monitoring	14 & 15/10/2016	14 & 15/11/2016	14 & 15/12/2016	17 & 18/01/2017	14 & 15/02/2017	14 & 15/03/2017
22:00-23:00	44.4	45.2	43.3	41.5	40.4	44.2
23:00-00:00	45.4	48.9	50.0	52.7	54.8	57.0
00:00-01:00	36.2	32.9	32.6	41.1	40.6	37.5
01:00-02:00	47.6	44.9	43.1	45.9	46.5	45.2
02:00-03:00	43.8	41.2	38.0	35.8	44.7	44.6
03:00-04:00	38.5	40.4	43.1	43.2	44.3	44.1
04:00-05:00	37.1	39.0	40.5	38.8	46.9	43.9
05:00-06:00	36.2	37.8	36.3	44.1	49.4	53.7

Annexure 5: Environment Monitoring Report from Oct,16 to Mar,17

Sampling Location	13 - Rock Bond Approach (Jetty)					
	During Day Time - Unit in dB (A)					
Date of Monitoring	15-10-2016	15-11-2016	15-12-2016	18-01-2017	15-02-2017	15-03-2017
6:00-7:00	46.1	49.3	47.4	48.9	55.2	58.4
7:00-8:00	42.5	44.2	42.1	49.8	53.4	52.3
8:00-9:00	51.0	49.0	50.5	50.7	53.2	50.8
9:00-10:00	46.7	46.5	45.1	42.7	45.2	49.1
10:00-11:00	42.4	42.0	38.9	46.3	54.3	59.1
11:00-12:00	45.7	47.8	50.6	47.6	47.9	48.6
12:00-13:00	59.5	59.2	60.9	58.8	63.1	65.1
13:00-14:00	48.1	49.7	47.3	48.2	53.1	55.2
14:00-15:00	46.5	46.6	46.5	46.7	50.5	51.7
15:00-16:00	54.7	52.6	52.5	50.8	52.8	49.9
16:00-17:00	45.0	48.2	48.4	49.5	53.4	57.3
17:00-18:00	58.2	59.4	56.1	55.5	59.3	59.2
18:00-19:00	48.6	47.2	48.7	46.8	52.0	54.2
19:00-20:00	47.8	46.7	49.3	51.0	52.9	51.9
20:00-21:00	50.1	52.6	55.3	56.6	62.3	65.2
21:00-22:00	49.4	48.8	50.6	47.7	50.7	51.8

Sampling Location	13 - Rock Bond Approach (Jetty)					
	During Night Time - Unit in dB (A)					
Date of Monitoring	15 & 16/10/2016	15 & 16/11/2016	15 & 16/12/2016	18 & 19/01/2017	15 & 16/02/2017	15 & 16/03/2017
22:00-23:00	42.3	44.7	45.4	47.8	50.4	47.0
23:00-00:00	45.2	48.3	50.7	49.5	52.3	52.7
00:00-01:00	49.6	48.5	51.1	50.1	58.0	62.4
01:00-02:00	40.1	42.3	41.9	40.0	38.5	35.9
02:00-03:00	41.6	40.6	37.9	38.8	40.7	45.7
03:00-04:00	37.5	39.8	38.3	38.2	42.3	43.1
04:00-05:00	46.1	42.9	42.4	40.8	42.7	47.1
05:00-06:00	46.6	49.2	47.3	48.6	52.3	51.4

Annexure 5: Environment Monitoring Report from Oct,16 to Mar,17

Sampling Location	14 - New Gate					
	During Day Time - Unit in dB (A)					
Date of Monitoring	17-10-2016	16-11-2016	16-12-2016	19-01-2017	16-02-2017	16-03-2017
6:00-7:00	40.6	42.0	40.5	40.8	44.8	42.7
7:00-8:00	42.1	43.8	45.2	46.7	50.0	49.1
8:00-9:00	47.0	43.8	41.8	41.4	46.9	43.5
9:00-10:00	46.6	44.5	41.2	40.4	46.0	44.8
10:00-11:00	59.9	59.6	61.6	59.7	62.6	64.9
11:00-12:00	54.2	55.5	55.9	54.5	53.2	53.5
12:00-13:00	49.5	50.5	52.1	55.0	52.7	55.6
13:00-14:00	49.5	48.0	47.7	49.8	51.4	49.8
14:00-15:00	62.1	63.1	63.4	64.4	72.5	72.6
15:00-16:00	50.9	54.4	54.7	55.0	60.5	57.5
16:00-17:00	46.7	47.2	49.6	49.3	55.8	55.6
17:00-18:00	53.0	53.8	52.6	52.8	62.2	62.2
18:00-19:00	45.5	46.7	47.4	49.2	58.5	59.1
19:00-20:00	45.3	47.0	47.8	47.2	50.0	53.6
20:00-21:00	48.1	49.4	46.6	46.5	47.6	50.9
21:00-22:00	51.9	54.8	51.3	48.9	51.5	48.8

Sampling Location	14 - New Gate					
	During Night Time - Unit in dB (A)					
Date of Monitoring	17 & 18/10/2016	16 & 17/11/2016	16 & 17/12/2016	19 & 20/01/2017	16 & 17/02/2017	16 & 17/03/2017
22:00-23:00	44.8	43.7	40.8	43.8	46.4	48.1
23:00-00:00	36.6	37.4	39.9	40.8	41.4	40.6
00:00-01:00	35.9	38.6	37.0	36.4	44.0	45.3
01:00-02:00	39.4	38.4	39.3	40.1	43.8	41.5
02:00-03:00	38.4	39.9	37.1	44.9	49.0	51.2
03:00-04:00	41.0	42.8	40.3	41.4	47.9	49.4
04:00-05:00	40.7	39.6	38.3	38.3	42.5	44.5
05:00-06:00	41.2	38.8	36.9	37.4	41.7	40.5

Annexure 5: Environment Monitoring Report from Oct,16 to Mar,17

Sampling Location	15 - Security Barrier Gate					
	During Day Time - Unit in dB (A)					
Date of Monitoring	17-03-2017	17-11-2016	17-12-2016	20-01-2017	17-02-2017	17-03-2017
6:00-7:00	51.8	45.8	45.9	47.5	48.4	51.8
7:00-8:00	54.5	42.4	43.8	40.8	50.9	54.5
8:00-9:00	53.5	41.4	43.5	43.2	52.5	53.5
9:00-10:00	55.1	52.5	52.1	54.3	55.4	55.1
10:00-11:00	54.1	53.9	55.3	53.6	56.8	54.1
11:00-12:00	48.9	50.9	49.3	46.8	51.7	48.9
12:00-13:00	55.6	48.5	49.8	52.8	55.0	55.6
13:00-14:00	72.3	60.6	59.6	62.6	68.3	72.3
14:00-15:00	50.9	44.7	46.5	44.2	47.6	50.9
15:00-16:00	56.0	59.0	59.4	58.4	59.1	56.0
16:00-17:00	50.0	46.1	44.3	41.7	48.6	50.0
17:00-18:00	62.8	55.0	54.6	56.9	60.4	62.8
18:00-19:00	55.3	49.5	46.9	45.7	52.2	55.3
19:00-20:00	50.1	47.3	44.8	45.7	45.7	50.1
20:00-21:00	47.6	45.1	42.7	40.3	48.3	47.6
21:00-22:00	49.7	45.6	45.5	42.6	46.1	49.7

Sampling Location	15 - Security Barrier Gate					
	During Night Time - Unit in dB (A)					
Date of Monitoring	18 & 19/10/2016	17 & 18/11/2016	17 & 18/12/2016	20 & 21/01/2017	17 & 18/02/2017	17 & 18/03/2017
22:00-23:00	47.3	45.6	44.5	44.2	48.3	48.8
23:00-00:00	44.7	46.4	45.6	45.1	47.5	46.3
00:00-01:00	40.3	40.4	38.2	36.9	44.3	42.1
01:00-02:00	42.0	41.9	44.7	47.4	45.8	47.5
02:00-03:00	40.7	40.7	41.8	42.3	51.1	47.7
03:00-04:00	41.7	40.3	38.9	38.8	43.5	40.8
04:00-05:00	40.5	40.8	40.1	38.4	41.8	46.5
05:00-06:00	42.8	40.2	38.7	36.6	37.7	44.7

Annexure 5: Environment Monitoring Report from Oct,16 to Mar,17

Sampling Location	16 - JS-2					
	During Day Time - Unit in dB (A)					
Date of Monitoring	18-03-2017	18-11-2016	19-12-2016	21-01-2017	18-02-2017	18-03-2017
6:00-7:00	48.9	40.8	43.6	42.4	47.2	48.9
7:00-8:00	49.6	47.7	46.6	45.0	45.8	49.6
8:00-9:00	59.7	41.8	39.1	49.7	55.0	59.7
9:00-10:00	52.0	48.6	47.6	45.4	52.3	52.0
10:00-11:00	54.1	48.7	45.6	45.3	49.1	54.1
11:00-12:00	52.6	47.3	46.9	45.3	50.3	52.6
12:00-13:00	49.7	47.8	45.3	47.6	49.4	49.7
13:00-14:00	45.8	44.3	44.5	44.4	46.1	45.8
14:00-15:00	50.2	46.1	43.9	44.7	52.1	50.2
15:00-16:00	56.6	52.1	54.1	55.5	58.5	56.6
16:00-17:00	61.5	52.2	52.5	55.2	63.7	61.5
17:00-18:00	45.5	48.5	48.8	47.2	48.2	45.5
18:00-19:00	46.2	42.7	41.7	43.0	49.7	46.2
19:00-20:00	46.7	41.7	42.1	43.3	48.0	46.7
20:00-21:00	49.0	43.9	43.4	44.1	47.6	49.0
21:00-22:00	48.0	46.8	43.6	43.3	45.7	48.0

Sampling Location	16 - JS-2					
	During Night Time - Unit in dB (A)					
Date of Monitoring	19 & 20/10/2016	18 & 19/11/2016	19 & 20/12/2016	21 & 22/01/2017	18 & 19/02/2017	18 & 19/03/2017
22:00-23:00	42.2	39.9	39.4	36.5	47.3	48.0
23:00-00:00	50.1	48.3	45.5	46.7	50.7	49.1
00:00-01:00	41.2	41.3	39.7	42.3	39.9	36.8
01:00-02:00	43.4	42.7	42.4	40.5	40.7	44.9
02:00-03:00	38.0	37.4	37.5	38.4	37.2	39.4
03:00-04:00	37.2	42.1	41.3	42.2	44.6	41.4
04:00-05:00	41.8	44.8	42.2	44.9	48.6	52.0
05:00-06:00	37.7	41.1	41.5	41.3	46.7	43.7

Annexure 5: Environment Monitoring Report from Oct,16 to Mar,17

Sampling Location	17 - Railway Dead End					
	During Day Time - Unit in dB (A)					
Date of Monitoring	20-10-2016	19-11-2016	20-12-2016	23-01-2017	20-02-2017	20-03-2017
6:00-7:00	46.7	47.6	50.1	51.2	55.7	58.7
7:00-8:00	44.4	46.9	46.3	48.4	48.8	46.3
8:00-9:00	52.1	53.2	53.6	51.3	57.6	56.1
9:00-10:00	43.7	46.6	47.0	48.8	51.3	50.2
10:00-11:00	48.9	47.9	49.6	47.0	46.3	43.2
11:00-12:00	51.0	52.2	53.6	50.6	56.9	53.6
12:00-13:00	40.8	42.2	43.1	43.0	40.4	42.9
13:00-14:00	40.2	40.6	39.6	41.1	47.0	46.9
14:00-15:00	47.9	46.0	44.4	42.3	45.3	44.6
15:00-16:00	57.8	58.9	57.1	55.3	62.3	60.9
16:00-17:00	51.4	52.6	54.3	55.1	52.6	51.7
17:00-18:00	47.8	51.0	53.6	55.7	58.1	60.3
18:00-19:00	53.7	56.4	53.1	54.5	61.9	64.4
19:00-20:00	50.5	47.1	49.3	51.3	49.3	52.0
20:00-21:00	43.6	41.2	39.9	49.9	48.1	46.7
21:00-22:00	42.3	45.5	43.9	46.4	51.3	55.1

Sampling Location	17 - Railway Dead End					
	During Night Time - Unit in dB (A)					
Date of Monitoring	20 & 21/10/2016	19 & 20/11/2016	20 & 21/12/2016	23 & 24/01/2017	20 & 21/02/2017	20 & 21/03/2017
22:00-23:00	43.6	45.4	44.8	44.7	51.2	50.0
23:00-00:00	42.0	39.9	39.8	42.5	47.1	43.8
00:00-01:00	40.9	37.6	36.6	39.6	42.1	40.1
01:00-02:00	42.8	43.6	45.0	45.9	47.1	50.3
02:00-03:00	34.5	34.1	31.0	38.1	39.8	38.4
03:00-04:00	36.3	38.7	36.6	35.5	41.4	45.4
04:00-05:00	36.1	40.0	38.9	38.4	42.5	47.4
05:00-06:00	42.4	40.7	41.9	41.1	38.2	40.9

Annexure 5: Environment Monitoring Report from Oct,16 to Mar,17

Sampling Location	18 - S and S Yard (South)					
	During Day Time - Unit in dB (A)					
Date of Monitoring	21-10-2016	21-11-2016	21-12-2016	24-01-2017	21-02-2017	21-03-2017
6:00-7:00	52.4	54.9	54.2	55.0	63.4	62.3
7:00-8:00	48.3	47.5	49.1	46.9	49.0	49.5
8:00-9:00	49.5	47.4	45.1	47.4	47.9	47.0
9:00-10:00	45.8	42.5	39.0	48.6	53.1	57.4
10:00-11:00	51.8	50.4	47.4	46.8	50.6	54.3
11:00-12:00	49.8	47.8	48.8	50.9	53.2	55.0
12:00-13:00	43.2	41.5	43.2	40.2	46.1	45.6
13:00-14:00	45.6	48.8	48.1	49.1	53.7	54.1
14:00-15:00	46.0	47.8	46.7	46.4	47.4	46.5
15:00-16:00	44.2	42.0	39.2	49.4	50.4	51.9
16:00-17:00	44.5	44.2	41.8	48.9	53.6	55.7
17:00-18:00	57.3	60.3	60.9	58.5	64.2	62.3
18:00-19:00	50.7	47.5	46.1	45.9	48.5	53.1
19:00-20:00	49.4	47.2	48.1	50.2	57.6	59.6
20:00-21:00	50.8	53.5	52.4	53.0	57.1	58.4
21:00-22:00	46.9	49.9	52.7	50.6	54.4	55.7

Sampling Location	18 - S and S Yard (South)					
	During Night Time - Unit in dB (A)					
Date of Monitoring	21 & 22/10/2016	21 & 22/11/2016	21 & 22/12/2016	24 & 25/01/2017	21 & 22/02/2017	21 & 22/03/2017
22:00-23:00	54.5	51.4	53.9	56.8	66.4	65.6
23:00-00:00	41.5	38.1	37.5	38.8	41.2	40.1
00:00-01:00	41.4	43.9	44.8	43.1	45.5	43.4
01:00-02:00	45.0	42.1	39.2	37.0	40.2	41.7
02:00-03:00	42.8	45.7	46.8	46.8	48.3	52.5
03:00-04:00	36.1	42.1	39.9	39.9	45.1	44.6
04:00-05:00	40.7	40.9	42.7	43.1	42.6	42.4
05:00-06:00	43.9	44.0	46.3	48.7	51.9	49.4

Annexure 5: Environment Monitoring Report from Oct,16 to Mar,17

Sampling Location	19 - S and S Yard (North) Boundary Wall					
	During Day Time - Unit in dB (A)					
Date of Monitoring	22-10-2016	22-11-2016	22-12-2016	25-01-2017	22-02-2017	22-03-2017
6:00-7:00	42.6	49.2	46.2	45.1	46.3	43.9
7:00-8:00	48.7	52.0	50.9	50.7	51.3	50.0
8:00-9:00	48.6	51.1	52.8	54.6	53.5	57.5
9:00-10:00	49.7	52.3	50.9	51.1	54.8	53.3
10:00-11:00	53.2	52.3	48.9	46.3	54.5	56.5
11:00-12:00	49.9	47.2	46.9	49.7	51.3	48.9
12:00-13:00	46.0	47.9	45.7	44.9	53.2	55.1
13:00-14:00	59.2	60.6	60.7	62.2	61.8	61.5
14:00-15:00	57.6	60.4	61.6	64.3	63.9	62.6
15:00-16:00	53.7	56.4	53.1	51.4	55.2	57.1
16:00-17:00	45.6	42.2	44.3	45.8	53.5	53.1
17:00-18:00	41.2	43.5	45.3	45.2	47.3	45.1
18:00-19:00	42.3	44.6	44.5	44.4	48.1	51.5
19:00-20:00	51.8	48.5	46.3	44.2	50.8	50.3
20:00-21:00	49.3	48.1	49.7	51.5	50.8	52.9
21:00-22:00	42.7	43.4	41.3	40.4	52.2	53.1

Sampling Location	19 - S and S Yard (North) Boundary Wall					
	During Night Time - Unit in dB (A)					
Date of Monitoring	22 & 23/10/2016	22 & 23/11/2016	22 & 23/12/2016	25 & 26/01/2017	22 & 23/02/2017	22 & 23/03/2017
22:00-23:00	40.9	42.3	41.1	41.9	47.1	45.5
23:00-00:00	38.4	38.0	37.3	44.5	45.0	44.6
00:00-01:00	42.5	45.1	46.6	45.9	46.1	43.0
01:00-02:00	40.2	37.8	36.6	37.7	46.1	47.8
02:00-03:00	43.3	46.7	46.2	47.5	49.4	53.4
03:00-04:00	45.0	48.0	47.0	48.4	49.0	45.7
04:00-05:00	51.2	52.3	54.3	56.7	61.4	61.3
05:00-06:00	40.0	46.6	43.3	43.8	41.6	42.2

Annexure 5: Environment Monitoring Report from Oct,16 to Mar,17

Sampling Location	20 - Lakhi Village (Below Conveyer Belt)					
	During Day Time - Unit in dB (A)					
Date of Monitoring	24-10-2016	23-11-2016	23-12-2016	26-01-2017	23-02-2017	23-03-2017
6:00-7:00	43.9	44.2	47.2	44.3	44.8	48.9
7:00-8:00	48.5	50.5	51.9	52.5	52.7	55.7
8:00-9:00	44.3	42.3	43.1	40.6	43.6	45.1
9:00-10:00	48.1	46.8	49.1	51.4	50.6	51.9
10:00-11:00	56.3	58.5	58.4	57.2	65.0	66.0
11:00-12:00	49.9	52.0	49.8	52.8	60.1	64.9
12:00-13:00	51.2	53.9	53.2	52.3	55.1	53.7
13:00-14:00	40.8	52.6	53.8	52.3	57.3	59.9
14:00-15:00	52.6	50.9	51.1	53.6	56.2	58.7
15:00-16:00	51.6	48.5	50.7	51.7	55.4	52.2
16:00-17:00	50.8	52.6	51.6	53.5	58.7	60.2
17:00-18:00	59.8	58.3	56.5	56.0	61.7	59.5
18:00-19:00	54.5	52.7	51.5	54.5	53.1	55.4
19:00-20:00	50.0	47.3	48.3	50.4	55.5	57.8
20:00-21:00	44.5	43.7	45.1	43.2	50.0	48.3
21:00-22:00	40.3	43.3	42.2	40.3	45.5	45.4

Sampling Location	20 - Lakhi Village (Below Conveyer Belt)					
	During Night Time - Unit in dB (A)					
Date of Monitoring	24 & 25/10/2016	23 & 24/11/2016	23 & 24/12/2016	26 & 27/01/2017	23 & 24/02/2017	23 & 24/03/2017
22:00-23:00	42.2	39.4	39.8	38.3	41.2	44.6
23:00-00:00	42.8	39.4	40.4	43.4	45.8	43.4
00:00-01:00	38.4	42.5	42.4	41.2	42.5	45.3
01:00-02:00	35.9	44.0	43.1	45.9	49.2	46.3
02:00-03:00	44.0	46.9	43.7	43.8	43.2	45.2
03:00-04:00	40.3	40.1	41.9	42.3	45.8	45.8
04:00-05:00	42.4	42.6	44.3	46.5	47.9	48.0
05:00-06:00	45.6	48.2	50.0	50.7	55.0	56.9

Annexure 5: Environment Monitoring Report from Oct,16 to Mar,17

5H. DG SETS STACK EMISSION AND NOISE LEVEL MONITORING: -

Table - DG Sets Stack Emission and Noise Level Monitoring Results for the Period: October, 2016 to March, 2017:-

DG SETS STACK EMISSION MONITORING RESULTS								
Monitoring Location			DG Set # 1 MRSS (SS5)	DG Set # 2 SS7B	DG Set # 3 Marine (SS8)	DG Set# 4 Silo (SS11)	GPCB Limit**	Test / Sampling Method
S. No.	Parameters	UNIT	18-01-17	18-01-17	18-01-17	18-01-17		
1.	Particulate Matter	mg/Nm ³	19.41	21.76	15.8	26.71	150	IS:11255 (Part-1) : 1985
2.	Sulphur Dioxide as SO ₂	ppm	5.84	7.3	6.5	8.58	100	IS:11255 (Part-2) : 1985
3.	Oxides of Nitrogen as NO _x	ppm	40.39	35.16	38.07	36.72	50	IS: 11255 (Part-7) : 2005
4.	Non Methyl Hydro Carbon (NMHC)	mg/m ³	BDL*	BDL*	BDL*	BDL*	Not Specified	Digital Gas Analyser
5.	Carbon Monoxide (CO)	mg/m ³	5.29	3.35	7.43	7.63	Not Specified	Gas Chromato-graphy

DG SETS NOISE LEVEL MONITORING RESULTS		
S. No.	Sampling Location	Noise Level Average Leq. dB(A) At 1 m from the enclose outside
		Date of Monitoring: 18-01-17
1.	DG Set # 1 MRSS (SS5)	70.2
2.	DG Set # 2 SS7B	70.4
3.	DG Set # 3 Marine (SS8)	69.2
4.	DG Set # 4 Silo (SS11)	69.6

તારીખ: ૩/૮/૨૦૦૯

Regd

પ્રતિ,
સરપંચ શ્રી,
લખીગામ,
જિ: લદાકી.

બાબા: પર્યાવરણીય મંજૂરી બાબત

સાહેબશ્રી,

ઉપરોક્ત વિષયના અંગ્રેજીમાં આપવાનું કે અમારી
સાત્તાડ કાર્ગી પોર્ટ અને રમીનિય પ્રોજેક્ટ માટે પર્યાવરણ
અને વનમંત્રાલય તરફથી ૬ જુલાઈ, ૨૦૦૯ ના રોજ પત્ર નં -
૧૧-૩૭/૨૦૦૯-આઈસી/III મારફત પર્યાવરણીય મંજૂરી મેળવે
છે.

આ અંગેની પર્યાવરણ અને વનમંત્રાલયની સૂચના મુજબની
નકલની કૌપી આ સાથે સામેલ છે.

આભાર સહ,

કેશવ પેટ્રોનેટ (દાહેજ) પાર્ટ પ્રા. લીમીટેડ વતી



Annexure 6: Acknowledgement & RPAD receipt of EC letter submission to Local Panchayat

बीमा नहीं NOT INSURED		क्रमांक 184
लगाये गये डाक टिकटों का मूल्य रु. पे.		No.
Amount of Stamps affixed Rs. 30 P.		
एक रजिस्ट्री 25 प्राप्त किया		
Received & Registered 6-9-77		
पानेवाले का नाम	Lakhyan	तारीख मोहर
Addressed to		Date Stamp
6-9-77		पानेवाले अधिकारी के हस्ताक्षर
		Signature of Receiving Officer

તા. : ૧૭/૧૧/૨૦૦૮

પ્રતિ,
સરકારી કચેરી,
ભરૂચ જિલ્લો,
તા. ભરૂચ, જિ. ભરૂચ.

પ્રમાણ: અરજદારશ્રીના નંબરની કાપ

(પરિશિષ્ટ ૪૨,

ઉપરોક્ત ભરૂચ ના સરકારી કચેરી ના અધિકારીશ્રી કે
અત્રે સરકારી કચેરી પાસે રાખવામાં આવેલ પત્ર, જે
નામ અંગે અરજદારશ્રી અને આ નંબરની કાપ આ
તા. ૧૭/૧૧/૨૦૦૮ ના રોજ આ નં. : NO-૧૧-૩૭/૨૦૦૭-IA-III
દ્વારા ફો. II નામ અંગે અરજદારશ્રીના નંબરની કાપ મળે છે.

આ અંગે અરજદારશ્રી અને આ નંબરની કાપ આ
ઉપરોક્ત નંબરની કાપ અંગે આ નંબરની કાપ મળે છે.

સહી,

અધિકારી પદોને (ફો. II) પા. નં.



૨૦૧૩ સુધી મળેલ
જિ. ભરૂચ
સરકારી કચેરી - ભરૂચ
તા. ભરૂચ, જિ. ભરૂચ.
૨૫/૧૧/૨૦૦૮



Annexure 7: Environment Budget and Expenditure for the FY: 2016-17

Annexure-7: Environment Budget and Expenditure for the FY: 2016-17

S. NO.	ACTIVITY/ CATEGORY	BUDGET (IN LAC)	EXPENDITURE (IN LAC)
1.	EHS Manpower	8.86	8.86
2.	Legal & Statutory Expenses	0.0	0.0
3.	Environmental Monitoring Services	20.0	18.5
4.	Water Consumption	36.21	36.21
5.	Hazardous Waste Management & Disposal	0.80	0.0
6.	Greenbelt Development and Plantation	21.62	21.62
7.	O&M of Pollution control measures	7.75	7.55
8.	Environment Day Celebration	0.50	0.20
9.	Treatment and Disposal of Bio-Medical Waste	2.10	1.92
10.	Operation and Maintenance of Road Cleaning equipment and manpower	45.42	45.42
11.	Operation and Maintenance of Fire staff	36.43	36.43
TOTAL AMOUNT (IN LACS)		179.69	176.71

CAPITAL EXPENDITURE			
S. NO.	ACTIVITY/ CATEGORY	BUDGET (IN LAC)	EXPENDITURE (IN LAC)
1.	Horticulture Development	35.0	30.0
2.	Canteen Solar Project	12.0	0.0
3.	Bio diversity Study	5.0	5.5
4.	EHS Display Board	5.0	2.0
TOTAL AMOUNT (IN LACS)		57.00	37.5

Annexure 8: Compliance status of EMP

Annexure-8: Compliance Status of EMP as mentioned in the EIA study For Phase-III Expansion of Adani Petronet (Dahej) Port Pvt. Ltd., March, 2015:

S. No.	EMP Conditions	Compliance Status
A.	ENVIRONMENTAL MANAGEMENT PLAN (CONSTRUCTION PHASE)	
1.1	Air Quality Management Plan	
	Dust suppression systems will be installed for fugitive dust emission control while undertaking civil works.	Complying with. Water sprinkler and mist canon is being used to suppress the fugitive dust during construction activity.
	Regular wetting of roads will be undertaken on the paved and unpaved artillery roads.	Complying with. Regular wetting of roads is undertaken on the paved and unpaved artillery roads
	Vehicle tyre washing facilities will be provided at the entrance to prevent spillover of dust sticking on tyre outside the facility.	Complied with. Vehicle tyre washing system has been provided.
	Construction materials kept in open area will be provided with barrier in order to prevent wind carryover of dust.	Complying with. Construction material is being kept in a secure area.
	Construction materials transportation in and outside the port will be appropriately covered to prevent fugitive dust emissions.	Complying with. Material transportation is being done through trucks covered with tarpaulin.
	Civil and Mechanical fabrication works will be carried out within the port facility at an appropriate location to avoid impact on the local air quality at project construction site.	Complying with. Civil and Mechanical fabrication is being done within the port premises.
	All construction equipments at site will be subjected to regular maintenance to minimize the vehicle exhaust.	Complying with. All vehicles are being checked for PUC.
	All trucks deployed at site will be a provided with fitness and pollution under control certificate.	Complying with. All vehicles are being checked for PUC.
	DG set with appropriate stack height as per CPCB guidelines for effective dispersion of pollutants shall be provided.	Complying with. All DG sets (standby source) are provided with stack height in compliance to the CPCB standards.
1.2	Noise Quality Management Plan	
	DG set with acoustic enclosure will be installed for power supply to construction activities.	Complying with. All DG sets (standby source) are provided with acoustic enclosures.
	All high decibel noise generating equipments should be repaired to meet the compliance noise level.	Complying with. Noise generating equipments are provided with acoustic enclosures.
	No activity involving with high intensity and magnitude of operation should be deployed. Silencers will be provided in Vehicle exhaust.	Complying with. <ul style="list-style-type: none"> All construction and operation activities are in compliance with the Noise level Norms. Monitoring of noise level is being done by M/s Pollucon

Annexure 8: Compliance status of EMP

		Laboratories, A NABL accredited and MoEF&CC recognized laboratory. <ul style="list-style-type: none">Monitoring reports are presented in the Annexure 5G.
	Onsite fabrication activities will be undertaken at a designated location, which should be located away from the office buildings and any other working areas.	Complying with. Separate designated fabrication yard has been provided.
	In case noise emissions from the fabrication activities exceed a level of 85 dB(A) at the fence-line of the fabrication yard, temporary noise barrier will be installed.	Complying with. <ul style="list-style-type: none">There is no occasion till date for exceeding the noise level at the port boundary.Persons working in the fabrication yard are provided with PPEs.
	Portable diesel engine generators and diesel engine driven compressors, if any, will be covered with acoustic enclosures.	Complying with. All noise generating equipments are provided with acoustic enclosures.
1.3	Sewage Management Plan	
	Sewage generated from the construction site will be treated in existing STP of 27 m ³ capacity.	Complying with. Domestic effluent is being treated in STPs. The treated water confirming to the norms is being used for horticulture purpose. The monitoring results of the treated wastewater from STP for the period from October 2016 – March 2017 are enclosed as Annexure – 5F
	Treated water will be used for green belt development / landscaping after achieving GPCB prescribed standards.	
1.4	Solid and Hazardous Waste Management Plan	
	Solid waste generated will be segregated at source for biodegradable and non-biodegradable with an option of reuse or recycle before disposal	Complying with. <ul style="list-style-type: none">All solid waste is being segregated for biodegradable and non-biodegradable.Biodegradable waste is being decomposed in Bioneer and other waste is being disposed in compliance to the Solid Waste Management Rules - 2016.
	All hazardous waste generated will be categorized as per Hazardous Waste Management Rules, 2008.	Complying with. Hazardous waste is being managed in compliance to the Hazardous Waste Management Rules 2016.
	Recycle/Reuse waste will be sold to authorized recyclers	Complying with. Recyclable waste such as used oil etc. is being sold to authorize recyclers only.
1.5	Construction Phase Storm Water Runoff	
	Existing storm water drainage network will be further strengthened and developed near the project site to prevent surface runoff to the sea.	Complying with. Storm water drainage system has been provided and regular maintenance is being done.

Annexure 8: Compliance status of EMP

B.	ENVIRONMENTAL MANAGEMENT PLAN (OPERATION PHASE)	
2.1	Air Quality Management Plan - Coal Handling and Stock Yard Area:	
	Appropriate stack height will be provided to DG sets to disperse the gases into the atmosphere as per the guidelines suggested by Central Pollution Control Board.	Complying with. All DG sets (standby source) are provided with stack height in compliance to the CPCB standards.
	Existing Port has installed robust dry fog dust suppression system (DFDS) at the Jetty, conveyor belt, transfer tower, and discharge point at coal stack yard area. Various types of water spray nozzles have been installed and the water spray is carried out through atomized water spray over the sources using compressors thereby controlling the fugitive dust effectively. Total number of nozzles installed in the port is 350 nos. It is recommended to maintain the same systems for the proposed project activities	Complying with. All dust control systems are maintained and operating well.
	At coal stack yard, 100 sprinklers have been installed to control fugitive coal dust emissions. At a time 4 sprinklers will be operated and consumes water around 3600 LPM. Similarly for the proposed expansion of port from 11.7 to 23 MMTPA such a robust DFDS and Sprinklers will be installed and maintained with maximum efficiency.	Shall be complied. Storage area for the additional storage of coal is yet to be developed.
	To prevent wind carryover of dust from coal stack yard, wind barrier have been erected around the coal stock pile area at a height of 14m from the ground level. The wind barrier is of galvanized sheet with perforated holes to withstand high velocity wind has been fitted in the structural beams and erected in solid foundation thereby effectively control the wind carryover of dust from the stock piles.	Shall be complied. Wind breaker of the same specification shall be provided in the additional storage area once completed.
	Road sweeping of dust is being undertaken using mobile van thereby preventing settled dust gets airborne due to movement of vehicles and high wind velocity and the same is recommended	Complying with. Two dust sweeping machines (mobile van) are working at site.
	High capacity vacuum cleaning machine installed at mobile truck is deployed for removal of dust settled on roads and the same practices will be implemented in the proposed project.	
	Regular wetting of the roads is undertaken through dedicated truck mounted spray arrangement with least water consumption. The same will be implemented in the proposed activities.	Complying with. Sprinkling of water is being done on the roads to control the dust.
2.2	Noise Control Management Plan	

Annexure 8: Compliance status of EMP

	High speed rotating equipments such as gantry cranes motors, hydraulic systems will be installed within-built acoustic systems to maintain the noise decibel as per the manufacturer specifications	Shall be complied. Mechanization of the south jetty is yet to be done.
	DG sets installed in open area will be provided with acoustic enclosure	Complying with. DG sets installed in open area will be provided with acoustic enclosure
	Compressors and Diesel generators and pump house will be installed in separate building provided with noise absorbing materials on the walls	Complying with. Compressor and DG sets are installed in separate building and provided with acoustic enclosures.
	Movement of vehicles within the port will be restricted with speed control measures	Complying with. <ul style="list-style-type: none"> Speed is limited within the port premises. Proper signage also provided with the premises.
	Using silent exhaust pipes for major diesel engine vehicles and heavy trucks operated inside the port	Complying with. All major diesel engine vehicles and heavy trucks operated inside the port are with silent exhaust.
	Planting trees which acts as barrier to arrest dispersion of noise levels along the internal roads and port boundary	Complying with. Green belt is being developed in an area of 8.0 ha including periphery of the project boundary.
	Using electricity powered equipment inside the port instead of diesel powered ones will be explored to the extent possible	Shall be complied.
	Change management process will be implemented to modify operation to address noise pollution if occurs	Complying with. APDPPL is certified with the ISO 14001:2015. A proper change management process in place for any kind of deviation. However, there is no occurrence of noise level exceeding norms.
2.3	Storm Water Management Plan	
	Following areas will be provided with storm water drainage systems to prevent any surface run-off in to the sea. <ul style="list-style-type: none"> Reclamation of 23 Ha back up area Coal stock pile development of 7.7 Ha area Railway siding area 	Complying with. Coal stock pile and Railway siding area are provided with storm water drainage. Reclamation of 23 Ha area is yet to be done.
	<ul style="list-style-type: none"> The drainage water will be channeled through a series of sediment traps to remove the majority of the coal sediment before discharging into the natural drains. 	Complied with. Runoff from the coal storage is being routed through dump pond where all the particles settled down.
2.4	Solid & Hazardous Waste Management Plan	
	Port operator will prepare the robust waste management plan for the entire operations, process carried out during operation. As part of the plan, a scavenging boat will be	Complying with. A waste management plan is in place and a boat is provided to collect the waste such as oil spill.

Annexure 8: Compliance status of EMP

	anchored for collection of waste due to windblown in to the sea.	
	In addition to the plan, the wastes that are expected to be generated will be disposed accordingly. The hazardous waste generated from the port operation will be disposed as per the HWM Rules 2008.	Complying with. All the wastes are being managed in compliance to the respective waste management rules as amended in 2016.
	Solid Waste generated during port operations will be disposed as per Solid Waste (Management & Handling) Rules 2000. Wherever possible the recycle and reuse will be explored for possibilities of recovery of any useful material. Option for recycle/reuse if not economical, then the waste will be disposed as per the SWM Rules, 2000.	
2.5	Green Belt Development Plan:	
	It is proposed to develop nearly 6 ha. of green cover all along the boundary of the port. Green Buffer Zone is being implemented at Eastern project site along the boundary. Saplings of Casuarina and Pedilanthus are planted along the coal stacking yards and periphery of port area.	Complying with. Three tier Green belt is being developed in an area of 8.0 ha including periphery of the project boundary.
	It is proposed to develop further three tier greenbelt to increase efficiency of dust control.	
2.6	Community Development Plan	
	<p>The proposed CSR programs are based on the needs felt and socioeconomic indicators of the study. The proposed CSR programs can be initially implemented in the five villages of the study area that is Lakhigam, Luvara, Jageshwar, Ambetha and Dahej. Based on the outcome of the CSR programs, it can be expanded to the other villages apart from the study area. The proposed CSR Programs can be grouped into the following subheadings.</p> <p>Health Promotions Programs</p> <ul style="list-style-type: none"> ✓ Health Camps and Health Awareness programs on Institutional Births and Immunization programs ✓ Mobile Clinic 	Complied. The CSR activities are executed at group level by Adani Foundation. Adani Foundation is taking care of Social-economic establishment activities and details of the same are enclosed as Annexure – 9
	<p>Education Promotion Programs</p> <ul style="list-style-type: none"> ✓ Providing sustenance funds for maintaining School Infrastructure like Drinking water Facilities, Sanitation facilities and providing supplies etc ✓ Providing scholarship programs ✓ Sport Coaching centre 	
	Economic Development Programs	

Annexure 8: Compliance status of EMP

	<ul style="list-style-type: none"> ✓ Knowledge centre regarding various government schemes and latest technology ✓ Skill Development Training Programs 																															
	Women Empowerment <ul style="list-style-type: none"> ✓ Sanitation Promotion Programs ✓ Construction and Maintenance of Sanitation complex ✓ Awareness Programs 																															
	Infrastructure development Programs <ul style="list-style-type: none"> ✓ Developing internal roads of villages ✓ Developing drainage systems ✓ Solar Street Lights ✓ Construction / Maintenance of Community Halls ✓ Social Forestry 																															
2.7	Village Specific Infrastructure Development Programs: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 5%;">S. No.</th><th style="width: 20%;">Village</th><th style="width: 75%;">Programs</th></tr> </thead> <tbody> <tr> <td>1.</td><td>Luvara</td><td>Developing proper drainage system in the village.</td></tr> <tr> <td>2.</td><td>Dahej</td><td>Providing Safe Drinking water Facilities in the schools</td></tr> <tr> <td>3.</td><td>Dahej</td><td>Developing medical facilities in the PHC such as facilities for storage of perishable medicines,</td></tr> <tr> <td>4.</td><td>Jageshwar</td><td>Developing Drainage System</td></tr> <tr> <td>5.</td><td>Lakhigam</td><td>Developing Drainage System</td></tr> <tr> <td>6.</td><td>Lakhigam Luvara Jageshwar</td><td>Developing Solar Street Light and Internal Village Roads</td></tr> <tr> <td>7.</td><td>Ambetha</td><td>Developing Drainage System</td></tr> <tr> <td>8.</td><td>Study Area Villages</td><td>Mobile Clinic providing medical facilities in the villages of the study area by having periodic visits and health camps.</td></tr> <tr> <td>9.</td><td>Study Area Villages</td><td>Developing Safe Drinking facilities at Schools in the study area.</td></tr> </tbody> </table>	S. No.	Village	Programs	1.	Luvara	Developing proper drainage system in the village.	2.	Dahej	Providing Safe Drinking water Facilities in the schools	3.	Dahej	Developing medical facilities in the PHC such as facilities for storage of perishable medicines,	4.	Jageshwar	Developing Drainage System	5.	Lakhigam	Developing Drainage System	6.	Lakhigam Luvara Jageshwar	Developing Solar Street Light and Internal Village Roads	7.	Ambetha	Developing Drainage System	8.	Study Area Villages	Mobile Clinic providing medical facilities in the villages of the study area by having periodic visits and health camps.	9.	Study Area Villages	Developing Safe Drinking facilities at Schools in the study area.	
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Annexure 8: Compliance status of EMP

	10.	Jageshwar	Providing training programs on latest technology of fishing, free fishing equipments and providing vocational training programme for alternate income source.	
2.8	Environmental Management Cell			
	APPPL has already established and maintained an Environmental Management Cell (EMC) with Head of Department (EHS), supported by field level executives and horticulturist for implementation of the compliance conditions as per Environmental Clearance obtained and GPCB Consent Conditions. Periodical monitoring activities are being undertaken by MoEF recognized and NABL accredited environmental laboratories. Environmental compliance reports are regularly submitted to MoEF regional office, Vadodara and New Delhi.			Complied. APDPPL has a well structured Environment Management Cell with qualified manpower for implementation of the Environment Management Plan. Detail of the Environment cell is enclosed as Annexure – 10
	EMC will be further strengthened in view of the proposed expansion by augmenting resources such as manpower and field equipments, for effective compliance of environmental clearance conditions. Environmental monitoring program will be undertaken by MoEF recognized and NABL accredited environmental laboratories as part of compliance report preparation and its submission to GPCB, MoEF Regional Office, Vadodara and New Delhi.			
2.9	Cost Estimates for Environmental Management Plan:			
	The estimated total cost of the proposed project is Rs.464.32 Crores. Under the project, about Rs.173.35 Crores is allocated towards pollution control equipment, implementation of environmental pollution control measures and environmental management programs.			Complied. Separate budget is allocated for Environmental Management and Socio Economic activities. <ul style="list-style-type: none"> Key components of environment budget are environmental Monitoring, STP's (O&M), Closed Conveyor System Maintenance and etc. The allocation of revenue budget for Environment Cell for the FY 2016-17 was approx. Rs. 172.77 lacs. Details of the environmental budget and expenditure for the Oct, 16 to Mar, 17 is enclosed as Annexure – 7



Impossible is nothing.
impossible is nothing.

2017 Corporate Social Responsibility Report

Adani Foundation - Dahej

At Adani Foundation-Dahej, our CSR approach is guided by the four pillars of our CSR & Sustainability framework - Education, Community Health, Sustainable Livelihood Development and Rural Infrastructure Development. These pillars establish a clear vision of our critical area of focus and are aligned with the work we're doing to address the issues of highest importance to our internal and external stakeholders. In this report, we've dedicated individual chapters to sharing our progress under each pillar.

1.0 INTRODUCTION



The Adani Foundation is the Corporate Social Responsibility arm of Adani Group with a vision to *"Accomplish passionate commitment to the social obligations towards communities, fostering sustainable and integrated development, thus improving quality of life"*. It's an integrated infrastructure conglomerate that is committed to inclusive growth and sustainable development in not only the communities it operates in, but also in contributing towards nation building.

The Adani Foundation - Dahej has been running several activities and catering to the needs of the local people residing in about 11 villages. The activities performed under the CSR initiatives of the Adani Foundation fall under four major domains. These include Education, Community Health, Sustainable Livelihood Development and Rural Infrastructure Development. In the Year 2015-16, Adani Foundation contributed largely towards the surrounding communities of Adani Dahej site in respect to its varied domains. Each domain has its set of objectives. All the objectives are fulfilled keeping in mind the vision of contributing towards framing a better society all around its catchment area. Till date several activities have been initiated and performed in lieu of these objectives. This Annual Report throws light on Adani Foundation's activities performed and initiatives taken for the year 2016-2017 at Dahej site.

2.0 Domains of CSR Framework



The Adani Foundation team - Dahej carried activities during the FY: 2016-17 which can be classified under the head of Education, Community health, Sustainable Livelihood Development and Rural Infrastructure Development.

The details of these initiatives are as follows: -

2.01 EDUCATION



Adani Foundation- Dahej core focus in this domain is based on below parameters: -

- ❖ Efforts to improve the quality of education
- ❖ Encourage education of girl child
- ❖ Encourage community participation through meetings and seminars
- ❖ Maximum (100%) enrollment of children in school and their retention

In rural India today, 4% of our children never start school, 58% don't complete primary schools, and 90% don't complete school according to a survey. AF- Dahej deduces lack of education to several challenges rooted in the local economy. Most families in the villages around port are economically backward. This sets up a whole series of challenges which prevent their children from receiving an education.

Children Aren't Accountable to their Education - Parents may spend off-season time searching for miscellaneous jobs, leaving their children home to their own devices. So, some days they may go to school and other days they don't.

Available Education Proves Inadequate - The schools in these villages begins late in the morning and ends early in the day. Besides, major concerns in these schools are fewer committed teachers, lack of learning materials and infrastructure in school.

Children Aren't Motivated to Learn - When students arrive home from school, they do not study, so what they learned that day is not reinforced. Parents don't encourage studying because they are not educated themselves and do not fully understand the value of education, reducing their motivation to instil this valuable opportunity in their children.

Families Lack Resources for a Proper Education - Many families in these rural villages work hard to just put a meal on the table every day. They do not have the resources for school supplies and school fees. They need their children to help with chores around the house after school.

AF- Dahej, after due discussions with school authorities and local leaders from these villages took several initiatives for improving education scene in these villages.

[a] Pragna Material Support:

Under this initiative, AF engages with the schools positioned in these villages by providing amenities/supplies for betterment of students.

This project directly **benefited 3600** students spread across **eight schools** that received supplies from AF under this project.

AF distributed all the basic stationaries in schools which are serving as an amenity for the students in the classroom during study hours also by providing this amenity it proved to be really helpful to teachers as well, as they have proper resource for each students. Enhancing the school facilities hugely benefitted these students.

[b] Exposure Visit: Science City and Akshardham.

Adani Foundation Dahej facilities exposure visit tours, for students in these schools to various educational institutions, historical places etc, this year we conducted our exposure with top three male and female students from all the eight schools. We took this student to Science city and Akshardham. This visit not only help them to understand the practical aspects of their studies but also gave them an exposure to a Cultural place. This program serves as an efficient tool to facilitate experiential and practical learning. It has directly **benefitted 92 students** from **eight different schools**.

[c] Bala Project (Fun based Learning):

AF-Dahej took upon itself to paint murals and educational paintings on the walls of the village schools. This makes for fun and interactive learning environment for the students.

This program has directly **benefitted 4000 students** spread across **thirteen different Aanganwadis** (Nursery Education) and two Schools.

[d] Praveshotsav (New Academic Year) Programme:

Under this programme, this time we have provided school kit to all the children. This not only helps student to motivate children to come to school but also curtails financial burden on parents to some extent. This project has benefited 290 children from eight school of Dahej Cluster.

[e] Sports Material Support programme:

Under this program, we have offered sports pertinent supplies to schools for improving sport and physical education in these schools.

This project has directly **supported 3600 students** from **eight different schools** who are now indulging in sports and physical education.

2.02 Community Health



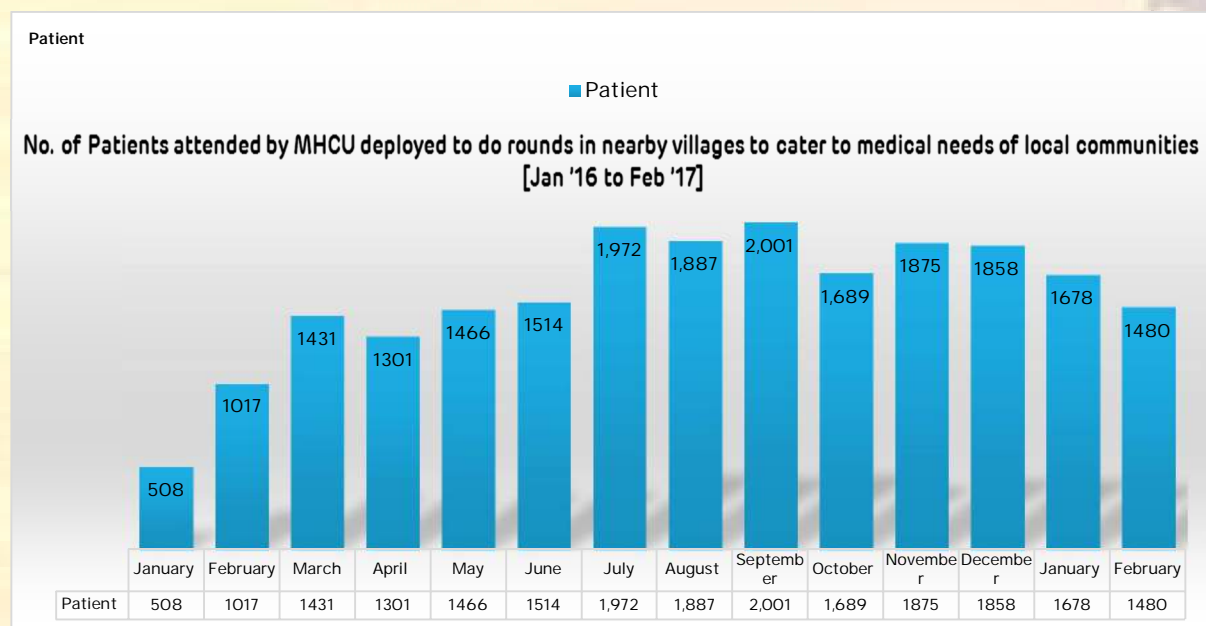
In the villages nearby, the health care delivery is constrained by lack of health care infrastructure, lack of doctors, lack of supply chain and lack of appropriate monitoring of existing health care infrastructure.

Hence, the local communities residing in these villages are not able to access formal health care and many of them after having to travel long distances to consult untrained local private practitioners in case of any illness.

Recognising this need to strengthen the health care delivery system, AF- Dahej is engaged in promoting healthy communities by improving access to basic health care and by helping the local communities to fight against infectious diseases

[a] Mobile Health Care Unit (MHCU):

AF- Dahej has deployed MHCU which is scheduled to visit villages in close vicinity of the port, for provision of basic health care & medical services to the patients. This facility has directly been **benefitting 21,677 people** residing in these **12 villages**.



[b] Multi- Disciplinary Health care camps: Mega Health Camp

AF-Dahej, also conducted multi-disciplinary standalone special health care camps to meet the immediate health care needs of local communities. The uniqueness of model lies in its comprehensive approach where health promotion and prevention are given equal importance while curative care is administered. These camps have directly benefitted **533 patients**

[c] Health and Sanitation Awareness Campaign

AF-Dahej frequently conducts Health and Sanitation awareness campaigns with Adolescent girls and other children, in schools and Aanganwadis with an aim to teach the local communities of the benefits associated with and lead an exemplary life in the village. This has directly **benefitted 4000 students** spread across all **11 schools and 13 Aanganwadis**.

[d] Project SuPoshan (Project Nourishment)

Malnutrition and Anaemia are two major concerns for developing local communities residing in vicinity of APDPPL. AF- Dahej took it as an objective to reduce malnutrition amongst children by 95% and anaemia amongst adolescent girls & women by 70% in nearby villages during the next three years. The project has three pronged strategies i.e. promoting awareness, building institutional capacity and knowledge-base in form of Sangini (representatives) and networking with existing government schemes. Post commencing in May 2016, Suposhan has incorporated 8 Sanginis and trained them on the subject. The project is now focusing on treatment of SAM (Severe Acute Malnourished) children to convert them to MAM (Moderately Acute Malnourished) to healthy child.

Project had identified a total of 28 malnourished children in nearby 12 villages/locations. By this project, APDPPL was **successful in converting 12 children from SAM to MAM and 6 children from MAM to perfectly healthy children**. We are currently in the process of treating the remainder 22 malnourished children to render them perfectly healthy.



2.03 Sustainable Livelihood and Community Engagement Programme



One major issue that these rural local communities residing near APDPPL face is securing sustainable livelihoods. With increasing population and decreasing land holdings, the dependency on primary livelihoods is at risk. In the absence of adequate employment opportunities, the rural people are unable to generate enough wages to sustain their livelihood. Therefore, it is altogether imperative to find suitable sustainable livelihood models and strategies for achieving inclusive growth.

Strengthening livelihood and increasing income opportunities for local communities, is one of the core responsibility now of AF- Dahej.

We invest in building social capital, promoting collective strength through self-help groups, supporting initiatives towards preservation of traditional art and organizing skill development training for the youth and women artisans thus impacting local communities directly.

[a] Skill Development Training - SHG Group

Under skill development initiative Adani Foundation, Dahej used to conduct training programme on beauty parlour, tailoring etc for rural women. Since it was conducted with training model now we proposed to convert this model into sustainable model for various livelihood activities. Based on communities' requirement and women skills, it is proposed to develop SHG group of women for making school bags. This project is designed in the phase manner, in the first phase we are targeting one SHG group consist of 10 women, and this women are going to prepare 400 bags for Praveshotsav which will be purchased by Adani foundation, Dahej from next year onwards. Under sustainability model SHG group will use income generated from the bags as revolving fund for their next.

[b] Fisher Man Support Programme:

AF- Dahej also captured the plight of these fishermen devoid of any lighting resources and required to go fishing during the dark hours of the day. In order to offer them a safe and secured passage and movement to their worksite, we distributed solar lanterns which can work for 800 hours after only 8 hours of charging them, amongst these fisher folk communities. Beyond their workplaces, these local communities are also making use of these solar lanterns for their household chores during the night. Moreover, they can also charge their mobiles with the solar panel, which will help them communicate effectively even during their emergencies. In all from all the villages we have identified a total of 198 licenced fisher man who are given benefits of this lantern.

[c] Community Engagement Programme:

{c.1} Traffic Safety Awareness:

On the occasion of National Traffic Safety Week celebrated each year in APDPPL; AF- Dahej, bearing in the mind the positioning of these nearby villages in highly concentrated industrial zone where the main roads stay infested with heavy motored vehicles, facilitated an awareness session for the youth of these villages to educate them about road traffic safety while commuting on these roads.

On this occasion, we gave traffic safety training to two wheeler bike riders and we also distributed crash helmets amongst these youths to safeguard themselves on the roads when riding their two wheeler vehicles; and Hi-Vis reflective jackets to safeguard themselves when

walking/riding during the dark hours of the day. This initiative directly **benefitted 200 personnel** from the nearby villages.

{c.2} Adani Rural Cricket Club:

Adani Foundation is actively involved with the youth group of all the cluster villages, every year we use to organize Cricket tournament with only one or two villages, but time we had organized Adani Cricket Club under which we registered 24 different teams from all the cluster villages. In total we had 288 participants for the Adani Cricket Tournament. And this event proved to be really fruitful as it has engaged almost all the youth group from cluster villages.

{c.3} Green Belt Development:

APDPPL has assumed the responsibility to make their surrounding villages greener and keep continuing this environmental friendly action in unison with the local communities.

2.04 Rural Infrastructure Development

Major livelihood groups based in villages in the vicinity of APDPPL comprises of Fishermen and daily wage labours, so situations are such that providing some good infrastructures will support them in their daily life. We at AF- Dahej tried to provided best infrastructure to the community since its inception. This year also provided infrastructure support to schools, panchayat, women group, etc. which helped them to minimise their daily problems.

These villages are suffering from water logging during monsoons every year. Rainwater infrastructure in these villages is insufficient to guarantee drainage of water and so the low lying areas always stay inundated. Roads stay blocked; pedestrians have to wade through flooded streets and especially the inhabitants have their homes damaged by water gushing into their homes, which would take several days to recede. These become harrowing times for the residents who are forced out on the roads.

APDPPL took significant steps to build and/or improve the rural infrastructure, thereby alleviating critical issues faced by the local communities, for the purpose of rural development.

[a] Construction and Repairs of Houses in these villages:

AF-Dahej took the initiative of building/repairing housing facilities to economic backward communities that would withstand heavy rains and other similar harsh climatic conditions thus enabling them to focus on their routine livelihood. This year we have constructed 11 New Houses and Repaired 68 Houses.in all benefiting This has benefitted **112 residents** residing in these habitats.

[b] Paving work at School:

AF-Dahej took this initiative to reduce dusting during dry weather and preventing sludge during monsoons, thus helping to maintain the sanctity and ambience within the school. This project **benefitted 425 students** studying in Dahej Boys Primary School.

[c] Rising the Height of existing compound walls in School:

We took this initiative to reduce thefts and pilferages from schools and reduced disturbances in learning environment which otherwise were caused during school hours. This project has **benefitted** total of **969 students** studying in Lakhigam & Dahej Primary schools.

[d] Provision of Solar Street Light:

This initiative involves utilizing renewable source of energy for providing lighting facilities in these villages which otherwise stayed immersed in total dark during the night. This initiative by AF- Dahej in offering basic lighting facilities to the villages has directly **benefited 3376 residents** of **Luvara village**.

[e] Miscellaneous civil work:

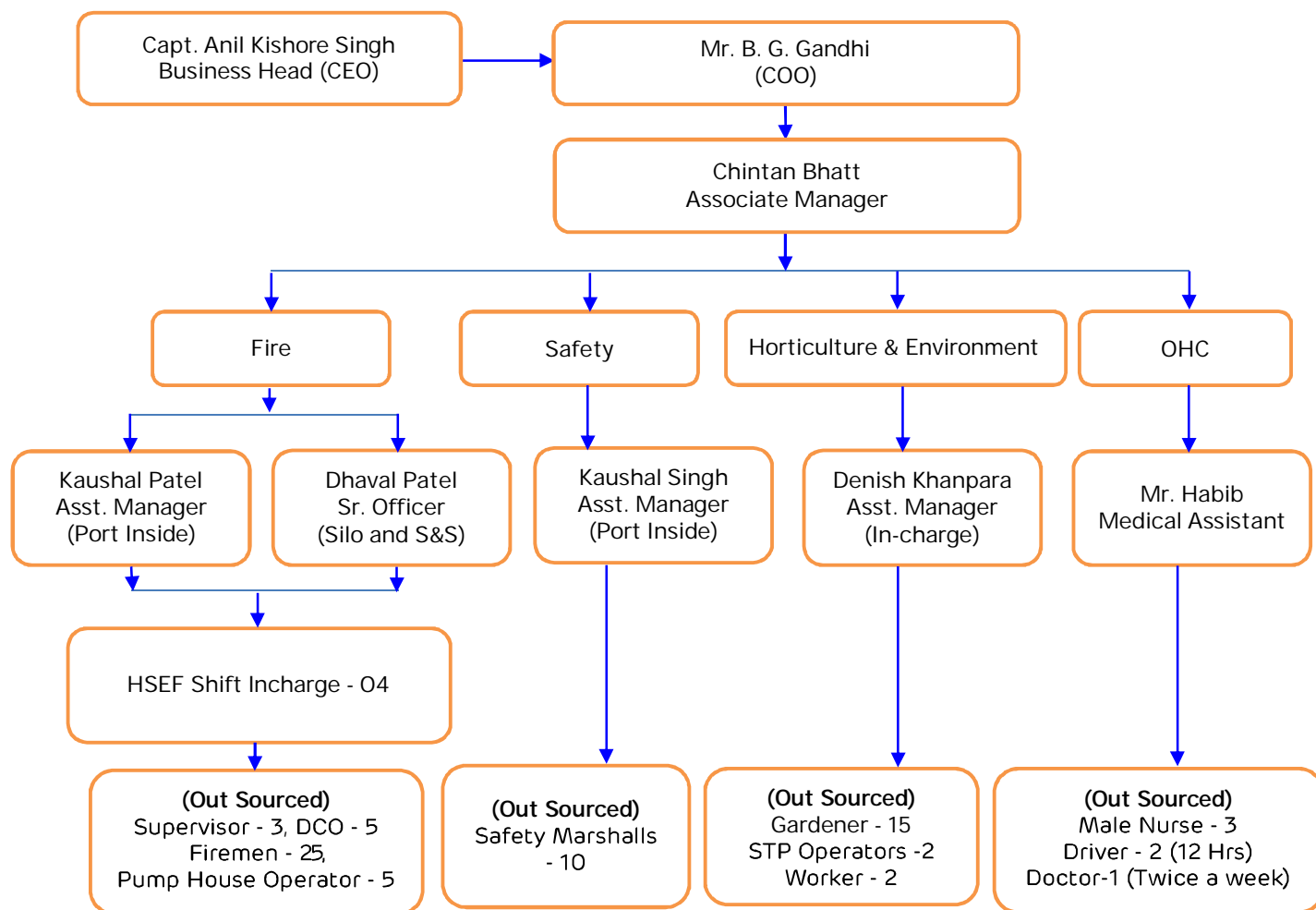
AF- Dahej has built bus stand as an amenity to the passengers commuting; toilet block facilities; Underground water tank equipped with Washing Area (Manual Launderette), thus, **benefitting 9900 inhabitants** of **Lakhigam village**.

Annexure 10 - Environment Management Cell

Annexure-10: Organogram of APPPL - Environment Management Cell

ADANI PETRONET (DAHEJ) PORT PVT. LTD.

Dept.: QHSE Management Cell



Details of Environment Cell				
S. No.	Name	Designation	Qualification	Work Experience
1.	Chintan N. Bhatt	Asso. Manager-HSE	M.Sc. Environment Science, PDIS, NEBOSH	14 Years
2.	Kaushal Singh	Asst. Manager	Dip-Mech, PGDFS, NEBOSH	10 Years
3.	Denish Khanpara	Asst. Manager	B.Sc. Horticulture, Post Diploma In Environment Technology (PDIEMT)	10 Years
4.	Kaushal Patel	Asst. Manager	B.Sc. Fire, Post Diploma In Environment Technology (PDIEMT) pursuing	12 Year
5.	Dhaval Patel	Officer	B.Sc. Fire, Post Diploma In Environment Technology (PDIEMT) pursuing	9 Year