**Reference:** Nayara/ENV/EC Compliance Report/9 to 60 MMTPA/2024/1323
19th November 2024

To,
**The Deputy Director General of Forests (C),**
**Ministry of Environment, Forest and Climate Change,**
Integrated Regional Office, Gandhinagar A wing- 407 & 409,
Aranya Bhawan, Near CH-3 Circle, Sector-10A,
Gandhi Nagar-382010

**Subject:** Six-monthly compliance report of Environment Clearance for expansion of refinery from 9 MMTPA to 60 MMTPA and Petrochemical Complex at Khambhalia, Dist- Devbhumi Dwarka, Gujarat, by M/s Nayara Energy Limited (Formerly known as Essar Oil Limited) as on 1st October 2024.

**Reference:**
1. Environment Clearance accorded to M/s Essar Oil Limited vide F. No: J-11011/320/2006-IA-II (I) dated 16th September 2008.
2. Extension of validity of Environment Clearance for 5 years vide MoEF &CC letter dated, 7th March 2014.
3. Transfer of Environment Clearance received in the name of M/s Nayara Energy Limited vide MoEF&CC letter dated 20th July 2018.

**Dear Sir,**

This has reference to the Environmental Clearance (EC) issued by Ministry of Environment, Forests & Climate Change, Government of India vide above referred letters. As per General Condition No. B (IX) of the Environmental Clearance, we hereby submit our six-monthly compliance status report for the period Apr'2024 to Sep'2024 along with relevant Annexures for your kind perusal and record please.

Thanking you,

Yours truly,

**For, Nayara Energy Limited**

**Authorized Signatory**

**Enclosures:** EC compliance report along with Annexures.

**Copy to:**
1. The Chairman, Central Pollution Control Board, Parivesh Bhavan, East Arjun Nagar, New-Delhi-110032.
2. The Member Secretary, Gujarat Pollution Control Board, Paryavaran Bhawan, Sector-10 A, Gandhinagar-382010.
3. Regional Officer, Gujarat Pollution Control Board, Jamnagar.

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**EC COMPLIANCE REPORT FOR NAYARA ENERGY LIMITED (FORMERLY KNOWN AS ESSAR OIL LIMITED), VADINAR, GUJARAT**

**Six-monthly compliance report of Environment Clearance for expansion of refinery from 9 MMTPA to 60 MMTPA and Petrochemical Complex**

**(Ref.: File No. -J-11011/320/2006-IA-II (I) dated September 16, 2008, and validity extended for 5 years vide MoEF letter No. F. No: J-11011/320/ 2006-IA-II (I), dated 7th, March 2014)**

**Status as on 1st October, 2024**

| Sr. No. | Specific Conditions | Compliance |
|---|---|---|
| I | M/s Essar Oil Limited shall comply with new standards / norms for Oil Refinery Industry Under the Environment Protection Rule 1986 vide GSR 186 (E) dated 18th March 2008. The design of refinery unit shall incorporate process features and equipment's to comply with the emission and effluent standards for petroleum refinery. | Nayara Energy Limited (Formerly known as Essar Oil Limited) is in compliance with the conditions given for Oil & Gas Industries in GSR 186 (E) dated 18th March, 2008.<br><br>The design of refinery units incorporates process features and equipment in such a manner to comply with all the norms prescribed in GSR 186 (E) dated 18th March 2008.<br><br>**Following features have been adopted in design stage to reduce air emission:**<br><br>Low Temperature Shell Claus off Gas Treating Units (LT SCOT) at sulfur recovery units.<br><br>Sulfur Recovery Unit having sulfur recovery efficiency of 99.9%.<br><br>Multistage multiple Cyclone Separator in Fluidized Catalytic Cracking & Regeneration unit for particulate emission control.<br><br>Amine Absorbers - The fuel gas produced in the refinery contains $H_2S$. This is removed in the Amine absorber columns and the sweet gas is routed to Refinery fuel gas system. |

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| | | Use of Low Sulfur Refinery fuel Gas and Fuel Oil in heaters / furnaces. Installed Low $NO_X$ burners in all heaters / furnaces.<br><br>Floating roof tanks are provided for storage of class A products; this reduces HC vapor loss. Double seal has been provided in order to minimize vapor leakage.<br><br>All vent offs are connected to the flare to take care, emergency releases from refinery plant. |
| II | The gaseous emissions ($SO_2$, NOx, $H_2S$, $NH_3$, NMHC, HC, VOC and Benzene) from various process units shall confirm to the standards prescribed by the concerned State Pollution Control Board.<br><br>All the measures detailed in the Environment Management Plan (EMP) and response to the public hearing shall be taken to control the point / stack and fugitive gaseous emission from the proposed facilities for ensuring that the ambient air quality around the refinery due to the expansion is maintained with in prescribed limit under the EPA, 1986. | The gaseous emissions parameters as prescribed by Gujarat Pollution Control Board in Consolidated Consent & Authorization (CC & A) from stacks attached to heaters / furnaces and to various process units are being complied with. It may kindly be noted that the CC&A specifies only $SO_2$, $NO_x$, PM, CO, Ni+V, $H_2S$ gases.<br><br>Refinery is operated in a closed loop, hence VOC emission is minimum. VOC are monitored as a part of LDAR program as per GSR 186 (E) dated 18th March, 2008.<br><br>For the period of Apr'24 to Sep'2024, gaseous emissions monitoring results are tabulated in **Annexure-I.**<br><br>Measures detailed in the Environment Management Plan (EMP) are attached as **Annexure-II.**<br><br>No issues raised regarding control of the fugitive gaseous emission during the Public hearing. However, Adequate control measures as mentioned above have been taken to ensure that ambient air quality around the refinery is maintained within prescribed limit.<br><br>The summary of the ambient air quality monitoring for the period of Apr'24 to Sep'2024 is given in **Annexure-III.** All the parameters are well below the limits prescribed by statutory authority. |

<table>
<tr>
<td>III</td>
<td>The company shall confirm to the process vent standards for organic chemicals including non-VOCs and all possible VOC i.e. TOCs standards and process vent standards for top priority chemicals.<br><br>Regular monitoring shall be carried out for VOC and HC and on–line monitors for VOC measurements may be installed.</td>
<td>All process vents are connected to flare.<br><br>VOC emissions are manually monitored in the vicinity of potential sources of VOC emissions.<br><br>Manual monitoring for VOC are regularly carried out as per GSR 186 (E) dated 18th March, 2008. The company has well established procedure for leak detection and repair under which VOCs are monitored in all the units manually though photo-ionization VOC meters since 2010.<br><br>LDAR program has been prepared and implemented in the refinery.<br><br>Nayara Energy Limited has hired third party M/s Hubert Enviro Care Services, Chennai for VOC monitoring.<br><br>VOC emission monitoring results for the period of Apr’24 to Sep’2024 are given in Annexure-IV.</td>
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<tr>
<td>IV</td>
<td>The total $SO_2$ emission load for 32 MMTPA refinery capacity and petrochemical complex will be below 24.60 tons/ day and for III phase for 60 MMTPA production petrochemicals shall not exceed 38.69 tons /day.<br><br>Regular record on sulfur emission shall be maintained as part of the environmental data record.<br><br>SRU of 99% sulfur removal will be established and efficiency will be monitored at regular intervals.<br><br>Performance evaluation will be done for all these activities on annual basis to check adequacies and improve on the deficiencies.</td>
<td>Presently, refinery is operating at 21 MMTPA capacity. The minimum monthly average $SO_2$ emission load is 5.25 MT/day and maximum SO2 emission load is 11.20 MT/day.<br><br>Regular records on sulfur emission are being maintained as a part of environmental data record. Details are as shown below:<br><br>$SO_2$ emission from Stack (MT/day)<br><br>
<table>
<tr><td colspan="6">Sulfur emission record based on the monitoring carried out by NABL accredited laboratory are given as below.</td></tr>
<tr><td>Apr’24</td><td>May’24</td><td>June’24</td><td>July’24</td><td>Aug’24</td><td>Sep'24</td></tr>
<tr><td>11.20</td><td>10.59</td><td>7.91</td><td>10.30</td><td>7.14</td><td>5.25</td></tr>
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| | | The refinery has three units of SRU. All SRU units are having LT-SCOT Technology with design efficiency of 99.9%. Performance evaluations of SRUs is being done on monthly basis. Presently, all SRUs are operating at 99.9% sulfur recovery efficiency. |
| V | On-line monitoring shall be carried out for stack emission of $SO_2$ & $NO_X$ contributed mainly from CDU, VDU, SRU, etc. and data shall be transferred to CPCB and SPCB regularly.<br><br>The instruments used for ambient air quality monitoring shall be calibrated regularly.<br><br>The monitoring protocol shall ensure continuous monitoring of all the parameters. | Online monitoring is being carried out for stack emission of $SO_2$ & $NO_X$ in all stacks including CDU, VDU etc. Online data are being transmitted to CPCB and GPCB server.<br><br>02 Nos. Continuous Ambient Air Quality Monitoring Stations (CAAQMS) have been installed. The Instruments used for ambient air quality monitoring are periodically calibrated by M/s Thermo Fisher Scientific. Online data are being transmitted to CPCB and GPCB server.<br><br>Continuous monitoring is being carried out and in case of any abnormality the concerned department is immediately informed, and prompt action is being taken to rectify the problem. |
| VI | The existing plant is using low NOx burners and the same or the one which are more efficient than the existing shall be used for the expansion of the projects too in all furnaces/ heaters. | Low $NO_X$ burners have been provided in all the heaters.<br><br>In expansion units, low $NO_X$ Burners have been installed in line with the burners installed in the base refinery existing unit i.e. CDU, VDU, NHTCCR, FCCH, DHDS analyzers. |
| VII | The company shall install Hydro desulphurization and sulfur recovery unit with efficiency more than 99% | Hydro desulphurization & sulfur recovery unit with efficiency 99.9 % were installed and commissioned in refinery. |

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| VIII | For additional LPG storages, refrigerated storage or mounded bullets shall be installed. | No additional LPG storages has been created after receipt of this EC & we confirm that refrigerated storage or mounded bullets will be installed for additional LPG storages, if required in future. |
| IX | Low sulfur internal fuel oil and fuel gas shall be fired in process heaters. | Internal Low sulfur fuel gas is fired in all the process heaters except CDU, VDU, CDU-II, VGOMHC and DHDT wherein mixture of low sulfur fuel oil and fuel gas is being fired. |
| X | Quarterly monitoring of fugitive emissions will be carried out by Fugitive Emission Detectors (GMI Leak Surveyor).<br>Guidelines of CPCB shall be followed for monitoring fugitive emissions. | Fugitive emissions monitoring is being carried out as per GSR (186) E, 2008. (Detailed compliance is given below in condition no XVI). |
| XI | Floating roof double seal tanks will be provided to reduce the VOC fugitives' emission.<br>For management of fugitive emissions, all unsaturated hydrocarbons will be routed to the flare systems. The flare system shall be designed for smoke less burning. | Floating roof double seal tanks have been provided to reduce the VOC fugitive emission for all Class-A & B Hydrocarbons (HC).<br>For management of fugitive emissions, all unsaturated hydrocarbons are being routed to the flare system which is designed for smokeless burning with steam. |
| XII | Flare Gas Recovery (FGR) system shall be installed for reduction of hydrocarbon loss and emission of VOCs, $NO_X$, $N_2O$, and SOx & $CO_2$ to the environment. | Provision for installing Flare Gas Recovery System has been made for reduction of hydrocarbon loss and to reduce emission of VOCs, $NO_X$, $N_2O$ and $SO_X$ & $CO_2$ to the environment. At present flare losses are minimal therefore it is flared directly. |
| XIII | FCC shall be provided with an ESP and other sources of particulate will be controlled to meet E (P) Act standards. | FCC has been provided with high efficiency multiple stage cyclone separator to ensure that the particulate emissions are within the limit. We are meeting with the E (P) Act standards by installing cyclone separator. |

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| | | Monitoring report for the FCC stack emission parameter for the period of Apr'24 to Sep'2024 is given in **Annexure-I.** |
| XIV | Regular Ambient Air Quality Monitoring shall be carried out.<br><br>The location and results of existing monitoring stations will be reviewed in consultation with the concerned State Pollution control Board based on the occurrence of maximum ground level concentration and downwind direction of wind.<br><br>Additional stations shall be set up, if required, It will be ensured that at least one monitoring station is set up in up wind & in down wind direction along with those in other direction. | Ambient Air Quality Monitoring is being carried regularly twice a week at 6 locations, in up wind, down wind direction & in cross wind direction.<br><br>The monitoring reports are regularly submitted to GPCB.<br><br>Apart from above, 2 nos. Continuous AAQM Stations have been also (One in upwind & one in downwind) installed within the Refinery premises.<br><br>Real time data of CAAQMS is being transferred to CPCB and GPCB server.<br><br>Ambient Air Quality monitoring results for the period Apr'24 to Sep'2024 carried out by M/s Unistar Environment & Research Labs Pvt. Ltd. (NABL accreditation no. for Chemical & Biological: TC-7753) are given in **Annexure-III.** |
| XV | The practice of acoustic plant design shall be adopted to limit noise exposure for personnel to an 8 hr time weighted average of 90 dB (A). | The acoustic plant design is in refinery to limit noise exposure for personnel to an 8 hr time weighted average of 90 db (A), All the equipment have been designed and are operated with noise level of <90 dB (A).<br><br>The design of project is such that the sound level in the work area is not exceeding 90 dB (A). Wherever practicable, attempts have been made to reduce the noise level below 90dB (A). However the areas where it is not reasonably practicable to reduce the noise level below the limit have been designated high noise area, where the movement is restricted and limited exposure is allowed to the working personnel.<br><br>Following measures have been adapted to reduce the noise exposure: |

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| | | ▪ The major areas of concern for noise generation has been addressed by considering it during procurement of the machinery from vendors, project implementation stage and by giving correct specification during tender floating.<br>▪ Periodic audiometric test is being conducted for employees working close to noise prone areas, such as compressors, DG Sets, the loading and unloading sections.<br>▪ PPE's are provided to ensure for eardrum protection of the employees, workers as well as visitors.<br>▪ Acoustic barriers or acoustic enclosures and silencers are provided for the high noise generating equipment.<br>▪ Sound proofing / glass paneling have been provided at critical operating stations / control rooms.<br><br>Further Periodical Monitoring of the exposure to the person working in high noise is being done. |
| XVI | All the pumps and other equipment's where is a likelihood of HC leakages shall be provided with LEL indicators and Hydrocarbon detectors. | All the pumps and other equipment where there is a likelihood of HC leakages are provided with hydrocarbon detectors with LEL indicators. Around 704 nos. of Hydrocarbon detectors have been installed in all areas where there is a likelihood of HC leakages from pumps and other equipment.<br>   |

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| | Provision for immediate isolation of such equipment, in case of a leakage will also be made.<br><br>The company shall provide a well-defined Leak Detection and Repair (LDAR) programme for quantification and control of fugitive emissions. The detector sensitivity will be in PPM levels. | The range of detector is 0-100% LEL of the Hydrocarbon of respective area and Alarm value is L1: 20% LEL and L2: 40% LEL. Standby pumps have been provided so that leaky pumps are immediately isolated and maintained.<br><br>The company has well established procedure for leak detection and repair as per GSR 186 (E) dated 18th March, 2008 under which VOCs are monitored in all the units manually though photo-ionization VOC meter since 2010.<br><br>The detection limit of the instrument used for measurement of VOC is 0.1 to 10,000 PPM. VOC monitoring for the month of Apr'24 to Sep'24 is shown in **Annexure-IV**. |
| XVII | The product loading gantry shall be connected to the product sphere in closed circuit through the vapor arm connected to the tanker.<br><br>Data on fugitive emission from here shall be regularly monitored and records will be maintained. | The LPG Loading gantry has been connected to the product sphere in closed circuit through the vapor arm connected to the tanker.<br><br>Data on fugitive emission from product gantry & nearby area is as shown in **Annexure-IV.** |
| XVIII | The company shall ensure that no halogenated organic is sent to the flares.<br><br>If any of the halogenated organic are present, then the respective streams may be incinerated, if there are no technically feasible or economically viable reduction/ recovery options.<br><br>Any stream containing organic carbon, other than halogenated shall be connected to proper flaring system, if not to a recovery device or an incinerator. | We will ensure that no halogenated organic is sent to the flare and suggested treatment will be implemented.<br><br>All other streams containing organic carbon are routed to flare system. |

<table>
<tr>
<td>XIX</td>
<td>Water requirement of the refinery and petrochemical complex shall be met from sea water desalination and no water shall be drawn either from the ground or from the surface.</td>
<td>The water requirement of the refinery is being met through seawater.<br><br>No groundwater is drawn.</td>
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<td>XX</td>
<td>No discharge of wastewater from sweet water ETP shall be carried out. The quantity of wastewater generation is 3726 $m^3$/hr from the project.<br><br>This effluent after appropriate treatment will be reused in process/ utilities or cooling or for green belt development.<br><br>Only brine from desalination plant and cooling tower blow down will be discharged to sea through a well-designed diffuser at a location identified by National Institute of Oceanography (NIO).<br><br>The quantity of sea water return is 26932 $m^3$/hr.</td>
<td>Treated Wastewater from ETP is being reused in Fire Water, Service Water, Cooling Tower make up, horticulture and RO feed.<br><br>The quantity of wastewater from ETP for the month of Apr’24 to Sep’2024 is as shown in Table below:<br><br>Wastewater from ETP
<table>
<tr><th>Month</th><th>Apr’24</th><th>May’24</th><th>June’24</th><th>July’24</th><th>Aug'24</th><th>Sep'24</th></tr>
<tr><td>Trade effluent, $M^3$/hr*</td><td>880</td><td>852</td><td>832</td><td>870</td><td>827</td><td>814</td></tr>
</table>
*Note: The quantity shown for wastewater from ETP is for 21 MMTPA refinery.<br><br>The influent is being routed to Effluent Treatment Plant (ETP) for required treatment and the entire Treated Effluent is then reused as Fire Water, Service Water, Cooling Tower make up, horticulture and RO feed.<br><br>Brine from desalination plants, RO Reject and cooling tower blow down is being discharged to sea through well designed diffuser at a location identified by National Institute of Oceanography.<br><br>The quantity of sea water return to sea is monitored daily and is well below the stipulated limits.</td>
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| | | **Month** \| **Apr'24** \| **May'24** \| **June'24** \| **July'24** \| **Aug'24** \| **Sep'24**<br>**Sea Water Return, $M^3$/hr** \| 3095 \| 3330 \| 3405 \| 2848 \| 2982 \| 3005 |
| XXI | Regular monitoring of relevant parameters for the underground water in the surrounding areas will be undertaken and the results will be submitted to the relevant States pollution Control Boards. | Monitoring of relevant parameters for the underground water in the surrounding areas is being carried out six-monthly, recent monitoring was done in May'24, results of ground water quality monitoring is given in **Annexure-VI.** Copy of EC compliance report comprising ground water quality monitoring results are being also submitted to the State pollution Control Board. |
| XXII | All organic waste shall be sent to incinerator only. For potential of heat recovery, the possibility of installing incinerator at site shall be explored and plan may be submitted to the SPCB.<br>Alternatively, it will be sent for use as fuel in the cement Kiln. | The refinery has taken membership of GPCB approved CHWTSDF & Incinerator facility of M/s SEPPL located at Bhachau, Kutch & M/s Safe Enviro Private Limited located at Magnad, Bhachau.<br>Organic waste (Oily Sludge) with high CV is being reprocessed in DCU as well as Co-processed in GPCB authorized Cement Plants. Waste/Residue containing oil, Spent carbon, contaminated cotton rags, heater deposits are also sent to cement industries for co-processing. |
| XXIII | Solid waste generated as Pre-treater and Reformer Catalysts, Sulphur guard absorbent and Alumina Balls will be disposed off as the authorization from the State Pollution Control Board.<br>Spent catalysts shall be regenerated and waste oil will be sold to the registered recycler only. | The company has obtained authorization from GPCB vide order no.: AWH-122211 issued in 2022 and valid till 2028 for collection, treatment, storage and disposal of hazardous waste, and conditions there under are being complied with.<br>As per provisions of the HW Rules 2016 the characterization of waste has been carried out. Those wastes categorized as HW, are disposed to Pollution Control Board authorized recyclers. |

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<tr><td></td><td></td><td>Used/spent oil generated from equipment is being sold to GPCB authorized recyclers.</td></tr>
<tr><td>XXIV</td><td>Oily sludge shall be sent to melting pit treatment for recovery of oil. The recovered oil shall be recycled into the refinery system.<br><br>The residual sludge will be stored in HDPE lined pit for disposal after treatment. The sludge will be incinerated in the premises only.</td><td>Oily sludge is being reprocessed in Delayed Coker Unit or co-processed in GPCB authorized Cement Plants.<br><br>Oily sludge is being stored in sludge drying pit with HDPE liner & leachate collection facility. Oily Sludge is being reprocessed in DCU or Co-processed in GPCB authorized Cement Plants.</td></tr>
<tr><td>XXV</td><td>The project authorities shall strictly comply with the provisions made in Manufacture, Storage and Import of Hazardous Chemicals rules, 1989 as amended in 2000 for handling of hazardous chemicals.</td><td>The details of the compliance of the applicable conditions are as given below<br><br>Compliance of the applicable conditions of MSIHC
<table>
<tr><th>Sr. No</th><th>Condition</th><th>Compliance Status</th></tr>
<tr><td>1</td><td>An occupier who has control of an industrial activity in term of sub-rule (I) shall provide evidence to show that he has,-<br>(a) identified the major accident hazards; and<br><br>(b) taken adequate steps to -<br>(i) prevent such major accidents and limit their consequences to persons and the environment;</td><td>a) Refinery has identified all the potential hazards linked with all kinds of operational, administrative and technical activities. Each department and units have their Environment Aspect-Impact, Hazard Identification - Risk Assessment Register as per the activities being carried out. This register is being updated from time to time.<br>b)<br>(i) Refinery has well established safety systems and procedures in place. It also has Emergency Response Disaster</td></tr>
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| | | | (ii) Provide to the persons working on the site with the information, training and equipment including antidotes necessary to ensure their safely. | Management Plan for prevention of major accidents. Mock drills are carried out timely as a part of prevention plan.<br>(ii)Refinery has a dedicated training center known as Nalanda Knowledge Centre wherein Induction training including firefighting, first aider, safety system awareness is being conducted for all the employees and contractors. In addition to this, Emergency Response Disaster Management Plan training, first aider training and safety refresher training is allotted every three years to all the personnel. |
| | | 2 | An occupier shall prepare and keep up-to-date an on-site emergency plan detailing how major accidents will be dealt with on the site on which the industrial activity is carried on and that plan shall include the name of The person who is responsible for safety on the site and the names of those who are authorized to take action in accordance with the plan in case of an emergency. | Refinery has Emergency Response Disaster Management Plan in line with the industrial activity as well as crude handling operations. |
| | | 3 | The occupier shall ensure that the emergency plan prepared in accordance with sub-rule (I) lakes into account any modification made in the industrial activity and that every | Refinery has Emergency Response Disaster Management Plan in line with the industrial activity as well as crude handling operations. |

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| | | | person on the site who is affected by the plan-is informed of its relevant provisions. | |
| | | 4 | An occupier, who has control of an industrial activity in term of sub-rule 1 of this rule, shall arrange to obtain or develop information in the form of safety data sheet as specified in Schedule 9. The information shall be accessible upon request for reference. | Refinery has a separate portal known as Process Safety Management portal wherein all the MSDS as well as chemical database are available. |
| | Necessary approvals from Chief controller of explosives must be obtained before commissioning of the expansion project. | | All necessary approvals from Chief Controller of Explosives have been obtained prior commissioning of the expansion project. | |
| | Requisite On-site and off-site Disaster Management plans will be prepared and implemented. | | Emergency Response Disaster Management Plan (ERDMP) for onsite and offsite has been prepared & implemented. | |
| | Regular mock drill shall be carried out for both On-Site and Off-site plans. | | Regular mock drills on ERDMP are conducted. Off-site emergency plan is implemented by the district administration in association with neighboring industries, mock drills are carried out regularly for the off -site emergency plan as well. We are in compliance with all the applicable conditions under MSIHC Rules 1989. | |
| XXVI | Green belt shall be provided to mitigate the effects of fugitive emissions all around the plant in a minimum of 33% | | Greenbelt has been developed in 410 Ha area around the periphery and in vacant area*. | |

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| | of the plant area in consultation with DFO as per CPCB guidelines. |   <br>Apart from this we have also done voluntary mangrove afforestation in area of 375 Ha.<br>*Note : Currently 21 MMTPA refinery is established in 1171 Ha area out of total project area of 2275 Ha. As per the current establishment, we have developed green belt in 410 Ha area which is 35 % of the plant area. |
| XXVII | The company shall strictly follow all the recommendations mentioned in the Charter on Corporate Responsibility for Environmental Protection (CREP). | CREP compliance status is given in a separate report as **Annexure-VII.** |
| XXVIII | The Company shall harvest surface as well as rainwater from the rooftops of the buildings proposed in the expansion project and storm water drains to recharge the ground water and use the same water for the various activities of the project to conserve fresh water. | Six Nos. reservoirs / ponds have been developed within refinery premises for storage and recharging of ground water. Total capacity of these ponds is 6,25,000 $m^3$.<br>Four Nos. ground water recharge wells have been made at strategic locations within refinery. |

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| XXIX | Occupational Health Surveillance of the workers shall be done on regular basis and records be maintained as per the Factories Act. | Occupational health Surveillance of the employees is being done in house on regular basis and records are maintained at Occupational Health Centre (OHC) at refinery site as per Factory Act.<br>For contractual staff also medical check-up includes audiometry test and periodic test compliance and records are ensured. |
| XXX | All the recommendations made in the EIA / EMP and Risk Assessment Reports in respect of environmental management and risk mitigation measures relating to refinery and petrochemical complex shall be implemented. In respect of activities in the marine national park, the recommendations of NIO shall be followed for protection of marine national park. | All recommendations of EIA / EMP have been implemented. Details are given in **Annexure-II.**<br><br>In respect of activities in the marine national park, the recommendations of NIO have been implemented for protection of marine national park. Details are given in **Annexure-VIII.** |

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| XXXI | The company shall undertake all relevant measures, as indicated during the public Hearing for improving the Socio-economic conditions of the surrounding area. CSR activities will be undertaken by involving local village and administration. | During public hearing various points have been discussed and the compliance status of public hearing points on Socio-economic & CSR activities are given in Annexure-IX as submitted in GPCB.<br><br>Apart from that we are committed to making positive impact in communities in surrounding village of Vadinar. We are committed to maintaining the highest standards of CSR in its business activities. This facilitates development initiatives in line with provisions under the Companies' Act, 2013, and aligns its vision with Nayara's philosophy of 4Ps – PEOPLE at the core, PROGRESS towards aspirations, POWER of synergy, and PASSION with compassion.<br><br>The initiatives are strategically designed based on community needs assessment, mapping, participatory planning and considering local feasibility. In all locations, the local Government's effort in development is supplemented with the company's resources and facilitation.<br><br>According to this philosophy whatever amount is needed as a part of CSR is spent for surrounding villagers.<br><br>Local people are being trained in technical skill required for plant operation and maintenance. These locally trained people are appointed in plant.<br><br>**CSR activities undertaken during Apr'24 to Sep'24 are given as Annexure-X.** |

| Sr. No. | General Conditions | Compliance |
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| I | The project authorities must strictly adhere to the stipulations made by the concerned State pollution Control Board (SPCB) and the State Government. | We are following the stipulations made by the Gujarat Pollution Control Board (GPCB) and the State Government. |
| II | No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment and Forests. | We confirm that no further expansion or modifications in the plant will be carried out without prior approval of the Ministry of Environment, Forest and Climate Change. |
| III | At no time, the emissions should go beyond the prescribed standards. In the event of failure any pollution control system adopted by the units, the respective unit should be immediately put out of operation and should not be restarted until the desired efficiency has been achieved. | It is ensured that the emission does not go beyond the prescribed standard as per CCA. For continuous emission monitoring of stacks (at the emission source) are provided with online analyzers for real time monitoring of parameters.<br><br>Alarm has been set in each stack for each parameter at the 90% value of emission standards mentioned in CC&A to ensure corrective action can be initiated in advance. Operators are 24 X 7 watching pollutants emission level of all stacks and immediate actions are taken in case of failure of any pollution control device/ system. |
| IV | Adequate number of influent and effluent quality monitoring stations shall be set up in consultation with the SPCB.<br><br>Regular monitoring shall be carried out for relevant parameters for both surface and ground water. | The untreated effluent received from various units is being collected in effluent collection tanks and necessary treatment is being imparted to achieve the norms prescribed in CCA for the Effluent Treatment Plant (ETP).<br><br>Influent / effluent's quantities & qualities are being monitored on a daily basis in the ETP. Treated effluent is being monitored by NABL accredited third party and results are provided in **Annexure-V.** Apart from third party for real time monitoring, online analyzers for effluent quality monitoring systems have been installed & integrated with CPCB server.<br><br>The groundwater quality of the surrounding villages is monitored six-monthly, which was last monitored in May'2024; results of the same are given in **Annexure-VI.** |

| | | |
|---|---|---|
| | | Surface water Quality monitoring (sea water) is being carried out by third parties like NIO and Gujarat Institute of Desert Ecology. |
| V | Industrial wastewater shall be properly collected and treated so to conform to the standards prescribed under GSR 422 (E) dated 1st May 1993 and 31st December, 1993 or as amended from time. The treated wastewater shall be utilized for plantation purpose. | Industrial wastewater is being collected at effluent treatment plant having primary, secondary and tertiary treatment system for treatment of effluent to meet the standards prescribed. Effluent quality parameter is within the prescribed limit mentioned in GSR 186 (E) dated 18th March, 2008. Treated water quality for the period of Apr'24 to Sep'24 is given in **Annexure-V.**<br><br>The entire Treated Effluent is then reused as Fire Water, Service Water, Cooling Tower make up, horticulture and RO feed. |
| VI | The overall noise levels in and around the plant area shall be limited within the prescribed standards by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. | The design of project is such that the sound pressure level in the work area is not exceeding 90 dB (A). Restricted areas are those locations where it is not reasonably practicable to reduce the noise level below the work area limit. Wherever practicable, attempts have been made to reduce the noise level below 90 dB (A). The noise level is not exceeding 70 dB (A) during daytime and 65 dB (A) during nighttime at the boundary of the project site. The equipment has been chosen in such a way that the above noise limit is never exceeded.<br><br>- The major areas of concern for noise generation has been addressed by considering it during procurement of the machinery from vendors, project implementation stage and by giving correct specification during tender floating.<br>- Periodic audiometric test is being conducted for employees working close to noise prone areas, such as compressors, DG Sets, the loading and unloading sections.<br>- PPE's are provided to ensure eardrum protection of the employees, workers as well as visitors.<br>- Acoustic barriers or acoustic enclosures and silencers are provided for the high noise generating equipment. |

| | | |
|---|---|---|
| | The ambient noise level shall conform to the standards prescribed under EPA Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time). | ▪ Sound proofing / glass paneling have been provided at critical operating stations / control rooms.<br><br>The ambient noise level is monitored during day and night in the periphery of refinery and found to be well within the prescribed standards. The ambient Noise level monitoring reports is given in **Annexure-XI.** All results are within limit. |
| VII | Authorization from the State Pollution Control Board must be obtained for collection / treatment /storage /disposal of Hazardous wastes. | Consolidated Consent & Authorization has been obtained from Gujarat Pollution Control Board vide Ref. No AWH-12221 dated 20.10.2022, which is valid up to 21.08.2028. |
| VIII | The project authorities will provide RS. 3853.00 Crore to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government. Adequate funds for recurring expenditure shall also be provided. The funds so provided shall not be diverted for any other purposes. | Funds as stipulated have already been ear-marked and implemented for the identified actions as per the EMP for 21 MMTPA refinery. Adequate funds for recurring expenditure are provided. |
| IX | The stipulated conditions will be monitored by the concerned Regional Office of this Ministry / Central pollution Control Board/State Pollution Control Board. A six monthly compliance report and the monitored data shall be submitted to them regularly. It will also be displayed on the website of the Company. | Six monthly EC compliance status along with monitoring report is regularly submitted to MoEF&CC- Bhopal, CPCB-New Delhi and GPCB - Gandhinagar.<br><br>The last six-monthly EC compliance report has been submitted vide letter no. Nayara/ENV/EC Compliance Report/9 to 60 MMTPA/2024/1273 dated 14/05/2024 to The Regional Office, MoEF &CC, Bhopal. Report has been displayed on the company website. |
| X | The date of financial Closure and final approval of the project by the concerned authorities and the date of commencing the land development work as well as the commissioning of the project will be informed to the Ministry and its regional Office. | The proposed expansion of 60 MMTPA is not complete yet. Presently we are operating our refinery at 21 MMTPA. All the necessary approval for the same are in place.<br><br>The details of financial closure and final approval of the project at various stages was submitted to the Ministry and its regional office vide letter no. EOL/ENV/EC refinery/2012/334, dated 25.10.2012. |

| | | |
|---|---|---|
| XI | Proper House-keeping and adequate occupational health program shall be taken up.<br><br>Regular Occupational Health Surveillance program for the relevant diseases shall be carried out and the records shall be maintained properly for at least 30-40 years. | We have implemented 5S work place management systems for continuous improvement in workplace.<br>  <br>  <br>Occupational Health Center has been established which takes care of surveillance program and maintain the records.<br>**1) Frequency of Medical Examination of Employees as well as Contract Staff**<br>**Employees:**<br>• Employees working in hazardous process – Once in six month<br>• Employees not working in hazardous process – >40 years: once in year, <40 years: once in two year<br>• **Summary of the Tests Carried out in brief**<br>**Once in six months**<br>1. Physical Examination,<br>2. Vision examination<br>3. PFT/PEFR<br>4. Blood investigation {CBC, FBS, kidney profile, Liver profile}<br>5. Urine Routine.<br>**Once in year** above + ECG + Lipid profile + Audiometry<br>**Contract staff:**<br>• Person working in hazardous process – Once in six month<br>• Person not working in hazardous process – once in year<br>• **Summary of the Tests Carried out in brief**<br>**Once in six months**<br>1. Physical Examination,<br>2. Vision examination |

| | | |
|---|---|---|
| | Sufficient preventive measures shall be adopted to avoid direct exposure to emission and other Hydrocarbons etc. | 3. PFT/PEFR<br>4. Audiometry.<br>5. Blood investigation {CBC, RBS, kidney profile, Liver profile}<br>6. Urine Routine.<br>**Once in year** ( Person not working in hazardous process) –above tests except Audiometry<br><br>Hydrocarbon and $H_2S$ detectors have been installed at strategic locations in all the units. Timely $H_2S$ and hydrocarbon exposure awareness training is being given to all the contract workman as well as employees. In addition, $H_2S$ detectors are provided to all the employees. It is mandatory for all the employees to carry personal $H_2S$ detectors during field visit. |

<table>
<tr>
<td>XII</td>
<td>A separate environment management cell with full fledge laboratory facilities to carry out various management and monitoring functions shall be set up under the control of Senior Executive.</td>
<td>The Environment Management Cell has been set up, headed by Senior Executive and reports directly to the Director. Technical qualification of staff is in table below.<br><br>Head HSEF Directly reports to Chairman and Head of Refinery.<br><br>Details Environment Management Cell
<table>
<tr><th>Sr. No.</th><th>Name of the Person</th><th>Designation</th><th>Technical Qualification</th></tr>
<tr><td>1</td><td>P. R. Dixit</td><td>VP & Head- HSEF</td><td>M. Tech Environment</td></tr>
<tr><td>2</td><td>Jay Pandya</td><td>Head Environment</td><td>M. Tech Environment</td></tr>
<tr><td>3</td><td>Asmita Patel</td><td>DGM Environment</td><td>M. Tech Environment</td></tr>
<tr><td>4</td><td>Harshit Shah</td><td>Sr. Manager Environment</td><td>B.E Electrical & PG Diploma in Environment & PG Diploma Safety</td></tr>
<tr><td>5</td><td>Jaymin Joshi</td><td>Manager Environment</td><td>M. Sc. Environmental Science.</td></tr>
<tr><td>6</td><td>Dip Jogidas</td><td>Manager Environment</td><td>B. E. Chemical Engineer, PG diploma in Environment and Sustainable Development</td></tr>
</table>
</td>
</tr>
</table>

**Annexure – I**

## Stacks Emissions Monitoring Data

**Period: Apr'2024 to Sep'2024**

**Frequency of monitoring: Monthly**

**(A) Emission through heater's/furnace's stacks:**

| Sr. No. | PLANT | Parameters monitored | | | | | |
|---|---|---|---|---|---|---|---|
| | | PM ($mg/Nm^3$) | $SO_2$ ($mg/Nm^3$) | NOx ($mg/Nm^3$) | CO ($mg/Nm^3$) | Ni ($mg/Nm^3$) | Vanadium ($mg/Nm^3$) |
| | | Min-Max | Min-Max | Min-Max | Min-Max | Min-Max | Min-Max |
| **1** | CDU | 12-56 | 114-303 | 32-64 | 6-46 | BDL | BDL |
| **2** | VDU | 20-32 | 273-487 | 42-135 | 12-72 | BDL | BDL |
| **3** | CDU - II | 5-14 | 75-1080 | 78-112 | 11-51 | BDL | BDL |
| **4** | DHDT | 2-2 | 6-19 | 34-51 | 7-23 | NA | NA |
| **5** | VGOMHC | 4-4 | 15-53 | 19-43 | 3-20 | NA | NA |
| **GPCB Limit (for Sr. No. 1 to 5)** | | **100** | **100** | **1700** | **450** | 200 | **5** |
| **6** | NHT/CCR | 4-6 | 4-9 | 35-50 | 5-56 | NA | NA |
| **7** | DHDS | 2-3 | 5-16 | 42-53 | 7-22 | NA | NA |
| **8** | FCC Feed heater | 2 – 2 | 4-14 | 37-67 | 22-73 | NA | NA |
| **9** | HMU - 1 | 2-3 | 2-5 | 10-83 | 3-33 | NA | NA |
| **10** | HMU - 2 | 2-3 | 3-6 | 17-108 | 3-15 | NA | NA |
| **11** | DCU - 1 | 2-3 | 8-17 | 32-36 | 3-38 | NA | NA |
| **12** | DCU - 2 | BDL – BDL | 7-16 | 15-50 | 3-22 | NA | NA |
| **13** | DCU - 3 | 2-3 | 6-23 | 27-41 | 3-23 | NA | NA |
| **GPCB Limit (for Sr. No. 6 to 13)** | | **10** | **10** | **50** | **350** | **150** | **-** |

## (B) Emission through processes stacks:

| Sr. No. | Plant | Parameters monitored | | | |
|---|---|---|---|---|---|
| | | Sulfur recovery (%) | $H_2S$ (mg/Nm$^3$) | NOx (mg/Nm$^3$) | CO (mg/Nm$^3$) |
| | | | Min-Max | Min-Max | Min-Max |
| **1** | SRU | 99.2-99.8 | BDL | 26-334 | 25-148 |
| **2** | SRU - 1 | 99.8-99.9 | BDL | BDL-96 | BDL-45 |
| **3** | SRU-2 | 99.9-99.9 | BDL | 26-44 | 15-39 |
| **GPCB Limit (for Sr. No. 1 to 3)** | | **98.7** | **15** | **350** | **150** |

| Sr. No. | Plant | Parameters monitored | | | | | |
|---|---|---|---|---|---|---|---|
| | | PM (mg/Nm$^3$) | $SO_2$ (mg/Nm$^3$) | NOx (mg/Nm$^3$) | CO (mg/Nm$^3$) | Ni (mg/Nm$^3$) | V (mg/Nm$^3$) |
| | | Min-Max | Min-Max | Min-Max | Min-Max | Min-Max | Min-Max |
| **4** | FCC Regenerator | 23-52 | 112-168 | 105-238 | 18-292 | BDL | BDL |
| **GPCB Limit (for Sr. No. 4)** | | **100** | **500** | **400** | **400** | **2** | **2** |

**Legends:**

| | | | |
|---|---|---|---|
| CDU/VDU | Crude Distillation Unit / Vacuum Distillation Unit | $SO_2$ | Sulfur Dioxide |
| CDU - II | Crude Distillation Unit – II | NOx | Oxides of Nitrogen |
| NHT/CCR | Naphtha Hydro Treater/ Continuous Catalytic Reforming | $H_2S$ | Hydrogen Sulfide |
| DHDS | Diesel Hydro de Sulfurization | CO | Carbon Monoxide |
| FCCU | Fluidized Catalytic Cracking Unit | Ni | Nickel |
| HMU | Hydrogen Manufacturing Unit | V | Vanadium |
| DHDT | Diesel Hydro Treater | | |
| VGOMHC | VGO Mild hydrocracker | | |
| DCU | Delayed Coker Unit | | |
| SRU | Sulfur Recovery Unit | | |
| PM | Particulate Matter | | |

**NA: Not applicable, BDL: Below Detection Limit**

**Annexure-II**

## Environmental Management Plan

Environmental Management Plan for mitigation of adverse impacts on environment due to Refinery operations is as follows:

**Air Pollution Prevention / Control Measures:**

Air pollution prevention / Control measures adopted at site are as following:

- Installed Low Temperature Shell Claus off Gas Treating (LT SCOT) Technology at sulfur recovery units.
- Installed Multistage Cyclone Separator in Fluidized Catalytic Cracking & Regeneration unit for particulate emission control.
- Installed Amine Absorbers - The fuel gas produced in the refinery contains $H_2S$. This $H_2S$ is removed in the Amine absorber columns and the sweet gas is routed to Refinery fuel gas system. Subsequently $H_2S$ is stripped out from rich amine in amine regeneration unit. Lean amine is reused while $H_2S$ is sent to sulfur recovery unit.
- Use of Low Sulfur Fuel - Refinery Fuel Gas, Natural Gas and Fuel Oil containing low Sulfur are used as fuel in heaters / furnaces.
- Installed Low $NO_X$ burners in all heaters / furnaces.
- Installed Sulfur Recovery Units having sulfur recovery efficiency of 99.7%.
- Floating roof tanks: Floating roof tanks are provided for storage of class A products; this reduces HC vapor loss. Double seal has been provided to minimize vapor leakage.
- Good Flare Management- all vent offs are connected to the flare to take care emergency releases from refinery plant.
- All access roads (internal as well as external) which is being used are paved either with concrete or bitumen to suppress the dust generation along the roads.

**Air Environment:**

The major sources of air emission is process emissions from FCCU, SRU and emissions from fuel burning in the different heaters / furnaces of refinery's plant operations. To minimize impacts, major steps taken are following:

- Regular monitoring and record keeping of emission at refinery as part of environmental data records.
- Monitoring the Performance of Sulfur Recovery Units (SRU) on a monthly basis.
- Energy conservation schemes have been launched, for instance, steam traps management, variable speed control drive.
- Leak Detection and Repair Program (LDAR) has been implemented in the refinery. The program includes leak detection of valves, flanges, pumps, floating & fixed rooftop of tanks etc. Total 68120 points were monitored during Apr'24 to Sep'24.
- Stack Monitoring Facility (SMF) have been provided at proper location in all stacks.
- Ambient air quality is being monitored simultaneously at 6 locations within refinery premises twice a week.
- Two Continuous Ambient Air Quality Monitoring stations (CAAQMS) have been installed. The same has been hooked up with CPCB and GPCB server.
- Continuous Emission Monitoring System (CEMS) has been hooked up with CPCB and GPCB server.
- To minimize occupational exposure / hazards, the practice of using personal protective equipment like helmets, safety (gas) masks/ safety dress, shoes etc. is followed, they are provided to all workers, engaged in operation of process units within the refinery complex.
- The health checkup (diagnostic) for all regular employees at the refinery complex at scheduled intervals is carried out and the corresponding health records are maintained.

**Noise Environment:**

The design of the project is such that the sound level in the work area does not exceed 85 dB (A). Restricted areas are those locations where it is not reasonably practicable to reduce the noise level below the work area limit. Wherever practicable, attempts have been made to reduce the

noise level below 85dB (A). The noise level does not exceed 70 dB (A) during daytime and 65 dB (A) during nighttime at the boundary of the project site. The equipment has been chosen in such a way that the above noise limit is never exceeded. The noise levels at the nearest habitation after refinery expansion is less than the stipulated standards of CPCB. Good Standard Operational Procedure, the following generic measures have been implemented in base refinery and same will be implemented in addition to the existing green belt, in the future expansion of the project:

- The major areas of concern for noise generation have been addressed by considering it during procurement of the machinery from vendors, project implementation stage and by giving correct specification during tender floating.
- Monitoring of job and location specific noise levels for compliance with HSE regulations by verifying acceptability of noise levels caused by the project activities and comparison with noise criteria.
- Periodic audiometric test is being conducted for employees working close to noise prone areas, such as compressors, DG Sets, the loading and unloading sections.
- PPE's are provided to ensure eardrum protection of the employees, workers as well as visitors.
- Acoustic barriers and silencers have been used in equipment wherever necessary.
- Sound proofing / glass paneling have been provided at critical operating stations / control rooms.
- Either acoustic barriers/ shelters shall be developed in noisy workplaces or acoustic enclosures are provided for the high noise generating equipment
- Monitoring of ambient noise levels is carried out regularly inside the refinery area.

**Water & Wastewater Environment:**

- **Water:** The main source of water requirement for the refinery is sea water. Sea water is drawn from Gulf of Kutchh by a 44 inch pipeline laid from Gulf of Kutch to refinery site. Sea water is mainly used as cooling media in cooling towers and for producing sweet water by desalination plant. Cooling Tower blow down, desalination plant reject, and RO reject are sent back to sea via a 52 inch pipeline and diffuser system. Sweet water is used for producing DM water, steam, and potable water and in process / operation.

- **Wastewater:** Main source of wastewater generation is refinery operations. Wastewater is treated in the wastewater treatment plant. Full quantity of treated wastewater is reused / recycled for cooling towers, fire water make-up, green belt and feed to RO plant.
  The quality of treated water is monitored daily to ensure that treated water quality is always in compliance with statutory limits.
- Continuous Effluent Monitoring has been hooked up with CPCB and GPCB server.

- **Land Environment:**
- Soils in the adjoining areas are sandy loam to silty loam with moderate infiltration rates. Considering this fact, every precaution has been taken to avoid spillage of oils and other petroleum products on soils to protect groundwater and to avoid any danger to other soil microbial groups which are sensitive to oil pollution.
- Green belt coverage inside the refinery is well maintained.
- Adequate storage facility for temporary storage of hazardous and non-hazardous wastes has been created within refinery premises.

**Green Belt Development:**

A large green belt area has been developed along the periphery of the refinery at Vadinar. 410 Ha. area is covered under thick Green Belt in refinery and associated facilities.

**Annexure – III**

## Ambient Air Quality Monitoring

**Period: Apr'2024 to Sep'2024**

| Particulars/ Parameters | Unit | GPCB CC&A Limit | At 93 Gate | Refinery Main Gate | Labor Gate | Main Flare | COT | Coal Storage Yard |
|---|---|---|---|---|---|---|---|---|
| | | | Min-Max | Min-Max | Min-Max | Min-Max | Min-Max | Min-Max |
| $PM_{2.5}$ | $\mu g/m^3$ | **60 (TWA 24 hrs)** | 14-32 | 12-32 | 12-28 | 14-32 | 12-33 | 12-34 |
| $PM_{10}$ | $\mu g/m^3$ | **100 (TWA 24 hrs)** | 50-86 | 50-88 | 51-88 | 50-88 | 51-84 | 51-88 |
| Sulphur Dioxide ($SO_2$) | $\mu g/m^3$ | **80 (TWA 24 hrs)** | 10-22 | 11-22 | 10-19 | 10-20 | 10-19 | 12-20 |
| Nitrogen Oxides ($NO_2$) | $\mu g/m^3$ | **80 (TWA 24 hrs)** | 15-26 | 14-26 | 16-24 | 14-25 | 13-24 | 13-23 |
| Carbon Monoxide (CO) | $mg/Nm^3$ | **2 (TWA 8 hrs)** | BDL | BDL | BDL | BDL | BDL | BDL |
| Benzene | $\mu g/m^3$ | **5 (TWA Annual)** | BDL | BDL | BDL | BDL | BDL | BDL |
| Benzo(a) – Pyrene | $ng/m^3$ | **1 (TWA Annual)** | BDL | BDL | BDL | BDL | BDL | BDL |

| | |
|---|---|
| **TWA** | **Time Weighted Average** |
| **BDL** | **Below Detection Limit** |
| **PM10** | **Particulate Matter of size less than 10 micron** |
| **PM2.5** | **Particulate Matter of size less than 2.5 micron** |

**Annexure - IV**

## Volatile Organic Compound (VOC) Monitoring

**Sampling period: Apr'24 to Sep'24**

**Frequency of monitoring: Monthly**

| Sr. No. | VOC monitoring area / unit / plant | Unit | VOC Min-Max |
|---|---|---|---|
| 1 | Near Truck Gantry (HC Truck Loading) | ppm | 0.8 - 4.5 |
| 2 | Primary Treatment Unit of Truck Dispatch Area | ppm | 17-24 |
| 3 | Expansion ETP | ppm | 16.6 - 76 |
| 4 | Hazardous waste storage sites | ppm | 0 |
| 5 | Primary Treatment Unit of ISBL-1 process | ppm | 16-31 |
| 6 | At Battery Limit in CDU/VDU | ppm | 0 |
| 7 | At Battery Limit in CDU – II | ppm | 0 |
| 8 | Downwind of Oil Separation Basin Unit-8400 of base ETP | ppm | 42-60 |
| 9 | Primary Treatment Plant of Crude Tank Storage (COT) Area | ppm | 14-21 |
| 10 | Sludge Pit 1 | ppm | 0 |
| 11 | Sludge Pit 2 | ppm | 0 |
| 12 | Sludge Pit 3 | ppm | 0 |

Note: Monitoring is carried out in the areas where probability of hydrocarbon presence is high. Monitoring is done by hand held (portable meter – detection limit 10000 ppm) VOC meter on monthly basis.

## Unit wise Monitoring Report

| Sr. No. | Unit | Total Components Monitored (Nos) (Valves, Flanges, Seals and Valve Glands) | Min TVOC (PPM) | Max TVOC (PPM) | TVOC After Leak attention (PPM) | Total Emissions before leak attention kg/ yr. | Total Emissions after leak attention kg/ yr. |
|---|---|---|---|---|---|---|---|
| 1 | ISOM | 6751 | 0 | 527.9 | 310.2 | 2.15 | 1.44 |
| 2 | HMU-1 | 4258 | 0 | 848 | 0 | 3.06 | 0.00 |
| 3 | COT | 3719 | 344.6 | 987 | 987 | 6.37 | 6.37 |
| 4 | PIT Unit | 22731 | 776.9 | 6854 | 3154 | 22.63 | 13.42 |
| 5 | DHDT | 8310 | 0 | 988 | 0 | 3.43 | 0.00 |
| 6 | DCU | 17833 | 0 | 609.1 | 0 | 2.39 | 0.00 |
| 7 | HMU-2 | 3723 | 0 | 0 | 0 | 0.00 | 0.00 |
| 8 | HMU MINI | 270 | 0 | 0 | 0 | 0.00 | 0.00 |
| 9 | DHDT | 525 | 0 | 0 | 0 | 0.00 | 0.00 |
| | Total | **68120** | **1121.5** | **10814** | **4451.2** | **40.03** | **21.23** |

*Total 77597 points monitored where the initial Total Volatile Organic compounds concentration was 747 kg/ yr. and after attending the leak the TVOC concentration was 465 kg/ yr.*

**Legends:**

| | |
|---|---|
| CDU/VDU | Crude Distillation Unit / Vacuum Distillation Unit |
| CDU - II | Crude Distillation Unit – II |
| NHT/CCR | Naphtha Hydro Treater/ Continuous Catalytic Reforming |
| DHDS | Diesel Hydro de Sulfurization |
| FCCU | Fluidized Catalytic Cracking Unit |
| VGOMHC | VGO Mild hydrocracker |
| PIT | Product Intermediate Tank |
| ETP | Effluent Treatment Plant |
| COT | Crude Oil Tank |
| VOC | Volatile Organic Compounds |

**Annexure – V**

## Treated water quality monitoring data

**Period: Apr'2024 to Sep'2024**

**Frequency of monitoring: Monthly**

| Pollutant Parameters | Unit | Limit specified by SPCB in CCA | Quality of Treated Effluent* Min-Max |
|---|---|---|---|
| pH | - | 6.5 – 8.5 | 7.1-8.01 |
| Suspended Solids | mg/l | 20 | 12-16 |
| Oil & Grease | mg/l | 5 | <2 |
| Phenol (as $C_6H_5OH$) | mg/l | 0.35 | <0.1 |
| Sulphide (as S) | mg/l | 0.50 | 0.21-0.24 |
| BOD (3 days, 27 $^oC$) | mg/l | 15 | 11-13 |
| COD | mg/l | 125 | 64.2-81.2 |
| Cyanide (as CN) | mg/l | 0.2 | <0.05 |
| Ammonia as N | mg/l | 15 | <2 |
| TKN | mg/l | 40 | <2 |
| P | mg/l | 3 | 0.022-0.034 |
| Cr (Hexavalent) | mg/l | 0.1 | <0.05 |
| Cr (Total) | mg/l | 2 | <0.05 |
| Pb | mg/l | 0.1 | <0.01 |
| Hg | mg/l | 0.01 | <0.001 |
| Zn | mg/l | 5 | <0.05 |
| Ni | mg/l | 1 | 0.011-0.014 |
| Cu | mg/l | 1 | 0.064-0.076 |
| V | mg/l | 0.2 | <0.01 |
| Benzene | mg/l | 0.1 | <0.001 |
| Benzo(a)- Pyrene | mg/l | 0.2 | <0.001 |

*Third party monitoring results.

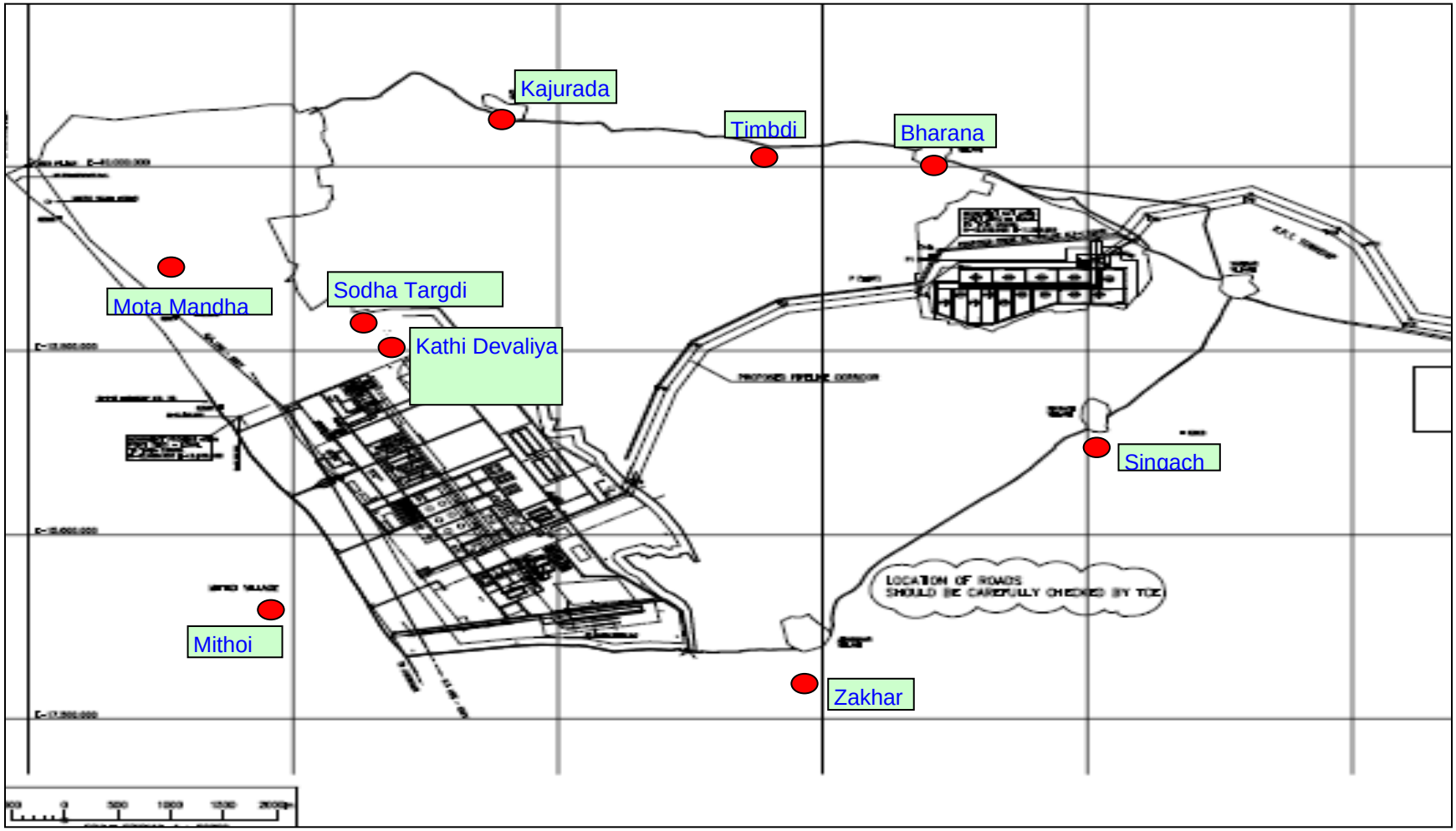
**Annexure – VI**

## Monitoring Results of Ground Water Quality of Surrounding Village

### Parameters analyzed

| Parameters | Unit | Vadinar | Timbdi | Bharana | Mithoi | Kathi Devaliya | Zakhar | Singach | Kajurada | Sodha Taragadi |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| pH | --- | 8.02 | 7.21 | 7.97 | 7.91 | 7.27 | 7.63 | 7.65 | 7.23 | 7.87 |
| TDS | ppm | 660 | 1450 | 321 | 656 | 3580 | 995 | 1380 | 4810 | 505 |
| Chloride | ppm | 140 | 423 | 78 | 169 | 1230 | 306 | 385 | 2280 | 101 |
| Sulphate | ppm | 94 | 154 | 49 | 75 | 232 | 72 | 118 | 280 | 65 |
| T-Hardness | ppm | 288 | 912 | 175 | 404 | 2050 | 710 | 916 | 2570 | 350 |
| Ca-Hardness | ppm | 173 | 590 | 84 | 234 | 1160 | 413 | 556 | 1250 | 189 |
| Mg-Hardness | ppm | 115 | 322 | 91 | 170 | 890 | 297 | 360 | 1320 | 161 |
| O & G | ppm | <4 | <4 | <4 | <4 | <4 | <4 | <4 | <4 | <4 |

*** Well water samples collected and analyzed in May, 2024**




**Location of Villages**

**Annexure – VII**

## CHARTER ON CORPORATE RESPONSIBILITY FOR ENVIRONMENTAL PROTECTION

**Sector: Petroleum Crude Oil Refineries**

**March 2003**

**Name of Industry – Nayara Energy Limited (formerly Essar Oil Limited)**

**Address –** Post Box No.24, PO: Khambhaliya, Jamnagar – Okha Highway

Devbhoomi Dwarka, Vadinar – 361305

Code - 09

| Sr. No. / Activity code No. | Action Point (in brief) | Action Taken Report |
|---|---|---|
| **A** | **AIR POLLUTION MANAGEMENT** | |
| 1. | All the refineries located in the critically polluted areas, identified by CPCB, will submit an action plan (within six months) for phase wise reduction of $SO_2$ emission from the present level | *Not Applicable:(Our refinery is neither identified by CPCB nor located in critically polluted area, hence condition is not applicable to us)* |
| 2. | Future refineries will have Sulphur Recovery Unit (SRU) with minimum 99% efficiency | *SRUs are operating at an average above 99% sulfur recovery efficiency.* |
| 3. | To enhance the efficiency of SRUs in the existing refineries, an expert committee will be constituted to look into various aspects and suggest a road map within six months. | *All the SRUs are provided with LTSCOT technology to enhance the efficiency of SRUs.* |

| Sr. No. / Activity code No. | Action Point (in brief) | Action Taken Report |
|---|---|---|
| 4. | With regard to NOx emission, the new refineries/process units will install low NOx burners. For retrofitting of low NOx burners in existing units, the expert committee will suggest the strategies and action plan within six months including NOx standard. | *All Heaters / boilers are equipped with Low NOx burners.* |
| 5. | The flare losses will be minimized and monitored regularly | *Flare loss is being estimated based on material balance and immediate actions are being taken to minimize losses.* |
| 6. | Refineries will install continuous emission monitoring systems for SOx and NOx in major stacks with proper calibration facilities. Action plan for this will be submitted within six months | *Stacks are provided with on-line continuous emission monitoring systems (OCEMS) for parameters $SO_2$ and $NO_x$ since start-up of refinery.*<br>*Coninuous Emission Monitoring data is being submitted on Central Pollution Control Board and Gujarat Pollution Control Board server.* |
| 7. | Refineries will also monitor total HC and Benzene in the premises (particularly at loading / un-loading operations and ETP). The status and action plan will be submitted within six months. | *VOC monitoring is carried out in the vicinity of all potential sources of HC emission such as Primary ETP, Secondary ETP, Truck Loading Gantry, and Rail Loading Gantry. This is being done on monthly basis. VOC emission monitoring results are attached as Annexure-IV.*<br>*The detection limit of the instrument used for measurement of Volatile Organic Compunds is 0.1 to 10,000 PPM.* |

| Sr. No. / Activity code No. | Action Point (in brief) | Action Taken Report |
|---|---|---|
| 8. | The expert committee will also suggest an action plan, within six months, for control and monitoring of hydrocarbon loss & VOC emissions, leak detection and repair (LDAR) program and vapor recovery systems (for loading & unloading operations within refineries only. | *We have established LDAR program. Under this program, total 68120 points were monitored during April'24 to Sep'24.* |
| **B** | **WASTE WATER MANAGEMENT** | |
| 1. | Refineries will prepare action plan for conservation of water resources and maximizing reuse/ recycling of treated effluent within six months. The treated effluent discharge quantity (excluding once through cooling water) will be limited to 0.4 $m^3$/per Ton (for 90% of time) except for the monsoon season. | *During period of Apr'24 to Sep'2024, Approx 90% of treated effleunt was reused / recycled within refinery for the fire water make up, service water, cooling tower make up, as a RO feed and in green belt area.* |
| 2. | Oil spill response facilities at coastal refineries will be in position within two years. To facilitate this, MoEF will coordinate with Coast Guards, Port Trust and other departments. | *Oil Spill Disaster Contingency Plan Tier-1 response has been approved by Indian Coast Guard (ICG). Regular Oil spill mock drills (once in 6 month Tier-1 mock drill) are conducted with ICG & Dindayal Port Authority (Formerly known as Kandla Port Trust KPT).* |
| **C** | **SOLID WASTE MANAGEMENT`** | |
| 1. | Refineries will explore new technologies for reduction in the generation of oily sludge. Strategy and action plan for liquidation of existing sludge will be submitted within six months | *ETP Oily sludge is recycled in Delayed Coker Unit(DCU), apart from that oily sludge is sent to M/s Digvijay Cement Company for co-processing* |

| Sr. No. / Activity code No. | Action Point (in brief) | Action Taken Report |
|---|---|---|
| 2. | The petroleum coke having high sulphur content will only be sold to/ reused by organized industries (having consent from SPCBs), which have systems to control $SO_2$ emissions. This will be ensured by June 2003. | *Pet coke is sold to reputed Cement Manufactures such as ACC, Ambuja, Shree Cement, JK Cement, Ultratech Cement, Diamond Cement, Manglam Cement, Orient Cement etc.* |
| **NEW ACTION POINTS AS PER FIRST MEETING ON REVISED NATIONAL TASK FORCE HELD ON OCTOBER 09, 2009** | | |
| 1 | Refineries will carry out monitoring and survey to assess HC loss and concentration of VOC in Ambient Air/ Wastewater treatment plant. (Action plan was to be submitted by Jan 2010) | *Same as Sr. No. 8 above under Air Pollution Management tab.* |
| 2 | Refineries will assess the quantity of flare gas. (Install the measurement system if the same is not possible) (Action plan was to be submitted by March 2010) | *The flare loss is being assesed on mohtly basis and monthly avg. flare loss for the period of Apr'24 to Sep'24 is 0.20 % of crude processed.* |
| 3 | Assessment of Potential leakages from petroleum storage tanks. (Action plan was to be submitted by Jan 2010) | *All tanks are above grounds. The highly volatile products / crudes are stored in floating roof tanks which are monitored regularly; so far we did not find any leakages from these tanks.* |
| 4 | Cleaner Technology options and information to be provided to CPCB. (to be submitted by Feb 2010) | *In addition of Fuel Oil and Fuel Gas, we are using NG as fuel in heaters / furnaces to the extent of NG available in the market.* |

**Annexure – VIII**

## NIO'S RECOMMENDATIONS & THEIR COMPLIANCE STATUS

NIO carried out Environment Impact Assessment (EIA) sequential studies for marine facilities of M/s Essar Oil Ltd (Now, Nayara Energy Limited), Vadinar from 1994 onwards. The compliance status of the salient recommendations stipulated in those studies is given below:

1. **Diffuser for discharge of return sea water into Gulf of Kutch:**
   Diffuser has been installed as per the design and recommendations of NIO.

2. **Overall Risk Assessment of Marine Facility:**
   Risk assessment was carried out through the third party, viz. M/s Enviro-Software, Bangalore.

3. **Contingency plan for Oil Pollution Control:**
   Based on overall risk assessment, Oil Spill Disaster Contingency Plan has been prepared, vetted by Indian Coast Guard and then implemented.

4. **Translocation of Corals:**
   Coral transplantation was carried out by NIO in consultation with Department of Forests, Government of Gujarat.

5. **Periodic Monitoring of Corals and Mangroves:**
   Initially, monitoring were carried out on half yearly basis for couple of years and thereafter it were undertaken on yearly basis as per NIO's recommendation and GoG's directives. Latest comprehensive marine monitoring along with the monitoring of Corals & Mangroves was done by NIO in March, 2023.

6. **Monitoring of Marine Environment:**
   Marine environment is being monitored for water and sediments quality every month by third party – M/s Gujarat Institute of Desert Ecology (GUIDE), Bhuj from November'2010 onward.

7. **Erection and Installation of all Marine Structures:**
   Erection and installation of all Marine Structure was carried out as per the recommendation of CWPRS (Central Water Power Research Station) and NIO.

**8. Periodic Inspection and Replacement of Flexible Hoses:**

Periodic inspection and replacement of hoses are carried out as per schedule and maintained as per OEM, OCIMF and requirements of our Class ABS. The flexible hoses were tested in Nov'2023 for their integrity as per international norms and were found satisfactory after pressure test. The safety breakaway couplings have been provided in the system.

**Annexure - IX**

**Compliance status of Public Hearing points on Socio-economic & CSR activities**.

During public hearing following point has been discussed and the compliance of the same as submitted in GPCB is given below:

| Sr. No. | Public Queries | PH coordinating Officer's Reply | Compliance Status |
|---|---|---|---|
| **Shri Jitubhai Bhatt local villager, stated** | | | |
| **1** | Due to any Industrial activity people get direct employment as well as indirect employment. This company should therefore keep local village people in direct employment.<br><br>Skilled category people are being recruited from outside the State. Company should make necessary arrangement to see that locals are made skilled and then recruited these locally skilled people within the company. | Company is complying with the GR of Government of Gujarat regarding 85% of local employment. Since the definition of the local as stated earlier is restricted to state of Gujarat as whole and so it is not within the purview of this company to change the definition of "locals".<br><br>The company officials further informed that if qualified persons are available from nearby area the company is committed to give top priority to them. | Being complied as per commitment |
| **Shri Dilipbahi Jadeja, Ex Sarpanch of Vadinar, stated** | | | |
| **2** | Each farmer whose land has been acquires should be given employment within the company. | At present no additional land is going to be acquired. The present land was acquired way back in the year 1993. Also, that preference would be given to people of the nearby village as per their skills. | Being complied as per commitment |
| **3** | Fodder for the cattle of nearby villages should be provided by the company | Fodder distribution in nearby villages is being done; Infrastructures - Gaushalas of nearby area have been upgraded. | Fodder is being distributed in 12 villages on monthly basis namely Sodha Targadhi, Kathi Devalia, Timbdi, Bharana, |

| | | | |
|---|---|---|---|
| |  <br>**Gaushala Construction** |  <br>**Gaushala Renovation** | Rasangpar, Modpar, Kajurda , Vadinar, Vadaliya Sihan, Zakhar, Singach, Mithoi.<br><br>Gaushala in Mithoi village was renovated in month of January 2024 this year. |
| **4** | Pipelines for water supply in vadinar village should be provided by the company. | Water supply Pipeline has been laid to 4 villages namely Mithoi, Zankhar, Singach & Vadinar and rest 6 villages are provided with drinking water by road tankers. | Continued being complied |
| **Shri Chandubhai Jadeja of village Vadinar, stated** | | | |
| **5** | The company should give preference in employing people of nearby area so that socio economic status of the nearby area also upgraded. He further added that company should initiate for an ITI center in coordination with Government, so that youth of the nearby village can take necessary advantage. | They welcome the suggestion for setting up an ITI center and would try to support such institute if the government proposal in this regard comes to it.<br>Separate budget is allocated under CSR. | Youth skilling activities are being taken up with ITI's in Khambhalia, Jamnagar and Youth Employability Skill (YES) Centers in Jamnagar, Vadinar and Technical Training Centre in Jamnagar. During the period of April -Sept 2024, below activities were taken up :<br><br>a. 758 youth were trained in 21st century skill (basis of English, IT, personality development, communication and life skills )<br><br>b. 710 youth were trained in certificate course in computers |

| | | | |
|---|---|---|---|
| | | | (CCC), beauty & wellness, General Duty Assistant (GDA) and tally.<br><br>c. 37 youth were trained in AutoCAD and CNC programing. |
| **Shri Kishorsinh Jadeja of Jankhar village, stated** | | | |
| **6** | The company should give employment to people whose land has been acquired. | At present no additional land is going to be acquired. The present land was acquired way back in the year 1993. However, company has taken approx. 300 people of nearby area for greenbelt development purpose. | Continued being complied |
| **Shri Mahesh Pandya from Paryavaran Mitra, stated** | | | |
| **7** | Government GR of 85% local employment should be implemented. | Government GR of 85% local employment has been already implemented. | Continued being complied |
| **8** | Nearby villagers should be given preference for new recruitment. | If qualified person is available in nearby area, company is giving priority to them. | As per the skill set and qualification, company is employing nearby villagers. |

**Annexure-X**

## CSR Activities of Nayara Energy Limited

Nayara Energy Limited is committed to maintaining the highest standards of Corporate Social Responsibility (CSR) in its business activities and aims to make a difference to the communities around. Nayara Energy Limited collaborates with key stakeholders, especially the local administration and institutions to facilitate development with initiatives in education, livelihoods, women's empowerment, and health. The interventions are in line with the UN Sustainable Development Goals (SDGs) and the provisions under the Companies' Act, 2013

**CSR Activities carried out in Apr'24 to Sep'24 are as under:**

| S No | Thematic Area | Activity Description | Expenditure in Cr |
|---|---|---|---|
| 1 | Health & Sanitation | Community Health Services in 15 Villages neighbouring Vadinar Refinery | 0.76 |
| 2 | | Insurance for TT Drivers and FSM | 0.45 |
| 3 | | Nutrition support to TB Patients: Eradication of Tuberculosis | 0.5 |
| 4 | | Project Tushti 2.0 | 1.29 |
| 5 | | State Level Centre of Excellence | 1.2 |
| 6 | | Swachh Halar | 0.06 |
| 7 | Sustainable Livelihood | Gram Samruddhi 1.0 | 1.36 |
| 8 | | Gram Samruddhi 2.0 | 1.21 |
| 9 | | Multi Utility Centre | 0.01 |
| 10 | | Project EXCEL | 2.5 |
| 11 | Rural Development | Village Transformation Projects - Model village / Sports promotion/ Expansion of ongoing projects / Research/ Assessments | 0.11 |
| **Total** | | | **9.45** |

**Annexure - XI**

## Noise Monitoring Results

**Period: Apr'2024 to Sep'24**

**Frequency of monitoring: Monthly**

| Locations | Noise Level, dB(A) during Day Time 06:00 am to 10:00 pm | Noise Level, dB(A) during Night Time 10:00 pm to 06:00 am |
|---|---|---|
| Ambient Station at Port A Camp | 46.6 – 49 | 44.8 - 47.6 |
| Ambient Station at Labour Gate | 49 – 50 | 47 – 49 |
| Ambient Station at West side of Main Flare1 | 48 – 50 | 45.8 – 49.4 |
| Nr. Batching Plant | 48.4 – 50.6 | 47 – 48.8 |
| Ambient Station at 93 Gate | 47 – 49 | 45.2 – 48.0 |
| Storm water drain outlet | 49 – 52 | 47.6 – 50.2 |
| Ambient Station at Refinery Main Gate | 48 – 50.4 | 46.6 – 47.8 |
| Petrol Pump (Near Delhi Darbar) | 50 – 52.2 | 48.4 – 49.8 |
| Ambient Station at Pet Coke Rail Loading Yard | 44.6 – 49.2 | 42.4 – 48.4 |
| **Ambient Air Quality standards in terms of Noise for industrial area** | **75 dB(A)** | **70 dB(A)** |