नुमालीगढ़ रिफाइनरी लिमिटेड
भारत सरकार का उपक्रम
নুমলীগড় ৰিফাইনেৰী লিমিটেড
ভাৰত চৰকাৰৰ এক প্ৰতিষ্ঠান

NUMALIGARH REFINERY LIMITED
A GOVERNMENT OF INDIA ENTERPRISE

Ref:

Date: DATE: 01.06.2022

To

The Regional Officer,
Ministry of Environment, Forest and Climate Change,
Integrated Regional Office, Guwahati,
4th Floor, Housefed Building, GS Road, Rukminigaon Guwahati-781022

Ref. No: NRL/ENV/MOEFCC/22-23/02

Sub: Submission of Half Yearly Compliance status on Environment Stipulation during the period **Oct'21 to March'22.**

Dear Sir,

Kindly find enclosed herewith the point wise Half Yearly EC Compliance Status pertaining to the conditions of following ECs granted to Numaligarh Refinery.

| SN | Project Name | MoEF&CC File No. | EC issued Date |
|---|---|---|---|
| 1 | i)Petroleum Refinery at Numaligarh (3 MMTPA) | i)J-11011/16/90-IA. II | May 31,1991 (EA) |
| 2 | BS-III Motor Spirit Project at NRL | J-11011/92/2003-IA II (I) | February 13, 2004 |
| 3 | Coke-Calcination Unit (0.1 MMTPA) | J-11011/203/2003-IA II (I) | March 22, 2004 |
| 4 | Diesel Quality Up-gradation Project (DQUP) at NRL | J-11011/272/2008-IA-II (I) | November 10, 2008 |
| 5 | Paraffin Wax | J-11011/113/2009-IA-II (I) | September 5, 2012 |
| 6 | Naphtha Splitter Unit | J-11011/534/2009-IA-II (I) | September 12, 2012 |
| 7 | Installation of new LPG mounded bullet & up-gradation of existing LPG bottling plant and BS-IV HSD project at NRL | J-11011/150/2015-IA-II (I) | December 9, 2016 |
| 8 | Expansion of the refinery from 3 MMTPA to 9 MMTPA | J-11011/274/2015–IA-II (I) | July 27, 2020 |

Hope, the above will meet the requirement.

Your's faithfully

**(Alok Nayan Nath)**

**Chief Manager (Tech Service-Environment)**

***Enclosure:*** *1. Ground water around SLF (Annexure-I) 2. Noise monitoring (Annexure-II)*

*3. Emission, Ambient & Effluent data (Annexure-III/IV/V) 4. Env Expenditure (Annexure-VI)*

*5. Fugitive & VOC monitoring 6. CER Report (Annexure-VII)*

Cc: Member Secretary, PCBA, Assam

**J-11011/16/90-IA. II , May 31st, 1991**

**Petroleum Refinery at Numaligarh (MOEF EC)**

| Sl. No. | A. Specific Condition | Remarks |
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| 1 | The layout of the refinery should be so planned within the proposed site so as to ensure that it is situated as far to the eastern side of the site as possible, to ensure that there is the maximum possible distance from the eastern boundary of the Kaziranga National Park. The layout of the site of refinery may be finalised in consultation with this Ministry. | *The layout of the refinery was finalised in consultation with MoE&F. Longitude 93$^{o}$ 43' 30" E & Latitude 26$^{o}$ 37' 30" N. Latest plot plan submitted to IRO,GHY* |
| 2 | The residential site as proposed should not be to the west of the refinery as it is only 19.5 kms from the boundary of Kaziranga National Park. It should be shifted further away, but keeping in view the distance from the Garampani Sanctuary, which is only 24 kms south of the proposed refinery site. The newly proposed site of the residential colony should be settled to the satisfaction of this Ministry. | *The NOC for the residential site has been issued by MoE&F vide No.J-11014/2/91 IA.II dated 18thJanuary1994 with six conditions. Details on the present status of compliance on these conditions are enclosed as* ***annexure A.*** |
| 3 | The National Highway-37 should be diverted away from the Kaziranga National Park and that portion of this road through and along the National Park (From Jakhalabandha to Bokakhat) to be denotified from all highway records and handed over to the National Park Authorities for regulating traffic. No movement of personnel, material or equipment for the project shall take place on the existing National Highway-37. The realignment of the National Highway-37 would be finalised in consultation with the Ministry of Environment and Forests, so that the wildlife habitat in the nearby Mikir Hills and areas rich in biological diversity therein are protected. Work on the diversion of NH-37 will start before construction of the refinery begins and the Ministry of Petroleum should ensure that the road is completed before the commissioning of the project. | *The original NGT applicationno.174 of 2013in this matters disposed of in July'18. Order submitted to MoEF RO earlier.* |
| 4 | A No Development Zone must be notified before the project construction starts within a radius of 15 kms all around the refinery site, except towards the northwest where the no development zone would extend into the Eastern boundary of the Kaziranga National Park | *The Govt. of Assam has already notified the "No Development Zone" on 19.01.95.* |

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| 5 | No pipeline will be laid through the Kaziranga National Park and adjacent wildlife habitats in the Mikir Hills. Pipeline alignment shall be finalized in consultation with the Ministry of Environment and Forests to minimize impact on environment and forests. | *NRL has not laid any pipeline through KNP* |
| 6 | The project authority must strictly adhere to the stipulations made by the SPCB and the State Government. | *The stipulations laid down by SPCB, Assam and the State Govt. are adhered to. The status on the compliance report has been regularly sent to PCBA, Regional Office, Golaghat.* ***A copy is enclosed as Annexure B. Latest CTO submitted to IRO,GHY.*** |
| 7 | Any expansion of the plant either with the existing product mix or new products can be taken up only with the prior approval of this Ministry. | *This is complied with as and when a change or expansion is contemplated. Any expansion of the plant either with the existing product mix or new products will be taken up with prior approval of the Ministry.* ***Production detail submitted to IRO,GHY*** |
| 8 | The gaseous emissions from various process units should conform to the standard prescribed by the concerned authorities, from time to time. At no time, the level should go beyond the stipulated standards. In the event of failure of any pollution control system adopted by the unit, the respective unit should be put out of operation immediately and should not be restarted until the control measures are rectified to achieve the desired efficiency. | *Automatic online stack analysers have been provided in all the major stacks for continuous monitoring of $SO_2$, NOx, CO & SPM. Further manual stack monitoring is being carried out bi-monthly as per latest MOEF notification. Monitoring reports of stack emissions are regularly submitted to the PCBA Regional Office, Golaghat and CPCB Regional Office, in every month. Real-time emission data has been transmitted to CPCB server on continuous basis.* ***Monitoring data attached as Annexure-III/IV/V*** |
| 9 | A minimum of five air quality monitoring stations should be set up in the downwind direction as well as where maximum ground level conc. is anticipated. Furthermore, stack emission should be monitored by setting up of automatic stack monitoring units. The data on stack emission should be submitted to the SPCB once in three months and to this Ministry once in six months, along with the statistical analysis. The air quality monitoring stations should be selected on the basis of modeling exercise to represent the short-term ground level conc. | *As an action of compliance, five (5) nos. of ambient air quality monitoring stations have been set up at the following locations:*<br>*SS 1 : Inside the refinery (Near WT No.5).*<br>*SS 2 : At the Eco-Park in NRL Township.*<br>*SS 3 : At the Raw Water Intake.*<br>*SS 4 : Near the NH-39 bypass.*<br>*SS 5 : Near the Kaziranga Wildlife Sanctuary at Agartoli.*<br><br>-Ambient Air Quality monitoring at the above locations is being carried out *in line with NAAQS-2009 in totality.* The Ambient Air |

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| | | Quality Monitoring reports are regularly submitted to the PCBA HQ Guwahati, PCBA Regional Office, Golaghat and CPCB Regional Office, Shillong in every month.<br>- *Automatic online stack analysers have been provided in all the major Stacks for continuous monitoring of SO2,NOx, CO & SPM. The monitoring reports of stacks emissions are regularly submitted to the PCBA Regional Office, Golaghat and CPCB Regional Office, Shillong in every month and to the MoEFCC Regional Office, Shillong in every six month.*<br>*NRL has installed one continuous Ambient Air Monitoring System inside the refinery premises. Real-time emission data is transmitted to CPCB server on continuous basis.*<br>*One more CAAQMS installed as per MoEFCC's recommendation in the refinery premises in 2019.*<br>- Ambient air quality report is enclosed as **annexure-IV**. |
| 10 | There should be no change in the stack design without the approval of SPCB. Alternate Pollution control system and proper design (Steam Injection System) in the stack should be provided to take care of excess emissions due to failure in any system of the plant. | *Prior approval of SPCB will be taken for any change in the stacks design. Pollution control measures like – Low NOx burners, Steam Injection System, Low excess air firing, ID and FD fan, Stack dampers have been provided.* |
| 11 | Only natural gas after de-sulphurization has to be used as fuel with low $NO_X$ burners | *Permission has been obtained from MoE&F, New Delhi vide No. J-11011/16/90-IA.II(I) dated 22 May,1996 to use Naphtha, which is produced in the refinery itself. Low NOx burners have been installed in all the refinery furnaces.* |
| 12 | Fugitive emissions should be monitored continuously. | *Regular monitoring of fugitive emission has been carried out using GMI since May, 2005 onwards.*<br>*The GMI survey has been carried on all gas/vapour valves, light liquid valves, hydrogen valves, light liquid pump seals, hydrocarbon compressor seals, hydrogen compressor seals, safety relief valves, flanges, connections, open-ended lines, drains, tankages, furnaces etc in line with the MoEF notification 2008.* ***Fugitive emission report attached.*** |

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| 13 | All gaseous emissions in the system shall be taken to the flare system and the flare should be smoke-less and non-luminous. | *All gaseous emissions have been taken to the flare system. A non-luminous elevated flare has been installed as regular flare. However, additionally, a ground flare has been also installed for using during emergencies.* |
| 14 | A sulphur recovery plant should be commissioned along with the refinery. | *The Sulphur Recovery Block (SRB) has been commissioned alongwith the refinery and has been under continuous operation since September'2000.* |
| 15 | Zero discharge of effluents should be ensured and built into the system. In case the effluent has to be discharged due to process disturbances etc. the contributing unit shall be immediately stopped from operation and will not be re-started without bringing the system to normalcy. To meet the emergency needs adequate number of effluent quality monitoring stations must be set up in consultation with the SPCB | *Zero discharge of effluent has been ensured. Since October, 2006 no effluent from refinery has been discharged into the River Dhansiri and since April, 2007 township effluent also routed to the refinery, so no effluent from refinery & township is discharged outside and the total effluent is recycled and reused within the Refinery as Fire water makeup, watering Green Belt and filter back washing in Cooling Tower. Treated effluent quality is enclosed as* ***annexure-V.*** |
| 16 | Guard ponds of sufficient holding capacity to take care of monsoon rains should be provided. | *Guard ponds (of capacity: 5329 m3) for oily water sewer (OWS) and Surge tank (of capacity: 5760 m3) for contaminated rain water system (CRWS) have been provided in the Effluent Treatment Plant. Further, as a step towards conservation of water, implementation of storm water recycle scheme as fire water make up is implemented.* |
| 17 | The solid waste from the ETP and waxy sludge should be incinerated | *NRL has installed an Incinerator for disposal of non hazardous incinerable wastes in February, 2008 and the same is being operated on a continuous basis for which NRL has received the consent to operate from SPCB.* |
| 18 | The solid waste (other than waxy sludge) dumping area should be made impervious so that the ground water, is not affected due to leaching and seepage of associated water containing pollutants. The solid waste disposal plan should be submitted to the Ministry once the process design and technological package is finalized. | *As per the recommendation of NEERI's report on Solid Waste Management, scheme for disposal of solid waste through Secured Landfill had been prepared. As compliance of the same a Secured Landfill facility was constructed within the Refinery premises and commissioned on 4$^{th}$ March, 2004.* |

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| | | *The proposal of solid waste disposal by Secured Land Fill was submitted to MoE&F and PCB, Assam.*<br><br>*NRL has installed another Secured Land Fill facility of capacity around 6000 m3 as per the latest CPCB guidelines. Also, NRL has construed a new bio-remediation facility in line with the requirement by applying "Oilzapper" for disposal of oily sludge generated during cleaning of tanks.*<br><br>*Alternately, some quantity of oily sludge being disposed by selling to authorized recyclers.*<br><br>***Solid waste disposal plan prepared by NEERI in July 1999submitted to IRO,GHY**.* |
| 19 | The project authorities should recycle the waste to the maximum extent and the recycling plan should be submitted along with a comprehensive EIA. | *All types of wastes generated from the refinery are recycled to the maximum extent possible. -The recycling plan for all types of wastes have been submitted to the MoE&F, Shillong vide letter no. NRL/NG/ENV/2.1/2 dated May'23, 2002* |
| 20 | A detailed risk-analysis based on Maximum Credible Accident analysis should be submitted once the process design and the layout are frozen. Based on this a disaster management plan has to be prepared and after approval by the concerned nodal agency, should be submitted to this Ministry. | *NEERI was engaged for Quantitative Risk Assessment including Maximum Credible Accident (MCA)analysis, Hazard Assessment and Evaluation, Disaster Management Plan (DMP) and Emergency Preparedness Plan(EPP).The report was submitted to the MoE&F on 03.02.97.* |
| 21 | A comprehensive EIA report covering one year (4 seasons) data should be submitted once the process design and technology package and layout are frozen. The Ministry or any other competent authority may stipulate any further conditions after reviewing the comprehensive impact assessment report | *CEIA report prepared by NEERI has been submitted to MoE&F on 22.04.96.* |
| 22 | A comprehensive study of the ecological status and likely impact of development should be initiated in consultation with the Ministry of Environment and Forests. The proposal should be submitted to this Ministry within three months | *This is included in the CEIA report and submitted.* |

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| 23 | A green belt with a minimum width of 500 mts should be provided and the green belt development plan taking into account various aspects including attenuation of noise and air pollution should be submitted to this Ministry within six months. | *Initially, as per Environmental Clearance granted for the Numaligarh Refinery Project, Ministry of Environment & Forest had stipulated a 500 mtrs wide green belt all around the refinery based on the EIA of Numaligarh Refinery carried out by NEERI*<br><br>*On request from Numaligarh Refinery, the width of the Green Belt was later reduced from the suggested width of 500 mtrs to 100 mtrs because of the reason that almost all the surrounding areas are having tea garden with shade trees.A wide natural green belt already existed all around the refinery.*<br><br>*Accordingly, a Green Belt covering a total area of around 60 hectares of land and around 100 mtrs width around the refinery and around 25 mtrs width around the NRMT has been developed as per the Green Belt Development Plan. (The Green Belt Development Plan has been submitted to MoEF along with the Half Yearly Report to MOEF on the 15th October, 2001). Periodically, massive plantation is carried out in the Green Belt so as to it can provide a natural barrier for attenuation of noise and air pollution. Nos of local variety have been planted including some fruit bearing samplings in & all around Green Belt.*<br><br>*Phase wise replantation is in progress in various locations in Green Belt, inside the refinery and in and around the township to increase the density.* |
| 24 | The rehabilitation plan for the persons to be displaced from the project site including township should be prepared and submitted to the Ministry for approval within 3 months. Plan should inter-alia contain rehabilitation site details, the facilities and compensation package to be provided. | *Rehabilitation of the displaced persons from the refinery site has been done by the State Govt. NRL has paid the compensation as fixed by Collector. Similar action has also been taken in case of those displaced from the Township site for which land acquired. Amenities like drinking water facility, building primary school, constructing roads in the villages etc. have been contributed by NRL.* |

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| 25 | The project authority must set up a laboratory facility for collection and analysis of samples under the supervision of competent technical person, who will directly report to the Chief Executive. | *The laboratory facility had been set up for collection and analysis of samples under the supervision of competent personnel, reporting to the Chief Manager (QC) and who reports to the General Manager (Technical). The QC lab is a NABL accreditated Laboratory and it has been proposed to apply as Environmental Approved Laboratory under EPA act.* |
| 26 | A separate environment management cell with suitably qualified people to carry out various functions should be set up under the control of senior executive who will report directly to the head of the organization. | *The same has been complied with.* |
| | a). The Ministry may revoke clearance if implementation of the conditions is not satisfactory. | *Noted* |
| | b). The above conditions will be enforced inter-alia under the provisions of the Water (Prevention & Pollution) Act, 1981, and Environment (Protection) Act, 1985 along with their amendments. | *Noted* |
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| **Sl. No.** | **Condition** | **Remarks** |
| i | The hill slopes should not be used for civil construction purposes | *Noted* |
| ii | Land use planning of the colony and the land around it should be finalized in construction with the State Town Planning Department. | *Noted* |
| iii | More open space should be left and the building construction may be done by acquiring minimum land and the houses should be constructed on ground plus two floors basis. | *Noted*<br>Open space left within the township is around is around 82% of the total area. |
| Iv | Township site should not involve any forest area. | Township is constructed only in the permitted area |
| v | The existing forest cover towards the west and north of the proposed colony site should not be disturbed. | It is not disturbed |
| vi | No organized human settlement or private colonies should be allowed in the hill or the areas adjoining the hill. (Atleast in a radius of 10 kms). | The Govt. of Assam has already notified the “No Development Zone” on 19.01.95. |

**J-11011/203/2003-IA. II (I), March 22, 2004**

**COKE CALCINATION UNIT**

| Sl. No. | A. Specific Condition | Remarks |
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| 1 | The company shall ensure strict implementation / compliance of the terms and conditions mentioned vide Ministry's letter No.J-11011/16/90-IA.II dated 31.05.1991 and letter no. J-11011/92/2003- IA.II (I) dated 13th February 2004. | Complied |
| 2 | The company shall ensure that the total sulphur emission from the Assam refinery (including Coke Calcination Unit) shall not exceed the existing level of 128 kg/hr as sulphur (256 kg/hr as $SO_2$). | *The average SO2 emission during the period is avg. 96 kg/hr which is well below the limit.* |
| 3 | The company should take adequate measures for control of fugitive emissions from the Coke handling system by installation of Bin vent filters and coke handling through closed conveyor system. Multiple cyclone separators should be installed for recovering coke particles from the Rotary Cooler Exhausts and bag filters to control suspended particulate matter from the waste heat recovery boiler exhaust gas. | *To control the fugitive emission from the Coke Calcination Unit, the following measures have been taken –*<br>*a) Bin vent filters provided to control even minor fugitive emissions from coke handling system.*<br>*b) The major portion of coke handling is done through closed conveyor system.*<br>*c) Cyclone separator provided for recovering coke particles from rotary cooler exhaust.*<br>*d) Bag filters with automatic pneumatic back flushing system to control SPM from waste heat boiler at exhaust gas has been provided.*<br>*e) The finished product of CPC has been packed in an automatic bagging machines, thus controls the fugitive emissions.*<br>*f) A 100 m wide green belt all along refinery boundary wall has been developed.* |
| 4 | Water requirement of 15 $m^3$/hr should be met from the recycling of coke cutting water from Delayed Coker Unit. There should be no additional drawl of water for the CCU from the river Dhansiri | *Coke cutting water from DCU is regularly used for quenching in CCU. There is no additional drawl of water beyond the permissible limit from the river Dhansiri for CCU.* |
| 5 | The Company should install continuous stack monitoring system for online measurement for SPM, $SO_2$ and NOx. | *Continuous stack monitoring systems for online measurement of SPM, $SO_2$ NOx and CO have been provided in the CCU stack.* |

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| 6 | The solid waste generated should be disposed off in the secured landfill site within the plant premises. The ground water quality around the secured landfill site should be monitored regularly and data submitted to the Ministry /CPCB/SPCB | *Normally the solid waste generated in the CCU is recycled back with the feed. There is no such solid waste generated at present, however any small quantity which is not possible to recycle back will be disposed off in the Secure Land Fill Facility.*<br>*Ground water around the secured landfill is monitored and results are submitted to MOE&F / CPCB & PCBA regularly*<br>*Analysis report of ground water around Secured Land Fill is enclosed as* ***Annexure –I****.* |
| **Sl. No.** | **General Condition** | **Remarks** |
| 1 | The project authorities must strictly adhere to the stipulations made by the Assam Pollution Control Board and the State Government | *The stipulations made by the Pollution Control Board of Assam and the State Government are strictly adhered to. A copy is enclosed as* ***Annexure B*** |
| 2 | No further expansion or modernization in the plant should be carried out without prior approval of the Ministry of Environment and Forests. | *Any expansion or modernization in the plant will be taken up only with prior approval of the Ministry of Environment & Forests* |
| 3 | The Company shall implement all recommendations made in the EMP and Risk Analysis reports. | *The recommendations made in the EMP of the Comprehensive Environmental Impact Assessment and the Risk Assessment reports have been implemented for the Numaligarh Refinery, which includes CCU also as an integral part of the refinery.* |
| 4 | At no time, the emissions should go beyond the prescribed standards. In the event of failure of 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 | *All the emissions parameters are monitored on continuous basis and are well within the prescribed limits. Adequate stack heights are provided in all the furnaces.* |
| 5 | The overall noise levels in and around the plant area should be kept well within the standards (85 dBA) by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels should conform to the standards prescribed under EPA Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time). | *The major sources of noise generation in the CCU are the BFW pumps and the Air Blowers, having low duty. Strong foundations have been provided to mitigate the noise generation further. The equipment's are monitored regularly at a distance of 01 mtr from the source and corrective measures are taken to maintain the noise level below 85 dBA. The ambient noise levels all around the refinery are monitored regularly so as to maintain within the* |

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| | | *standards, prescribed under EPA Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time).*<br>*Noise monitoring result carried out in the Refinery recently enclosed as Annexure II* |
| 6 | The project authorities must strictly comply with the rules and regulations under Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 as amended in 1994 and 2000. Prior approvals from the Chief Inspectorate of Factories, Chief Controller of Explosives, Fire Safety Inspectorate etc. must be obtained. | *The rules and regulations under the Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 and as amended in 1994, and 2000 are adhered to.*<br>*Approvals from Chief Inspectorate of Factories, Chief Controller of Explosives etc as applicable for the Numaligarh Refinery have been obtained.* |
| 7 | The project authorities must strictly comply with the rules and regulations with regard to handling and disposal of hazardous wastes in accordance with the Hazardous Wastes (Management and Handling) Rules, 2003. Authorization from the State Pollution Control Board must be obtained for collection/treatment/storage/disposal of hazardous wastes. | *The rules and regulations with regard to handling and disposal of hazardous wastes in accordance with the Hazardous Wastes (Management, Handling & Transboundary Movement) Rules, 2008 are adhered to. In regard to the same, authorization for collection/treatment/storage and disposal of hazardous wastes through Secured Land Fill has been obtained from the PCB, Assam.* |
| 8 | The project authorities will provide adequate funds both recurring and non-recurring to implement the conditions stipulated by the Ministry of Environment & Forests as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so provided should not be diverted for any other purposes. | *Adequate funds have been provided for implementing the conditions stipulated by MoE&F and the State Govt. and not diverted for any other purpose.* |
| 9 | The stipulated conditions will be monitored by the Regional of this Ministry at Shillong /Central Pollution Control Board/State Pollution Control Board. A six monthly compliance report and the monitored data should be submitted to them regularly. | *A six monthly compliance report on the Environmental Clearance conditions of the Numaligarh Refinery along with the monitored data has been submitted regularly to the MoE&F Regional Office, Shillong. Along with six monthly compliance report, the compliance status on the environmental clearance conditions for the CCU Unit also have been submitted to the MoE&F Regional Office at Guwahati, CPCB, Shillong and the SPCB, Assam* |

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| 10 | The Project Proponent should inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the State Pollution Control Board / Committee and may also be seen at Website of the Ministry of Environment & Forests at http:/envfor.nic.in. This should be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same should be forwarded to the Regional office. | *The same has been complied. Advertisement regarding the environmental clearance for the Coke Calcination Unit was published in two local newspapers namely, The Assam Tribune (in English) and The Pratidin (Assamese) on the 26th March'04 and copies of both advertisements were forwarded to the MoEF Regional Office, Shillong vide letter no. NRL/TS/ENV/2.1/14 dated 27.03.04.* |
| 11 | The Project Authorities should inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of commencing the land development work. | *The same has been complied.* |
| 12 | The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory. | Noted |
| 13 | The Ministry reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner will implement these conditions | Noted |
| 14 | The above conditions will be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous Waste (Management, Handling & Transboundary Movement) Rules, 2008 and the Public Liability Insurance Act, 1991 along with their amendments and rules. | Noted |

**J-11011/92/2003-IA. II (I), March 13, 2004**

**Petroleum Refinery at Numaligarh (Euro III MS Status)**

| Sl. No. | A. Specific Condition | Remarks |
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| 1 | The company shall ensure strict implementation / compliance of the terms and conditions mentioned vide Ministry's letter No. J-11011/16/90-IA.II dated 31.05.1991. | Complied |
| 2 | The company shall ensure that the total sulphur emission from the Assam refinery (including MS Quality Improvement Project) shall not exceed 128 kg/hr as sulphur (256 kg/hr as $SO_2$). M/s NRL should maintain regular record of sulphur balance in the refinery. Off gases from the proposed unit should be treated in amine absorption and regeneration unit meant for $H_2S$ removal for desulphurization of off gases. Performance evaluation of sulphur recovery block should be done regularly. Data on VOC should be monitored and submitted to the Ministry. The continuous emission monitoring systems for SOx and NOx in the major stacks with proper calibration facilities should be installed. The low NOx burners should be installed in all the furnaces. | *The total sulphur emission from the refinery including Euro III Motor Spirit Project being maintained below 128 kg/hr as Sulphur (256 kg/hr as $SO_2$).*<br>*-Regular sulphur balance of the refinery is maintained and the average $SO_2$ emission from the refinery during The average SO2 emission during this period is avg.96 kg/hr which is well below the limit.*<br>*-Off gases from the proposed unit has been treated in the amine absorption and regeneration unit.*<br>*-Performance evaluation of Sulphur Recovery Block is done on a daily basis.*<br>*- VOC data for MS is attached.*<br>*-Continuous emission monitoring for $SO_2$, CO, PM and NOx have been provided in all the stacks.*<br>*-Ultra low NOx burners have been provided in all the furnaces.* |
| 3 | Additional water requirement shall not exceed 1200 m3/hr. The total quantity of effluent generation should not exceed 3830 m3/day as indicated in the EMP of which (3530 m3/d from the existing and 300 m3/d from the proposed unit). Treated effluent should be recycled and rest should be discharged after primary, secondary and tertiary treatment into the Dhansiri river through 11 km long pipeline. The treated effluent should comply with the prescribed standards. | *The additional water requirement is very minimal as compared to the present requirement and is maintained within the limits. Treated effluent quality in Effluent Treatment Plant is maintained within the prescribed standards and all the treated effluent is recycled inside the refinery. NRL has achieved 100 % reuse of treated effluent since October,2006.* |
| 4 | As reflected in the EIA / EMP, the spent catalyst (0.33 TPM) along with small quantity of oily and chemical sludge should be disposed off in secured landfill site within the plant premises. The leachate from the landfill site should be sent back to | *The oily sludge, generated in ETP is disposed off in the Secured Land Fill Facility (SLF) after recovering the oil by centrifuging. As* |

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| | the effluent treatment plant. The ground water quality around the secured landfill site should be monitored regularly and data submitted to the Ministry/CPCB/SPCB. The biological sludge generated from the ETP should be used as manure/fertilizer for the green belt. | *per the requirement, leachate generated is routed back to the IRS of ETP for further processing.*<br><br>*The ground water quality around the Secured Landfill site has been monitored on a regular basis and the monitoring data has been submitted regularly to the MoE&F Regional Office along with the half-yearly report and to SPCB.*<br><br>*Spent catalyst is disposed off through authorized recyclers as per Hazardous Waste Management Handling and Tran boundary Movement Rules, of latest amendment.*<br>*Ground water monitoring data around Secured Land Fill is enclosed as* ***Annexure –I*** |
| 5 | Oil spill response facilities should be in place, in accordance with OISD guidelines with regard to the likely risks associated with transportation of finished products. All recommendations made in the risk analysis report should be complied with during design, construction and operation stages to contain the risk within the plant boundary | *The same is complied.*<br>*Oil from various units is routed through OWS (Oily Water Sewer) & CRWS (Contaminated rain Water Sewer) to ETP. The oily water from various units, OM&S and NRMT go through the CRWS and OWS systems to ETP for necessary oil removal and treatment in various sections. The slop oil is recovered in ETP and sent to OM&S for needful reprocessing in various units.*<br><br>*The Strom Water Channel from various plans are connected and channel through Oil Catchers. There are several oil catchers in the final outlet of Strom Water channel. The final outlet of storm water channel is made closed immediately in case of any accidental oil carryover and is trapped in the oil catcher for necessary removal. The accumulated oil from the oil catchers is lifted with the help of MOSRU (Mobile Oil Spill Recovery Unit).* |
| 6 | Green Belt of adequate width and density as per the CPCB guidelines should be provided to mitigate the effects of fugitive emission all around the plant in | *A Green Belt of width around 100 mtrs surrounding the refinery and around 25 mtrs. around the NRMT covering a total area of about 60 hectares have been provided. with adequate trees and* |

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| | consultation with the local DFO. The bio sludge should be used as manure in the Green Belt development. | *proper density. Massive plantation has been carried out in the Green Belt so that it can provide a natural barrier for attenuation of noise and air pollution. Nos of local variety have been planted including some fruit bearing samplings in & all-around Greenbelt. Further, to increase the density in the Green Belt, fresh plantation it being continued at regular intervals. Within the Numaligarh Refinery premises, few gardens have been developed near various units including one in ETP with varieties of flowering plants. Also, different varieties of saplings are also planted in the roadside areas, through-out the refinery*. |
| 7 | Occupational Health Surveillance of the workers should be done on a regular basis and records maintained as per the Factories Act and the West Bengal Factories Rules. | *Complied.* ***Health check up status of workers for 2020-21 submitted to IRO,GHY.*** |
| **Sl. No.** | **General Condition** | **Remarks** |
| 1 | The project authorities must strictly adhere to the stipulations made by the Assam Pollution Control Board and the State Government. | *The stipulations made by the Assam Pollution Control Board and the State Government are strictly adhered to. A copy is enclosed as* ***Annexure B. CTO submitted to IRO,GHY.*** |
| 2 | No further expansion or modernization in the plant should be carried out without prior approval of the Ministry of Environment and Forests. | *Noted. Any expansion or modernization in the plant will be taken up only with prior approval of the Ministry of Environment & Forests.* |
| 3 | The Company shall implement all recommendations made in the EMP and Risk Analysis reports. | *Complied.* |
| 4 | At no time, the emissions should go beyond the prescribed standards. In the event of failure of 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. | *All the emissions parameters are monitored on continuous basis and are well within the prescribed limits. Adequate stack heights are provided in all the furnaces.* |
| 5 | The overall noise levels in and around the plant area should be kept well within the standards (85 dBA) by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels should conform to the standards prescribed under EPA Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time). | *The overall noise levels in and around the plant premises has been maintained below 85 dBA at 1 mtr distance from the source. For the same, control measures like silencer to vent, low noise Rotary equipment have been provided. The ambient noise levels all around the refinery are monitored regularly so as to* |

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| | | *maintain the standards prescribed under EPA Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time).*<br><br>*-Noise monitoring result carried out is enclosed as* ***Annexure-II***<br>*- Measures taken towards noise control:*<br>*- Ensuring PPE use in high noise areas of the plant.* |
| 6 | The project authorities must strictly comply with the rules and regulations under Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 as amended in 1994 and 2000. Prior approvals from Chief Inspectorate of Factories, Chief Controller of Explosives, Fire Safety Inspectorate etc. must be obtained. | *The rules and regulations under the Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 and as amended in 1994 and 2000 are adhered to. Approvals from Chief Inspectorate of Factories, Chief Controller of Explosives etc as applicable for the proposed unit have been obtained.* |
| 7 | The project authorities must strictly comply with the rules and regulations with regard to handling and disposal of hazardous wastes in accordance with the Hazardous Wastes (Management and Handling) Rules, 2003. Authorization from the State Pollution Control Board must be obtained for collection/treatment/storage/disposal of hazardous wastes. | *The rules and regulations with regard to handling and disposal of hazardous wastes in accordance with the Hazardous Wastes (Management, handling & Transboundary Movement) Rules, 2008 are adhered to. In regard to the same, authorization for collection/treatment/storage and disposal of hazardous wastes has been obtained from the PCB, Assam.* ***Hazardous waste authorization is valid upto 2026.*** |
| 8 | The project authorities will provide adequate funds both recurring and non-recurring to implement the conditions stipulated by the Ministry of Environment & Forests as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so provided should not be diverted for any other purposes. | *Adequate fund has been provided for implementing the conditions stipulated by the MOEFCC and the State Govt and not diverted for any other purpose.* ***Environmental expenditure is attached as Annexure-VI*** |
| 9 | The stipulated conditions will be monitored by the Regional Office of this Ministry at Shillong / Central Pollution Control Board/The State Pollution Control Board. A six monthly compliance report and the monitored data should be submitted to them regularly. | *A six monthly compliance report on the Environmental Clearance conditions and NOC conditions of Numaligarh Refinery including the compliance status on the environmental Clearance for MS Plant being submitted six monthly regularly to* |

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| | | *the MoE&F Regional Office, CPCB, Shillong and the SPCB, Regional Office, Golaghat, Assam.* |
| 10 | The Project Proponent should inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the State Pollution Control Board / Committee and may also be seen at Website of the Ministry of Environment & Forests at http:/envfor.nic.in. This should be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same should be forwarded to the Regional office. | *Advertisement regarding the environmental clearance for the Euro III MS Project was published in two local newspapers, The Assam Tribune (in English) and The Pratidin (in Assamese) on 18th Feb'04 and copies of both were forwarded to the MoE&F Regional Office, Shillong vide letter no NRL/NG/ENV/2.1/11 dated 20th Feb'04* |
| 11 | The Project Authorities should inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of commencing the land development work. | *The same has been complied. Project commissioned on June 2006* |
| 12 | The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory. | *Noted* |
| 13 | The Ministry reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner will implement these conditions | *Noted* |
| 14 | The above conditions will be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous Waste (Management, Handling & Transboundary Movement) Rules, 2008 and the Public Liability Insurance Act, 1991 along with their amendments and rules. | *noted* |

**J-11011/272/2008-IA. II (I), Nov' 10, 2008**

***DIESEL QUALITY UPGRADATION PROJECT (DQUP)***

| Sl. No. | A. Specific Condition | Remarks |
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| 1 | The company shall comply with new standards/norms Notified by the Ministry for Oil refineries vide G.S.R. 186(E) dated 18th March 2008. | - *Compliance status of few points are as follows:*<br>*(a) Secondary seals in IFRT and EFRT tanks -installation of double seals in EFRT, IFRT completed.*<br>*(b) LDAR-programme: The same is implemented.*<br>*(c) Implementation of VOC recovery system in ETP: VOC recovery system in ETP has been implemented.* |
| 2 | The company shall comply with all the stipulations of environmental clearances issued vide letter No. J-11011/92/2003-IA.II(I) dated 13th February 2004 and J-11011/203/2003-IA.II(I) dated 22nd March, 2004. | *Complied.* |
| 3 | The process emissions (SO2, NOx, HC, VOCs and Benzene) from various units shall conform to the standards prescribed by the Assam State Pollution Control Board from time to time. At no time, the emission levels shall go beyond the stipulated standards. In the event of failure of pollution control system(s) adopted by the unit, the unit shall be immediately put out of operation and shall not be restarted until the desired efficiency has been achieved. | *Monitoring data submitted in Annexure-III/IV/V* |
| 4 | The Diesel Quality Up-gradation Project (DQUP) shall be through Hydrocracker from 1.1 to 1.45 MMTPA, Hydrogen Unit from 38,000 to 48150 TPA, CDU/VDU modification of CDU without any feed change to take out additional 0.35 MMTPA diesel for Hydrocracker, Sulphur unit 14.7 to 19.5 TPD and associated modifications for the utilities, offsite and flare facilities. | *Complied.* |
| 5 | Quarterly monitoring of fugitive emissions shall be carried out as per the guidelines of CPCB by fugitive emission detectors (GMI Leak Surveyor) and reports shall be submitted to the Ministry's regional office at Shillong. | *Presently being practiced and complied.* ***Fugitive emission data attached.*** |

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| 6 | For control of fugitive emission, all unsaturated hydro carbon will be routed to the flare system and the flare system shall be designed for smoke less burning. | *Taken care during the preparation of DFR and BEDP.* |
| 7 | The company shall strictly follow all the recommendation mentioned in the charter on corporate responsibility for environmental protection (CREP). | *Complied.* |
| 8 | Occupational health surveillance of worker shall be done on a regular basis and records maintained as per the Factory Act. | *Presently being practiced and complied.* ***Health check up status for 2020-21 submitted to IRO,GHY.*** |
| 9 | Greenbelt shall be developed to mitigate the effect of fugitive emission all around the plant in a minimum 30% plant area in consultation with DFO as per CPCB guidelines. | *Initially, as per Environmental Clearance granted for the Numaligarh Refinery Project, Ministry of Environment & Forest had stipulated a 500 mtrs wide green belt all around the refinery based on the EIA of Numaligarh Refinery carried out by NEERI.*<br><br>*On request from Numaligarh Refinery, the width of the Green Belt was later reduced from the suggested width of 500 mtrs to 100 mtrs because of the reason that almost all the surrounding areas are having tea garden with shade trees (Sirish trees). A wide natural green belt already existed all around the refinery.*<br><br>*Accordingly, a Green Belt covering a total area of around 60 hectares of land and around 100 mtrs width around the refinery and around 25 mtrs width around the NRMT has been developed as per the Green Belt Development Plan. (The Green Belt Development Plan has been submitted to MoEF along with the Half Yearly Report to MOEF on the 15$^{th}$ October, 2001).*<br><br>*Massive Plantation have been carried out in the Green Belt so that it can provide a natural barrier for attenuation of noise and air pollution. No. of local variety have been planted including some fruit bearing samplings in & all around Green Belt.*<br><br>*Further, it has been planned to increase the density by planting more saplings in the Green Belt in the days ahead.Green belt detail submitted to IRO,GHY.* |

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| 10 | The Company shall make the suitable arrangement for disposal of catalyst waste and other wastes. The report of waste disposal shall be submitted to Ministry's Regional Office at Shillong. | *Spent catalysts are disposed off through CPCB approved recyclers. Other wastes are being disposed off as per Hazardous Waste Management, Handling, Disposal (Trans Boundary Movement), 2008 with latest amendments and the reports are being sent to Pollution Control Board.* ***Form-IV/V (20-21) submitted with EC compliance status of April'21 to Sept'21.*** |
| 11 | The Company shall take necessary measures to prevent fire hazards, containing oil spill and soil remediation as needed. At place of ground flaring, the overhead flaring stack with knockout drums shall be installed to minimize gaseous emissions during flaring. | *Knockout drums are installed in the flare systems.* |
| 12 | To prevent fire and explosion at Oil and Gas facility, potential ignition sources should be kept to a minimum and adequate separation distance between potential ignition sources and flammable material shall be in place | *Complied.* |
| 13 | Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, Safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project. | *Complied.* |
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| **Sl. No.** | **General Condition** | **Remarks** |
| 1 | The project authorities must strictly adhere to the stipulations made by the concerned State Pollution Control Board (SPCB) and the State Government and any other statuary body. | *The stipulations made by the Pollution Control Board of Assam and the State Government are strictly adhered to.* ***A copy is enclosed as Annexure B.*** |
| 2 | No further expansion or modification in the project shall be carried without prior approval of the Ministry of Environment and Forests. In case of deviations or alternations in the project proposal from those submitted to the Ministry for clearance, a fresh reference shall be made to the Ministry. | *Any expansion or modernization in the plant will be taken up only with prior approval of the Ministry of Environment & Forests.* ***Year wise production detail submitted to IRO,GHY*** |

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| 3 | At no time, the emissions should go beyond the prescribed standards. In the event of failure of any pollution control system, the respective well site should be immediately put out of operation and should not be restarted until the desired efficiency has been achieved. Provision of adequate height of stack attached to DG sets & flare is to be done. | *All the emissions parameters are monitored on continuous basis and are well within the prescribed limits. Adequate stack heights are provided in all the furnaces* |
| 4 | Wastewater shall be properly collected and treated so as to conform to the standards prescribed under EP Act & Rules and mentioned in the Consents provided by the relevant SPCB. | *Wastewater generated is routed through the existing ETP for proper treatment. The effluent generated from refinery and township is totally reused after treatment.* |
| 5 | The overall noise levels in and around the premises shall be limited within the prescribed standards (75 dBA) by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels should conform to the standards prescribed under EPA Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time). | *Few noise generation sources in the project are the BFW pumps and the Air Blowers. Strong foundations are provided to mitigate the noise generation and the equipment are monitored regularly at a distance of 01 mtr from the source. The noise levels all around the refinery is being monitored regularly so as to maintain within the standards, prescribed under EPA Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time).* ***Noise monitoring report during the period is enclosed in Annexure-II***<br>*- Measures taken towards noise control:*<br>• *Ensuring PPE use in high noise areas of the plant.* |
| 6 | The project authorities must 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 etc. Necessary approvals from Chief Controller of Explosives must be obtained before commission of the expansion project, if required. Requisite On-site and Off-site Disaster Management Plans will be prepared and implemented. | *- The rules and regulations under the Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 and as amended in 2000 are adhered to.*<br>*Approvals from Chief Inspectorate of Factories, Chief Controller of Explosives etc as applicable for the Numaligarh Refinery have been obtained.* |
| 7 | Disposal of hazardous wastes shall be as per the Hazardous Wastes (Management and Handling) Rules, 2003. Authorization from the State Pollution Control Board must be obtained for collections/treatment/storage/disposal of hazardous wastes. | *The rules and regulations with regard to handling and disposal of hazardous wastes in accordance with the Hazardous Wastes (Management, Handling & Trans Boundary Movement) Rules, 2008 as per latest amendments are adhered to.* |

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| | | ***Hazardous authorization is valid upto 2026 and submitted to IRO,GHY*** |
| 8 | The project authorities will provide adequate funds as non-recurring and recurring expenditure to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so provided should not be diverted for any other purposes. | *Adequate funds have been provided for implementing the conditions stipulated by MoEF and the State Govt. and not diverted for any other purpose.* ***Environmental expenditure attached as Annexure-VI*** |
| 9 | The company shall develop rain water harvesting structures to harvest the run off water for recharge of ground water. | *Storm water reuse system to refinery fire water network scheme commissioned.* |
| 10 | 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 should be submitted to them regularly. It will also be displayed on the Website of the Company. | *A six monthly compliance report on the Environmental Clearance conditions of the Numaligarh Refinery along with the monitored data is being submitted regularly to the MoE&F Regional Office.*<br>*The same is being displayed in the company's website also.* |
| 11 | The Project Proponent should inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the State Pollution Control Board/ Committee and may also be seen at Website of the Ministry of Environment and Forests at http://www.envfor.nic.in. This should be advertised within seven days from the date of issue of the clearance letter at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same should be forwarded to the concerned Regional office of this Ministry. | *Advertisement regarding the environmental clearance for the Diesel Quality Upgradation Project (DQUP) was published in two local newspapers namely, The North East Times (in English) and The Amar Asom (Assamese) on the 16th November'08 and copies of both advertisements were forwarded to the MoE&F Regional Office, Shillong vide letter no. NRL/TS/ENV/2.3/07 dated 17.11.08.* |
| 12 | A separate environment management cell with full-fledged laboratory facilities to carry out various management and monitoring functions shall be set up under the control of a Senior Executive. | *A fully functional, dedicated environment management cell manned by qualified engineers/officers and headed by a Chief General Manager (Technical) has been continuously working for constant improvement, monitoring, safeguarding and reporting of environmental activities of the refinery.* ***Person name and qualification submitted to IRO,GHY.*** *Also, a multidisciplinary Apex-level Committee on Environment which includes senior level officers from various departments as members under the chairmanship of Director (Technical) constantly guides the* |

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| | | *Environment Cell regarding all the environmental issues in the refinery. The Apex Committee that convenes quarterly discusses the unresolved issues if any and monitors the regular environmental activities.* |
| 13 | The project authorities shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of start of the project. | *The same has been complied* |

**J-11011/534/2009-IA. II (I), Sept 12, 2012**

***NAPHTHA SPLITTER PROJECT***

| Sl. No. | A. Specific Condition | Remarks |
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| 1 | Compliance to all the environmental conditions stipulated in the environmental clearance letter nos J011011/16/90-IA.II dated 31st May, 1991, J011011/92/2003-IA.II dated 13th February, 2004, J011011/272/2008-IA.II (I) dated 10th November, 2008 shall be satisfactorily implemented and monitoring reports submitted to the Ministry's Regional Office at Shillong. | *Complied. Half yearly compliance report of all ECs regulary being sent to MoEF,RO.* |
| 2 | Environmental clearance is subject to their obtaining prior clearance from Wildlife angle due to location of Kaziranga National Park (KNP) nearby including clearance from the Standing Committee of the National Board for Wildlife as applicable. | *The proposed project will be constructed within the existing refinery premises, hence it does not require any additional land. As such, the requirement of approval from wild life is not envisaged.* |
| 3 | No heavy equipments shall be routed through Kaziranga National Park, for which only the route identified earlier shall be used. | *Complied.* |
| 4 | M/s Numaligarh Refinery Limited shall comply with new standards/norms for oil Refinery Industry notified under the Environment (Protection) Rules, 1986 vide GSR 186 (E) dated 18th March, 2008. | *Complied*. |
| 5 | Continuous online stack monitoring for SO2 and SPM of all the stacks shall be carried out. SO2 on-line analysers shall be installed in all the furnace stacks. Low NOx burners shall be installed with online analysers to monitor NOx emissions shall be provided. | O*nline stack analysers have been provided in all the major stacks for continuous monitoring of $SO_2$ ,NOx, CO and SPM. Further manual stack monitoring is being carried out bi-monthly as per latest MOEF notification. Monitoring reports of stack emissions are regularly submitted to the PCBA Regional Office, Golaghat in every month.* ***Monitoring data attached as Annexure-III/IV/V*** |
| 6 | The process emissions [SO2, NOx, HC (Methane & Non-methane)], VOCs and Benzene from various units shall conform to the standards prescribed under the Environment (Protection) Act, 2008. At no time, the emission levels shall go beyond the stipulated standards. In the event of failure of pollution control systems(s) | *Presently being practiced and complied.* |

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| | adopted by the unit, the unit shall be immediately put out of operation and shall not be restarted until the desired efficiency has been achieved. | |
| 7 | Ambient air quality monitoring stations [SPM, SO2, NOx, H2S, Mercaptan, non-methane-HC, and benzene] shall be set up in the complex in consultation with Assam State Pollution Control Board, based on occurrence of maximum ground level concentration and down-wind direction of wind. The monitoring network must be decided based on modeling exercise to represent short term GLCs. Ambient air quality shall also be carried out in one location at Kaziranga National Park for SOx, NOx, SPM, CO & HC. | *As an action of compliance, five (5) nos. of ambient air quality monitoring stations have been set up at the following locations:*<br><br>*SS 1 : Inside the refinery (Near WT No.5).*<br>*SS 2 : At the Eco-Park in NRL Township.*<br>*SS 3 : At the Raw Water Intake.*<br>*SS 4 : Near the NH-39 bypass.*<br>*SS 5 : Near the Kaziranga Wildlife Sanctuary at Agartoli.*<br><br>*Ambient Air Quality monitoring at the above locations is being carried out in line with NAAQS-2009 in totality. The Ambient Air Quality Monitoring reports are regularly submitted to the PCBA HQ Guwahati, PCBA Regional Office, Golaghat in every month. Further, real time continuous ambient air quality data and online stack anayser data being transmitted to CPCB server since Sept'11.*<br><br>*NRL has installed one Continuous Ambient Air Monitoring System inside the refinery premises and realtime emission data has been transmitted to CPCB server on continuous basis. One additional continuous Ambient Air Monitoring System inside the refinery premises as recommended by MoEFCC based on occurrence of maximum ground level concentration and down-wind direction of wind installed.*<br><br>*-**Ambient air quality for the period is enclosed as Annexure – IV**.* |
| 8 | Ambient air quality data shall be collected as per NAAQMS notified by the Ministry on 16th September, 2009 and trend analysis wrt. past monitoring results shall also | *Ambient air quality data is monitored in line with NAAQMS, 2009 in totality and trend analysis is carried out.* |

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| | be carried out. Adequate measures based on the trend analysis shall be taken to improve the ambient air quality in the project area. | |
| 9 | Monitoring of fugitive emissions shall be carried out as per the guidelines of CPCB by fugitive emission detectors and reports shall be submitted to the Ministry's Regional Office at Shillong. For control of fugitive emissions, all unsaturated hydrocarbon will be routed to the flare system and the flare system shall be designed for smoke less burning. | *Presently being practiced as per the requirement. Regular monitoring of fugitive emission has been carried out using GMI. The GMI survey has been carried on all gas/vapour valves, light liquid valves, hydrogen valves, light liquid pump seals, hydrocarbon compressor seals, hydrogen compressor seals, safety relief valves, flanges, connections, open-ended lines, drains, tankages, and furnaces etc. as per the guidelines. In case of any leak observed, the same is attended immediately in line with the requirement.*<br>***Fugitive emission data attached.*** |
| 10 | Fugitive emissions of HC from product storage tank yards etc. must be regularly monitored. Sensors for detecting HC leakage shall also be provided at strategic locations. The company shall use low Sulphur fuel to minimize SO2 emissions. Sulphur recovery units shall be installed for control of H2S emissions. Leak detection and Repair programme shall be implemented to control HC/VOC emissions. Work zone monitoring shall be carried out near the storage tanks besides monitoring of HCs/VOCs in the work zone. | *Regular fugitive emission survey is being carried out with the help of GMI Gaskoseeker as a part of monitoring and control of fugitive emission. The GMI survey has been carried in all gas/vapour valves, light liquid valves, hydrogen valves, light liquid pump seals, hydrocarbon compressor seals, hydrogen compressor seals, safety relief valves, flanges, connections, open-ended lines, drains, tankages, furnaces etc. It is being practiced in all the Process Units, Tankage areas, Marketing Terminal, and other important locations. Low suphur fuels is being used in all the furnaces to minimize SO2 emissions and will be implemented in future projects if required, a SRU is already installed during the commissioning of the refinery. Monitoring of fugitive emissions is carried out near the storage tanks.* |
| 11 | As proposed, record of sulphur balance shall be maintained at the Refinery as a part of the environmental data on regular basis. The basis component of sulphur balance includes sulphur input through feed (sulphur content in crude oil), sulphur output from Refinery through products, byproduct (elemental sulphur), and atmospheric emissions.etc. | *-The total sulphur emission from the refinery including NSU Spirit Project being maintained below 128 kg/hr as Sulphur (256 kg/hr as $SO_2$).* ***SO2 emission from the refinery is 96 kg/hr avg for the period.*** |

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| | | *-Regular sulphur balance of the refinery is maintained and the average $SO_2$ emission from the refinery during this period is well below the limit.* |
| 12 | The total water requirement shall not exceed 11907 m3/day and prior permission shall be obtained from the competent authority. The wastewater shall be treated in the waste water treatment plant and the treated effluent shall meet the prescribed standards. Treated effluent shall be recycled/reused within the factory premises. Domestic sewage shall be treated in sewage treatment plant (STP). | *Complied. NRL has already obtained consent from State Government for drawl of max. 1200 m3/hr of water. Additional water requirement and treated effluent discharged is maintained within the limits. The treated effluent quality is maintained within the prescribed standards and no treated effluent is discharged from the refinery into River Dhansiri since October,2006. Further no treated effluent from township is discharged since April, 2007 which means the effluent is totally recycled.* ***Permission letter submitted to IRO,GHY.*** |
| 13 | No effluent shall be discharged outside the factory premises and "zero water concept" shall be adopted. | *Zero discharge of treated waste water has already been achieved since 2006 and Ministry's Regional Office is kept informed.* |
| 14 | Oil catchers/oil traps shall be provided at all possible locations in rain/storm water drainage system inside the factory premises. | *Complied. Oil catchers/oil traps are installed in various locations in the storm water channel to avoid any oil carry over to the open channel. Construction of 6 nos additional oil catcher completed. Additionally NRL has installed a series of hay fliters in the storm water channel and used oil adsorbent booms as precautionary measures. As a step towards conservation of water, construction of a holding pond near the storm water channel is completed.* |
| 15 | Oily sludge shall be disposed off into Coker. Annual Oily Sludge generation and disposal data shall be submitted to the Ministry's Regional Office and CPCB. | *- NRL produces Anode grade coke which is further processed in Coke Calcination Unit (CCU) to get high value Calcined Petroleum coke (CPC). Trial run for processing of sludge in Delayed Coker Unit (DCU) was carried out on an experimental basis. However, the process led to the deterioration of the CPC quality to a great extent and the experiment had to be called off. Instead, NRL follows a robust sludge handling process for disposal wherein oily sludge is suitably disposed in bioremediation or is being sold to CPCB authorized recyclers.*<br>*To waive this condition NRL submitted one application to MoEF, Delhi on 29.01.19.* |

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| | | ***Form-4 , Annual return on hazardous waste Submitted with EC compliance status for April'21 to Sept'21*** |
| 16 | The project authorities must strictly comply with the rules and regulation with regard to handling and disposal of Hazardous Waste (Management, Handling and Tran boundary Movement) Rules, 2008 wherever applicable. Authorization from the State Pollution Control Board must be obtained for collection/treatment/storage/disposal of hazardous wastes | *The rules and regulations under the Hazardous Waste (Management, handling and Trans-boundary Movement) Rules, 2008 as amended in 2009 are adhered to.*<br>*Approvals from State Pollution Control Board for authorization (management, handling & disposal) of hazardous waste as per the requirement ) has been obtained. Hazardous waste Authrisation certificate valid upto April, 2026.* |
| 17 | Proper oil spillage prevention management plan shall be prepared to avoid spillage/leakage of oil/petroleum products and ensure regular monitoring. | *Complied.*<br>*- Oil from various units is routed through OWS (Oily Water Sewer) & CRWS (Contaminated rain Water Sewer) to ETP. The oily water from various units, OM&S and NRMT go through the CRWS and OWS systems to ETP for necessary oil removal and treatment in various sections. The slop oil is recovered in ETP and sent to OM&S for needful reprocessing in various units.*<br>*-The Strom Water Channel from various plans are connected and channel through Oil Catchers. There are several oil catchers in the final outlet of Strom Water channel. The final outlet of storm water channel is made closed immediately in case of any accidental oil carryover and is trapped in the oil catcher for necessary removal. The accumulated oil from the oil catchers is lifted with the help of MOSRU (Mobile Oil Spill Recovery Unit).* |
| 18 | The company shall strictly follow all the recommendation mentioned on the Charter on corporate Responsibility for Environmental protection (CREP). | *Complied.* |
| 19 | The Company shall take necessary measures to prevent fire hazards, containing oil spill and soil remediation as needed. At place of ground flaring, the overhead flaring stack with knockout drums shall be installed to minimize gaseous emissions during flaring. | *Knockout drums are installed in the flare systems.* |

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| 20 | To prevent fire and explosion at oil and gas facility, potential ignition sources shall be kept to a minimum and adequate separation distance between potential ignition sources and flammable material shall be in place. | *Complied.* |
| 21 | Green belt shall be developed at least in 33% of the plant area in and around plant premises to mitigate the effects of fugitive emissions all around the plant as per the CPCB guidelines in consultation with DFO. Thick greenbelt with suitable plant species shall be developed around unit. Selection of plant species shall be as per the CPCB guidelines. | *Initially, as per Environmental Clearance granted for the Numaligarh Refinery Project, Ministry of Environment & Forest had stipulated a 500 mtrs wide green belt all around the refinery based on the EIA of Numaligarh Refinery carried out by NEERI.*<br><br>*On request from Numaligarh Refinery, the width of the Green Belt was later reduced from the suggested width of 500 mtrs to 100 mtrs because of the reason that almost all the surrounding areas are having tea garden with shade trees (Sirish trees). A wide natural green belt already existed all around the refinery.*<br><br>*Accordingly, a Green Belt covering a total area of around 60 hectares of land and around 100 mtrs width around the refinery and around 25 mtrs width around the NRMT has been developed as per the Green Belt Development Plan. (The Green Belt Development Plan has been submitted to MoEF along with the Half Yearly Report to MOEF on the 15$^{th}$ October, 2001).*<br><br>*Massive Plantation have been carried out in the Green Belt so that it can provide a natural barrier for attenuation of noise and air pollution. No. of local variety have been planted including some fruit bearing samplings in & all around Green Belt. Again it has been planned to increase the density by planting more saplings in the Green Belt in the days ahead.* |
| 22 | Company shall prepare project specific environmental manual and a copy shall be made available at the project site for the compliance. | *Complied.* ***Submitted to IRO,GHY*** |
| 23 | All the recommendations mentioned in the rapid risk assessment report, disaster management plan and safety guidelines shall be implemented. | *Complied.* |

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| 24 | All the issue raised in the public hearing/consultation meeting held on 14th July, 2011 shall be satisfactorily implemented. | *Complied.* |
| 25 | Company shall adopt Corporate Environment Policy as per the Ministry's O.M No. J-11013/41/2006-IA.II (I) dated 26th April, 2011 and implemented. | *NRL has already adopted a Env. policy as per the requirement of Environment Management ISO 14001.* |
| 26 | Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, Safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structure to be removed after completion of the project. | *Complied.* |
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| **Sl. No.** | **General Condition** | **Remarks** |
| 1 | The project authorities must strictly adhere to the stipulations by the State Pollution Control Board (SPCB), State Government and any other statutory authority | *The stipulations made by the Pollution Control Board of Assam and the State Government are strictly adhered to.* ***CTO submitted to IRO,GHY*** |
| 2 | No further expansion or modification in the project shall be carried out without prior approval of the Ministry of Environment & Forests. In case of deviations or alterations in the project proposal from those submitted to this Ministry for clearance, a fresh reference shall be made to the Ministry to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any. | *Any expansion or modernization in the plant will be taken up only with prior approval of the Ministry of Environment & Forests.* ***Yearwise production pattern submitted to IRO,GHY*** |
| 3 | The project authorities must strictly comply with the rules and regulations under Manufacturer, Storage and Import of Hazardous Chemicals Rules, 2000 as amended subsequently. Prior approvals from Chief Inspector of Factories, Chief Controller of Explosives, Fire Safety Inspectors etc. must be obtained, whenever applicable | *The rules and regulations under the Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 and as amended in 2000 are adhered to.*<br><br>*- Approvals from Chief Inspectorate of Factories, Chief Controller of Explosives etc as applicable for the Numaligarh Refinery have been obtained.* |
| 4 | The overall noise levels in and around the plant area shall be kept well within the standards by providing noise control measures including acoustics hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels shall | *The major sources of noise generation in the proposed project are the pumps and the Air coolers. Strong foundations have been provided to mitigate the noise generation further. The* |

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| | conform to the standards prescribed under EPA Rules, 1989 viz. 75 dBA (daytime) and 70 dBA (nighttime). | *equipment are monitored regularly and the ambient noise levels all around the refinery is being monitored regularly so as to maintain within the standards, prescribed under EPA Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time).* ***Noise monitoring report submitted as Annexure-II*** |
| 5 | A separate Environmental Management Cell equipped with full-fledged laboratory facilities must me set up to carry out the environment management and monitoring functions. | *A fully functional, dedicated environment management cell manned by qualified engineers/officers and headed by a Chief General Manager (Technical) has been continuously working for constant improvement, monitoring, safe guarding and reporting of environmental activities of the refinery. Also, a multidisciplinary Apex-level Committee on Environment which includes senior level officers from various departments as members under the chairmanship of Director (Technical) constantly guides the Environment Cell regarding all the environmental issues in the refinery. The Apex Committee that convenes quarterly discusses the unresolved issues if any, regarding the environment and monitors the regular environmental activities.* |
| 6 | Adequate funds shall be earmarked towards capital cost and recurring cost/annum for environment protection control measures and shall be used to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so provided shall not be diverted for any other purposes. | *Adequate funds have been provided for implementing the conditions stipulated by MoEF and the State Govt. and shall not be diverted for any other purpose.* ***Environmental expenditure Submitted as Annexure-VI*** |
| 7 | The Regional Office of this Ministry/Central Pollution Control board/State Pollution Control Board will monitor the stipulated conditions. A six monthly compliance report and the monitored data along with statistical interpretation shall be submitted to them regularly. | *Six monthly compliance report is being sent to the Regional Office of this Ministry/Central Pollution Control Board/State Pollution Control Board as per the requirement.* |
| 8 | A copy of the clearance letter shall be sent by the proponent to concerned Panchayat, Zila Parishad/Municipal Corporation, Urban Local Body and the local NGO, if any, from whom suggestion/ representation, if any, were received while | *Copy of the clearance letter sent to concerned Panchayat/ Zila Parishad/ Circle Office.* |

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| | processing the proposal. The clearance letter shall also be put on the web site of the company by the proponent. | |
| 9 | The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of the MOEF, the respective Zonal Office of CPCB and the SPCB. The criteria pollutant levels namely; SPM, RSPM, SO2, NOx, HC (Methane & Non-methane), VOCs (ambient levels as well as stack emission) or critical sectoral parameters, indicated for the projects shall be monitored and displayed at a convenient location near the main gate of the company in the public domain. | *The same is complied.* |
| 10 | The project proponent shall also submit six monthly reports on the status of the compliance of the stipulated environmental conditions including results of monitored data (both in hard copies as well as by e-mail) to the Regional Office of MOEF, the respective Zonal Office of CPCB and the SPCB. The Regional Office of this Ministry/ CPCB/ SPCB/ shall monitor the stipulated conditions. | *A six monthly compliance report on the Environmental Clearance conditions of the Numaligarh Refinery along with the monitoring data is being submitted regularly to the MoE&F Regional Office.*<br><br>*The same is being displayed in the company's website also.* |
| 11 | The environmental statement for each financial year ending 31st March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986. As amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental conditions and shall also be sent to the respective Regional Offices of the MOEF by e-mail. | *Environmental Statement for each financial year ending 31st March, in form-V is being sent to SPCB every year as per the requirements.*<br>*- The same is being displayed in the company's website also.*<br>- ***The environmental statement for financial year, 2020-21 as per Form-V Submitted with EC compliance status for April'21 to Sept'21*** |
| 12 | The project proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB and may also be seen at Website of the Ministry of Environment and Forests at http:/envfor.nic.in. This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locally concerned and a copy of the same shall be forwarded to the Regional Office | *The same has been complied. Advertisement regarding the environmental clearance for the Naphtha Splitter Unit (NSU) was published in two local newspapers namely, The Assam Tribune (in English) and The Dainik Janambhumi (in Assamese (on the 21st September'12and copies of both the advertisements were forwarded to the MOEF Regional Office, Shillong.* |

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| 13 | Project authorities shall inform the Regional Office as well as the Ministry , the date of financial closure and final approval of the project by the concerned authorities and the date of commencing the land development work. | *Complied.* |

**J-110011/113/2009-IA. II (I), Sept' 5th, 2012**

**Compliance status on the conditions of environmental cearance for the *WAX PROJECT***

| Sl. No. | A. Specific Condition | Remarks |
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| 1 | Compliance to all the environmental conditions stipulated in the environmental clearance letter nos. J011011/16/90-1A.ll dated 31st May, 1991, J011011/92/2003-1A.ll (I) dated 13th February, 2004, J011011/203/2003-IA. II (I) dated 22nd March, 2004, J011011/272/2008-IA. II (I) dated 10nd November, 2008 shall be satisfactorily implemented and monitoring reports submitted to the Ministry's Regional Office at Shillong. | *Complied. Half yearly compliance report of all ECs regulary being sent to MoEF,RO .* |
| 2 | M/s Numaligarh Refinery Limited shall comply with new standards/norms for oil Refinery Industry and petrochemical industry notified under the Environment (protection)-Rules 1986. | *The same is being complied as per the requirement.* |
| 3 | Environmental clearance is subject to their obtaining prior clearance from wildlife angle due to nearby location of Kaziranga National Park (KNP) and clearance from the Standing Committee of the National Board for Wildlife as applicable. | *The matter has been discussed with Chief Wildlife Warden of Assam and Director, Kaziranga National Park. As the proposed project has been constructed within the existing refinery premises, it does not require any additional land. As such, the requirement of approval from wild life is not envisaged.* |
| 4 | No heavy equipments shall be routed through Kaziranga National Park, for which only the route identified earlier shall be used. | *Complied.* |
| 5 | Adequate stack height shall be provided to fuel gas fired heaters as per CPCB/Assam pollution Control Board (APCB) guidelines to disperse waste heat into atmosphere. Low NOx burners shall be installed with on-line analyzers. Low sulfur fuels shall be used in boiler. | *All the stacks are provided with adequate stack heights (min. 60 & 77 meters against the requirement of 30 meters). Low NOX burners are installed in all the stacks. Online SOx ,NOx, CO,SPM analysers are installed in all the stacks. NRL is using low sulfur fuels in the boilers* |
| 6 | Continuous on-lines stack monitoring equipment shall be installed for the measurement of particulate matter, VOCs, SO2, NOX, non-methanated Hydrocarbons (Benzene, Xylene and Tolune). | *PM analysers installed in all the stacks. For continuous monitoring of VOCs, Non-methanated hydrocarbon (Benzene, Xylene and Toluene) , online analysers are available with the existing CAAQMS.* ***Data attached as Annexure-III/IV/V*** |

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| 7 | Fugitive emissions from HVGO, MVGO and MIBK shall be recovered and controlled. Fugitive emissionis in the work environment from product raw material storage area etc. shall be regularly monitored. The emissions shall conform to the limits imposed by Assam Pollution Control Board. | *Fugitive emission survey for HVGO and MVGO is being carried out with the help of GMI Gaskoseeker as a part of monitoring and control of fugitive emission. The GMI survey has been carried in all gas/vapour valves, light liquid valves, hydrogen valves, light liquid pump seals, hydrocarbon compressor seals, hydrogen compressor seals, safety relief valves, flanges, connections, open-ended lines, drains, tankages, furnaces etc. In case of any leak observed, the same is attended immediately in line with the requirement*. ***Fugitive emission data attached.*** |
| 8 | The process emissions [SO2, NOx, HC (Methane& Non-methane)] VOCs and Benzene from various units shall conform to the standards prescribed under the Environment Protection Act. At no time, the emission levels shall go beyond the stipulated standards. In the event of failure of pollution control systems adopted by the unit, the unit shall be immediately put out of operation and shall not be restarted until the desired efficiency has been achieved. | *Complied* |
| 9 | Ambient air quality monitoring stations [,SPM, SO2, NOx, H2S, mercaptan, non-methane-HC, and Benzene shall be set up in the complex in consultation with Assam Pollution Control Board, based on occurrence of maximum ground level concentration and down-wind direction of wind. The monitoring network must be decided based on modeling exercise to represent short term GLCS. Ambient air quality shall also be carried in one location at Kazirang National Park for SO", NO", SPM, CO and HC. | *As an action of compliance, five (5) nos. of ambient air quality monitoring stations have been set up at the following locations:*<br><br>*SS 1 : Inside the refinery (Near WT No.5).*<br>*SS 2 : At the Eco-Park in NRL Township.*<br>*SS 3 : At the Raw Water Intake.*<br>*SS 4 : Near the NH-39 bypass.*<br>*SS 5 : Near the Kaziranga Wildlife Sanctuary at Agartoli.*<br><br>*-Ambient Air Quality monitoring at the above locations is being carried out in line with NAAQS-2009 in totality. The Ambient Air Quality Monitoring reports are regularly submitted to the PCBA HQ Guwahati, PCBA Regional Office, Golaghat and CPCB Regional Office, Shillong in every month.* |

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| | | *- Further, continuous ambient air quality data and online stack anayser data have been made accessible to CPCB from NRL's company's website since Sept'11.*<br><br>*- NRL has installed one Continuous Ambient Air Monitoring System inside the refinery premises and realtime emission data has been transmitted to CPCB server on continuous basis.*<br><br>*-Further, action initiated to install one additional continuous Ambient Air Monitoring System inside the refinery premises as recommended by MoEFCC based on occurrence of maximum ground level concentration and down-wind direction of wind. To be installed by Mar'19.*<br><br>***Ambient air quality for the period is enclosed as Annexure-IV.*** |
| 10 | Ambient air quality data shall be collected as per NAAQMSs standard notified by the Ministry on 16th September, 2009 and trend analysis w.r.t past monitoring results shall also be carried out. Adequate measures based on the trend analysis shall be taken to improve the ambient air quality in the project area | *Being practiced.* |
| 11 | Monitoring of fugitive emission shall be carried out as per the guidelines of CPCB by fugitive emission detectors and reports shall be submitted to the Ministry's regional office at Shillong. For control of fugitive emissions all unsaturated hydrocarbon will be routed to the flare system and the flares system shall be designed for smoke less burning. | *The same has been noted. Regular monitoring of fugitive emission has been carried out using GMI. The GMI survey has been carried on all gas/vapour valves, light liquid valves, hydrogen valves, light liquid pump seals, hydrocarbon compressor seals, hydrogen compressor seals, safety relief valves, flanges, connections, open-ended lines, drains, tankages, and furnaces etc. as per the guidelines. In case of any leak observed, the same is attended immediately in line with the requirement.* ***Fugitive emission data attached.*** |
| 12 | A proper Leak Detection and Repair (LDAR) Program shall be prepared and implemented. Focus shall be given for prevention of fugitive emissions for which preventive maintenance of pumps, valves, pipelines are required. Proper | *Presently being practiced in line with MoEF notification, 2008.* |

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| | maintenance of mechanical seals of pumps and valves shall be given. A preventive maintenance schedule for each unit shall be prepared and adhered to. | |
| 13 | Methyl lso Butyl Ketone (MIBK) solvent should be handled as per the standard procedure and guidelines issued time to time. MIBK solvents should be stored in cool and dry place, recovered from process through solvent recovery unit and reused in the system. | *The system is designed to strictly follow standard procedure & statutory guidelines for handling & storage of MIBK solvent, and is adequate. Also a highly efficient solvent recovery unit has been implemented to recover and re-use MIBK solvent from foots oil & wax.* |
| 14 | Total fresh water requirement from River Dhansiri for the proposed unit shall not exceed 60 m3/hr. and prior permission shall be obtained from the competent authority. The industrial effluent generation shall not exceed 5 m3/hr. The industrial effluents shall be treated in the ETP and the treated effluent shall meet the prescribed standards. Treated effluents hall be recycled/reused within the factory premises. Domestic sewages hall be treated in sewage treatment plant (STP). | *Scheme for reuse of storm water as cooling tower/FW makeup implemented. Treated effluent is fully recycled.* |
| 15 | No effluent shall be discharged outside the factory premises and Zero Water Concept shall be adopted. | *Total recycle of treated effluent has been ensured. Since October, 2006 no effluent from refinery has been discharged outside the refinery and since April, 2007 township effluent also routed to the refinery, so no effluent from refinery & township is discharged outside and the total effluent is recycled within the Refinery.*<br><br>*Treated effluent quality for the period April'21 to September'21 is enclosed as annexure-V.* |
| 16 | Oil catchers/oil traps shall be provided at all possible locations in rain/ storm water drainage system inside the factory premises. | *Oil catchers/oil traps are installed in various locations in the storm water channel to avoid any oil carry over to the open channel. Insignificant quantities of emulsified oil generated if any has been recovered and reused with the help of MOSRU (Mobile Oil Spill Recovery Unit). Six new oil catcher has been installed.* |
| 17 | Methyl-lso-Butyl Ketone (MIBK) shall not be allowed to mix with the effluents as well as with storm water and ground water. | *Due consideration has been taken in the unit design to avoid MIBK carryover along with effluent and avoid ground water* |

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| | | *Contamination. Moreover, a dedicated MIBK close blow-down facility along with recovery system has been incorporated to avoid intermixing of MIBK with other streams.* |
| 18 | Oily sludge shall be disposed off into coker. Annual oily sludge generation and shall be submitted to the Ministry's Regional Office and CPCB. | *NRL produces Anode grade coke which is further processed in Coke Calcination Unit (CCU) to get high value Calcined Petroleum coke (CPC). Trial run for processing of sludge in Delayed Coker Unit (DCU) was carried out on an experimental basis. However, the process led to the deterioration of the CPC quality to a great extent and the experiment had to be called off. Instead, NRL follows a robust sludge handling process for disposal wherein oily sludge is suitably disposed in bioremediation or is being sold to CPCB authorized recyclers.* |
| 19 | The Company should strictly comply with the rules and guidelines under Manufacture, and import of Hazardous storage chemical Rules, 1989 as amended in october,1994 and January, 2000. Hazardous waste should be disposed of as per Hazardous Waste (Management, Handling and Transboundary Movement) Rules 2008 and amended time to time. | *The rules and regulations under the Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 and as amended in 2000 are adhered to.*<br><br>*-Approvals from Chief Inspectorate of Factories, Chief Controller of Explosives etc as applicable for the Numaligarh Refinery have been obtained.* |
| 20 | The membership of common TSDF should be obtained for the disposal of hazardous waste. Otherwise, secured land fill should be created at the site as per the guidelines of CPCB and obtain authorization from the SPCB. Copy of authorization or membership of TSDF should be submitted to Ministry's Regional office at Shillong. | *NRL has constructed a Secured Landfill Facility as recommended by NEERI in 2004 for a safe and systematic dipsal of hazardous materials and authorization is accorded from the concerned authorities and renewed as per the requirement. NRL has installed another SLF of capacity 6000 m3 as per CPCB recommendation.* |
| 21 | Proper oil spillage prevention management plan shall be prepared to avoid spillage/leakage of oil/petroleum products of and ensure regular monitoring. | *Complied. Proper oil spill prevention management in place. Alternately, a MOSROU is used in case of emergency situation if any. Nos. of Oil catchers and Hay filters installed in various locations. Oil adsorbent boom is also placed in many locations.* |

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| | | *Further, OWS & CRWS systems are very effectively constructed to divert the spilled material to ETP for further treatment.* |
| 22 | The company shall strictly follow all the recommendation mentioned in the charter of Corporate Responsibility for Environmental Protection (CREP). | *The same is being complied.* |
| 23 | The company shall take necessary measures to prevent fire hazards containing oil spill and soil remediation as needed. At place of ground flaring, the overhead flaring stack with knockout drums shall be installed to minimize gaseous emissions during flaring. | *Knockout drums are installed in the flare system.* |
| 24 | To prevent fire and explosion at oil and gas facility, potential ignition sources shall be minimum and kept to a adequate separation distance between potential ignition sources and flammable material shall be in place. | *Complied*. |
| 25 | Green belt shall be developed at least in 33% of the total plant area in and around the plant premises to mitigate the effects of fugitive emissions all around the plant as per CPCB guidelines in consultation with DFO. Thick greenbelt with suitable plant species shall be developed around units. Selection of plant species as per the CPCB guidelines | *Initially, as per Environmental Clearance granted for the Numaligarh Refinery Project, Ministry of Environment & Forest had stipulated a 500 mtrs wide green belt all around the refinery based on the EIA of Numaligarh Refinery carried out by NEERI.*<br><br>*On request from Numaligarh Refinery, the width of the Green Belt was later reduced from the suggested width of 500 mtrs to 100 mtrs because of the reason that almost all the surrounding areas are having tea garden with shade trees (Sirish trees). A wide natural green belt already existed all around the refinery.*<br><br>*Accordingly, a Green Belt covering a total area of around 60 hectares of land and around 100 mtrs width around the refinery and around 25 mtrs width around the NRMT has been developed as per the Green Belt Development Plan. (The Green Belt Development Plan has been submitted to MoEF along with the Half Yearly Report to MOEF on the 15$^{th}$ October, 2001).*<br><br>*Massive Plantation has been carried out in the Green Belt so that it can provide a natural barrier for attenuation of noise and air pollution. No. of local variety have been planted including* |

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| | | *some fruit bearing samplings in & all around Green Belt. Again it has been planned to increase the density by planting more saplings in the Green Belt in the days ahead.* |
| 26 | Company shall prepare project specific environmental manual and a copy should be made available at the project site for the compliance. | *Complied.* |
| 27 | All the recommendations mentioned in the rapid risk assessment report, disaster management plan and safety guidelines shall be implemented. | *Complied.* |
| 28 | All the issues raised and committed made during the public hearing/consultation meeting held on 14th July, 2011 shall be satisfactorily implemented. Accordingly, provision of budget to be kept. | *Complied.* |
| 29 | Company shall adopt Corporate Environment policy as per the Ministry's O M. No. J- 11013/41/2O06-IA(I) dated 26th April, 2011and implemented. | *NRL has already adopted a Env. policy as per the requirement of Environment Management ISO 14001.* |
| 30 | Provision shall be made for the housing of construction labour within the site with infrastructure and all necessary facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project. | Complied. |
| **Sl. No.** | **General Condition** | **Remarks** |
| 1 | The project authorities must strictly adhere to the stipulations made by the State pollution Control Board ( SPCB) Stale Government and any other statutory authority. | *The stipulations made by the Pollution Control Board of Assam and the State Government are strictly adhered to.* |
| 2 | No further expansion or modification in the project shall be carried out without prior approval from the Ministry of Environment & Forests. In case of deviations or alterations in the project proposal from those submitted to this Ministry for clearance a, fresh reference shall be made to the Ministry to assess the adequacy of conditions imposed and to add additional environment protection measures required if any. | *Any expansion or modernization in the plant will be taken up only with prior approval of the Ministry of Environment & Forests.* |
| 3 | The project authorities to strictly comply with the rules and regulations under Manufacture, Storage and Import of Hazardous Chemicals Rules, 2008 as amended | *The rules and regulations under the Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 and as amended in 2000 are adhered to.* |

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| | subsequently. Prior approvals from Chief Inspector of Factories Chief Controller of Explosives Fire Safety Inspector must be obtained wherever applicable. | *Approvals from Chief Inspectorate of Factories, Chief Controller of Explosives etc as applicable for the Numaligarh Refinery have been obtained.* |
| 4 | The overall noise levels in and around the plant area shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels shall conform to the standards prescribed under PAR ules,1 989v iz.75 dBA( day time) and 70 dBA (nighttime). | *The major sources of noise generation in the proposed project are the pumps and the blowers. Strong foundations provided to mitigate the noise generation further. The equipment being monitored regularly at a distance of 01 mtr from the source and corrective measure being taken to maintain the noise level below 85 dBA. The ambient noise levels all around the refinery is being monitored regularly so as to maintain within the standards, prescribed under EPA Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time).* |
| 5 | A separate Environmental Management Cell equipped with full fledged laboratory facilities must be setup to carry out the environmental management on monitoring functions. | *A fully functional, dedicated environment management cell manned by qualified engineers/officers and headed by Chief General Manager (Technical) has been continuously working for constant improvement, monitoring, safeguarding and reporting of environmental activities of the refinery. Also, a multidisciplinary Apex-level Committee on Environment which includes senior level officers from various departments as members under the chairmanship of Director (Technical) constantly guides the Environment Cell regarding all the environmental issues in the refinery. The Apex Committee that convenes quarterly discusses the unresolved issues if any, regarding the environment and monitors the regular environmental activities.* |
| 6 | Adequate funds shall be earmarked towards capital cost and recurring cost/ annum for environment pollution control measures and shall be used to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so provided shall not be diverted for any other purposes. | *Adequate funds have been provided for implementing the conditions stipulated by MoEF and the State Govt. and not diverted for any other purpose* |

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| 7 | The Regional office of this Ministry/Central Pollution Control Board//State Pollution Control Board will monitor the stipulated conditions. A six-monthly compliance report and the monitored data along with statistical interpretations shall be submitted to them regularly. | *Six monthly compliance report is being sent to the Regional Office of this Ministry/Central Pollution Control board/State Pollution Control Board as per the requirement.* |
| 8 | A copy of clearance letter shall be sent by the proponent to concerned Panchayat/ Zila Parishad/ Municipal Corporation/ Urban Local Body and the local NGO if any, from whom suggestion/representation if, any, were received while processing the proposal. The clearance letter shall also be put on the web site of the company by the proponent. | Copy of the clearance letter sent to concerned Panchayat/ Zila Parishad/ Circle Office. |
| 9 | The project proponent shall upload the status of compliance of the stipulated environment clearance conditions including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of the MoEF, the respective Zonal Office of CPCB and the SPCB. The criteria pollutant levels namely SPM, RSPM, SO2, NOx, HC (Methane& Non-methane),VOCs (ambient levels as wel1 as stack emissions) or critical sectoral parameters indicated for the projects shall be monitored and displayed at a convenient location near the main gate of the company in the public domain. | *Complied.* |
| 10 | The project proponent shall also submit six monthly reports on the status of the compliance of the stipulated environmental conditions including results of monitored data (both in hard copies as well as by e-mail) to the Regional Office of MoEF, the respective Zonal Office of CPCB and the SPCB. The Regional office of this Ministry/ CPCB/ SPCB shall monitor the stipulated conditions | *The same is being complied.*<br><br>*The same is being displayed in the company's website also.* |
| 11 | The environmental statement for each financial year ending 31st March, in form-IV as is mandated to be submitted by the project proponent to the concerned state pollution control board as prescribed under the Environment (Protection) Rules 1986 as mended subsequently shall also be put in the website of the company alonwith the status of compliance of environmental conditions and shall also be sent to the respective Regional offices of the MoEF by e-mail. | *The same is being complied. Environmental Statement for each financial year ending 31st March, in form-IV is being sent to SPCB every year as per the requirements.* ***The environmental statement for financial year, 2020-21 submitted with earlier compliance report*** |
| 12 | The Project Proponent shall inform the public that the project has been accorded environmental clearance by Ministry and copies of the clearance letter area available with the SPCB and may also be seen at website of the Ministry of Environment & Forests at http:/ envfor.nic.in. this shall be advertised within seven | *The same has been complied. Advertisement regarding the environmental clearance was published in two local newspapers namely, The Assam Trubine (in English) dated 13.09.2012 and The Amar Axom (Assamese) dated 12.09.2012.* |

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| | days from the date of issue of the clearance letter at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locally concerned and a copy of the same shall be forwarded to the Regional Office. | *Copies of both advertisements were forwarded to the MoEF Regional Office.* |
| 13 | Project authorities shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of commencing the land development work. | *Complied.* |
| 14 | The Ministry may revoke or suspend the clearance, if implementation of any of the above Conditions is not satisfactory | *The same has been noted.* |
| 15 | The Ministry reserves the right to stipulate additional conditions if found necessary. Company in a time bound manner shall implement these conditions. | *The same has been noted.* |
| 16 | The above conditions will be enforced inter-alia under the provisions of Water (Prevention & Control of pollution) Act 1974, Air (Prevention & control of Pollution) Act' 1981' the Environment (Protection) Act 1986, Hazardous Waste (Management Handling and Transboundary Movement) Rules 2008 and the Public Liability Insurance Act 1991 alonwith their amendments and rules | *The same has been noted.* |
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**J-110011/150/2015-IA. II (I), Dec' 9th, 2016**

*EURO-IV HSD PROJECT ALONGWITH INSTALLTION OF LPG MOUNDED BULLET AND MODIFICATION OF EXISTING LPG BOTTLING FACILITY*

| Sl. No. | A. Specific Condition | Remarks |
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| 1 | NRL shall comply with new standards/norms for Oil Refinery Industry notified under the Environment (Protection) Rules, 1986 vide G.S.R. 186(E) dated 18th March, 2008. | *Compliance status of few points are as follows:*<br>*(a) Secondary seals in IFRT and EFRT tanks -installation of double seals in EFRT, IFRT tanks completed.*<br>*(b) LDAR-programme: The same is implemented.*<br>*(c) Implementation of VOC recovery system in ETP: VOC recovery system in ETP has been implemented* |
| 2 | Compliance to all the environmental conditions stipulated in the environmental clearance letter nos. J011011/16/90-1A.ll dated 31.05.1991, J011014/2/1991-1A (I) dated 18.01.1994, J011011/92/2003-1A.ll (I) dated 13.02.2004, J011011/203/2003-IA. II (I) dated 22.03.2004, J011011/272/2008-IA. II (I) dated 10.11.2008, J011011/113/2009-IA. II (I) dated 05.09.2012, J011011/534/2009-IA. II (I) dated 12.09.2012 shall be satisfactorily implemented and monitoring reports submitted to the Ministry's Regional Office at Shillong. | *Being complied. Half yearly compliance report of all ECs regulary being submitted to MoEF,RO* |
| 3 | Continuous on-line stack monitoring for SO2, NOx and CO of all the stacks shall be carried out. Low NOx burners shall be installed | *Online Sox, NOx, CO and SPM analyser installed in all the stacks. Low NOx burners installed in all the stacks* |
| 4 | The process emissions [SO2, NOx, HC (Methane & Non-methane)], VOCs and Benzene from various units shall conform to the standards prescribed under the Environment (Protection) Act. In the event of failure of pollution control system(s) adopted bythe unit, the unit shall be immediately put out of operation and shall not be restarted until the desired efficiency of the pollution control device has been achieved. | *Complied.* |
| 5 | Leak Detection and Repair programme shall be prepared and implemented to control HC/VOC emissions. Focus shall be given to prevent fugitive emissions for which preventive maintenance of pumps, valves, pipelines are required. Proper maintenance of mechanical seals of pumps and valves shall be given. A preventive | *LDAR program implemented for DHT in line with the existing practice carried out in various units.* |

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| | maintenance schedule for each unit shall be prepared and adhered to. Fugitive emissions of HC from product storage tank yards etc. must be regularly monitored. Sensors for detecting HC leakage shall be provided at strategic locations. | |
| 6 | SO2 emissions after expansion from the plant shall not exceed 256 kg/hr and further efforts shall be made for reduction of SO2 load through use of low sulphur fuel. Sulphur recovery unit with tail gas treating facilities having 99.9 % efficiency shall be provided. | SO2 emission for this period is 96 kg/hr avg . TGTU being implemented |
| 7 | As proposed, record of sulphur balance shall be maintained at the Refinery as part of the environmental data on regular basis. The basic component of sulphur balance include sulphur input through feed (sulphur content in crude oil), sulphur output from Refinery through products, byproduct (elemental sulphur), atmospheric emissions etc. | *Complied. Regular Sulphur balance for the refinery is carried out and record maintained. Also, sulfur balance post DHDT prepared.* |
| 8 | Ambient air quality monitoring stations, [PM10, PM2.5, SO2, NOx, H2S, mercaptan, non-methane-HC and Benzene] shall be set up in the complex in consultation with Maharashtra Pollution Control Board, based on occurrence of maximum ground level concentration and down-wind direction of wind | *Monitoring of ambient air quality parameter is being complied as pet NAAQM, 2009. New additional CAAQMS alongwith analyser inside the refinery premises* based *on occurrence of maximum ground level concentration and down-wind direction of wind installed* |
| 9 | The gaseous emissions from DG set shall be dispersed through adequate stack height as per CPCB standards. Acoustic enclosure shall be provided to the DG sets to mitigate the noise pollution. | *Complied as per CPCB standard.* |
| 10 | Fresh water requirement from Dhansiri River shall not exceed 688 m3/hr after expansion and prior permission shall be obtained from the competent authority. Industrial effluent generation will be 130 m3/hr and treated in the Effluent Treatment Plant. Treated effluent shall be fully reused/recycled as make-up water for raw water cooling towers. | *Prior permission from state irrigation dept obtained .Treated effluent is being fully recycled. Permission letter submitted to IRO,GHY* |
| 11 | No effluent shall be discharged outside the plant premises and „Zero" effluent discharge concept shall be followed | *NRL does not discharge ETP treated effluent to outside environment. 100% treated effluent is reused.* |
| 12 | Comprehensive water audit to be conducted on annual basis and report to the concerned Regional Office of MEF&CC. Outcome from the report to be implemented for conservation scheme | *Water audit completed. Audit report submitted to IRO,GHY* |

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| 13 | Automatic /online monitoring system (24 x 7 monitoring devices) for flow measurement and relevant pollutants in the treatment system to be installed. The data to be made available to the respective SPCB, Regional Office of MoEFCC and in the Company's website. | Flowmeter in the treated effluent line installed in Nov'18. For pollutant level measurement pH & TOC (for measurement of COD & BOD ) analyser is already exist. TSS analyser installaed in November'18. |
| 14 | Oil catchers/oil traps shall be provided at all possible locations in rain/ storm water drainage system inside the factory premises. | *Oil catchers/oil traps are installed in various locations in the storm water channel to avoid any oil carry over to the open channel. Insignificant quantities of emulsified oil generated if any has been recovered and reused with the help of MOSRU (Mobile Oil Spill Recovery Unit).* ***Construction of 6 nos new oil catcher Near CDU,HCU,OMS north, near ETP, near PH-3, near storm water final O/L completed , So, complied .*** *Also storm water recycle system to FW/CW has been commissioned* |
| 15 | Oily sludge shall be disposed off into Coker. Annual Oily sludge generation and disposal data shall be submitted to the Ministry‟s Regional Office and CPCB. | *NRL produces Anode grade coke which is further processed in Coke Calcination Unit (CCU) to get high value Calcined Petroleum coke (CPC). Trial run for processing of sludge in Delayed Coker Unit (DCU) was carried out on an experimental basis. However, the process led to the deterioration of the CPC quality to a great extent and the experiment had to be called off. Instead, NRL follows a robust sludge handling process for disposal wherein oily sludge is suitably disposed in bioremediation or is being sold to CPCB authorized recyclers.* |
| 16 | The Company should strictly comply with the rules and guidelines under Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 as amended in October, 1994 and January, 2000. Hazardous waste should be disposed of as per Hazardous Waste (Management, Handling and Trans-boundary Movement) Rules, 2008 and amended time to time | *The rules and regulations under the Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 and as amended in 2000 are adhered to. Hazardous waste authorization is valid till April,2026.* |
| 17 | The membership of common TSDF should be obtained for the disposal of hazardous waste. Copy of authorization or membership of TSDF should be submitted to Ministry‟s Regional Office at Shillong. Chemical/inorganic sludge shall be sent to treatment storage disposal facility (TSDF) for hazardous waste. Spent catalyst shall be sent to authorized recyclers/re-processors. | *NRL has its own SLF for disposal of oily sludge. NRL has constructed a Secured Landfill Facility as recommended by NEERI in 2004 for a safe and systematic disposal of hazardous materials and authorization is accorded from the concerned* |

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| | | *authorities and renewed as per the requirement. Installation of another SLF as per CPCB recommendation has been completed.* |
| 18 | Proper oil spillage prevention management plan shall be prepared to avoid spillage/leakage of oil/petroleum products and ensure regular monitoring | *Proper oil spill prevention management in place. Alternately, a MOSROU is used in case of emergency situation if any. 6 Nos. of additional Oil catchers and Hay filters installed in various locations. Oil adsorbent boom is also placed in many locations. Further, OWS & CRWS systems are very effectively constructed to divert the spilled material to ETP for further treatment.* |
| 19 | Acoustic enclosure /silencer shall be installed wherever it is possible | *Complied* |
| 20 | Occupational Health Surveillance of the workers should be done on a regular basis and records maintained as per the Factories Act | *Complied. Health examination report of workers for 2020-21 submitted to IRO,GHY* |
| 21 | *The company should make the arrangement for protection of possible fire and explosion hazards during construction and operation phase.* | *Complied.* |
| 22 | The company shall strictly follow all the recommendation mentioned in the charter of Corporate Responsibility for Environmental Protection (CREP). | *Complied.* |
| 23 | Thick greenbelt with suitable plant species shall be developed around unit. Selection of plant species shall be as per the CPCB guidelines | *Initially, as per Environmental Clearance granted for the Numaligarh Refinery Project, Ministry of Environment & Forest had stipulated a 500 mtrs wide green belt all around the refinery based on the EIA of Numaligarh Refinery carried out by NEERI. On request from Numaligarh Refinery, the width of the Green Belt was later reduced from the suggested width of 500 mtrs to 100 mtrs because of the reason that almost all the surrounding areas are having tea garden with shade trees (Sirish trees). A wide natural green belt already existed all around the refinery.*<br><br>*Accordingly, a Green Belt covering a total area of around 60 hectares of land and around 100 mtrs width around the refinery and around 25 mtrs width around the NRMT has been developed as per the Green Belt Development Plan. (The Green Belt Development Plan has been submitted to MoEF along with the Half Yearly Report to MOEF on the 15th October, 2001).* |

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| | | *Massive Plantation have been carried out in the Green Belt so that it can provide a natural barrier for attenuation of noise and air pollution. No. of local variety have been planted including some fruit bearing samplings in & all around Green Belt. Again it has been planned to increase the density by planting more saplings in the Green Belt in the days ahead. Grren belt detail submitted to IRO,GHY.* |
| 24 | All the recommendations mentioned in the rapid risk assessment report, disaster management plan and safety guidelines shall be implemented. | *The same has been noted & being implemented. QRA by M/s Ifluids completed.* |
| 25 | At least 2.5 % of the total cost of the project shall be earmarked towards the Enterprise Social Commitment (ESC) based on local needs and action plan with financial and physical breakup/details shall be prepared and submitted to the Ministry‟s Regional Office at Shillong. Implementation of such program shall be ensured accordingly in a time bound manner. Detailed action plan to be submitted to MOEFCC Regional Office, Shillong. | *Comprehensive plan prepared. A*ction *plan with financial and physical breakup/details with time line submitted to IRO,GHY.* |
| **Sl. No.** | **General Condition** | **Remarks** |
| 1 | The project authorities must strictly adhere to the stipulations made by the State pollution Control Board ( SPCB) Stale Government and any other statutory authority | *The stipulations made by the Pollution Control Board of Assam and the State Government are strictly adhered to. CTO copy submitted to IRO,GHY* |
| 2 | No further expansion or modification in the project shall be carried out without prior approval from the Ministry of Environment & Forests. In case of deviations or alterations in the project proposal from those submitted to this Ministry for clearance a, fresh reference shall be made to the Ministry to assess the adequacy of conditions imposed and to add additional environment protection measures required if any. | *Any expansion or modernization in the plant will be taken up only with prior approval of the Ministry of Environment & Forests. Year wise production detail submitted to IRO,GHY.* |
| 3 | The project authorities to strictly comply with the rules and regulations under Manufacture, Storage and Import of Hazardous Chemicals Rules, 2008 as amended subsequently. Prior approvals from Chief Inspector of Factories Chief Controller of Explosives Fire Safety Inspector must be obtained wherever applicable | *The rules and regulations under the Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 and as amended in 2000 are adhered to.* |

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| | | *Approvals from Chief Inspectorate of Factories, Chief Controller of Explosives etc as applicable for the Numaligarh Refinery have been obtained.* |
| 4 | The overall noise levels in and around the plant area shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels shall conform to the standards prescribed under PAR ules,1 989v iz.75 dBA( day time) and 70 dBA ( nighttime). | *The major sources of noise generation in the proposed project are the pumps and the blowers. Strong foundations shall be provided to mitigate the noise generation further. The equipment shall be monitored regularly at a distance of 01 mtr from the source and corrective measure shall be taken to maintain the noise level below 85 dBA. The ambient noise levels all around the refinery is being monitored regularly so as to maintain within the standards, prescribed under EPA Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time).* ***Noise report attached.*** |
| 5 | A separate Environmental Management Cell equipped with full fledged laboratory facilities must be setup to carry out the environmental management on monitoring functions | *A fully functional, dedicated environment management cell manned by qualified engineers/officers and headed by Chief General Manager (Technical) has been continuously working for constant improvement, monitoring, safe guarding and reporting of environmental activities of the refinery.* ***List of persons and qualification submitted to IRO,GHY.*** *Also, a multidisciplinary Apex-level Committee on Environment which includes senior level officers from various departments as members under the chairmanship of Director (Technical) constantly guides the Environment Cell regarding all the environmental issues in the refinery. The Apex Committee that convenes quarterly discusses the unresolved issues if any, regarding the environment and monitors the regular environmental activities.* |
| 6 | Adequate funds shall be earmarked towards capital cost and recurring cost/ annum for environment pollution control measures and shall be used to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government along with the implementation schedule for all the conditions | *Adequate funds have been provided for implementing the conditions stipulated by MoEF and the State Govt. and shall not be diverted for any other purpose* |

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| | stipulated herein. The funds so provided shall not be diverted for any other purposes. | |
| 7 | The Regional office of this Ministry/Central Pollution Control Board//State Pollution Control Board will monitor the stipulated conditions. A six monthly compliance report and the monitored data along with statistical interpretations shall be submitted to them regularly. | *Six monthly compliance report is being sent to the Regional Office of this Ministry/Central Pollution Control board/State Pollution Control Board as per the requirement.* |
| 8 | A copy of clearance letter shall be sent by the proponent to concerned Panchayat/ Zila Parishad/ Municipal Corporation/ Urban Local Body and the local NGO if any, from whom suggestion/representation if, any, were received while processing the proposal. The clearance letter shall also be put on the web site of the company by the proponent. | *Copy of the clearance letter sent to concerned Panchayat/ Zila Parishad/ Circle Office.* |
| 9 | The project proponent shall upload the status of compliance of the stipulated environment clearance conditions including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of the MoEF, the respective Zonal Office of CPCB and the SPCB. The criteria pollutant levels namely SPM, RSPM, SO2, NOx, HC (Methane& Non-methane),VOCs (ambient levels as wel1 as stack emissions) or critical sectoral parameters indicated for the projects shall be monitored and displayed at a convenient location near the main gate of the company in the public domain. | *Complied.* |
| 10 | The project proponent shall also submit six monthly reports on the status of the compliance of the stipulated environmental conditions including results of monitored data (both in hard copies as well as by e-mail) to the Regional Office of MOEF, the respective Zonal Office of CPCB and the SPCB. The Regional Office of this Ministry/ CPCB/ SPCB/ shall monitor the stipulated conditions | *A six monthly compliance report on the Environmental Clearance conditions of the Numaligarh Refinery along with the monitored data is being submitted regularly to the MoEFCC Regional Office.*<br><br>*The same is being displayed in the company's website also.* |
| 11 | The environmental statement for each financial year ending 31st March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986. As amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental conditions and shall also be sent to the respective Regional Offices of the MOEF by e-mail | *The same is being complied. The reports as mentioned being uploaded in NRL website.* ***The environmental statement for financial year, 2020-21 submitted to IRO,GHY with EC compliance status for April'21 to Sept'21*** |

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| 12 | The project proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB and may also be seen at Website of the Ministry of Environment and Forests at http:/envfor.nic.in. This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locally concerned and a copy of the same shall be forwarded to the Regional Office. | *Advertisement regarding the environmental clearance for the DHDT Unit was published in two local newspapers namely, The Assam Tribune (in English) and The Dainik Janambhumi (in Assamese (on the 26th December, 2016 of both the advertisements were forwarded to the MOEF Regional Office, Shillong.* |
| 13 | Project authorities shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of commencing the land development work. | *Project commissioned in March,2018.* |
| 14 | The Ministry may revoke or suspend the clearance, if implementation of any of the above Conditions is not satisfactory. | *The same has been noted.* |
| 15 | The Ministry reserves the right to stipulate additional conditions if found necessary. Company in a time bound manner shall implement these conditions. | *The same has been noted.* |
| 16 | The above conditions will be enforced inter-alia under the provisions of Water (Prevention & Control of pollution) Act 1974, Air (Prevention & control of Pollution) Act' 1981' the Environment (Protection) Act 1986, Hazardous Waste (Management Handling and Transboundary Movement) Rules 2008 and the Public Liability Insurance Act 1991 alonwith their amendments and rules. | *The same has been noted.* |

**COMPLIANCE STATUS ON THE CONDITIONS OF ENVIRONMENTAL CLEARANCE FOR THE EXPANSION OF THE REFINERY FROM 3 MMTPA TO 9 MMTPA OBTAINED VIDES LETTER NO. J-11011/274/2015 –IA II (I) DATED JULY 27, 2020 FROM MOEF & CC, NEW DELHI**

| Sl No | Conditions | Compliance status |
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| 13(i) | The EC granted to the project/ activity is strictly under the provisions of the EIA Notification 2006 and its amendments. It does not tantamount / construe to approvals/ consent/ permissions etc. required to be obtained or standards/ conditions to be followed under any other acts/ Rules/ Subordinate legislations, etc., as may be applicable to the project. | Noted. |
| 13(ii) | The effluent shall be treated and recycled/ reused to meet the requirement of different industrial operations and Zero Liquid Discharge shall be achieved. The treated effluent of 300 cum/hr, if discharged to Dhansiri river through pipeline (to downstream only), shall conform to the standards prescribed under the Environment (protection) Rules, 1986. If Zero Liquid Discharge is not followed, the Project Proponent shall submit plan for achieving Zero Liquid Discharge with its techno-economic feasibility within 3 months before the EAC/Ministry. | A Zero Liquid Discharge techno-economic feasibility study has been carried out through M/s EIL. The feasibility report with recommendations submitted to MoEF, Delhi on 02.11.2020.<br><br>Recommendation of feasibility report are-<br><br>Although Zero Liquid Discharge is better option in terms of water recovery and no wastewater disposal to the Dhansiri River, however, disposal of RO-DM plant reject/ wastewater is proposed in view of the following considerations:<br>• Insignificant impact on the river water quality (~0.3 ppm TDS during wet weather and ~12 ppm TDS during dry weather) due to disposal of RO-DM plant reject water.<br>• Less consumption of input energy (steam, power, etc.) required for disposal of RO-DM plant reject water (as compared to ZLD plant option).<br>• Less fuel requirement for additional power requirement (as compared to ZLD plant option wherein more fuel shall be required for generation of power and steam) and lesser |

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| | | emissions.<br>• No requirement of secured landfill for disposal of significant quantity (30 TPD) of salt generation as in case of ZLD plant option.<br>• No possibility of ground water contamination in the areas nearby secured landfill site as in case of ZLD plant option.<br>• Lower CAPEX and OPEX involved in plant installation and operation (as compared to ZLD plant option).<br>• Very little maintenance or operator's attention requirement (as compared to ZLD plants which are more prone to downtime).<br>As advised by MoEF, NRL applied online for EC amendment on 04.03.2021. The proposal was appraised by EAC committee(I-2) in the ministry in its meeting held on 18 th March'2021. The EAC after deliberations, recommended the amendment in EC as proposed by NRL. Based on the recommendation MoEF accords approval to the proposed amendment on 06.05.2021 as stated below-<br>*The effluent shall be treated and recycled/reused to meet the requirement of different industrial operations. The RO-DM reject of 300 cum/hr to be discharged to Dhansiri River through pipeline (to downstream only), shall conform to the CPCB guidelines.* |
| 13(iii) | The project proponent shall finalize and submit the details of sites to be utilized for associated activities of the refinery in the NDZ area within six months. Preference shall be given to the sites which is adjoining / adjacent to the refinery area. The project proponent shall submit MoU/commitment from the stackholders regarding transfer of the land. | Noted for compliance.<br>The outright purchase/ lease rent deal with the landowners could not be finalized yet due to commercial reasons. Accordingly, NRL has initiated another effort to procure land parcels in and around Refinery premises for the purpose. Accordingly, EOI was published in newspapers and a few offers are received out of which some plots are within the NDZ and some are outside of it. Evaluation/scrutiny of the offers is going on and shall require some more time to conclude the exercise. NRL will approach MoEF&CC with fresh proposal seeking prior |

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| | | permission of any land selected within the NDZ area as per the stipulation of NDZ Notification.<br><br>In view of above NRL requested to extend the period of compliance of Clause 13(iii) of the EC for a period of three months and allow to submit a consolidated proposal after finalization with the stakeholders/land owners. A letter in this regard submitted to MoEF&CC office on 21.01.2021. A copy is forwarded to MoEF,RO, Ghy on 28.01.2021. |
| 13(iv) | The National Emission Standards for Petroleum Oil refinery issued by the Ministry vide G.S.R. 186 (E) dated 18th March, 2008 and G.S.R. 595(E) dated 21st August, 2009 as amended from time to time, shall be followed. | Noted for compliance. |
| 13(v) | Volatile organic compounds (VOCs)/ Fugitive emissions shall be controlled at 99.997% with effective chillers/ modern technology. For emission control and management, use of FG/NG in heater & boiler, continuous stack monitoring, Sulphur recovery plant, etc. shall be installed / ensured. | Noted for compliance. |
| 13(vi) | Total fresh water requirement after expansion shall not exceed 2508 cum/hr to be met from Dhansiri river. Fresh water requirement shall be reduced by recycling/reuse of water. Necessary permission for freshwater procurement shall be obtained from the concerned regulatory authority. | Permission obtained from State Irrigation Dept. Approval letter for drawal of water from River Dhansiri on 21.07.1995 and 02.05.2019 submitted to IRO,GHY |
| 13(vii) | Process effluent/ any wastewater shall not be allowed to mix with storm water. Storm water drain shall be passed through guard pond. | Noted for compliance. |
| 13(viii) | Hazardous chemicals shall be stored in tanks, tank farms, drums, carboys etc. Flame arrested shall be provided on tank farm, and solvent transfer to be done through pumps. | Noted for compliance. |
| 13(ix) | Process organic residue and spent carbon, if any, shall be sent to cement industries. ETP sludge, process inorganic & evaporation salt shall be disposed off to the TSDF. | Noted for compliance. |
| 13(x) | Fly ash should be stored separately as per CPCB guidelines so | Noted for compliance. |

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| | that it should not adversely affect the air quality, becoming air borne by wind or water regime during rainy season by flowing along with the storm water. Direct exposure of workers to fly ash & dust should be avoided. The ash from boiler shall be sold to brick manufacturers / cement industry. | |
| 13(xi) | The company shall undertake waste minimization measures as below:-<br>a) Metering and control of quantities of active ingredients to minimize waste.<br>b) Reuse if by-products from the process as raw materials or as raw material substitutes in other processes.<br>c) Use of automated filling to minimize spillage.<br>d) Use of Close Feed system in to batch reactors.<br>e) Venting equipment through vapour system<br>f) Use of high pressure hoses for equipment cleaning to reduce waste water generation. | Noted for compliance. |
| 13(xii) | The green belt of 5-10m width shall be developed in the total project area, mainly along the plant periphery, in downwards wind direction, and along road sides etc. The project proponent shall ensure 40% greenbelt area vis-à-vis the project area through afforestation in the degraded area. The selection of plant species shall be as per the CPCB guidelines in consultant with the State Forest Department. | -Noted for compliance.<br>- An MoU was signed on 14.09.2020 between NRL and Golaghat Social Forestry Division, Govt. of Assam for compensatory afforestation of 40 Hectares of land in Nak-Kati Chapori, Khumtai Revenue Circle, Golaghat for plantation of 1 lakh tree saplings.<br>-Another MoU was signed between NRL and Nagaon Forest Division for Compensatory afforestation drive in 35 Ha land in Kondoli PRF on 23.08.2021. |
| 13(xiii) | As proposed, at least Rs. 36.51 crore shall be allocated towards Corporate Environment Resposibility (CER). As proposed, the CER allocation shall be spent mainly for addressing the issue raised during public consultation/ hearing including assistance/ infrastructure for transport facility, drinking water, social/ environmental activities, education & skill development, etc. | CER model prepared. **Attached as Annexure-VIII** |

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| 13(xiv) | For the DG sets, emission limits and the stack height shall be in conformity with the extant regulations and the CPCB guidelines. Acoustic enclosure shall be provided to DG set for controlling the noise pollution. | Noted for compliance. |
| 13(xv) | The unit shall make the arrangement for protection of possible fire hazards during manufacturing process in material handling. Firefighting system shall be as per the norms. | Noted for compliance. |
| 13(xvi) | Continuous onlne (24X7) monitoring system for stack emissions shall be installed for measurement of flue gas discharge and the pollutants concentration, and the data to be transmitted to the CPCB and SPCB serve. For online continues monitoring of effluent, the unit shall installed web camera with night vision capability and flow meters in the channel/drain carrying effluent within the premises. In case of the treated effluent to be utilized for irrigation/gardening, real time monitoring system shall be installed at the ETP outlet. | Monitoring data shall be submitted after project completion and commissioning of new 6 MMTPA refinery train.<br>Existing data for 3 MMTPA being submitted regularly with half yea rly EC compliance status. |
| 13(xvii) | Process safety and risk assessment studies shall be further carried out using advanced models, and the mitigating measures shall be undertaken/implemented accordingly. | Quantitative Risk Assement study for existing 3 MMTPA refinery last carried out in 2018. Same shall be carried out for new 9 MMTPA refinery after project completion & commissioning. |
| 13(xviii) | The project proponent shall implement the Site-Specific Conservation Plan for conservation of Schedule I Species in the study area and obtain approval from the State Chief Wildlife Warden of the Department. The recommendations of the approved Site-Specific Conservation Plan shall be implemented in consultation with the State Wildlife Department. The implementation report shall be furnished along with the six-monthly compliance report. | Site specific conservation plan for Schedule I species prepared and submitted to Chief Wildlife Warden, Guwahati for approval. hetter submitted to CWW and plan submitted to IRO,GHY |
| 13(xix) | The PP should improved the efficiency of ETP Plant and the water discharge should be as per prescribed CPCB Norms. They should also install 24X7 hours monitoring system (of the discharge) and the same should be connected to the server of SPCB/CPCB. | Noted for compliance. |
| 13(xx) | Fly Ash Brick making plant shall be installed for proper | Noted for compliance. |

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| | disposal of fly ash. | |
| General Conditions | | |
| 13.1(i) | No further expansion or modifications in the plant, other than mentioned in the EIA Notification, 2006 and its amendments, shall be carried out without prior approval of the Ministry of Environment, Forest and Climate Change. In case of deviations or alterations in the project proposal from those submitted to this Ministry for clearance, a fresh reference shall be made to the Ministry to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any. | Noted for compliance. |
| 13.1 (ii) | The energy source for lighting purpose shall be preferably LED based, or advance having preference in energy conservation and environment betterment. | Noted for compliance. |
| 13.1 (iii) | The locations of ambient air quality monitoring stations shall be decided in consultation with the State Pollution Control Board )SPCB) and it shall be ensured that at least one station each is installed in the upwind and downwind direction as well as where maximum ground level concentrations are anticipated. | Noted for compliance. |
| 13.1 (iv) | The National Ambient Air Quality Emission Standards issued by the Ministry vide GSR No. 826(E) dated 16$^{th}$ November, 2009 shall be followed. | Noted for compliance. |
| 13.1 (v) | The overall noise levels in and around the plant area shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels shall conform to the standards prescribed under Environment (Protection) Act, 1986 Rules, 1989 viz 75dBA (day time) and 70 DBA (night time). | Noted for compliance. |

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| 13.1 (vi) | The company shall harvest rainwater from the roof tops of the buildings and storm water drains to recharge the ground water and to utilize the same for process requirements. | Noted for compliance. |
| 13.1 vii) | Training shall be imported to all employees on safety and health aspects of chemicals handling. Pre- employment and routine periodical medical examinations for all employees shall be undertaken or regular basis. Training to all employees on handling of chemicals shall be imparted. | Noted for compliance. |
| 13.1(viii) | The company shall also comply with all the environmental protection measures and safeguards proposed in the documents submitted to the Ministry. All the recommendations made in the EIA/EMP in respect of environmental managements, and risk mitigation measures relating to the project shall be implemented. | Noted for compliance. |
| 13.1 (ix) | The company shall undertake all relevant measures for improving the socio-economic conditions of the surrounding area. CER activities shall be undertaken by involving local villages and administration and shall be implemented. | CER model prepared. **Attached as Annexure-VIII** |
| 13.1 (x) | The company shall undertake eco-development measures including community welfare measures in the project area for the overall improvement of the environment. | Noted for compliance. |
| 13.1 (xi) | A separate Environmental Management Cell having qualified person with Environmental Science/ Environmental Engineering / specialization in the project area) equipped with full fledged laboratory facilities shall be set up to carry out the Environmental Management and Monitoring functions. | Noted for compliance. Environmental management cell already exist. |
| 13.1 (xii) | The company shall earmark sufficient funds towards capital cost and recurring cost per annum to implement the conditions stipulated by the Ministry of Environment, Forest and Climate Change as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so diverted for any other purpose. | Noted for compliance. |

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| 13.1(xiii) | A copy of the clearance letter shall be sent by the project proponent to concern Panchayat, Zilla Parishad/ Municipal Corporation, urban local body and the local NGO, if any, from whom suggestions/ representations, if any, were received while processing the proposal. | Copy of clearance letter submitted to Letekujan Gaon Panchyat, Rongbong Gaon Panchyat, Ponka Gaon Panchyat, Morongi Circle Office on 19.08.2020. Copy submitted to IRO,GHY |
| 13.1(xiv) | The project proponent shall also submit six monthly report on the status of compliance of the stipulated Environmental Clearance conditions including results of monitored date (both in hard copies we well as by e-mail) to the respective Regional Office of MoEF & CC, the respective Zonal Office of CPCB and SPCB. A copy of Environmental Clearance and six Monthly compliance status report shall be posted on the website of the company. | -Noted for compliance.<br>-EC compliance status as on 1 st June'22 submitted. |
| 13.1 (xv) | The environmental statement for each financial year ending 31st March in form-V as is mandated shall be submitted to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental clearance conditions and shall also be sent to the respective Regional Offices of MoEF & CC by e-mail. | -Noted for compliance.<br>-EC compliance status as on 1 st June'22 submitted. |
| 13.1(xvi) | The project proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB/Committee and may also be seen at Website of the Ministry and at https://parivesh.nic.in/. this shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which on shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the concerned Regional Office of the Ministry. | The advertisement of granting of EC grant broadly published in widely circulated local newspapers - **Amar Asom**, **Pratidin, Dainik Asom, Asomia Khobor, Dainik Agradoot, Dainik Janambhumi, Niyamia Barta** (Assamese) and The **Assam Tribune** and **The Sentinel** (English) on 30th July, 2020 for information to public. The copy of EC letter and paper advertise sent to MoEF,RO on 06.08.2020 |

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|---|---|---|
| 13.1(xvii) | The project authorities shall inform the Regional Office as well as the Ministry, the date of Financial closure and final approval of the project by the concerned authorities and the date of start of the project. | Noted for compliance |
| 13.1(xviii) | This Environmental clearance is granted subject to final outcome of Hon'ble Supreme Court of India. Hon'ble High Court, Hon'ble NGT and any other Court of Law, if any, as may be applicable to this project. | Noted |

Annexure-A

CPMPLIANCE STSTUS OF THE SIX CONDITIONS GIVEN WITH THE DEVELOPMENT OF TOWNSHIP OBTAINED VIDE LETTER NO. J-11014/2/91-IA.II DATED 18TH JANUARY, 1994 FROM MOEF NEW DELHI.

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**CONDITIONS:**

i) The hill slopes should not be used for civil construction purposes

- Noted.

ii) Land use planning of the colony and the land around it should be finalized in construction with the State Town Planning Department.

- Consultation was done, but minutes of the same are not available at present.

iii) More open space should be left and the building construction may be done by acquiring minimum land and the houses should be constructed on ground plus two floors basis.

- Noted.

Open space left within the township is around is around 82% of the total area.

iv) Township site should not involve any forest area.

- Township is constructed only in the permitted area.

v) The existing forest cover towards the west and north of the proposed colony site should not be disturbed.

- It is not disturbed.

vi) No organized human settlement or private colonies should be allowed in the hill or the areas adjoining the hill. (Atleast in a radius of 10 kms).

- The Govt. of Assam has already notified the “No Development Zone” on 19.01.95.

**Annexure B**

***POINT-WISE STATUS OF CONDITIONS MENTIONED IN THE "NO OBJECTION CERTIFICATE" VIDE NO. WB/T-843/89-90/154 DATED 01.09.1990 OF POLLUTION CONTROL BOARD, ASSAM***

**1. No Air, Water, Soil pollution shall be created by the industry beyond the permissible limits prescribed by this Board. The industry would incorporate adequate pollution control measures before they put the plant into operation.**

*- This has been complied. For abatement of pollution, the following environment initiatives have been incorporated:*

- *Effluent Treatment Plant with tertiary treatment facilitie. This is further enhanced by implantation of ETP modernization and VOC recovery system in ETP. .*
- *Sulphur Recovery Block*
- *Ambient Air Quality monitoring*
- *Automatic online stack monitoring system*
- *Green Belt around refinery and NRMT*
- *Non-illuminating ground flare*
- *Low NOx burners incorporated in design*
- *Township sewage treatment plant and composting plant*
- *Hazardous oily waste and other solid waste management by Secured Landfill Facility, Bio-remediation and selling to approved recyclers.*

**2. To maintain the environmental and ecology in the area provision for planting selected species of these within the compound and approaches along with provisions for park, garden and fountain shall have to be made. Massive afforestation will have to be made by the industry in the factory and township.**

*-Within the refinery premises, few gardens have been developed near various units like Hydrocracker(HCU), Captive Power Plant (CPP), Effluent Treatment Plant (ETP), QC lab, Central Control Room (CCR) etc. Plantation of different variety of saplings have been widely carried out mainly along the all roadside areas all throughout the refinery. Fountain has been made in front of the Administrative Building. Massive plantations have been also carried out on all along the road sides in the Township and plantation also have been done in wide scale in the Butterfly Valley, Herbal garden, public places and club premises and few other places in the Township.*

3. **As per provisions of water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act, 1981 any officer empowered, by this Board in its behalf shall without any interruption, the right at any time to enter the industry for inspection, to take samples for analysis and may call for any information etc. Violation of this right will be withdrawal of the "NO OBJECTION CERTIFICATE".**

*-This has been followed without any exception.*

4. **As per provisions of the Acts, regular monitoring are to be done by the industry from the locations/points fixed by this Board and the reports to be submitted to the Board timely as prescribed.**

*- Regular monitoring of air pollution and effluent quality has been carried out and results are submitted to the PCBA Regional office, Golaghat in every month.*

5. **Effluent carrying drains must be segregated from storm water drains and effluent must be disposed in effluent pond. In no case, effluent will be discharged into nearby nullah / natural watercourse etc. without treatment and bringing it within ISI permissible limits or limits fixed by the Board.**

*-Effluent collection and segregation philosophy was submitted to PCBA. Discharge of any effluent ex-refinery into the River Dhansiri has been stopped since October, 2006.*

6. **Standard linings and flat embankment of effluent pond shall have to be provided in the pond to prevent and control of overflow, seepage and leakage of effluent to the nearby areas.**

*-This was incorporated in the design of the storage ponds of the Effluent Treatment Plant and constructed accordingly.*

7. **To regularise the subsequent process, the legal provisions of CONSENT LICENCE and RETURNS shall have to be timely adhered to.**

*-Submission of application for revalidation of Consent from PCB, Assam for running of the various units and Returns are being timely adhered to.*

8. **Gaseous pollutants due to the burning of the fuel to run engine, boiler, etc. should be controlled by adopting preventive measures.**

*-Low NOx burners have been installed in all the furnaces and also, low sulfur fuels are being used.*

9. **Solid waste that arises during the operation should be properly graded and disposed off scientifically without causing nuisance.**

*-Solid waste has been properly graded, hazardous oily waste and other solid waste disposed off through the Secured Land Fill facility and bio-remediation after taking due authorization from PCBA. Spent catalyst is disposed off through approved recyclers and few quantity of oily sludge has been sold to approve recyclers.*

10. **For low-lying areas, special care is to be taken by the Industry to prevent any overflow, seepage and leakage of the effluent**.

*-Does not arise.*

*Presently no effluent is discharged from the refinery and township into the River Dhansiri or any water Body.*

11. **For warning systems (Alarm, Siren) is to be installed by the Industry to guard against accidental pollution/mishap together with fire fighting devices.**

*-Sirens have been installed at the refinery site and Township to alert workers on emergency and a complete fire fighting network has been installed. Fire tenders are readily available at site and in operation.*

12. **All pipes connections, joints, fittings etc in the factory and plant are to be frequently checked and leak proof all the time by the industry.**

*-These are being physically checked on regular basis and in case of any leakage corrective action is taken at the earliest. However, for the detection of very minor gas/vapour leak - fugitive emission monitoring is done on regular basis by using Gas Measuring Instrument and rectified the leaking points on priority. In additions, acoustic survey is also carried out in various units in regular intervals.*

13. **Proper house keeping and adequate maintenance has to be ensured/ enforced as per provisions of the Acts.**

*- This is complied.*

14. **All unwanted/toxic chemicals/fluid/gases are to be neutralized and flared up as necessary.**

*-The point is adhered to without any deviation.*

15. **Production process is to be monitored and in the event of danger, immediate shutdown is to be ensured by the Industry.**

*-Production process is continuously being monitored from the Control Room and applicable step is initiated as per requirement.*

**16. Provisional "NO OBJECTION CERTIFICATE" will be valid till the proposed date of commissioning of the plant.**

*-Noted*

**17. The provisional "NO OBJECTION CERTIFICATE" has been issued being on the particulars furnished by the applicant and subject to imposition of further/more conditions if warranted by the subsequent development.**

*-Noted*

**18. Healthy working environment for the workers must be maintained and there should not be health hazard to the workers for inadequate arrangements for ventilation, dust removal etc. Arrangements should be adequate and full proof for the health of the workers. Their health should be regularly monitored.**

*- NRL follows OISD – GDN – 166 Guideline for Occupational Health Hazard monitoring to provide specific level of occupational health & hygiene services to the employees and necessary health care.*

*This includes:*

*a) Work Environment monitoring – Occupational hygiene.*
*b) Pre-employment / Pre-placement medical examination.*
*c) Periodic health check-up / examination.*
*d) Infrastructure for occupational health monitoring.*

*The Frequency for Periodic health check-up / examination of NRL has been decided as follows:*

| *Sl. No.* | *Area* | *Frequency* |
|---|---|---|
| *1.* | *Hazardous* | *Half- yearly* |
| *2.* | *Less hazardous* | *Annually* |
| *3.* | *Non- hazardous* | • *Annually the employees of age 50 yrs and above.*<br>• *Once in 2 yrs for employees of age group 40 – 50 yrs.*<br>• *Once in 3 yrs for employees of age group below 40 yrs.* |

**19. The Industry must submit compliance report of action taken on the conditions given by the Board before commissioning of the Plant.**

*-Complied.*

**20. Adequate trees should be planted and maintained in the vacant spaces of the premises and all around the factory and township.**

*Massive plantation of different variety has been carried out mainly along the roadside areas, vacant places, in ETP and in the gardens within the Refinery as well as Township also.*

**21. The Board will be at liberty to withdraw the "NO OBJECTION CERTIFICATE" at any time without notice if necessary steps for prevention of pollution and preservation of environment is not taken by the Industry as per mentioned condition.**

*-Noted.*

**22. The issuance of this NOC does not convey any property right in either real or personal property or any exclusive privileges nor does it authorises any injury to private property nor any invasion right nor any infringement of Central, State or Local Laws or Regulations.**

*-Noted.*

**23. The NOC does not authorize or approve the construction of any physical structures of facilities or the undertaking of any work in any natural watercourse except of the works specially instructed herein.**

*-Noted.*

**24. Effluent treatment plant must be constructed before commissioning of the plant and the treated effluent must conform to the MINAS and IS: 2490 all the time.**

*-The Effluent Treatment Plant equipped with tertiary treatment facilities constructed before the commissioning of the plant. Treated effluent quality is checked regularly as per new MOEF notifications before every discharge from ETP for reuse in the Laboratory and has been intimated regularly to PCB, Assam and CPCB, Shillong on monthly basis. It is worth-mentioning that since October, 2006 no effluent has been discharged outside the refinery. This is further enhanced by implantation of ETP modernization and VOC recovery system in ETP.*

**25. Construction of Effluent Treatment Plant must be started before starting the construction of the Refinery itself.**

*-That has been complied*

**26. Treated effluent shall be discharged through a closed pipeline into the mid-stream of river Brahmaputra after confluence point of Dhansiri river and arrangement is to be made by the Refinery authority for proper mixing.**

*-Permission has been obtained from PCB, Assam to discharge treated effluent at the downstream of jetty in the mid-stream of river Dhansiri through a closed pipeline.*

*However, no treated effluent has been discharged since October, 2006 into the River Dhansiri or any other natural water body as 100% reuse of treated effluent is sustained.*

**27. The applicant shall provide sampling arrangement in the treated effluent carrying closed pipeline at two sites i.e. near NH crossing and before the final outfall point at Dhansiri mukh. Easy access for the sample collection at these two sites will have to be made by the Refinery Authority.**

*-Provision for sampling has been made at various locations in the EDPL at the initial point of the pipeline, near Township and at the final discharge point. However, the requirement is not applicable at present as no treated effluent is discharged outside the refinery. 100% reuse of treated effluent is sustained.*

**28. Regular monitoring is to be done for the parameters, TOC and others as mentioned in MINAS and reports are to be submitted fortnightly to the Board.**

- *The relevant parameters for treated effluent have been monitoring regularly as per the latest CPCB norms and the monitoring reports are being submitted regularly to the PCBA, Regional Office, Golaghat, CPCB Zonal Office, Shillong on monthly basis as per requirement stipulated in the Consent for the refinery.*

**29. The detailed design of the ETP will have to be submitted to the Board before starting construction of ETP.**

*- The same has been submitted before starting the construction of ETP.*

**30. The time schedule for construction and commissioning of the ETP should be submitted to the Board quarterly.**

*- This has been complied.*

**31. Necessary arrangements for sample collection at the following points are to be provided by the industry before commissioning of the plant.**

a) Before entering ETP
b) Before aerobic system of ETP
c) After leaving ETP (on EDPL)
d) At interim point of effluent carrying pipeline near NH crossing
e) Ultimate point of effluent discharge

*-Sampling points as required have been provided.*

**32. Samples will have to be collected and analyzed by the industry from the above points as per condition 31 above and as well as from the following points.**

**a) Near each village situated on the bank of the Dhansiri River.**
**b) Receiving water course (i.e. Brahmaputra) after it receives effluent from the refinery.**

**The applicant is to submit the monitoring results to the Board fortnightly.**

*-The discharge of treated effluent from the Refinery and from the STP, NRL Township has been stopped since October, 2006 and April, 2007 respectively, as such Monitoring of Dhanisiri water becomes irrelevant. Request has been placed to PCBA for discontinuation of the same.*

**33. Recording and monitoring activities and results:**

a) M/s. IBP Co. Ltd., are to monitor effluent everyday and maintain records of all information resulting from monitoring activities.

b) The industry is to record for each measurement for samples to be taken to the requirement of this NOC with the following information.

i) The date, exact place and time of sampling
ii) The dates on which analysis performed
iii) Who perform the analysis
iv) Method used for the analysis
v) The results of all required analysis

c) The industry is to retain for minimum of five years of all records of monitoring activities and results including all records. This period of retention shall be extended during course of any unresolved litigation regarding the discharge of Pollutants by the applicant or when required by the Board.

*Regular monitoring of effluent quality has been carried out and records are kept properly.*

**34. Monitoring information shall be submitted and reported by submitting a discharge monitoring report form duly filled in and signed to the Boards Office.**

*- This is complied.*

**35. The applicant will have to install automatic pH recorder, flow recorder and TOC analyzer on the effluent carrying line.**

*-Flow recorder, TOC analyser and automatic pH recorder have been installed in ETP to monitor the effluent quality going through the Effluent Disposal Pipeline (EDPL). However, the discharge of treated effluent from the Refinery and from the STP, NRL Township has been stopped into River Dhansiri since October, 2006 & April, 2007 respectively.*

**36. The applicant shall not discharge effluents in excess defined as harmful in the NOC. In addition the refinery shall not discharge hazardous substances into watercourses in quantities defined as harmful in the NOC given by the Board.**

*- There is no discharge of effluent from the refinery into River Dhansiri since October, 2006. No hazardous substances are discharged into any watercourses.*

**37. Nothing in this NOC shall be deemed to preclude than institution of any legal action nor receive from any responsibilities or penalties to which the industry is or may be liable.**

*-Noted.*

**38. Applicant shall take adequate and efficient measures so that sulfur is recovered fully and there will not be any release of Sulfide in the effluent. Special monitoring arrangement is to be carried out by the applicant after the coagulation unit as well as at final outlet before disposal.**

*-To minimize sulphur pollution, a Sulphur Recovery Block has been installed and is functioning continuously. Monitoring of sulphide in the effluent is done regularly before every reuse and sulphide level in the final treated effluent is maintained well within the standards.*

**39. The applicant must take special care to contain all the untreated effluent within their compound at the time of malfunctioning of ETP and must be treated to the prescribed limit before disposal.**

*-Guard ponds and Surge Tanks of sufficient holding capacity have been provided in ETP to cater for emergency need. This is further enhanced by implantation of ETP modernization and VOC recovery system in ETP.*

**40. Refinery authority must take special care to keep the noise level within permissible limit all the time. As suggested by NEERI, Green belt development is to be taken up right from the time of construction.**

- *A Green Belt covering a total area of around 60 hectares of land and around 100 mtrs width around the refinery and around 25 mtrs width around the NRMT has been developed as per the Green Belt Development Plan. (The Green Belt Development Plan has been submitted to MoEF along with the Half Yearly Report to MOEF on the 15th October, 2001).*

*Massive Plantation have been carried out in the Green Belt so as to it can provide a natural barrier for attenuation of noise and air pollution. Nos of local variety have been planted including some fruit bearing samplings in & all around Green Belt.*

*Phase wise replantation is in progress in various locations in Green Belt to increase the density.*

*-Noise monitoring inside the work zone has been carried out on a regular basis, and if required, corrective action is taken accordingly.*

**41. Authority shall take adequate care to keep the impact of noise within the limit at the time of loading/unloading and transportation etc.**

*-Adequate care has been taken.*

**42. IBP Ltd. shall construct and commission the sewage treatment plant for their Township area and the treated effluent must confirm IS standards before discharging, special care must be taken to contain the pathogens and coliforms within count before discharge.**

*-A separate Sewage Treatment Plant for Township area has been constructed and in operation. No effluent is discharged into River from STP, the same has been routed back to ETP at refinery.*

**43. Disposal of Sludge:**

**a) Intake Water Treatment:**

Solids, sludges, dust, silt or other pollutants separated from or water prior to use by IBP Ltd. shall be disposed off in such a manner as to prevent any pollutant from such materials from entering any such water. Any live fish or other animals

collected or trapped as a result of intake water screening or treatment may be returned to water body habitat.

*-This has been complied.*

**b) Waste /Water Treatment:**

For disposal of sludge from the treatment plant, IBP Ltd., shall have to take separate specific permission from this Board. IBP Ltd. shall apply for such permission giving three months time for detailed scrutiny of their proposal for disposal off should be intimated to the Board immediately. Detailed proposal for sludge disposal shall be submitted by IBP Ltd. immediately.

*-Based on NEERI's report on Solid Waste Management, one Secured Land Fill was constructed for disposal of sludge from the treatment plant / solid waste. Proposal of the same was submitted to both i.e. MoE&F and PCB, Assam and due permission for disposal of sludge in the Secured Landfill was received from PCB, Assam. NRL has installed another SLF of capacity 6000 m3 as per CPCB recommendations.*

**c) Hazardous waste disposal:**

For disposal of hazardous waste generated from the refinery, IBP Ltd. shall have to take specific permission from the Board separately.

*-Hazardous waste disposal was incorporated in the above proposal and authorization has been granted for disposal of sludge in the Secured Landfill by PCB, Assam. Some quantity has been sold to authorised recyclers.*

**d) Spent Catalyst:**

Spent Catalysts must be disposed off through sale only. No spent catalyst should be disposed at landfill site and must not be buried underground in concrete silo/bunker under any circumstances.

- *Spent catalyst has been sold to the CPCB registered purchasers.*

**e) Sewage Treatment:**

Solid waste generated in the sewage treatment plant should be disposed off in a proper scientific manner so that it will not create any health hazard in the environment.

*-Sludge drying beds have been provided in the Sewage Treatment Plant at Township*

**44. Before applying "Consent To Operate" after commissioning for discharge of treated effluent, the applicant must clarify to the Board that IBP Ltd. have installed an alternative electric power source sufficient to operate all the facilities utilized by the applicant to maintain compliance with terms and conditions of this NOC.**

- *Complied.*

**45. Arrangements are to be made for analysis of bottom sludge of their units particularly of the heavy metals.**

*- Equipment for analysis of heavy metals in bottom sludges like Atomic Absorption Spectrophotometer, Flame Photometer and Spectrophotometer have been procured.*

**46. The applicant shall analyze the solid waste and submit the report to the Board regularly.**

*-Analysis of solid waste has been carried out regularly and submitted to Pollution Control Board.*

**47. The applicant shall take adequate care to contain the raw materials, chemical products etc within the site itself and proper protection arrangements will have to be made around the raw material, product storage area. No seepage/leakage shall take place from this area.**
*Raw materials and products are stored in their respective tanks with all the necessary precautions required for.*

**48. Height of chimneys shall be such that it allows proper dilution of the emitted as and it shall not be less than 30 mtrs under any circumstances.**

*-All the chimney heights are much more than 30 mtrs.*

**49. Stack emissions from the industry must meet the standards prescribed by PCB and Dept. of Environment, Govt. of India all the time.**

*-Monitoring of stack emission has been carried out regularly as per the latest MOEF notification and are well maintained within the standards. The monitoring results are submitted regularly to the PCBA Regional Office, Golaghat, Shillong as per the requirements.*

50. **The applicant is to contain the total sulphur emission into the atmosphere as $SO_2$ within 256 kg/hr.**

*-This is complied*

**51. Fugitive emissions from the refinery should not be more than 6.11 kg/hr.**

- *Regular monitoring of fugitive emission has been carried out in various locations inside the refinery using GMI.*

*The GMI survey has been carried on all gas/vapour valves, light liquid valves, hydrogen valves, light liquid pump seals, hydrocarbon compressor seals, hydrogen compressor seals, safety relief valves, flanges, connections, open-ended lines, drains, tankages, furnaces etc.*

**52. Ground Level conc. of $SO_2$ and $NO_X$ at Kaziranga National Park, due to the release of gases from the refinery shall not exceed 2.25 and 3.51 microgram per cubicmetre resp. during highly unstable condition. Also, during stable condition, $SO_2$ and $NO_X$ shall not exceed 25.0 and 39.0 microgram per cubicmetre resp.**

*-As a compliance of the above, an Air Quality Monitoring Station has been installed at Agratoli, near Kaziranga to monitor the required parameters on a regular basis. The same have been monitored regularly and the value found within limit. Action initiated to install another CAAQMS inside the refinery premises in the down wind direction.*

**53. The refinery authority must also contain the CO, HC within the specified limit and as per NEERI's report.**

*-CO and HC are monitored along with the parameters $SO_2$, NOx and SPM in the ambient air quality monitoring. The same are found to be within standards as prescribed in the Consent for Numaligarh Refinery by PCB, Assam.*

*However, NRL has started monitoring of ambient air quality in line with NAAQS-2009 in totality since April' 2011. Further, real time emission data has been transmitted to CPCB server on continuous basis.*

**54. IBP Ltd. must install automatic $SO_2$ and flow measuring device at all the stacks. If at any stage $SO_2$ exceeds the permissible limits immediate shutdown of operations will have to be ensured.**

*-Automatic $SO_2$ online analysers have been installed in all the refinery unit stacks. The total $SO_2$ emission in terms of kg/hr from the stacks is done on the basis of fuel consumption in the furnaces and sulphur content in the fuel.*

**55. Systematic Green Belt development is to be made by the applicant in and around the refinery site as well as in Township area. Selected trees should be of fast growing with thick canopy cover, perennial and evergreen, with large leaf area, resistant to specific air pollutants.**

*-A Green Belt of around 100 mtrs width around the refinery and around 25 mtrs width around the NRMT covering a total area of land around 60 hectares has been developed. The Green Belt has been developed & maintain as per the Green Belt development plan.*

56. **The applicant will have to take Socio-Economic Development of the area.**

*-Various forms of Community Development Schemes have been carried out regularly.*

**57. Ambient Air Quality Monitoring is to be done daily by the industry in and round factory as well as at Kaziranga National Park and results must be submitted monthly to the Board.**

*- The ambient air quality monitoring is being carried out at 5 locations at a frequency of 8/9 samples per month, taken twice a week 24 hourly at uniform interval. (This is as per the statutory requirement of CPCB, where the minimum no. of samples to be analyzed for a station is 104 samples in a year). The monitoring results are submitted regularly to the PCBA Regional Office, Golaghat and CPCB Regional Office, Shillong in every month.*

*However, NRL has started monitoring of ambient air quality in line with NAAQS-2009 in totality since April' 2011. However, NRL has started monitoring of ambient air quality in line with NAAQS-2009 in totality since April' 2011. Further, real time emission data has been transmitted to CPCB server on continuous basis.*

58. **Stack Monitoring is to be done daily and results must be submitted fortnightly to the Board.**

*-This has been complied.*

59. **The applicant is to submit the detailed Environmental Management Plan, Disaster Management Plan, and Project Report before commissioning the refinery**

*-The reports have been submitted.*

**60. The applicant will have to install water meters at all the water carrying pipelines before commissioning the refinery.**

*-Water meters have been installed on all the water carrying pipelines.*

**61. Automatic pH monitoring of effluent should be provided for by installing automatic pH indicator and recorder.**

*-Automatic pH analyzer has been installed.*

**62. Suitable flow measuring arrangements with automatic measuring devices should be installed in the outlets to measure accurately the quantities of effluents discharged. No effluent shall remain unmeasured and records of daily flow should be maintained.**

- *Flow meter with totalizer has been installed on the effluent discharge pipeline and records are maintained daily. The treated effluent is reused in the Refinery premises only, there is no discharge into River Dhansiri.*

**63. The applicant is to take special care to raise the height of Electric Poles including towers so that animals can pass the area safely. If necessary, alternative arrangements is to be made for safe movement of animals.**

-*Steps have been taken accordingly.*

**64. The refinery authority will have to strictly adhere to the provisions of the Water (Prevention and Control of Pollution) Act, 1974; Water (Prevention and Control of Pollution) Amendment Acts, 1978 &1980; Air (Prevention and Control of Pollution) amendment Act, 1981; Environment (Protection) Act 1986.**

- *This is complied.*

**65. The Board will be at liberty to withdraw the "NO OBJECTION CERTIFICATE" at any time without notice if necessary steps for Prevention and Control of Pollution and preservation of environment is not taken by IBP Ltd. as per above mentioned conditions.**

-*Noted.*

****************

# NUMALIGARH REFINERY LIMITED

(Quality Control Department)

**Analysis of ground water around secured land fills**
**Date of sampling: 16.02.2022**
**Tested by: Manash Protim Borah**

| Sl No. | Parameters | UOM | Results of Piezometric tubes |
|---|---|---|---|
| 1 | Odour | -- | Odourless |
| 2 | pH Value | -- | 7.0 |
| 3 | Iron | ppm | 0.34 |
| 4 | Copper | ppm | 0.009 |
| 5 | Nickel | ppm | 0.001 |
| 6 | Cadmium | ppm | 0.000 |
| 7 | Arsenic | ppm | 0.000 |
| 8 | Lead | ppm | 0.000 |
| 9 | Zinc | ppm | 0.0009 |
| 10 | Chromium | ppm | 0.0004 |
| 11 | Magnesium | ppm | 1.623 |
| 12 | Calcium | ppm | 4.480 |
| 13 | Selenium | ppm | 0.000 |
| 14 | Sodium | ppm | 11.20 |

**Certified by: Dr. Bedobrat Barhai**
**Officer(Quality Control)**
**For Numaligarh Refinery Limited**

Nitya Work for Quality

# NITYA LABORATORIES

BUILDING & ROAD, MATERIAL, SOIL, ENVIRONMENTAL & CALIBRATION TESTING LAB

**NITYA LABORATORIES**
43, Sector-A1 Ext., Bhalla Enclave, Channi Himmat, Jammu-180 015, J&K (UT), India
+91-191-2465597
info@nityalab.com www.nityalab.com

## Test Report

**Issued To** **M/s Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Test Report Date** 25/03/2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

**Sample Particulars**

Nature of the Sample : **Ambient Noise**
Date of Sampling : 22/03/2022
Parameter Tested : Noise Level, Leq dB (A)*
Instrument Used : Sound Level Meter

**Analysis Report**

| Sr. No. | URL No. | Area | Location | Observed Value dB(A) | | Standard dB(A) |
|---|---|---|---|---|---|---|
| | | | | Day | Night | |
| 1 | 202203220114-202203220132 | CDU/VDU | Field Cabin (Inside) | 63.7 | 61.2 | **92 for 6 hrs** |
| 2 | | | Crude Booster Pump Area (C) | 87.2 | 86.3 | |
| 3 | | | Crude Booster (B) | 88.3 | 85.2 | |
| 4 | | DCU | Filed Cabin | 61.2 | 59.8 | |
| 5 | | | LPG Compressor | 78.5 | 76.1 | |
| 6 | | HCU | Field Cabin (Inside) | 65.2 | 63.3 | |
| 7 | | | Near RGC Area | 78.2 | 75.7 | |
| 8 | | H2U | Field Cabin (Inside) | 56.2 | 54.0 | |
| 9 | | | PSA Area | 88.3 | 86.6 | |
| 10 | | SRB | Field Cabin (Inside) | 61.2 | 59.2 | |
| 11 | | | Control Rooms | 57.2 | 54.3 | **90 for 8 hrs** |
| 12 | | PH#1 | Field Cabin (Inside) | 50.3 | 49.9 | |
| 13 | | PH#3 | Field Cabin (Inside) | 55.2 | 53.2 | |
| 14 | | CPP | Control Rooms | 61.2 | 60.2 | |
| 15 | | | Field Cabin (Inside) | 59.2 | 57.1 | |
| 16 | | | Instrumentation Room | 63.2 | 60.2 | |
| 17 | | | Air Compressor (Utility) | 83.3 | 81.4 | |
| 18 | | CPP (2) | Cabin (2) | 60.6 | 58.2 | |
| 19 | | | Sound Prone Zone | 82.2 | 80.1 | |

Remark: *dB (A) Leq denotes the time weighted average of the level of sound in decibel on scale 'A' which is relatable to human hearing.

**(AUTHORISED SIGNATORY)**
**(RAVINDER MITTAL)**

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## Test Report

**Issued To** **M/s Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Test Report Date** 25/03/2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

### Analysis Report

| Sr. No. | URL No. | Area | Location | Observed Value dB(A) | | Standard dB(A) |
|---|---|---|---|---|---|---|
| | | | | Day | Night | |
| 20 | 202203220133-202203220152 | CPP 3 | Cooling Tower ( North Side) | 90.1 | 88.9 | 92 for 6 hrs |
| 21 | | | Cooling Tower (South Side) | 91.5 | 89.7 | |
| 22 | | DM Plant | Field Cabin (Inside) | 58.7 | 57.2 | |
| 23 | | WPH | Control Rooms (Inside) | 59.2 | 58.1 | |
| 24 | | ETP | Disposal Pump (House) | 88.2 | 84.3 | |
| 25 | | | Control Rooms (Inside) | 58.3 | 57.1 | |
| 26 | | CCU | Control Rooms (Inside) | 60.1 | 58.3 | |
| 27 | | | Near BFW | 88.2 | 86.2 | |
| 28 | | | Near Air Blower | 89.3 | 86.5 | |
| 29 | | MSP | Filed Cabin | 53.5 | 51.2 | |
| 30 | | | Near Compressor House | 88.2 | 85.3 | |
| 31 | | | Near Furnace Area | 78.2 | 76.3 | 90 for 8 hrs |
| 32 | | N2 Plant /Compressor | Control Rooms (Inside) | 55.7 | 53.2 | |
| 33 | | | Near Compressor House | 88.5 | 87.1 | |
| 34 | | N2 Plant | LP Compressor ( 27-KA0002A) | 89.2 | 88.2 | |
| 35 | | | LP Compressor ( 27-KA0002B) | 90.3 | 89.1 | |
| 36 | | Wax (ASPU) | Compressor ( 304- A) | 85.2 | 83.4 | |
| 37 | | | Compressor ( 304- B) | 84.3 | 82.2 | |
| 38 | | | Office Cabin (ASPU) | 51.6 | 49.1 | |
| 39 | | Wax (SDU) | Field Cabin | 54.5 | 53.2 | |

Remark: *dB (A) Leq denotes the time weighted average of the level of sound in decibel on scale 'A' which is relatable to human hearing.

**(AUTHORISED SIGNATORY)**
**(RAVINDER MITTAL)**

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**Test Report**

**Issued To** **M/s Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Test Report Date** 25/03/2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

**Analysis Report**

| Sr. No. | URL No. | Area | Location | Observed Value dB(A) | | Standard dB(A) |
|---|---|---|---|---|---|---|
| | | | | Day | Night | |
| 40 | 202203220153-202203220168 | LPG B Plant | Casual 1 | 102.1 | 101.3 | 92 for 6 hrs |
| 41 | | | Unloading | 104.4 | 102.2 | |
| 42 | | | Cyling | 106.1 | 104.1 | |
| 43 | | | Loading | 107.6 | 105.5 | 90 for 8 hrs |
| 44 | | DHDT | F. Cabin | 58.2 | 56.1 | |
| 45 | | WAX | Hydro Finishing | 59.3 | 56.6 | |
| 46 | | Lab | Outside Lab Building | 58.1 | 55.5 | 75 |
| 47 | | | Near Laboratory | 50.2 | 48.8 | |
| 48 | | IT Deptt. | Server Room | 52.3 | 49.6 | |
| 49 | | ADM Building | Near AC Room | 64.4 | 61.2 | |
| 50 | | | Near ADM Building | 63.3 | 60.4 | |
| 51 | | Watch Tower No. | Near W.T. No.1 | 54.4 | 51.9 | |
| 52 | | Central Control Room | In front of CCR | 63.4 | 60.6 | |
| 53 | | Flare Area | Near Flare Area | 54.4 | 51.2 | |
| 54 | | VKNRL Hospital | Hospital Premises | 63.4 | 60.1 | |
| 55 | | DPS | DPS Premises | 56.3 | 53.3 | |

Remark: *dB (A) Leq denotes the time weighted average of the level of sound in decibel on scale 'A' which is relatable to human hearing.

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**Annexure-III**

**QUARTERLY PERFORMANCE REPORT W.R.T ENVIRONMENTAL ASPECT.**

**DURING QUARTER III(OCT-DEC'21),2021-22**

**Online Stack Analyser data**

| UNIT | FURNACE STACK | PARAMETER | OBSERVED VALUE CONC. (In mg/Nm$^3$) | | Limiting Concentration in mg/Nm$^3$ | Remarks Limit conc. calculated using fuel type& quan. used during the period |
|---|---|---|---|---|---|---|
| | | | MAX. | MIN. | | |
| CDU/VDU | FF-01/02 | $SO_2$ | 335.87 | 21.75 | **607** | Stack with dual firing (FG:FO=66:34) |
| | | NOX | 85.48 | 3.7 | **384** | |
| | | CO (FFI&II) | 7.1 | 4.94 | **167** | |
| DCU | FF-01 | $SO_2$ | 222.03 | 1.27 | **878** | Stack with dual firing (FG:FO=50:50) |
| | | NOX | 176.35 | 6.45 | **400** | |
| HCU | FF-01/02 | $SO_2$ | 26.85 | 1.1 | **50** | Stack with Gas firing |
| | | NOX | 34.07 | 5.99 | **350** | |
| HCU | FF-03 | $SO_2$ | 194.07 | 3.74 | **214** | Stack with dual firing (FG:FO=90:10) |
| | | NOX | 89.10 | 4.7 | **360** | |
| H2U | FF-01 | $SO_2$ | 48.3 | 5.80 | **50** | Stack with Gas firing |
| | | NOX | 58.12 | 1.12 | **350** | |
| MSP | FF-01 | $SO_2$ | 44.92 | 20.52 | **50** | Stack with Gas firing |
| | | NOX | 64.67 | 21.35 | **350** | |
| CPP HRSG | | $SO_2$ | 11.55 | 10.00 | **50** | Stack with dual firing (FG:NAP=100:00) |
| | | NOX | 21.83 | 7.83 | **350** | |
| CPP UTILITY BOILER | | $SO_2$ | 47.21 | 14.15 | **50** | Stack with Dual firing (FG:FO=100:0) |
| | | NOX | 235.2 | 15.01 | **350** | |
| DHDT | | $SO_2$ | 218.91 | 0.47 | **50** | Stack with Gas firing |
| | | NOX | 55.4 | 12.20 | 350 | |

*** Limiting concentration of emission calculated as per MOEF new notification on standard vide GSR- 186 (E) dated 18th March, 2008. Emission level for all the stacks are found to be within limit**

**Annexure-III**

**QUARTERLY PERFORMANCE REPORT W.R.T ENVIRONMENTAL ASPECT.**

**DURING QUARTER IV(JAN-MAR'22),2021-22**

**Online Stack Analyser data**

| UNIT | FURNACE STACK | PARAMETER | OBSERVED VALUE in mg/Nm3 | | | Limiting Concentration in mg/Nm3 | Remarks |
|---|---|---|---|---|---|---|---|
| | | | MAX. | MIN. | AVG | | |
| CDU/VDU | FF-01/02 | SO2 | 248.36 | 6.60 | 132.24 | 632 | Stack with dual firing (FG:FO=65:35) |
| | | NOx | 225.39 | 1.28 | 34.63 | 385 | |
| | | CO | 8.53 | 4.86 | 7.28 | 168 | |
| | | PM | 12.00 | 6.85 | 9.78 | 42 | |
| DCU | FF-01 | SO2 | 251.60 | 1.06 | 157.07 | 1058 | Stack with dual firing (FG:FO=39:61) |
| | | NOx | 194.79 | 7.09 | 141.20 | 411 | |
| | | CO | 102.78 | 1.14 | 53.60 | 181 | |
| | | PM | 28.00 | 7.00 | 9.21 | 65 | |
| HCU | FF-01/02 | SO2 | 28.95 | 1.70 | 14.07 | 50 | Stack with Gas firing |
| | | NOx | 41.48 | 6.58 | 37.11 | 350 | |
| | | CO | 105.00 | 0.30 | 20.71 | 150 | |
| | | PM | 3.36 | 2.85 | 3.14 | 10 | |
| HCU | FF-03 | SO2 | 162.40 | 0.83 | 66.66 | 177 | Stack with dual firing (FG:FO=92:08) |
| | | NOx | 86.50 | 1.01 | 40.34 | 358 | |
| | | CO | 74.33 | 0.04 | 10.20 | 154 | |
| | | PM | 7.40 | 5.30 | 6.03 | 17 | |
| H2U | FF-01 | SO2 | 51.21 | 2.65 | 22.89 | 50 | Stack with Gas firing |
| | | NOx | 30.41 | 5.83 | 21.38 | 350 | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | CO | 10.63 | 5.76 | 7.67 | **150** | |
| | | PM | 9.03 | 8.00 | 8.43 | 10 | |
| **CPP(HRSG)** | | SO2 | 49.90 | 10.00 | 23.55 | **50** | Stack with Gas firing |
| | | NOx | 39.96 | 14.00 | 24.46 | **350** | |
| | | CO | 18.47 | 0.31 | 4.40 | **150** | |
| | | PM | 13.24 | 1.85 | 3.16 | **10** | |
| **CPP (UB)** | | SO2 | 77.77 | 45.00 | 60.99 | **75** | Stack with dual firing (FG:FO=99:1) |
| | | NOx | 118.47 | 94.64 | 105.36 | **351** | |
| | | CO | 9.00 | 0.20 | 4.47 | **151** | |
| | | PM | 2.81 | 2.67 | 2.72 | **11** | |
| **MSP (CRU)** | | SO2 | 47.80 | 22.87 | 37.01 | **50** | Stack with Gas firing |
| | | NOx | 85.21 | 55.00 | 70.58 | **350** | |
| | | CO | 2.75 | 0.55 | 1.47 | **150** | |
| | | PM | 5.70 | 4.78 | 5.19 | **10** | |
| **MSP (NHTU)** | | SO2 | 50.00 | 18.16 | 25.94 | **50** | Stack with Gas firing |
| | | NOx | 77.19 | 45.00 | 62.41 | **350** | |
| | | CO | 4.00 | 0.60 | 2.02 | **150** | |
| | | PM | 5.70 | 4.78 | 5.19 | **10** | |
| **DHDT** | | SO2 | 70.52 | 2.40 | 28.79 | **50** | Stack with Gas firing |
| | | NOx | 58.37 | 37.69 | 48.36 | **250** | |
| | | CO | 17.13 | 0.40 | 4.73 | **100** | |
| | | PM | 0.64 | 0.58 | 0.61 | **5** | |

* Limiting concentration of emission calculated as per MOEF new notification on standard vide GSR- 186 (E) dated 18th March, 2008. Emission level for all the stacks are found to be within limit

**Annexure-IV**

## NUMALIGARH REFINERY LIMITED

### QUARTERLY PERFORMANCE WITH RESPECT TO ENVIRONMENTAL ASPECTS DURING QUARTER III (OCT-DEC'21), 2021-22

**Ambient Air Quality Data**

| STATION | PARAMETER | STD NAAQS-2009 | Unit | OBSERVATIONS | | |
|---|---|---|---|---|---|---|
| | | | | MAX | MIN | AVG |
| REFINERY (WATCH TOWER NO. 6) | SO2 | 80 (24 hr avg.) | µg/m3 | 14.9 | 9.30 | 12.2 |
| | NO2 | 80 (24 hr avg.) | µg/m3 | 20.0 | 12.4 | 16.1 |
| | $O_3$ | 100 (8 hr avg.) | µg/m3 | 43.1 | 16.8 | 24.1 |
| | CO | 2.000 (8 hr.avg.) | mg/m3 | 1.100 | 0.69 | 0.893 |
| | $NH_3$ | 400 (24 hr.avg.) | µg/m3 | 37.3 | 16.2 | 21.06 |
| | PM 10 | 100 (24 hr.avg.) | µg/m3 | 72.7 | 48.5 | 46.3 |
| | PM 2.5 | 60 (24 hr.avg.) | µg/m3 | 39.9 | 18.2 | 21.0 |
| | Benzene | 05 (Annual) | µg/m3 | 3.50 | 1.30 | 1.98 |
| | HC | | mg/m3 | 1.37 | 0.70 | 0.79 |
| | BaP | 01 (Annual) | ng/m3 | <0.5 | <0.5 | <0.5 |
| | Pb | 1.0 (24 hr.avg.) | µg/m3 | 0.49 | 0.17 | 0.25 |
| | As | 06 (Annual) | ng/m3 | 1.00 | 1.00 | 1.00 |
| | Ni | 20 (Annual) | ng/m3 | 4.30 | 1.40 | 2.13 |
| ECO-PARK IN NRL TOWNSHIP | SO2 | 80 (24 hr avg.) | µg/m3 | 12.60 | 9.10 | 10.8 |
| | NO2 | 80 (24 hr avg.) | µg/m3 | 17.00 | 11.50 | 14.3 |
| | $O_3$ | 100 (8 hr avg.) | µg/m3 | 33.3 | 15.20 | 23.8 |
| | CO | 2.000 (8 hr.avg.) | mg/m3 | 0.900 | 0.710 | 0.793 |
| | $NH_3$ | 400 (24 hr.avg.) | µg/m3 | 30.1 | 15.60 | 20.4 |
| | PM 10 | 100 (24 hr.avg.) | µg/m3 | 57.7 | 44.9 | 52.3 |
| | PM 2.5 | 60 (24 hr.avg.) | µg/m3 | 31.7 | 18.2 | 22.1 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Benzene | 05 (Annual) | µg/m3 | 3.10 | 1.10 | 2.1 |
| | HC | | mg/m3 | 1.08 | 0.67 | 0.9 |
| | BaP | 1.0 (Annual) | ng/m3 | <0.5 | <0.5 | <0.5 |
| | Pb | 1.0 (24 hr.avg.) | µg/m3 | 0.39 | 0.17 | 0.263 |
| | As | 6.0 (Annual) | ng/m3 | 1.00 | 1.00 | 1.00 |
| | Ni | 20 (Annual) | ng/m3 | 3.60 | 1.40 | 2.62 |
| **RAW WATER INTAKE** | SO2 | 80 (24 hr avg.) | µg/m3 | 11.8 | 8.2 | 10.1 |
| | NO2 | 80 (24 hr avg.) | µg/m3 | 16.5 | 10.5 | 13.3 |
| | $O_3$ | 100 (8 hr avg.) | µg/m3 | 30.4 | 14.8 | 23.2 |
| | CO | 2.000 (8 hr.avg.) | mg/m3 | 0.85 | 0.61 | 0.72 |
| | $NH_3$ | 400 (24 hr.avg.) | µg/m3 | 27.90 | 14.40 | 21.03 |
| | PM 10 | 100 (24 hr.avg.) | µg/m3 | 53.8 | 43.6 | 48.4 |
| | PM 2.5 | 60 (24 hr.avg.) | µg/m3 | 27.3 | 16.5 | 21.7 |
| | Benzene | 05 (Annual) | µg/m3 | 2.90 | 1.10 | 2.1 |
| | HC | | mg/m3 | 1.00 | 0.61 | 0.8 |
| | BaP | 01 (Annual) | ng/m3 | <0.5 | <0.5 | <0.5 |
| | Pb | 1.0 (24 hr.avg.) | µg/m3 | 0.360 | 0.15 | 0.25 |
| | As | 06 (Annual) | ng/m3 | 1.00 | 1.00 | 1.00 |
| | Ni | 20 (Annual) | ng/m3 | 3.30 | 1.30 | 2.17 |
| **NH-39 BYPASS** | SO2 | 80 (24 hr avg.) | µg/m3 | 16.3 | 10.6 | 13.0 |
| | NO2 | 80 (24 hr avg.) | µg/m3 | 22.0 | 13.8 | 17.1 |
| | $O_3$ | 100 (8 hr avg.) | µg/m3 | 41.7 | 18.6 | 29.7 |
| | CO | 2.000 (8 hr.avg.) | mg/m3 | 1.140 | 0.790 | 0.973 |
| | $NH_3$ | 400 (24 hr.avg.) | µg/m3 | 40.0 | 19.9 | 29.1 |
| | PM 10 | 100 (24 hr.avg.) | µg/m3 | 75.5 | 54.6 | 64.7 |
| | PM 2.5 | 60 (24 hr.avg.) | µg/m3 | 39.9 | 19.5 | 29.5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Benzene | 05 (Annual) | µg/m3 | 4.10 | 1.40 | 2.66 |
| | HC | - | mg/m3 | 1.33 | 0.85 | 1.13 |
| | BaP | 1 | ng/m3 | <0.5 | <0.5 | <0.5 |
| | Pb | 1.0 (24 hr.avg.) | µg/m3 | 0.51 | 0.22 | 0.363 |
| | As | 6 | ng/m3 | 1.00 | 1.00 | 1.00 |
| | Ni | 20 (Annual) | ng/m3 | 4.50 | 1.70 | 2.94 |
| **KAZIRANGA WILDLIFE SANCTUARY AT AGARTOLI** | $SO_2$ | 80 (24 hr avg.) | µg/m3 | 12.70 | 8.40 | 10.14 |
| | $NO_2$ | 80 (24 hr avg.) | µg/m3 | 16.5 | 10.7 | 13.4 |
| | $O_3$ | 100 (8 hr avg.) | µg/m3 | 34.3 | 15.70 | 23.3 |
| | CO | 2.000 (8 hr.avg.) | mg/m3 | 0.870 | 0.610 | 0.7 |
| | $NH_3$ | 400 (24 hr.avg.) | µg/m3 | 30.50 | 14.10 | 20.1 |
| | PM 10 | 100 (24 hr.avg.) | µg/m3 | 56.1 | 41.3 | 48.0 |
| | PM 2.5 | 60 (24 hr.avg.) | µg/m3 | 29.9 | 16.1 | 20.9 |
| | Benzene | 05 (Annual) | µg/m3 | 2.90 | 1.00 | 2.2 |
| | HC | - | mg/m3 | 1.07 | 0.61 | 0.8 |
| | BaP | 1.0 | ng/m3 | <0.5 | <0.5 | <0.5 |
| | Pb | 1.0 (24 hr.avg.) | µg/m3 | 0.35 | 0.14 | 0.23 |
| | As | 6.0 | ng/m3 | 1.00 | 1.00 | 1.00 |
| | Ni | 20 (Annual) | ng/m3 | 3.50 | 1.20 | 2.2 |

**BDL:Below Detection Level, All the parameters are found to be within limt**

**Annexure-IV**

## NUMALIGARH REFINERY LIMITED

### QUARTERLY PERFORMANCE WITH RESPECT TO ENVIRONMENTAL ASPECTS DURING QUARTER IV (JAN-MAR'22), 2021-22

**Ambient Air Quality Data**

| STATION | PARAMETER | STD NAAQS-2009 | Unit | OBSERVATIONS | | |
|---|---|---|---|---|---|---|
| | | | | MAX | MIN | AVG |
| REFINERY (WATCH TOWER NO. 6) | SO2 | 80 (24 hr avg.) | µg/m3 | 13.7 | 9.80 | 11.9 |
| | NO2 | 80 (24 hr avg.) | µg/m3 | 19.2 | 12.5 | 15.7 |
| | $O_3$ | 100 (8 hr avg.) | µg/m3 | 36.8 | 17.8 | 27.0 |
| | CO | 2.000 (8 hr.avg.) | mg/m3 | 1.080 | 0.72 | 0.877 |
| | $NH_3$ | 400 (24 hr.avg.) | µg/m3 | 33.9 | 15.4 | 24.36 |
| | PM 10 | 100 (24 hr.avg.) | µg/m3 | 64.7 | 49.3 | 57.1 |
| | PM 2.5 | 60 (24 hr.avg.) | µg/m3 | 32.6 | 19.5 | 25.3 |
| | Benzene | 05 (Annual) | µg/m3 | 3.20 | 1.00 | 2.35 |
| | HC | - | mg/m3 | 1.21 | 0.56 | 0.94 |
| | BaP | 01 (Annual) | ng/m3 | <0.5 | <0.5 | <0.5 |
| | Pb | 1.0 (24 hr.avg.) | µg/m3 | 0.46 | 0.19 | 0.33 |
| | As | 06 (Annual) | ng/m3 | 1.00 | 1.00 | 1.00 |
| | Ni | 20 (Annual) | ng/m3 | 4.00 | 1.30 | 2.55 |
| ECO-PARK IN NRL TOWNSHIP | SO2 | 80 (24 hr avg.) | µg/m3 | 14.60 | 10.60 | 12.5 |
| | NO2 | 80 (24 hr avg.) | µg/m3 | 19.90 | 13.40 | 16.6 |
| | $O_3$ | 100 (8 hr avg.) | µg/m3 | 41.4 | 17.80 | 28.1 |
| | CO | 2.000 (8 hr.avg.) | mg/m3 | 1.070 | 0.720 | 0.893 |
| | $NH_3$ | 400 (24 hr.avg.) | µg/m3 | 33.6 | 17.70 | 24.9 |
| | PM 10 | 100 (24 hr.avg.) | µg/m3 | 69.5 | 51.0 | 61.1 |
| | PM 2.5 | 60 (24 hr.avg.) | µg/m3 | 36.9 | 22.1 | 27.6 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Benzene | 05 (Annual) | µg/m3 | 3.60 | 1.30 | 2.5 |
| | HC | | mg/m3 | 1.28 | 0.78 | 1.0 |
| | BaP | 1.0 (Annual) | ng/m3 | <0.5 | <0.5 | <0.5 |
| | Pb | 1.0 (24 hr.avg.) | µg/m3 | 0.44 | 0.18 | 0.317 |
| | As | 6.0 (Annual) | ng/m3 | 1.00 | 1.00 | 1.00 |
| | Ni | 20 (Annual) | ng/m3 | 4.20 | 1.50 | 2.83 |
| **RAW WATER INTAKE** | SO2 | 80 (24 hr avg.) | µg/m3 | 13.3 | 8.6 | 11.3 |
| | NO2 | 80 (24 hr avg.) | µg/m3 | 18.1 | 11.4 | 14.9 |
| | $O_3$ | 100 (8 hr avg.) | µg/m3 | 35.1 | 18.9 | 26.7 |
| | CO | 2.000 (8 hr.avg.) | mg/m3 | 0.96 | 0.62 | 0.83 |
| | $NH_3$ | 400 (24 hr.avg.) | µg/m3 | 32.20 | 15.20 | 24.11 |
| | PM 10 | 100 (24 hr.avg.) | µg/m3 | 60.7 | 45.2 | 54.7 |
| | PM 2.5 | 60 (24 hr.avg.) | µg/m3 | 33.4 | 17.4 | 25.2 |
| | Benzene | 05 (Annual) | µg/m3 | 3.30 | 1.20 | 2.3 |
| | HC | | mg/m3 | 1.14 | 0.61 | 0.8 |
| | BaP | 01 (Annual) | ng/m3 | <0.5 | <0.5 | <0.5 |
| | Pb | 1.0 (24 hr.avg.) | µg/m3 | 0.410 | 0.18 | 0.31 |
| | As | 06 (Annual) | ng/m3 | 1.00 | 1.00 | 1.00 |
| | Ni | 20 (Annual) | ng/m3 | 3.40 | 1.50 | 2.36 |
| **NH-39 BYPASS** | SO2 | 80 (24 hr avg.) | µg/m3 | 16.9 | 11.0 | 13.7 |
| | NO2 | 80 (24 hr avg.) | µg/m3 | 21.8 | 13.9 | 18.1 |
| | $O_3$ | 100 (8 hr avg.) | µg/m3 | 43.7 | 21.8 | 31.8 |
| | CO | 2.000 (8 hr.avg.) | mg/m3 | 1.180 | 0.820 | 0.980 |
| | $NH_3$ | 400 (24 hr.avg.) | µg/m3 | 39.8 | 21.5 | 30.3 |
| | PM 10 | 100 (24 hr.avg.) | µg/m3 | 78.6 | 49.1 | 66.7 |
| | PM 2.5 | 60 (24 hr.avg.) | µg/m3 | 37.3 | 23.4 | 29.5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Benzene | 05 (Annual) | µg/m3 | 4.30 | 1.50 | 2.88 |
| | HC | - | mg/m3 | 1.37 | 0.74 | 1.12 |
| | BaP | 1 | ng/m3 | <0.5 | <0.5 | <0.5 |
| | Pb | 1.0 (24 hr.avg.) | µg/m3 | 0.48 | 0.18 | 0.323 |
| | As | 6 | ng/m3 | 1.00 | 1.00 | 1.00 |
| | Ni | 20 (Annual) | ng/m3 | 4.40 | 1.70 | 3.05 |
| **KAZIRANGA WILDLIFE SANCTUARY AT AGARTOLI** | SO2 | 80 (24 hr avg.) | µg/m3 | 12.50 | 7.50 | 10.64 |
| | NO2 | 80 (24 hr avg.) | µg/m3 | 16.4 | 10.0 | 14.1 |
| | $O_3$ | 100 (8 hr avg.) | µg/m3 | 32.3 | 14.60 | 23.6 |
| | CO | 2.000 (8 hr.avg.) | mg/m3 | 0.880 | 0.620 | 0.7 |
| | $NH_3$ | 400 (24 hr.avg.) | µg/m3 | 30.70 | 14.50 | 22.1 |
| | PM 10 | 100 (24 hr.avg.) | µg/m3 | 56.8 | 43.7 | 50.2 |
| | PM 2.5 | 60 (24 hr.avg.) | µg/m3 | 28.2 | 15.3 | 22.2 |
| | Benzene | 05 (Annual) | µg/m3 | 3.00 | 1.30 | 2.1 |
| | HC | - | mg/m3 | 1.04 | 0.55 | 0.8 |
| | BaP | 1.0 | ng/m3 | <0.5 | <0.5 | <0.5 |
| | Pb | 1.0 (24 hr.avg.) | µg/m3 | 0.37 | 0.15 | 0.28 |
| | As | 6.0 | ng/m3 | 1.00 | 1.00 | 1.00 |
| | Ni | 20 (Annual) | ng/m3 | 3.50 | 1.40 | 2.38 |

**BDL:Below Detection Level, All the parameters are found to be within limt**

**Annexure-V**

## QUARTERLY PERFORMANCE REPORT W.R.T ENIVRONMENTAL ASPECT

## DURING QR. III (OCT -DEC'21) 2021 -22

| TABLE-1 LIQUID EFFLUENT POLLUTANT LEVEL - MONITORED VALUES in mg/lit.except pH | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| SL. NO | PARAMETERS | NO. OF OBS | MAX. | MIN. | AVG. | Limiting value for conc. (mg/l except for pH) | Quantum limit in Kg / 1000 MT of crude processed | |
| | | | | | | | Actual | Standard |
| 1 | pH | 92 | 8.2 | 6.0 | 7.2 | 6-8.5 | - | - |
| 2 | OIL & GRE | 92 | 5.0 | 1.5 | 2.99 | 5 | 1.15 | 2.0 |
| 3 | SULPHIDE | 92 | <0.1 | <0.1 | <0.1 | 0.5 | 0.04 | 0.2 |
| 4 | PHENOL | 92 | 0.30 | 0.08 | 0.12 | 0.35 | 0.04 | 0.14 |
| 5 | S. SOLID | 92 | 20.0 | 8.0 | 15.44 | 20.0 | 5.95 | 8.0 |
| 6 | COD | 92 | 104.0 | 17.40 | 49.0 | 125.0 | 18.9 | 50.0 |
| 7 | BOD3 | 92 | 15.0 | 4.0 | 8.65 | 15.0 | 3.33 | 6.0 |
| 8 | CN | 92 | <0.02 | <0.02 | <0.02 | 0.2 | 0.01 | 0.08 |
| 9 | Ammonia as N | 3 | 10.2 | | 7.50 | 15.0 | 2.89 | 6.0 |
| 10 | Cr (Hexavalent) | 3 | 0 | | 0.00 | 0.1 | 0.00 | 0.04 |
| 11 | Cr (Total) | 3 | 0.009 | | 0.004 | 2.0 | 0.00 | 0.8 |
| 12 | Pb | 3 | 0.004 | | 0.0013 | 0.1 | 0.001 | 0.04 |
| 13 | Zn | 3 | 0.041 | | 0.019 | 5.0 | 0.01 | 2.0 |
| 14 | Ni | 3 | 0.021 | | 0.009 | 1.0 | 0.00 | 0.4 |
| 15 | Cu | 3 | 0.021 | | 0.008 | 1.0 | 0.003 | 0.4 |
| 16 | Benzene | 3 | 0.058 | | 0.050 | 0.1 | 0.019 | 0.04 |
| 17 | Benzo (a)-Pyrene | 3 | 0.062 | | 0.055 | 0.2 | 0.021 | 0.08 |
| 18 | Hg | 3 | 0.005 | | 0.0043 | 0.01 | 0.00 | 0.004 |
| 19 | V | 3 | 0.089 | | 0.08 | 0.2 | 0.0 | 0.8 |
| 20 | TKN | 3 | 23.6 | | 21.2 | 40.0 | 8.15 | 16.0 |
| 21 | P | 3 | 1.4 | | 1.29 | 3.0 | 0.50 | 1.2 |

**Limiting concentration of effluent is as per MoEF notification on standard vide GSR-186 (E)dated 18th March, 2008.**

*** BDL- Detectable Limit : 0.1 microgram/Litre**

*** Parameters from 9 to 21 are monitored once in a month as per CPCB norms**

**Annexure-V**

## QUARTERLY PERFORMANCE REPORT W.R.T ENIVRONMENTAL ASPECT

### DURING QR. IV (JAN-MAR'22) 2021 -22

**TABLE-1 LIQUID EFFLUENT POLLUTANT LEVEL -**

**MONITORED VALUES in mg/lit.except pH**

| SL. NO | PARAMETERS | NO. OF OBS | MAX. | MIN. | AVG. | Limiting value for conc. (mg/l except for pH) | Quantum limit in Kg / 1000 MT of crude processed | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Actual | Standard |
| 1 | pH | 90 | 8.0 | 6.5 | 7.3 | 6-8.5 | - | - |
| 2 | OIL & GRE | 90 | 4.8 | 1.1 | 2.96 | 5 | 0.79 | 2.0 |
| 3 | SULPHIDE | 90 | <0.1 | <0.1 | <0.1 | 0.5 | 0.03 | 0.2 |
| 4 | PHENOL | 90 | 0.34 | 0.09 | 0.13 | 0.35 | 0.03 | 0.14 |
| 5 | S. SOLID | 90 | 20.0 | 7.0 | 15.11 | 20.0 | 4.00 | 8.0 |
| 6 | COD | 90 | 124.0 | 23.00 | 66.3 | 125.0 | 17.6 | 50.0 |
| 7 | BOD3 | 90 | 15.0 | 6.0 | 7.74 | 15.0 | 2.05 | 6.0 |
| 8 | CN | 87 | <0.02 | <0.02 | <0.02 | 0.2 | 0.01 | 0.08 |
| 9 | Ammonia as N | 3 | 10.2 | | 9.93 | 15.0 | 2.63 | 6.0 |
| 10 | Cr (Hexavalent) | 3 | | | 0.00 | 0.1 | 0.00 | 0.04 |
| 11 | Cr (Total) | 3 | 0.002 | | 0.001 | 2.0 | 0.00 | 0.8 |
| 12 | Pb | 3 | 0 | | 0.0000 | 0.1 | 0.000 | 0.04 |
| 13 | Zn | 3 | 0.02 | | 0.011 | 5.0 | 0.00 | 2.0 |
| 14 | Ni | 3 | 0.002 | | 0.002 | 1.0 | 0.00 | 0.4 |
| 15 | Cu | 3 | 0.004 | | 0.003 | 1.0 | 0.001 | 0.4 |
| 16 | Benzene | 3 | 0.053 | | 0.044 | 0.1 | 0.012 | 0.04 |
| 17 | Benzo (a)-Pyrene | 3 | 0.059 | | 0.050 | 0.2 | 0.013 | 0.08 |
| 18 | Hg | 3 | 0.004 | | 0.0033 | 0.01 | 0.00 | 0.004 |
| 19 | V | 3 | 0.058 | | 0.05 | 0.2 | 0.0 | 0.8 |
| 20 | TKN | 3 | 22.4 | | 19.5 | 40.0 | 5.16 | 16.0 |
| 21 | P | 3 | 1.26 | | 1.11 | 3.0 | 0.29 | 1.2 |

**Limiting concentration of effluent is as per MoEF notification on standard vide GSR-186 (E)dated 18th March, 2008.**

*** BDL- Detectable Limit : 0.1 microgram/Litre**

*** Parameters from 9 to 21 are monitored once in a month as per CPCB norms**

**Annexure VI**

# ENVIRONMENTAL EXPENDITURE FOR OCT'21-MARCH'22 (FY-2021-22)

| Sl No | Name of the Facilities | Expenditure |
|---|---|---|
| 1 | Effluent Treatment plant | 3,24,78,924.48 |
| 2 | Sulphur Recovery Unit | 5,90,10,128.64 |
| 3 | Pollution & Environmental Expenses | 4,46,022.74 |
| 4 | Environmental Cell | 1,21,12,137.54 |
| 5 | R & M Contract Services | 1,21,56,906.01 |
| | **Grand total (Rs)** | **11,62,04,119.41** |

# NUMALIGARH REFINERY LIMITED

## ACTIVITY REPORT OF CORPORATE ENVIRONMENT RESPONSIBILITY (CER) FOR FY 2021-22

# INTRODUCTION

Corporate Environment Responsibility (CER) refers to the responsibility of the corporations/companies to contribute towards economic, social and environmental development of the affected area around the project. On 1st May 2018, the Ministry of Environment, Forest & Climate change, Govt. of India, issued an Office Memorandum F. No. 22-65/2017-IA.III to suggest a common principal for affixing the corporate environmental responsibility for Greenfield as well as Brownfield projects.

On 27th July,2020 the Expert Appraisal Committee (EAC) of MoEF has recommended granting of Environmental Clearance to prestigious 22,594 crore Numaligarh Refinery Expansion Project (NREP) through notification F. No. J-11011/274/2015-IAII(I). The notification proposed Rs. 36.51 crores towards Corporate Environment Responsibility (CER) of the NREP.

Competent authority of NRL approved modalities for implementation of CER vide approval dtd. 21.09.2020. Accordingly, to identify, access and recommend and monitor activities CER, a steering committee was constituted vide circular HR/CER/2020/01 dated. 10.11.2020. On the other hand, CER Approval system was implemented at NRL and portal become ready by the end of July'2021.

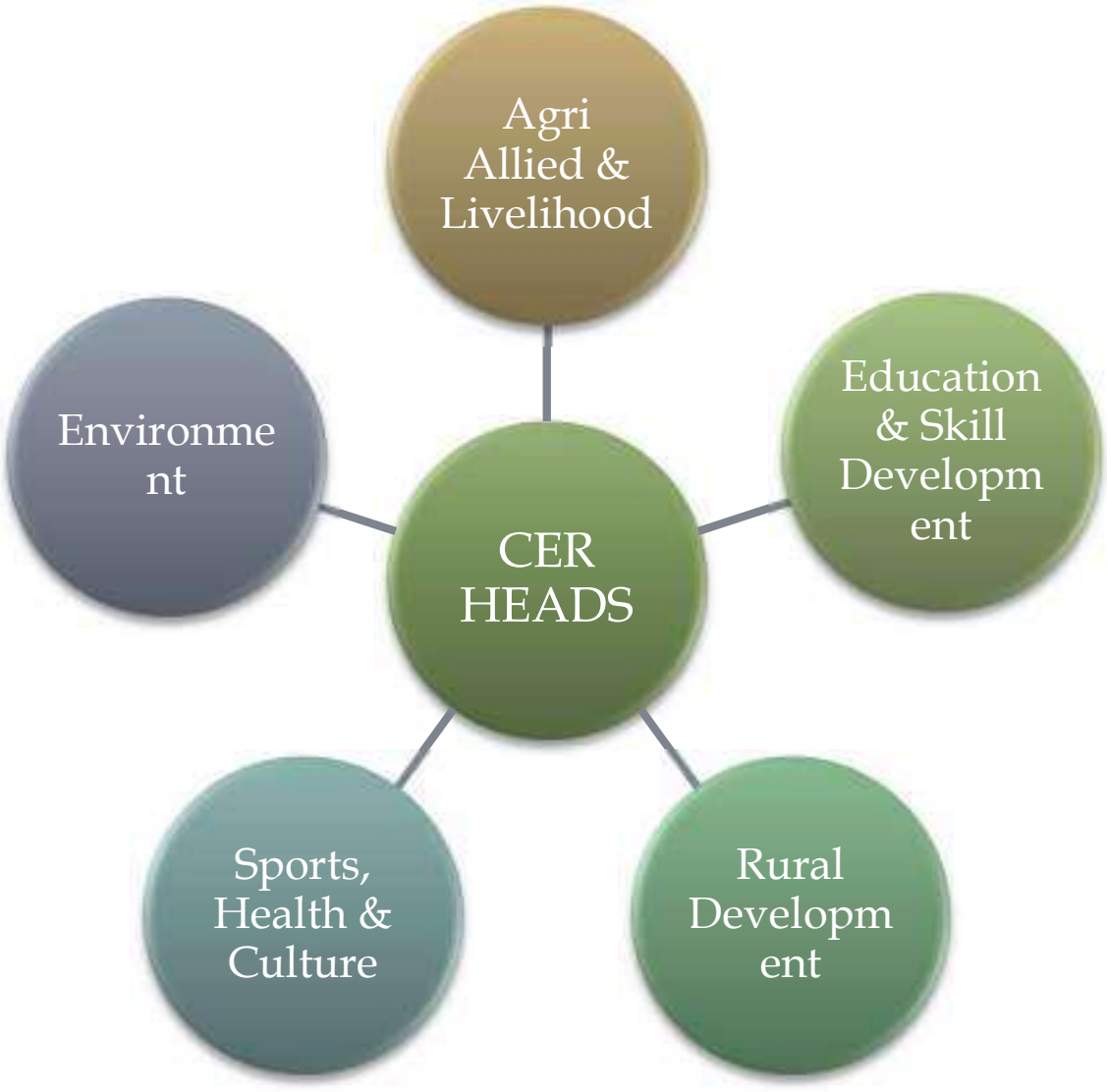
In the environment clearance (EC) of NREP F. No. J-11011/274/2015-IAII(I)stated that proposed fund (36.51 crores) shall be spent mainly for addressing the issues raised during public consultation/hearing including assistance/infrastructure for transport facility, drinking water, socio environmental activities, education and skill development, etc.

In line with the EC of NREP, several discussions were made with DC Golaghat, Officials Gaon Panchayat, Block Development Officer, Officials of Assam State Rural Livelihood Mission (ASRLM), local organizations, etc. to identify activities for socio-economic and environmental upliftment community around Numaligarh Refinery Limited. Suggestions were received for taking up various activities related to rural development, assistance to farmers for scientific cultivation and livestock farming, promotion of sports, education & skill development, health support and positive environmental impact. However, the focus of almost all discussion was to address adverse impact of Covid-19 pandemic by introducing various incoming generating schemes for unemployed youth/women and thereby improving their livelihood.

The first steering committee meeting was held on 25-06-2021. In that meeting based on above discussions following broad heads are identified

1. Agri-allied and Livelihood
2. Education and Skill development
3. Sports, health, and culture
4. Environment
5. Rural development

In line with above planning, several activities were identified, discussed in steering committee meeting, and agreed proposals were sent for approval from competent authority. Approved proposals are being executed and reviewed in steering committee meeting. The process of identification of new activities and taking necessary approval is also in progress. Here is a head wise brief description of NREP CER jobs taken up in the financial year 2021-2022.



# 1. Agri Allied & Livelihood:

i) Project: “Self Help Group and beyond”

The CER’s livelihood project ‘Self Help Group and Beyond’ is a joint initiative of Numaligarh Refinery Limited (NRL) and and Assam State Rural Livelihood Mission (ASRLM). The theme of the project is to provide support to various income generating schemes of selected Self Help Groups (SHG) of nearby Gram Panchayatas. As a part of 1st phase og the project total 30 nos SHGs were selected from Ponka, Lettekujan and Rongbong GPs for following as bellow:

| Sl No | Schemes | Nos of SHGs | Sl No | Schemes | Nos of SHGs |
|---|---|---|---|---|---|
| 1 | Piggery | 03 | 6 | Duck farming | 02 |
| 2 | Goatary | 12 | 7 | Agri farming | 01 |
| 3 | Poultry | 01 | 8 | Fishery | 02 |
| 4 | Weaving | 06 | 9 | Food processing and packaging | 01 |
| 5 | Cutting and Tailoring | 02 | | **Total** | **30** |

The program was inaugurated by Sri Biswajit Phukan, honorable MLA of Sarupathar LA in presence of Sri Mrigesh Narayan Baruah DC Golaghat, Sri Kajal Saikia, GM(HR) NRL, Sri Mintu Kr. Handique- GM(HR-IR/ER/PR) NRL, Sri S D Choudhary -DVO Golaghat, Sri Sanjib Bora, LDM-Golaghat and other officials of ASRLM and NRL on 23.11.2021. More than 400 people including members of SHGs were present in the inaugural function


In addition to financial assistance provided to SHGs for respective schemes, technical support is also being provided by a team engaged for supervision, monitoring under the project which shall be extended for 24 months.

| **Financial position of the project** | |
|---|---|
| Particulars | Amount |
| Total approved budget of the project including monitoring, supervision and technical support | Rs. 64,82,400.00 |
| Grant per SHGs (group of 10 women) | Rs. 1,50,000.00 |
| Total expenditure during FA-2021-22 | Rs. 47,91,166.00 |

Glimpse of activities of SHGs

Activities of SHGs have been thoroughly monitored by our project team and necessary technical support has been provided. In addition to that before disbursement of 2nd installment, a review meeting was organized on 14-02-2022 at Marangi Block Development Office in presence of GM(HR-IR/ER/PR)-NRL, BDO-Morangi and Officials of ASRLM- Marangi. From interaction the with members of SHGs it was ascertained that money disbursed to them were fully utilized and a very good work culture developed among them.

Before disbursement of 3rd installment, a team of NRL visited activity locations of SHGs and interacted with members. It has been found that members of SHGs have utilized money very well in their respective income generating schemes. Their activities are highly appreciable. After that 3rd installments have been released.

### ii) Project: "Livestock farming"

Livestock farming is one of the major areas, having potential for growth and scientific improvement, which can contribute to better livelihood of people near Numaligarh Refinery Limited, significantly. Considering this, NRL started a livestock farming project in the year 2019 on as a first time attempt jointly with State Veterinary Department, under DHDT CER. Despite several challenges including tough covid period, the project has been successfully implemented.

Under NREP CER, support to livestock farmers is being continued in terms of providing technical and medical support to existing farmers, including those assisted by NRL under previous project. In addition to the project for monitoring, supervision and technical support, another project is being in progress for organizing animal health camp.

This project was inaugurated by Sri Mrigesh Narayan Baruah, honorable Deputy Commissioner of Golaghat on 20-12-2021 in presence of Sri S D Choudhary, District Veterinary Officer, other officials of NRL and veterinary department and representatives of Gram Panchayata. Total 15 nos of health camp were planned mainly for providing vaccination to goats at 15 nos of nearby villages. Out of those 11 nos of camps have been completed within FY-2021-22.

| Financial position of the livestock project | |
|---|---|
| Particulars | Amount |
| Total approved budget of the project health camp, monitoring, supervision (budget taken from both DHDT & NREP) | Rs. 9,13,500.00 |
| Total expenditure during FA-2021-22 | Rs. 3,24,570.00 |

### iii) Fish Farming

Fish farming being another important area for livelihood support, two projects were taken up for assisting fish farmers

a) Providing feed seed and medicine to existing local fish farmers
b) Support for pen culture type Fish farming at Sankar Beel, Marangi

Financial support for feed seed and medicine is being provided to 19 nos of fish farmers of Rongbong and Letekujan GP. Already 2nd installments have been released after getting utilization of the 1st one. Activities of fish farmers are being closely monitored by our project team. Till now it has been found satisfactory. For improvement, it is planned to implement such projects jointly with district fishery department.

Juvasakti NirmanAtma Sahayak Gut, Morongi, a SHG formed by 10 nos. local unemployed youth has been involving in scientific cage type fish farming in Sankar Beel (wetland) using HDPE (High Density Polyethylene) modular cages. We have supported them to start fish farming using pen culture method by barricading a portion of the beel (wetland) by using Bamboo net. They have now started rearing fish after completing bamboo net and cleaning the Beel.

| **Financial position of the livestock project** | |
|---|---|
| Particulars | Amount |
| Total cost of the project pen culture type fish farming and Providing feed seed and medicine to existing local fish farmers. | Rs. 13,16,100.00 |
| Total expenditure during FA-2021-22 | Rs. 7,99,001.00 |

## iv) Scientific Agriculture farming

NRL in collaboration with Krishi Vigyan Kendra, Golaghat, has been providing assistance for scientific agriculture farming though six nos of Custom Hiring Centres established under CSR initiative. As complementary to this it is also planed to assist farmers for scientific cultivation using CER fund too. One of such project has been successfully implemented in FY-2021-22. The project is financial assistance to Heaven's Human Life Society (HHLS) for ginger cultivation.

Being a suitable area from the viewpoint of climatic condition, Heaven's Human Life Society (HHLS), a NGO formed by local unemployed youths, selected a land of nearly 14 bighas for ginger cultivation at Borchapori village. A team of NRL CER project team visited their paddy field and proposed for assisting them for further improvement. With CER fund, NRL provided financial assistance to them for mechanization of the farm as well for construction of storage fiscality. M/s HHLS has such successfully completed the project with a production of nearly 35 tons of ginger.

| **Financial position of the ginger project** | |
|---|---|
| Particulars | Amount |
| Total cost of the ginger project | Rs. 4,30,000.00 |
| Total expenditure during FA-2021-22 | Rs. 4,30,000.00 |

A part of product has been sold by M/s Heaven's Human Life Society to local market and rests are stored for further food processing.

### v) Promotion of rearing of Assam Silk (Muga)

Muga, the golden Silk of Assam is one of the rarest silks in the world. Despite having suitable environment and necessary infrastructure for rearing of Muga in nearby area of Numaligarh Refinery Ltd. particularly at Bogidhala muga, Sensowa and Bhogakaboru Muga VG,. the same was not properly utilized and production of muga silk was very less. Proposal was received from Sericulture Department for a joint project for promotion of rearing and reeling of Muga. After necessary approval, the project was started on Nov'2021 with the help of 10000 nos of seed cocoons brought from Garo Hill.

Rearing and reeling in the first phase of the project has been completed successfully with production as bellow:

| Result of Phase I | |
|---|---|
| Nos Seed Cocoons | 10000 nos |
| Cocoons Yield | 1,70,000 nos |
| Muga Yarn Obtained | 14 kg |

Production of cocoons in a season is the highest in the history of of Bogidhala Muga VGR which was established on 1971.


Actual cycle of 1st phase rearing

Glimpse of different stages of rearing & reeling

| Financial position of the 1st phase | |
|---|---|
| Particulars | Amount |
| Total approved budget for rearing and reeling | Rs. 14,53,130.00 |
| Total expenditure during FA-2021-22 | Rs. 6,13,995.00 |

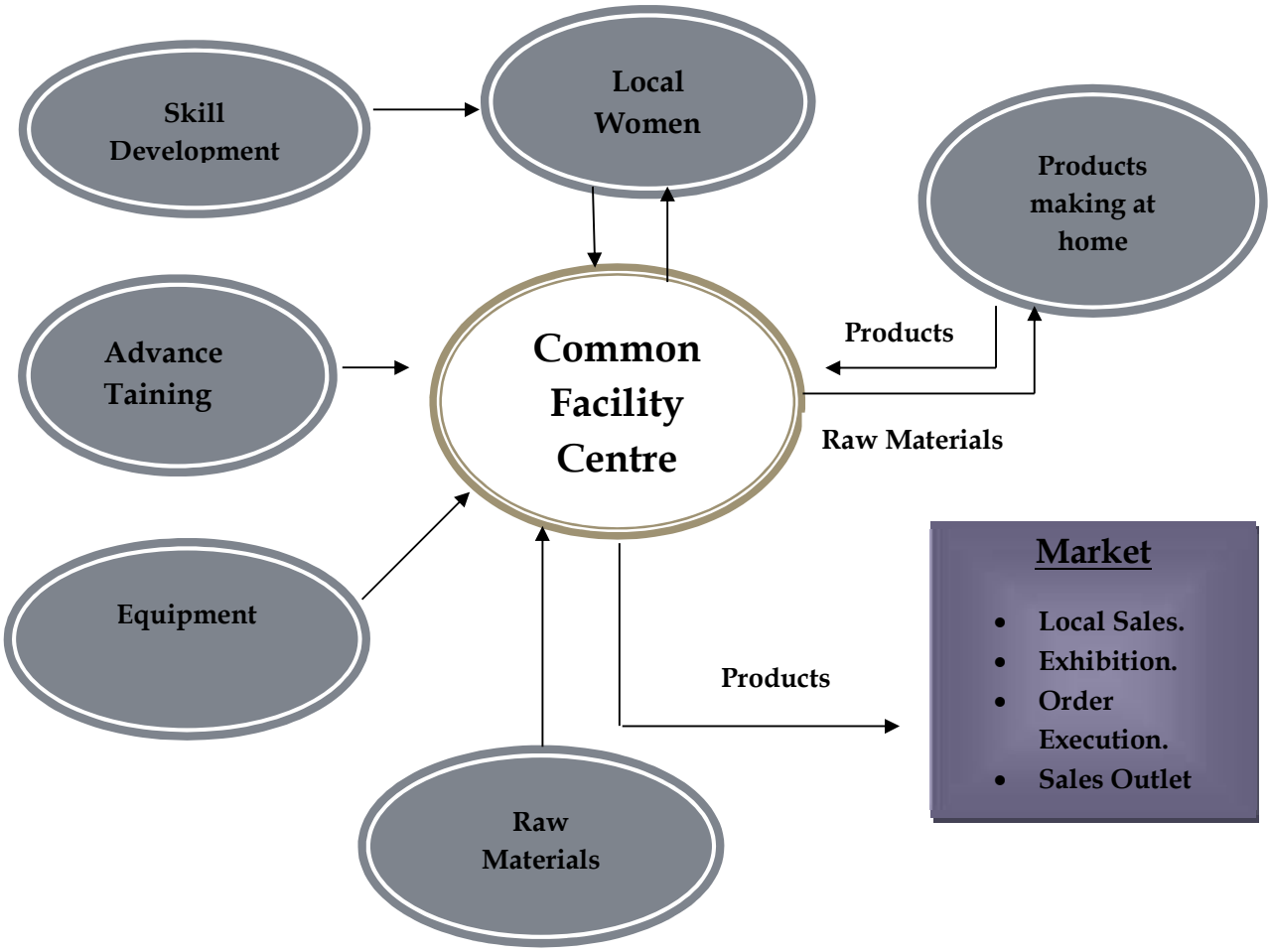
Interested women of nearby area & girl students of Morongi College are also involved in reeling process. Students have been trained and engaged

Being satisfied by initiative of NRL in promoting Muga rearing, to inspire farmers, honorable MLA of Sarupathar LA purchased 5 kg Muga yarn produced in the project. This project shall be continued till the process of muga rearing & reeling become self-sustainable.

### vi) Water Hyacinth Project

Water Hyacinth Handicraft has been identified as one of the very good idea for livelihood support people of nearby area. Water hyacinth is readily available in water bodies of nearby area and interested women, after necessary training, can prepare various products with fibers of water hyacinth which has a very good market demand.

NRL jointly with ASRLM under corporate environment responsibility (CER) has undertaken initiatives to promote Water Hyacinth Craft as a sustainable livelihood option for a group of women of Rongbong gram panchayata.




**IMPLEMENTATION MODEL**

The project was started with a 25 day Skill development and advance training held at Common Facility Centre at Jackson Grant Bokial, from 25th January'2022 to 23rd February'2022. Total 40nos of Local women participated in these training. Necessary machineries, raw material and consumables were provided for the training. Training was provided by two nos of outsourced trainers trained under NEDFi.

Women are now capable of making valuable water hyacinth product and have been making such product under this project. Quality of products have been gradually improving. The have also participated exhibition at Golaghat town and received very good response. Products are also taken by Deputy Commissioner, Golaghat as gift for high level dignitaries including President of India.

Exhibition stall of water hyacinth project

Product to DC, Golaghat

| **Financial position** | |
|---|---|
| Particulars | Amount |
| Total approved budget | Rs. 24,80,000.00 |
| Total expenditure during FA-2021-22 | Rs. 4,89,987.00 |

Technical, marketing and other assistance have been providing to the group of women under the project which shall be extended up to 18 months so that they become self-sustainable.

## vii) Providing Bar Bending and Bar Cutting Machine to local youths group

To assist local youths in entering construction sector as entrepreneur a set of necessary equipment has been provided to six groups of youth. Each set consists of one bar bending and one bar cutting machine.

| SL NO | Details of beneficiary | Amount (Rs) |
|---|---|---|
| 1 | M/s Surya Construction, Letekujan (Group of 05 unemployed youths) | 3,86,804.00 |
| 2 | M/s Arjun Construction, Letekujan (Group of 05 unemployed youths) | 3,86,804.00 |
| 3 | M/S Kaliyani Enterprise, 05 no Rong bong (Group of 05 unemployed youths) | 3,86,804.00 |
| 4 | T.G. Construction, Numaligarh (Group of 05 unemployed youths) | 3,86,804.00 |
| 5 | B.T. Construction, Telgaram (Group of 05 unemployed youths) | 3,86,804.00 |
| 6 | M/S Partha Hazarika, 05 no Rong Bong (Group of 05 unemployed youths) | 3,86,804.00 |
| Total | | 23,20,824.00 |

Typical bar cutting machine


Typical bar bending machine

Order for machines have been placed by groups and machines are expected to be delivered within one month.

# 2. Environment

i) **Plantation of fruit bearing trees**

Form the experience of plantation drive under CSR and DHDT ESC, it has been ascertained that survival rate of tree sapling planted in individual house premises is very high and people are more interested to fruit bearing trees with high market value. Based on this a plantation project has been taken in which 2000 nos of fruit bearing tree saplings shall be distributed among 500 nos of beneficiaries of Ponka GP. Order has been placed for purchasing of tree saplings and list of beneficiaries has been received from Ponka GP. After distribution of tree saplings plantation, protection and maintenance activities shall be monitored for one year.

| **Financial position** | |
|---|---|
| Particulars | Amount |
| Total approved budget | Rs. 4,80,000.00 |
| Total expenditure during FA-2021-22 (Only order placed) | Rs. 3,30,000.00 |

ii) Processing of single use plastic

Under CSR initiative of NRL, M/S Go Green Enterprise has been continuously working towards better management of plastic waste. It is associated with plastic recycling activities and awareness campaign for our mother earth making it plastic pollution free. Under this project they have been assisted to collect plastic waste with DHDT CER fund.

| **Financial position** | |
|---|---|
| Particulars | Amount |
| Total approved budget | Rs 4,95,118.00 |
| Total expenditure during FA-2021-22 | Rs. 3,59,718.00 |

# 3. Education and Skill Development

i) Development of math and science lab at numaligarh high school.

With the aim to boost education and skill development in nearby areas under this project NRL built a science and mathematics laboratory for class 7th and 8th standard students at Numaligarh High School with the help of NGO, Centre for improvement of Science Education This practical and digital learning platform helps the students to create a scientific and logical mind at a very early stage. Six nearly school of NRL can access to the laboratory.

| Financial position | |
|---|---|
| | |
| Particulars | Amount |
| Total approve budget | Rs 4,95,118.00 |
| Total expenditure during FA-2021-22 (Only order plac | Rs. 3,59,718.00 |

ii) DPR preparation and Baseline Survey for setting up Infrastructure for Incubator & Accelerator for Training cum Production centre of Textile & Fashion

Under this project Sualkuchi Institute of Fashion Technology, Sualkuchi, Kamrup has been engaged for DPR preparation and Baseline Survey for setting up Infrastructure for Incubator & Accelerator for Training cum Production centre of Textile & Fashion. The agency after necessary survey has submitted detail report. Based on the report necessary action shall be taken for skill development of identified area in textile and fashion field.

| Financial position | |
|---|---|
| | |
| Particulars | Amount |
| Total approve budget | Rs 5,00,000.00 |
| Total expenditure during FA-2021-22 | Rs 5,00,000.00 |

# 4. Rural Development

i) **Development of roads**

Several requests have been received for development of roads of nearby area. After necessary survey few roads (Total around 10 km) have been identified for development. Out of these, as of now, approvals have been received for following roads:

| SL No | Description of road work | Approved amount (Rs.) |
|---|---|---|
| 1 | Construction of interlocking concrete block pavement road from Letekuchapori chariali to Bio Refinery connecting road. | 33,05,922.00 |
| 2 | Construction of interlocking concrete block pavement road from Bahbari to water ATM. | 1634759.00 |
| 3 | Construction of interlocking concrete block pavement road from bypass (NH-39) to Jiten Bora house. | 36,86,619.00 |
| 4 | Construction of interlocking concrete block pavement road from bypass (NH-39) Indira Das to Amlokhitol connecting road. | 73,79,630.00 |
| 5 | Construction of interlocking concrete block pavement road ougurichapori road. | 31,54,797.00 |
| 6 | Construction of interlocking concrete block pavement road from Mineswar Saikia House to Prafulla Hazarika House. | 44,52,065.00 |
| 7 | Construction of interlocking concrete block pavement road from State Highway to Letekujan Tea estate medical | 7,31,032.00 |
| Total | | 2,43,44,824.00 |

Construction of roads have been inaugurated by honorable MLA of Sarupathar LA on 25.03.2022 in presence of GM(HR-ER/PR/IR) of NRL andothers officials of NRL. Construction of interlocking concrete block pavement road from Letekuchapori Chariali to Bio Refinery connecting road have been started.

ii) **Electrification of Letekujan and Purabangla bazar including high mast**.

As per proposal from Latekujan Development Committee and Purabangla Bazar Committee, electrification of of Letekujan and Purabangla bazar including high mast.have been taken up and implemented through APDCL, using DHDT ESC budget. Total cost of the project is Rs. 15,29,170.65. The project has already been completed.

iii) **Installation of high-resolution Solar Street Lights in the vicinity of the Refinery.**

Continuing NRL's effort to install high-resolution Solar Street Lights in identified area of villages i) in the vicinity of the Refinery the project for installation of 176 nos of high-resolution Solar Street Lights have been taken up. Total cost of project is Rs. 99,99,147.00 and implementing agency is M/s Energy and Resources Institute (TERI), New Delhi.

iv) **Construction of information centers**

As per proposal received from different organization construction of 3 nos of information centers have been taken up. Construction activity shall be started soon.

| SL NO | Details of information | Amount (Rs.) |
|---|---|---|
| 1 | Construction of Information centre at Ouguri Rajabari Ahom gaon. | 10,67,962.00 |
| 2 | Construction of Information centre at Marangi T.E. Boys Club. | 10,67,962.00 |
| 3 | Construction of Information centre at Ouguri Choura gaon Junali Club. | 10,67,962.00 |
| | Total | 32,03,886.00 |

Proposed model of information center

Photo source: Information center constructed under DHDT, CET on FY-2020-2021

v) **Development of playgrounds**

As per proposal received from different organization development of 3 nos of playgrounds have been taken up. Construction activity shall be started soon.

| SL No | Details of playground | Amount (Rs.) |
|---|---|---|
| 1 | Playground at Ponka Rupram Hazarika High School. | 24,27,672.19 |
| 2 | Playground at Bishnupur Youth Club | 20,63,866.18 |
| 3 | Playground at Ouguri Chaoragaon. | 24,97,117.40 |
| Total | | 69,88,655.77 |

**Summary of NREP CER Budget and expenditure till 31.03.2022**

| S/L No | Thrust Areas | Value of approved projects (Rs.) | Actual expenditure (Rs.) |
|---|---|---|---|
| 1 | Agri-allied and Livelihood | 1,49,45,954.00 | 7174148.8 |
| 2 | Education and Skill development | 9,95,118.00 | 859718.00 |
| 3 | Sports, health and culture | 2,74,763.00 | 0 |
| 4 | Environment | 4,95,118.00 | 0 |
| 5 | Rural development | 3,45,37,365.77 | 0 |
| | **Total** | **5,12,48,318.77** | **80,33,866.80** |

## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| **UNIT: MSP** | | | | | | |
| **Area** | **16 Unit** | | | | | |
| 1 | 16-PA-CF-0011A Suction line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 2 | 16-PA-CF-0011A Suction line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 3 | 16-PA-CF-0011A Suction line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 4 | Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 5 | Drain Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 6 | Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 7 | Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 8 | Suction Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 9 | Pump Seal | 0 | 0 | 0 | 0.000 | 0.000 |
| 10 | Discharge Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 11 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 12 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 13 | Meter Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 14 | Suction Line Outlet line to 1st I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 15 | Suction Line Outlet line to 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 16 | Suction Line Outlet line to 1st I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 17 | Drain Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 18 | Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 19 | OWS Point | 0 | 0 | 0 | 0.000 | 0.000 |
| 20 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 21 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 22 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 23 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 24 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 25 | Suction Line Outlet line to 2nd I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 26 | Suction Line Outlet line to 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 27 | Suction Line Outlet line to 2nd I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 28 | 16-PA-CF-0011B Suction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 29 | 16-PA-CF-0011B Suction Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 30 | 16-PA-CF-0011B Suction Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 31 | Stainer Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |

NITYA LABORATORIES Authorised

## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 32 | Drain Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 33 | Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 34 | Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 35 | Suction Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 36 | Pump Seal | 0 | 0 | 0 | 0.000 | 0.000 |
| 37 | Discharge Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 38 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 39 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 40 | P.G. Meter I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 41 | Discharge Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 42 | Discharge Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 43 | Discharge Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 44 | Drain Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 45 | Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 46 | OWS Point | 0 | 0 | 0 | 0.000 | 0.000 |
| 47 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 48 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 49 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 50 | Discharge Line To Outlet Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 51 | Discharge Line To Outlet Line Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 52 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 53 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| | 16-PA-CF-013A | | | | | |
| 54 | Suction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 55 | Suction Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 56 | Suction Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 57 | Stainer Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 58 | Suction Line to Outlet Line 1st I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 59 | Suction Line to Outlet Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 60 | Suction Line to Outlet Line 1st I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 61 | Suction Line To Outlet line 2nd I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 62 | Suction Line To Outlet line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 63 | Suction Line To Outlet line 2nd I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |

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## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 64 | Suction Line To Outlet line 3rd I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 65 | Suction Line To Outlet line 3rd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 66 | Suction Line To Outlet line 3rd I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 67 | OWS Point | 0 | 0 | 0 | 0.000 | 0.000 |
| 68 | Drain Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 69 | Steamer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 70 | Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 71 | Suction Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 72 | Discharge Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 73 | P.G. Meter I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 74 | Discharge Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 75 | Discharge Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 76 | Discharge Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 77 | Drain Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 78 | Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 79 | OWS Point | 0 | 0 | 0 | 0.000 | 0.000 |
| 80 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 81 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 82 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| | 16-PA-CF-013B | | | | | |
| 83 | Suction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 84 | Suction Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 85 | Suction Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 86 | Stainer Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 87 | Drain Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 88 | Steamer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 89 | Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 90 | Suction Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 91 | Discharge Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 92 | P.G. Meter I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 93 | Discharge Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 94 | Discharge Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 95 | Discharge Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |

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## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 96 | Drain Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 97 | Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 98 | OWS Point | 0 | 0 | 0 | 0.000 | 0.000 |
| 99 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 100 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 101 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 102 | 16-FV-2201 line C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 103 | 16-FV-2201 line C/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 104 | 16-FV-2201 line C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 105 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 106 | 16-FV-2201 line C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 107 | 16-FV-2201 line C/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 108 | 16-FV-2201 line C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 109 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 110 | 16-FV-2201 D/S line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 111 | 16-FV-2201 D/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 112 | 16-FV-2201 D/S line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 113 | Bypass line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 114 | Bypass line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 115 | Bypass line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 116 | 16-FV-2103 U/S line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 117 | 16-FV-2103 U/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 118 | 16-FV-2103 U/S line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 119 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 120 | 16-FV-2103 C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 121 | 16-FV-2103 C/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 122 | 16-FV-2103 C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 123 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 124 | 16-FV-2103 D/S line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 125 | 16-FV-2103 D/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 126 | 16-FV-2103 D/S line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 127 | Bypass line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 128 | Bypass line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |

NITYA LABORATORIES Authorised

## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 129 | Bypass line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 130 | 16-FV-2205 U/S line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 131 | 16-FV-2205 U/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 132 | 16-FV-2205 U/S line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 133 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 134 | 16-FV-2205 line C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 135 | 16-FV-2205 line C/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 136 | 16-FV-2205 line C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 137 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 138 | 16-FV-2205 D/S line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 139 | 16-FV-2205 D/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 140 | 16-FV-2205 D/S line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 141 | Bypass line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 142 | Bypass line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 143 | Bypass line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| | 16-PA-CF-010A | | | | | |
| 144 | Suction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 145 | Suction Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 146 | Suction Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 147 | Stainer Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 148 | Suction Line to Outlet Line 1st I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 149 | Suction Line to Outlet Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 150 | Suction Line to Outlet Line 1st I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 151 | Suction Line to Outlet Line 2nd I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 152 | Suction Line to Outlet Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 153 | Suction Line to Outlet Line 2nd I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 154 | Suction Line to Outlet Line 3rd I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 155 | Suction Line to Outlet Line 3rd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 156 | Suction Line to Outlet Line 3rd I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 157 | OWS Point | 0 | 0 | 0 | 0.000 | 0.000 |
| 158 | Drain Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 159 | Steamer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 160 | Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |

NITYA LABORATORIES Authorised

## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 161 | Suction Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 162 | Pump Seal | 0 | 0 | 0 | 0.000 | 0.000 |
| 163 | Discharge Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 164 | P.G. Meter I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 165 | Discharge Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 166 | Discharge Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 167 | Discharge Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 168 | Drain Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 169 | Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 170 | OWS Point | 0 | 0 | 0 | 0.000 | 0.000 |
| 171 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 172 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 173 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| | 16-PA-CF-010B | | | | | |
| 174 | Suction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 175 | Suction Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 176 | Suction Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 177 | Stainer Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 178 | Drain Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 179 | Steamer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 180 | Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 181 | Suction Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 182 | Pump Seal | 0 | 0 | 0 | 0.000 | 0.000 |
| 183 | Discharge Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 184 | P.G. Meter I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 185 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 186 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 187 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 188 | Drain Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 189 | Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 190 | OWS Point | 0 | 0 | 0 | 0.000 | 0.000 |
| 191 | Discharge Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 192 | Discharge Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |

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## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 193 | Discharge Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| | 16-PA-CF-012A | | | | | |
| 194 | Suction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 195 | Suction Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 196 | Suction Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 197 | Stainer Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 198 | Drain Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 199 | Steamer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 200 | Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 201 | Suction Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 202 | Discharge Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 203 | Meter Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 204 | Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 205 | Drain Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 206 | Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 207 | OWS Point | 0 | 0 | 0 | 0.000 | 0.000 |
| 208 | Discharge Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| | 16-PA-CF-012B | | | | | |
| 209 | Suction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 210 | Suction Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 211 | Suction Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 212 | Stainer Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 213 | Drain Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 214 | Steamer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 215 | Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 216 | Suction Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 217 | Discharge Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 218 | Meter Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 219 | Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 220 | Drain Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 221 | Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 222 | OWS Point | 0 | 0 | 0 | 0.000 | 0.000 |
| 223 | Discharge Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |

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## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 224 | 16-FV-2204 D/S Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 225 | Drain Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 226 | Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 227 | Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 228 | 16-FV-2204 line C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 229 | 16-FV-2204 line C/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 230 | 16-FV-2204 line C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 231 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 232 | D/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 233 | Bypass line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 234 | 16-FV-2206 U/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 235 | Drain Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 236 | Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 237 | Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 238 | 16-FV-2206 C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 239 | 16-FV-2206 C/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 240 | 16-FV-2206 C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 241 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 242 | D/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 243 | Bypass Line Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 244 | Bypass line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| | 16-PA-CF-006A | | | | | |
| 245 | Suction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 246 | Suction Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 247 | Suction Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 248 | Stainer Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 249 | Drain Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 250 | Steamer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 251 | Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 252 | Suction Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 253 | Pump Seal | 0 | 0 | 0 | 0.000 | 0.000 |
| 254 | Discharge Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 255 | Vrain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |

## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 256 | Vrain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 257 | Meter Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 258 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 259 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 260 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 261 | Drain Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 262 | Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 263 | OWS Point | 0 | 0 | 0 | 0.000 | 0.000 |
| 264 | Discharge Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 265 | Discharge Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 266 | Discharge Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| | 16-PA-CF-006B | | | | | |
| 267 | Suction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 268 | Suction Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 269 | Suction Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 270 | Stainer Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 271 | Drain Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 272 | Steamer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 273 | Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 274 | Suction Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 275 | Pump Seal | 0 | 0 | 0 | 0.000 | 0.000 |
| 276 | Discharge Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 277 | Vrain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 278 | Vrain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 279 | Meter Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 280 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 281 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 282 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 283 | Drain Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 284 | Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 285 | OWS Point | 0 | 0 | 0 | 0.000 | 0.000 |
| 286 | Discharge Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 287 | Discharge Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |

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## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 288 | Discharge Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 289 | MIN FLOW to 16 VV-06 U/S line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 290 | MIN FLOW to 16 VV-06 U/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 291 | MIN FLOW to 16 VV-06 U/S line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 292 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 293 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 294 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 295 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 296 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 297 | Heavy Reformate to Storage U/S line I/V | 0 | 0 | 0 | 0.000 | 0.000 |
| 298 | Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 299 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 300 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 301 | D/S line Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 302 | D/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 303 | 16-PV-2102 U/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 304 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 305 | 16-PV-2102 line C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 306 | 16-PV-2102 line C/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 307 | 16-PV-2102 line C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 308 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 309 | D/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 310 | Bypass Line Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 311 | Bypass line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| | 16-PA-CF-003A | | | | | |
| 312 | Suction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 313 | Suction Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 314 | Suction Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 315 | Stainer Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 316 | Suction Line to Outlet Line 1st I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 317 | Suction Line to Outlet Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 318 | Suction Line to Outlet Line 1st I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 319 | Suction Line to Outlet Line 2nd I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |

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## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 320 | Suction Line to Outlet Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 321 | Suction Line to Outlet Line 2nd I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 322 | Vrain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 323 | Vrain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 324 | Suction Line to Outlet Line 3rd I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 325 | Suction Line to Outlet Line 3rd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 326 | Suction Line to Outlet Line 3rd I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 327 | Drain Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 328 | Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 329 | Steamer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 330 | Suction Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 331 | Discharge Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 332 | P.G. Meter I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 333 | Meter Line To Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 334 | Meter Line To Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 335 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 336 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 337 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 338 | Drain Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 339 | Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 340 | OWS Point | 0 | 0 | 0 | 0.000 | 0.000 |
| 341 | Discharge Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 342 | Discharge Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 343 | Discharge Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| | 16-PA-CF-003B | | | | | |
| 344 | Suction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 345 | Suction Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 346 | Suction Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 347 | Stainer Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 348 | Drain Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 349 | Steamer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 350 | Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 351 | Suction Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |

## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 352 | Discharge Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 353 | Meter Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 354 | Meter Line To Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 355 | Meter Line To Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 356 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 357 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 358 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 359 | Drain Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 360 | Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 361 | OWS Point | 0 | 0 | 0 | 0.000 | 0.000 |
| 362 | Discharge Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 363 | Discharge Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 364 | Discharge Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 365 | 16-FV-1803 U/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 366 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 367 | 16-FV-1803 C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 368 | 16-FV-1803 C/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 369 | 16-FV-1803 C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 370 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 371 | D/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 372 | Bypass line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 373 | 16-FV-1802 D/S line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 374 | 16-FV-1802 D/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 375 | 16-FV-1802 D/S line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 376 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 377 | 16-FV-1802 C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 378 | 16-FV-1802 C/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 379 | 16-FV-1802 C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 380 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 381 | 16-FV-1802 D/S line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 382 | 16-FV-1802 D/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 383 | 16-FV-1802 D/S line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 384 | Bypass line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |

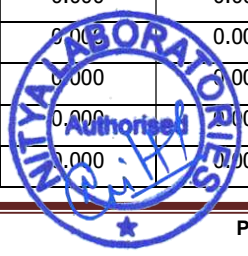
NITYA LABORATORIES Authorised

## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 385 | Bypass line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 386 | Bypass line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| | 16-PA-CF-005A | | | | | |
| 387 | Suction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 388 | Suction Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 389 | Suction Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 390 | Stainer Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 391 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 392 | Suction Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 393 | Discharge Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 394 | Meter Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 395 | Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 396 | Drain Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 397 | Steamer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 398 | Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 399 | OWS Point | 0 | 0 | 0 | 0.000 | 0.000 |
| 400 | Discharge Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| | 16-PA-CF-005B | | | | | |
| 401 | Suction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 402 | Suction Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 403 | Suction Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 404 | Stainer Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 405 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 406 | Suction Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 407 | Discharge Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 408 | P.G. Meter I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 409 | Drain Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 410 | Steamer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 411 | Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 412 | OWS Point | 0 | 0 | 0 | 0.000 | 0.000 |
| 413 | Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 414 | Discharge Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 415 | 16-PV-2301 U/S line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |



## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 416 | 16-PV-2301 U/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 417 | 16-PV-2301 U/S line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 418 | Drain Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 419 | Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 420 | Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 421 | Drain Line 3rd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 422 | 16-PV-2301 C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 423 | 16-PV-2301 C/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 424 | 16-PV-2301 C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 425 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 426 | 16-PV-2301 D/S line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 427 | 16-PV-2301 D/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 428 | 16-PV-2301 D/S line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 429 | Bypass line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 430 | Bypass line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 431 | Bypass line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 432 | 16-FV-1701 U/S line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 433 | 16-FV-1701 U/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 434 | 16-FV-1701 U/S line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 435 | 16-FV-1701 C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 436 | 16-FV-1701 C/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 437 | 16-FV-1701 C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 438 | 16-FV-1701 D/S line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 439 | 16-FV-1701 D/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 440 | 16-FV-1701 D/S line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 441 | Bypass line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 442 | Bypass line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 443 | Bypass line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| **Area** | **16 Unit** | | | | | |
| 444 | 16-FV-1102 U/S line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 445 | 16-FV-1102 U/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 446 | 16-FV-1102 U/S line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 447 | Drain Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |

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## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 448 | Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 449 | Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 450 | 16-FV-1102 C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 451 | 16-FV-1102 C/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 452 | 16-FV-1102 C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 453 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 454 | 16-FV-1102 D/S line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 455 | 16-FV-1102 D/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 456 | 16-FV-1102 D/S line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 457 | Bypass line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 458 | Bypass line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 459 | Bypass line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 460 | 16-FV-1703 C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 461 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 462 | 16-FV-1703 C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 463 | 16-FV-1703 C/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 464 | 16-FV-1703 C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 465 | Drain Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 466 | Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 467 | Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 468 | 16-FV-1703 D/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 469 | Bypass line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| | 16-PA-CF-001A | | | | | |
| 470 | Suction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 471 | Suction Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 472 | Suction Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 473 | Stainer Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 474 | Drain Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 475 | Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 476 | OWS Point | 0 | 0 | 0 | 0.000 | 0.000 |
| 477 | Suction Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 478 | Pump Seal | 0 | 0 | 0 | 0.000 | 0.000 |
| 479 | Discharge Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |

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## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 480 | P.G. Meter line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 481 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 482 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 483 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 484 | Steamer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 485 | Drain Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 486 | Steamer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 487 | Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 488 | Discharge Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 489 | Discharge Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 490 | Discharge Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| | 16-PA-CF-001B | | | | | |
| 491 | Suction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 492 | Suction Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 493 | Suction Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 494 | Stainer Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 495 | Drain Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 496 | Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 497 | OWS Point | 0 | 0 | 0 | 0.000 | 0.000 |
| 498 | Suction Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 499 | Pump Seal | 0 | 0 | 0 | 0.000 | 0.000 |
| 500 | Discharge Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 501 | P.G. Meter line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 502 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 503 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 504 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 505 | Drain Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 506 | Steamer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 507 | Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 508 | Discharge Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 509 | Discharge Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 510 | Discharge Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 511 | From FEED DRYER line D/S I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |

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## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 512 | Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 513 | Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 514 | D/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 515 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 516 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 517 | From 16-C-01 Bottom line 1st I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 518 | From 16-C-01 Bottom line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 519 | From 16-C-01 Bottom line 1st I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 520 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 521 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 522 | From 16-C-01 Bottom line 2nd I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 523 | From 16-C-01 Bottom line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 524 | From 16-C-01 Bottom line 2nd I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 525 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 526 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 527 | 16-FV-1804 U/S line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 528 | 16-FV-1804 U/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 529 | 16-FV-1804 U/S line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 530 | Drain Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 531 | Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 532 | Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 533 | 16-FV-1804 C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 534 | 16-FV-1804 C/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 535 | 16-FV-1804 C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 536 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 537 | 16-FV-1804 D/S line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 538 | 16-FV-1804 D/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 539 | 16-FV-1804 D/S line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 540 | Bypass line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 541 | Bypass line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 542 | Bypass line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 543 | ISOMER From DRYER DEGASSER U/S line | 0 | 0 | 0 | 0.000 | 0.000 |
| 544 | ISOMER From DRYER DEGASSER U/S line | 0 | 0 | 0 | 0.000 | 0.000 |

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## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 545 | ISOMER From DRYER DEGASSER U/S line | 0 | 0 | 0 | 0.000 | 0.000 |
| 546 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 547 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 548 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 549 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 550 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 551 | D/S line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 552 | D/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 553 | D/S line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 554 | 16-FV-2301 U/S line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 555 | 16-FV-2301 U/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 556 | 16-FV-2301 U/S line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 557 | Drain Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 558 | Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 559 | Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 560 | 16-FV-2301 D/S line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 561 | 16-FV-2301 D/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 562 | 16-FV-2301 D/S line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 563 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 564 | 16-FV-2301 D/S line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 565 | 16-FV-2301 D/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 566 | 16-FV-2301 D/S line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 567 | Bypass line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 568 | Bypass line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 569 | Bypass line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| Area | Furnace | | | | | |
| 570 | From CBD Pump Discharge line 1st I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 571 | From CBD Pump Discharge line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 572 | From CBD Pump Discharge line 1st I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 573 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 574 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 575 | From CBD Pump Discharge line 2nd I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |

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## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 576 | From CBD Pump Discharge line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 577 | From CBD Pump Discharge line 2nd I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 578 | FEED NAPTHA line 1st I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 579 | FEED NAPTHA line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 580 | FEED NAPTHA line 1st I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 581 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 582 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 583 | FEED NAPTHA line 2ndt I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 584 | FEED NAPTHA line 2ndt I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 585 | FEED NAPTHA line 2ndt I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 586 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 587 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 588 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 589 | MS Product line 1st I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 590 | MS Product line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 591 | MS Product line 1st I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 592 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 593 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 594 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 595 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 596 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 597 | MS Product line 2nd I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 598 | MS Product line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 599 | MS Product line 2nd I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 600 | OFF SPEC NAP to Storage line 1st I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 601 | OFF SPEC NAP to Storage line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 602 | OFF SPEC NAP to Storage line 1st I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 603 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 604 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 605 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 606 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 607 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 608 | OFF SPEC NAP to Storage line 2nd I/V U/S | 0 | 0 | 0 | 0.000 | 0.000 |

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## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| | Flange | | | | | |
| 609 | OFF SPEC NAP to Storage line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 610 | OFF SPEC NAP to Storage line 2nd I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 611 | Sl. No. 342963 line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 612 | Sl. No. 342963 line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 613 | Sl. No. 342963 line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 614 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 615 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 616 | Sl. No. 342966 line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 617 | Sl. No. 342966 line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 618 | Sl. No. 342966 line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 619 | Bypass Line Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 620 | Bypass line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 621 | 14-UV-1804 line C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 622 | 14-UV-1804 line C/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 623 | 14-UV-1804 line C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 624 | Sl. No. 342945 line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 625 | 14-UV-1805 line C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 626 | 14-UV-1805 line C/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 627 | 14-UV-1805 line C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 628 | Sl. No. 342975 line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 629 | Sl. No. 342975 line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 630 | Sl. No. 342975 line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 631 | Sl. No. 342958 line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 632 | Sl. No. 342958 line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 633 | Sl. No. 342958 line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 634 | Sl. No. 342977 line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 635 | Sl. No. 342977 line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 636 | Sl. No. 342977 line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 637 | Sl. No. 342976 line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 638 | Sl. No. 342976 line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 639 | Sl. No. 342976 line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 640 | Sl. No. 342971 line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |

NITYA LABORATORIES Authorised

## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 641 | Sl. No. 342971 line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 642 | Sl. No. 342971 line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 643 | FG To 14-FF-01 Main Burner Sl. No. 3429 | 0 | 0 | 0 | 0.000 | 0.000 |
| 644 | FG To 14-FF-01 Main Burner Sl. No. 3429 | 0 | 0 | 0 | 0.000 | 0.000 |
| 645 | FG To 14-FF-01 Main Burner Sl. No. 3429 | 0 | 0 | 0 | 0.000 | 0.000 |
| 646 | Sl. No. 343005 line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 647 | Sl. No. 343005 line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 648 | Sl. No. 343005 line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 649 | Sl. No. 342983 line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 650 | Sl. No. 342983 line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 651 | Sl. No. 342983 line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 652 | Sl. No. 343003 line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 653 | Sl. No. 343003 line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 654 | Sl. No. 343003 line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 655 | Sl. No. 342990 line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 656 | Sl. No. 342990 line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 657 | Sl. No. 342990 line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 658 | 14-UV-1801 line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 659 | 14-UV-1801 line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 660 | 14-UV-1801 line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 661 | 14-UV-1802 line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 662 | 14-UV-1802 line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 663 | 14-UV-1802 line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 664 | Sl. No. 342943 line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 665 | Sl. No. 342943 line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 666 | Sl. No. 342943 line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 667 | Sl. No. 342993 line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 668 | Sl. No. 342993 line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 669 | Sl. No. 342993 line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 670 | 14-PV-1801 line C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 671 | 14-PV-1801 line C/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 672 | 14-PV-1801 line C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 673 | 15-FF-3 PILOT F.G. Line Sl. No. 34297 line | 0 | 0 | 0 | 0.000 | 0.000 |

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## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 674 | 15-FF-3 PILOT F.G. Line Sl. No. 34297 line | 0 | 0 | 0 | 0.000 | 0.000 |
| 675 | 15-FF-3 PILOT F.G. Line Sl. No. 34297 line | 0 | 0 | 0 | 0.000 | 0.000 |
| 676 | Drain Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 677 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 678 | Drain Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 679 | Sl. No. 342950 line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 680 | Sl. No. 342950 line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 681 | Sl. No. 342950 line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 682 | Sl. No. 342973 line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 683 | Sl. No. 342973 line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 684 | Sl. No. 342973 line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 685 | Sl. No. 342953 line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 686 | Sl. No. 342953 line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 687 | Sl. No. 342953 line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 688 | Sl. No. 342960 line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 689 | 15-UV-2305 line C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 690 | 15-UV-2305 line C/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 691 | 15-UV-2305 line C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 692 | Sl. No. 342946 line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 693 | Sl. No. 342946 line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 694 | Sl. No. 342946 line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 695 | 15-UV-2304 line C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 696 | 15-UV-2304 line C/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 697 | 15-UV-2304 line C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 698 | Near 15-PT-2304 to PTY-2305 U/S line I/V | 0 | 0 | 0 | 0.000 | 0.000 |
| 699 | Near 15-PT-2304 to PTY-2305 U/S line I/V | 0 | 0 | 0 | 0.000 | 0.000 |
| 700 | Near 15-PT-2304 to PTY-2305 U/S line I/V | 0 | 0 | 0 | 0.000 | 0.000 |
| 701 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 702 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 703 | Near 15-PT-2304 to PTY-2305 D/S line I/V | 0 | 0 | 0 | 0.000 | 0.000 |
| 704 | Near 15-PT-2304 to PTY-2305 D/S line I/V | 0 | 0 | 0 | 0.000 | 0.000 |
| 705 | Near 15-PT-2304 to PTY-2305 D/S line I/V | 0 | 0 | 0 | 0.000 | 0.000 |
| 706 | 15-PV-2301 U/S line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |

NITYA LABORATORIES Authorised

## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 707 | 15-PV-2301 U/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 708 | 15-PV-2301 U/S line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 709 | 15-PV-2301 line C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 710 | 15-PV-2301 line C/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 711 | 15-PV-2301 line C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 712 | 15-PV-2301 D/S line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 713 | 15-PV-2301 D/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 714 | 15-PV-2301 D/S line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 715 | Bypass line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 716 | Bypass line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 717 | Bypass line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 718 | 15-UV-2301 line C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 719 | 15-UV-2301 line C/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 720 | 15-UV-2301 line C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 721 | 15-FF-03 MAIN-FG To Sl. No. 342992 line | 0 | 0 | 0 | 0.000 | 0.000 |
| 722 | 15-FF-03 MAIN-FG To Sl. No. 342992 line | 0 | 0 | 0 | 0.000 | 0.000 |
| 723 | 15-FF-03 MAIN-FG To Sl. No. 342992 line | 0 | 0 | 0 | 0.000 | 0.000 |
| 724 | Drain Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 725 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 726 | Drain Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 727 | Sl. No. 343002 line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 728 | Sl. No. 343002 line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 729 | Sl. No. 343002 line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 730 | Sl. No. 342986 line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 731 | Sl. No. 342986 line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 732 | Sl. No. 342986 line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 733 | Sl. No. 342981 line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 734 | Sl. No. 342981 line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 735 | Sl. No. 342981 line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 736 | Sl. No. 343001 line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 737 | Sl. No. 343001 line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 738 | Sl. No. 343001 line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 739 | 15-UV-2302 line C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |

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## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 740 | 15-UV-2302 line C/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 741 | 15-UV-2302 line C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 742 | Sl. No. 342947 line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 743 | Sl. No. 342947 line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 744 | Sl. No. 342947 line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| **Area** | **Battery Area** | | | | | |
| 745 | Fuel Gas Inlet line U/S I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 746 | Fuel Gas Inlet line U/S I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 747 | Fuel Gas Inlet line U/S I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 748 | Fuel Gas Inlet line D/S I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 749 | Fuel Gas Inlet line D/S I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 750 | Fuel Gas Inlet line D/S I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 751 | Sour Gas Outlet line U/S I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 752 | Sour Gas Outlet line U/S I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 753 | Sour Gas Outlet line U/S I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 754 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 755 | LPG R/D First I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 756 | Sour Gas Outlet line D/S I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 757 | Sour Gas Outlet line D/S I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 758 | Sour Gas Outlet line D/S I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 759 | LPG R/D Outlet line U/S I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 760 | LPG R/D Outlet line U/S I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 761 | LPG R/D Outlet line U/S I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 762 | Drain line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 763 | Drain line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 764 | LPG R/D Outlet line D/S I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 765 | LPG R/D Outlet line D/S I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 766 | LPG R/D Outlet line D/S I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 767 | Hydrogen Rich Gas To PSA Outlet line U/ | 0 | 0 | 0 | 0.000 | 0.000 |
| 768 | Hydrogen Rich Gas To PSA Outlet line U/ | 0 | 0 | 0 | 0.000 | 0.000 |
| 769 | Hydrogen Rich Gas To PSA Outlet line U/ | 0 | 0 | 0 | 0.000 | 0.000 |
| 770 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 771 | Drain line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |

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## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 772 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 773 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 774 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 775 | Hydrogen Rich Gas To PSA Outlet line D/ | 0 | 0 | 0 | 0.000 | 0.000 |
| 776 | Hydrogen Rich Gas To PSA Outlet line D/ | 0 | 0 | 0 | 0.000 | 0.000 |
| 777 | Hydrogen Rich Gas To PSA Outlet line D/ | 0 | 0 | 0 | 0.000 | 0.000 |
| 778 | Hydrogen From PSA Inlet line U/S I/V U/S | 0 | 0 | 0 | 0.000 | 0.000 |
| 779 | Hydrogen From PSA Inlet line U/S I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 780 | Hydrogen From PSA Inlet line U/S I/V D/S | 0 | 0 | 0 | 0.000 | 0.000 |
| 781 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 782 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 783 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 784 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 785 | Drain line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 786 | Hydrogen From PSA Inlet line D/S I/V U/S | 0 | 0 | 0 | 0.000 | 0.000 |
| 787 | Hydrogen From PSA Inlet line D/S I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 788 | Hydrogen From PSA Inlet line D/S I/V D/S | 0 | 0 | 0 | 0.000 | 0.000 |
| 789 | To 14-VV-01 S/U H. NAPTHA To 1st I/V U | 0 | 0 | 0 | 0.000 | 0.000 |
| 790 | To 14-VV-01 S/U H. NAPTHA To 1st I/V G | 0 | 0 | 0 | 0.000 | 0.000 |
| 791 | To 14-VV-01 S/U H. NAPTHA To 1st I/V D | 0 | 0 | 0 | 0.000 | 0.000 |
| 792 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 793 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 794 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 795 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 796 | Drain line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 797 | To 14-VV-01 S/U H. NAPTHA To 2nd I/V U | 0 | 0 | 0 | 0.000 | 0.000 |
| 798 | To 14-VV-01 S/U H. NAPTHA To 2nd I/V G | 0 | 0 | 0 | 0.000 | 0.000 |
| 799 | To 14-VV-01 S/U H. NAPTHA To 2nd I/V D | 0 | 0 | 0 | 0.000 | 0.000 |
| 800 | To 14-VV-01 S/U H. NAPTHA To Storage | 0 | 0 | 0 | 0.000 | 0.000 |
| 801 | To 14-VV-01 S/U H. NAPTHA To Storage | 0 | 0 | 0 | 0.000 | 0.000 |
| 802 | To 14-VV-01 S/U H. NAPTHA To Storage | 0 | 0 | 0 | 0.000 | 0.000 |
| 803 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 804 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |

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## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 805 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 806 | Drain line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 807 | Drain line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 808 | To 14-VV-01 S/U H. NAPTHA To Storage | 0 | 0 | 0 | 0.000 | 0.000 |
| 809 | To 14-VV-01 S/U H. NAPTHA To Storage | 0 | 0 | 0 | 0.000 | 0.000 |
| 810 | To 14-VV-01 S/U H. NAPTHA To Storage | 0 | 0 | 0 | 0.000 | 0.000 |
| 811 | 14-LV-1701 U/S line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 812 | 14-LV-1701 U/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 813 | 14-LV-1701 U/S line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 814 | CDE line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 815 | CDE line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 816 | Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 817 | CDE line 3rd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 818 | 14-LV-1701 line C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 819 | 14-LV-1701 line C/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 820 | 14-LV-1701 line C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 821 | 14-LV-1701 D/S line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 822 | 14-LV-1701 D/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 823 | 14-LV-1701 D/S line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 824 | Bypass line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 825 | Bypass line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 826 | Bypass line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 827 | 15-FV-1401 U/S line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 828 | 15-FV-1401 U/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 829 | IS-FV-1401 U/S line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 830 | CDE line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 831 | CDE line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 832 | Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 833 | CBD Drain line Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 834 | 15-FV-1401 line C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 835 | 15-FV-1401 line C/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 836 | 15-FV-1401 line C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 837 | 15-FV-1401 D/S line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |

NITYA LABORATORIES Authorised

## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 838 | 15-FV-1401 D/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 839 | 15-FV-1401 D/S line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 840 | Bypass line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 841 | Bypass line t/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 842 | Bypass line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 843 | 15-PV-1401 U/S line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 844 | 15-PV-1401 U/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 845 | 15-PV-1401 U/S line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 846 | 15-PV-1401 line C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 847 | 15-PV-1401 line C/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 848 | 15-PV-1401 line C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 849 | 15-PV-1401 D/S line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 850 | 15-PV-1401 D/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 851 | 15-PV-1401 D/S line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 852 | To Flare line 1st I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 853 | To Flare line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 854 | To Flare line 1st I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 855 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 856 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 857 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 858 | Drain line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 859 | Drain line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 860 | To Flare line 2nd I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 861 | To Flare line 2nd l/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 862 | To Flare line 2nd I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 863 | To FG Header line 1st I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 864 | To FG Header line 1st l/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 865 | To FG Header line 1st I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 866 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 867 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 868 | Drain line l/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 869 | Drain line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 870 | To FG Header line 2nd l/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |

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## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 871 | To FG Header line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 872 | To FG Header line 2nd I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| | 15-PA-CF-001A | | | | | |
| 873 | Suction line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 874 | Suction line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 875 | Suction line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 876 | Stainer Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 877 | P.G. Meter line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 878 | Suction line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 879 | Pump Seal | 0 | 0 | 0 | 0.000 | 0.000 |
| 880 | CBD line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 881 | Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 882 | CBD line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 883 | Drain line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 884 | OWS Point | 0 | 0 | 0 | 0.000 | 0.000 |
| 885 | Discharge line U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 886 | Meter line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 887 | Discharge line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 888 | Discharge line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 889 | Discharge line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 890 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 891 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 892 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| | 15-PA-CF-001B | | | | | |
| 893 | Suction line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 894 | Suction line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 895 | Suction line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 896 | Stainer Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 897 | P.G. Meter line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 898 | Suction line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 899 | Pump Seal | 0 | 0 | 0 | 0.000 | 0.000 |
| 900 | CBD line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 901 | Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |

## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 902 | CBD line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 903 | Drain line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 904 | OWS Point | 0 | 0 | 0 | 0.000 | 0.000 |
| 905 | Discharge line U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 906 | Meter line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 907 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 908 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 909 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 910 | Discharge line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 911 | Discharge line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 912 | Discharge line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 913 | 15-PV-1301 A U/S I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 914 | 15-PV-1301A U/S I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 915 | 15-PV-1301A U/S I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 916 | 15-PV-1301A C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 917 | 15-PV-1301A C/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 918 | 1S-PV-1301 A C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 919 | 15-PV-1301 A D/S I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 920 | 15-PV-1301 A D/S I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 921 | 15-PV-1301 A D/S I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 922 | Bypass line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 923 | Bypass line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 924 | Bypass line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| | 15-PA-CF-002A | | | | | |
| 925 | Suction line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 926 | Suction line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 927 | Suction line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 928 | Stainer Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 929 | P.G. Meter I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 930 | Suction line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 931 | Pump Seal | 0 | 0 | 0 | 0.000 | 0.000 |
| 932 | CBD line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 933 | Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |

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## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 934 | CBD line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 935 | Drain line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 936 | OWS Point | 0 | 0 | 0 | 0.000 | 0.000 |
| 937 | Discharge line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 938 | Meter line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 939 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 940 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 941 | Discharge line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 942 | Discharge line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 943 | Discharge line l/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| | 15-PA-CF-002B | | | | | |
| 944 | Suction line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 945 | Suction line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 946 | Suction line l/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 947 | Stainer Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 948 | Meter line l/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 949 | Suction line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 950 | Pump Seal | 0 | 0 | 0 | 0.000 | 0.000 |
| 951 | CBD line 1st l/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 952 | CBD line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 953 | Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 954 | Drain line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 955 | OWS Point | 0 | 0 | 0 | 0.000 | 0.000 |
| 956 | Discharge line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 957 | Meter line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 958 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 959 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 960 | Discharge line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 961 | Discharge line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 962 | Discharge line l/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 963 | 15-FV-1503 U/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 964 | CBD line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 965 | CBD line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |

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## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 966 | Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 967 | CBD line 3rd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 968 | 15-FV-1503 line C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 969 | 15-FV-1503 line C/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 970 | 15-FV-1503 line C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 971 | 15-FV-1503 D/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 972 | Bypass line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| | 14-PACF-004A | | | | | |
| 973 | Suction line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 974 | Suction line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 975 | Suction line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 976 | Stainer Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 977 | Suction line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 978 | Pump Seal | 0 | 0 | 0 | 0.000 | 0.000 |
| 979 | Discharge line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 980 | Meter line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 981 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 982 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 983 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 984 | Discharge line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 985 | Discharge line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 986 | Discharge line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 987 | CBD line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 988 | CBD line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 989 | Drain line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 990 | OWS Point | 0 | 0 | 0 | 0.000 | 0.000 |
| 991 | Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| | 14-PACF-004B | | | | | |
| 992 | Suction line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 993 | Suction line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 994 | Suction line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 995 | Stainer Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 996 | Suction line Flange | 0 | 0 | 0 | 0.000 | 0.000 |

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## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 997 | Pump Seal | 0 | 0 | 0 | 0.000 | 0.000 |
| 998 | Discharge line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 999 | Meter line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1000 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1001 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1002 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1003 | Discharge line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1004 | Discharge line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1005 | Discharge line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1006 | CBD line 1st l/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1007 | CBD line 2nd l/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1008 | Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1009 | CBD line 3rd l/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1010 | Drain line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1011 | OWS Point | 0 | 0 | 0 | 0.000 | 0.000 |
| | 14-PACF-006A | | | | | |
| 1012 | Suction line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1013 | Suction line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1014 | Suction line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1015 | Stainer Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1016 | Suction line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1017 | Pump Seal | 0 | 0 | 0 | 0.000 | 0.000 |
| 1018 | Discharge line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1019 | Meter line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1020 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1021 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1022 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1023 | Drain line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1024 | Drain line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1025 | Discharge line l/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1026 | Discharge line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1027 | Discharge line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1028 | Pump To CBD line 1st I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |

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## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 1029 | Pump To CBD line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1030 | Pump To CBD line 1st I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1031 | Pump To CBD line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1032 | Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1033 | Pump To CBD line 3rd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1034 | OWS Point | 0 | 0 | 0 | 0.000 | 0.000 |
| | 14-PACF-006B | | | | | |
| 1035 | Suction line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1036 | Suction line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1037 | Suction line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1038 | Stainer Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1039 | Suction line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1040 | Pump Seal | 0 | 0 | 0 | 0.000 | 0.000 |
| 1041 | Discharge line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1042 | Meter line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1043 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1044 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1045 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1046 | Drain line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1047 | Drain line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1048 | Discharge line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1049 | Discharge line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1050 | Discharge line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1051 | Pump To CBD line 1st I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1052 | Pump To CBD line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1053 | Pump To CBD line 1st I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1054 | Pump To CBD line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1055 | Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1056 | Pump To CBD line 3rd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1057 | OWS Point | 0 | 0 | 0 | 0.000 | 0.000 |
| 1058 | 14-FV-1103 U/S line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1059 | 14-FV-1103 U/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1060 | 14-FV-1103 U/S line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |

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## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 1061 | Drain line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1062 | Drain line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1063 | Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1064 | Drain line 3rd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1065 | 14-FV-1103 line C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1066 | 14-FV-1103 line C/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1067 | 14-IV-1103 line C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1068 | 14-FV-1103 D/S line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1069 | 14-FV-1103 D/S line l/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1070 | 14-FV-1103 D/S line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1071 | Bypass line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1072 | Bypass line l/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1073 | Bypass line l/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1074 | 14-UV-1101 CV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1075 | 14-UV-1101 CV Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1076 | 14-UV-1101 CV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| | 14-PA-CF-001A | | | | | |
| 1077 | Suction line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1078 | Suction line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1079 | Suction line l/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1080 | Stainer Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1081 | Drain line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1082 | Drain line Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1083 | Suction line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1084 | Pump Seal | 0 | 0 | 0 | 0.000 | 0.000 |
| 1085 | Discharge line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1086 | Meter line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1087 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1088 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1089 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1090 | Drain line l/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1091 | Drain line Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1092 | Discharge line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |

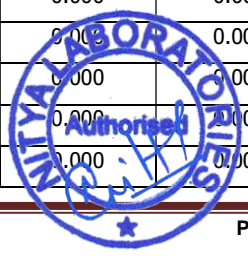
NITYA LABORATORIES Authorised

## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 1093 | Discharge line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1094 | Discharge line l/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1095 | Pump To CBD \|ine 1st l/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1096 | Pump To CBD line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1097 | Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1098 | Pump To CBD line 3rd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1099 | OWS Point | 0 | 0 | 0 | 0.000 | 0.000 |
| | 14-PA-CF-001B | | | | | |
| 1100 | Suction line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1101 | Suction line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1102 | Suction line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1103 | Stainer Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1104 | Drain line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1105 | Drain line Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1106 | Suction line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1107 | Pump Seal | 0 | 0 | 0 | 0.000 | 0.000 |
| 1108 | Discharge line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1109 | Meter line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1110 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1111 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1112 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1113 | Drain line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1114 | Drain line Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1115 | Discharge line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1116 | Discharge line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1117 | Discharge line l/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1118 | Pump To CBD line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1119 | Pump To CBD line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1120 | Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1121 | Pump To CBD line 3rd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1122 | OWS Point | 0 | 0 | 0 | 0.000 | 0.000 |
| 1123 | NAPTHA to SLOP U/S line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1124 | NAPTHA to SLOP U/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |



## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 1125 | NAPTHA to SLOP U/S line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1126 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1127 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1128 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1129 | Drain line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1130 | Drain line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1131 | NAPTHA to SLOP D/S line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1132 | NAPTHA to SLOP D/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1133 | NAPTHA to SLOP D/S line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1134 | Splitter Reflux To SLOP U/S line I/V U/S £ | 0 | 0 | 0 | 0.000 | 0.000 |
| 1135 | Splitter Reflux To SLOP U/S line I/V Glan | 0 | 0 | 0 | 0.000 | 0.000 |
| 1136 | Splitter Reflux To SLOP U/S line I/V D/S F | 0 | 0 | 0 | 0.000 | 0.000 |
| 1137 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1138 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1139 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1140 | Drain line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1141 | Drain line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1142 | Splitter Reflux To SLOP D/S line I/V U/S F | 0 | 0 | 0 | 0.000 | 0.000 |
| 1143 | Splitter Reflux To SLOP D/S line I/V Glan | 0 | 0 | 0 | 0.000 | 0.000 |
| 1144 | Splitter Reflux To SLOP D/S line I/V D/S F | 0 | 0 | 0 | 0.000 | 0.000 |
| 1145 | 2nd I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1146 | 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1147 | 2nd I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1148 | Stritter Reflux To SLOP U/S line 1st I/V U | 0 | 0 | 0 | 0.000 | 0.000 |
| 1149 | Stritter Reflux To SLOP U/S line 1st I/V G | 0 | 0 | 0 | 0.000 | 0.000 |
| 1150 | Stritter Reflux To SLOP U/S line 1st I/V D | 0 | 0 | 0 | 0.000 | 0.000 |
| 1151 | Stritter Reflux To SLOP U/S line 2nd I/V U | 0 | 0 | 0 | 0.000 | 0.000 |
| 1152 | Stritter Reflux To SLOP U/S line 2nd I/V G | 0 | 0 | 0 | 0.000 | 0.000 |
| 1153 | Stritter Reflux To SLOP U/S line 2nd I/V D | 0 | 0 | 0 | 0.000 | 0.000 |
| 1154 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1155 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1156 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1157 | Drain line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |

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## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 1158 | Drain line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1159 | Stritter Reflux To SLOP D/S line I/V U/S F | 0 | 0 | 0 | 0.000 | 0.000 |
| 1160 | Stritter Reflux To SLOP D/S line I/V Glanc | 0 | 0 | 0 | 0.000 | 0.000 |
| 1161 | Stritter Reflux To SLOP D/S line I/V D/S F | 0 | 0 | 0 | 0.000 | 0.000 |
| 1162 | Hydrogen Rich gas From unit 15 U/S I/V | 0 | 0 | 0 | 0.000 | 0.000 |
| 1163 | Hydrogen Rich gas From unit 15 U/S I/V | 0 | 0 | 0 | 0.000 | 0.000 |
| 1164 | Hydrogen Rich gas From unit 15 U/S I/V | 0 | 0 | 0 | 0.000 | 0.000 |
| 1165 | NRV U/5 Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1166 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1167 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1168 | Drain line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1169 | Drain line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1170 | Hydrogen Rich gas From unit 15 D/S l/V | 0 | 0 | 0 | 0.000 | 0.000 |
| 1171 | Hydrogen Rich gas From unit 15 D/S I/V | 0 | 0 | 0 | 0.000 | 0.000 |
| 1172 | Hydrogen Rich gas From unit 15 D/S I/V | 0 | 0 | 0 | 0.000 | 0.000 |
| 1173 | Hydrogen From PSA To 16-VV-2 U/S I/V | 0 | 0 | 0 | 0.000 | 0.000 |
| 1174 | Hydrogen From PSA To 16-VV-2 U/S I/V | 0 | 0 | 0 | 0.000 | 0.000 |
| 1175 | Hydrogen From PSA To 16-VV-2 U/S I/V | 0 | 0 | 0 | 0.000 | 0.000 |
| 1176 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1177 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1178 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1179 | Drain line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1180 | Drain line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1181 | Hydrogen From PSA To 16-VV-2 D/S I/V | 0 | 0 | 0 | 0.000 | 0.000 |
| 1182 | Hydrogen From PSA To 16-VV-2 D/S I/V | 0 | 0 | 0 | 0.000 | 0.000 |
| 1183 | Hydrogen From PSA To 16-VV-2 D/S I/V | 0 | 0 | 0 | 0.000 | 0.000 |
| 1184 | 14-FV-1501-CV U/S I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1185 | 14-FV-1501-CV U/S I/'V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1186 | 14-FV-1501-CV U/S I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1187 | CBD Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1188 | CBD Line 2nd l/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1189 | CBD Line 3rd l/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1190 | Staines Flange | 0 | 0 | 0 | 0.000 | 0.000 |

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## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 1191 | 14-FV-1501-CV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1192 | 14-FV-1501-CV Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1193 | 14-FV-1501-CV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1194 | 14-FV-1501 CV D/S I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1195 | 14-FV-1501-CV D/S I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1196 | 14-FV-1501-CV D/S I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1197 | Bypass line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1198 | Bypass line l/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1199 | Bypass line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1200 | From 14-PA-4 A/B to SLOP 1st I/V U/S FI | 0 | 0 | 0 | 0.000 | 0.000 |
| 1201 | From 14-PA-4 A/B to SLOP 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1202 | From 14-PA-4 A/B to SLOP 1st I/V D/S FI | 0 | 0 | 0 | 0.000 | 0.000 |
| 1203 | From 14-PA-4 A/B to SLOP 2nd I/V Glanc | 0 | 0 | 0 | 0.000 | 0.000 |
| 1204 | From 14-PA-4 A/B to SLOP 2nd I/V D/S F | 0 | 0 | 0 | 0.000 | 0.000 |
| 1205 | 14-FV-1701 U/S l/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1206 | 14-FV-1701 U/S I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1207 | 14-FV-1701 U/S I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1208 | CBD Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1209 | CBD Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1210 | CBD Line 3rd l/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1211 | Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1212 | 14-FV-1701 C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1213 | 14-FV-1701 C/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1214 | 14-FV-1701 C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1215 | 14-FV-1701 D/S I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1216 | 14-FV-1701 D/S I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1217 | 14-FV-1701 D/S I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1218 | Bypass line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1219 | 14-FV-1401 U/S I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1220 | 14-FV-1401 U/S I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1221 | 14-FV-1401 U/S I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1222 | CBD Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1223 | CBD Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |

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## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 1224 | CBD Line 3rd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1225 | Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1226 | 14-FV-1401 C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1227 | 14-FV-1401 C/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1228 | 14-FV-1401 C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1229 | 14-FV-1401 D/S I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1230 | 14-FV-1401 D/S I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1231 | 14-FV-1401 D/S I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1232 | Bypass line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1233 | Bypass line IN Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1234 | Bypass line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1235 | From 14-PA-CF-001 Start Up line I/V U/S | 0 | 0 | 0 | 0.000 | 0.000 |
| 1236 | From 14-PA-CF-001 Start Up line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1237 | From 14-PA-CF-001 Start Up line I/V D/S | 0 | 0 | 0 | 0.000 | 0.000 |
| 1238 | Hydrogen From Unit 15 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1239 | Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1240 | Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1241 | Drain line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1242 | Drain line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1243 | Hydrogen From Unit 15 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1244 | 14-FV-1402 M/U to 14-vv-03 U/S Line I/ | 0 | 0 | 0 | 0.000 | 0.000 |
| 1245 | CBD line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1246 | 14-FV-1402 C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1247 | 14-FV-1402 C/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1248 | CBD line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1249 | 14-FV-1402 D/S I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1250 | Bypass line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1251 | Heavy Naptha From Unit-14 line 1st I/V | 0 | 0 | 0 | 0.000 | 0.000 |
| 1252 | Heavy Naptha From Unit-14 line 1st I/V | 0 | 0 | 0 | 0.000 | 0.000 |
| 1253 | Heavy Naptha From Unit-14 line 1st I/V | 0 | 0 | 0 | 0.000 | 0.000 |
| 1254 | Heavy Naptha From Unit-14 line 2nd I/V | 0 | 0 | 0 | 0.000 | 0.000 |
| 1255 | Heavy Naptha From Unit-14 line 2nd I/V | 0 | 0 | 0 | 0.000 | 0.000 |
| 1256 | Feed Naptha To Unit-15 line U/S I/V U/S | 0 | 0 | 0 | 0.000 | 0.000 |

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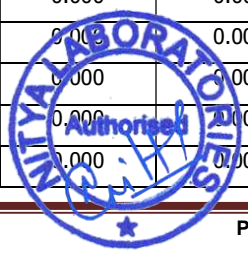
## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 1257 | Feed Naptha To Unit-15 line U/S I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1258 | Feed Naptha To Unit-15 line U/S I/V D/S | 0 | 0 | 0 | 0.000 | 0.000 |
| 1259 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1260 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1261 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1262 | Drain line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1263 | Drain line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1264 | Feed Naptha To Unit-15 line D/S I/V U/S | 0 | 0 | 0 | 0.000 | 0.000 |
| 1265 | Feed Naptha To Unit-15 line D/S l/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1266 | Feed Naptha To Unit-15 line D/S I/V D/S | 0 | 0 | 0 | 0.000 | 0.000 |
| 1267 | S/U line (Reaction Section BP) line U/S I/ | 0 | 0 | 0 | 0.000 | 0.000 |
| 1268 | S/u line (Reaction Section BP) line U/S I/ | 0 | 0 | 0 | 0.000 | 0.000 |
| 1269 | S/U line (Reaction Section BP) line U/S I/ | 0 | 0 | 0 | 0.000 | 0.000 |
| 1270 | S/U line (Reaction Section BP) line D/S I/ | 0 | 0 | 0 | 0.000 | 0.000 |
| 1271 | S/U line (Reaction Section BP) line D/S I/ | 0 | 0 | 0 | 0.000 | 0.000 |
| 1272 | Hydrogen From PSA To 15-KA-001 Seal U | 0 | 0 | 0 | 0.000 | 0.000 |
| 1273 | Hydrogen From PSA To 15-KA-001 Seal U | 0 | 0 | 0 | 0.000 | 0.000 |
| 1274 | Hydrogen From PSA To 15-KA-001 Seal U | 0 | 0 | 0 | 0.000 | 0.000 |
| 1275 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1276 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1277 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1278 | Drain line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1279 | Drain line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1280 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1281 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1282 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1283 | From 16-KA-001 A/B To 15-KA-001 (Seal) | 0 | 0 | 0 | 0.000 | 0.000 |
| 1284 | From16-KA-001A/BTo15-KA-001(Seal) | 0 | 0 | 0 | 0.000 | 0.000 |
| 1285 | From 16-KA-001 A/B To 15-KA-001 (Seal | 0 | 0 | 0 | 0.000 | 0.000 |
| 1286 | Hydrogen From PSA To 15-KA-001 Seal E | 0 | 0 | 0 | 0.000 | 0.000 |
| 1287 | Hydrogen From PSA To 15-KA-001 Seal E | 0 | 0 | 0 | 0.000 | 0.000 |
| 1288 | Hydrogen From PSA To 15-KA-001 Seal £ | 0 | 0 | 0 | 0.000 | 0.000 |
| 1289 | Vrain line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |



## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 1290 | Vrain line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1291 | From 16-KA-001 A/B To 15-KA-001 (Seal) | 0 | 0 | 0 | 0.000 | 0.000 |
| 1292 | From 16-KA-001 A/B To 15-KA-001 (Seal) | 0 | 0 | 0 | 0.000 | 0.000 |
| 1293 | From 16-KA-001 A/B To 15-KA-001 (Seal) | 0 | 0 | 0 | 0.000 | 0.000 |
| 1294 | To-15-KA-001 Seal line U/S I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1295 | To-15-KA-001 Seal line U/S I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1296 | To-15-KA-001 Seal line U/S I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1297 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1298 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1299 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1300 | To-15-KA-001 Seal line D/S I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 1301 | To-15-KA-001 Seal line D/S I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 1302 | To-15-KA-001 Seal line D/S I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |

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## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| **UNIT : WAX** | | | | | | |
| **Area** | **Pump -18PA109A Wax Scripper Bottom Pump** | | | | | |
| 1 | Suction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 2 | I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 3 | I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 4 | Drain line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 5 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 6 | Discharge line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 7 | I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 8 | I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 9 | Pump Seal | 0 | 0 | 0 | 0.000 | 0.000 |
| 10 | Meter Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 11 | OWS point | 0 | 0 | 0 | 0.000 | 0.000 |
| 12 | 18PA109B Suction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 13 | I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 14 | I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 15 | Drain line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 16 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 17 | Discharge line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 18 | I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 19 | I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 20 | Pump Seal | 0 | 0 | 0 | 0.000 | 0.000 |
| 21 | Meter Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 22 | Meter Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 23 | OWS point | 0 | 0 | 0 | 0.000 | 0.000 |
| 24 | 18PA105A Suction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 25 | I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 26 | I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 27 | Drain line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 28 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 29 | Meter Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 30 | Meter Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 31 | Pump Seal | 0 | 0 | 0 | 0.000 | 0.000 |

## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 32 | 18PA105B Suction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 33 | I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 34 | I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 35 | Discharge line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 36 | I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 37 | Drain line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 38 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 39 | Meter Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 40 | Meter Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 41 | OWS point | 0 | 0 | 0 | 0.000 | 0.000 |
| 42 | 18PA105C Suction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 43 | I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 44 | I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 45 | Discharge line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 46 | I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 47 | I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 48 | Pump Seal | 0 | 0 | 0 | 0.000 | 0.000 |
| 49 | Drain line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 50 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 51 | Meter Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 52 | Meter Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 53 | OWS point | 0 | 0 | 0 | 0.000 | 0.000 |
| 54 | 18PA105D Suction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 55 | I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 56 | I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 57 | Pump Seal | 0 | 0 | 0 | 0.000 | 0.000 |
| 58 | Drain line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 59 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 60 | Meter Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 61 | Meter Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 62 | OWS point | 0 | 0 | 0 | 0.000 | 0.000 |
| 63 | LV1902 Suction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 64 | I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |

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## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 65 | I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 66 | Drain line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 67 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 68 | 1902CV Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 69 | Discharge Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 70 | Discharge Line Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 71 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 72 | LV2002 Suction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 73 | I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 74 | I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 75 | Drain line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 76 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 77 | LV2002 CV Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 78 | Discharge Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 79 | Discharge Line Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 80 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 81 | LV1802 Suction Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 82 | LV1802 CV Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 83 | Discharge Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 84 | Drain line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 85 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 86 | PV2401 Suction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 87 | I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 88 | I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 89 | Drain line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 90 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 91 | PV2401 Suction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 92 | PV2401 CV Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 93 | CV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 94 | Discharge line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 95 | I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 96 | I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 97 | Drain line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |

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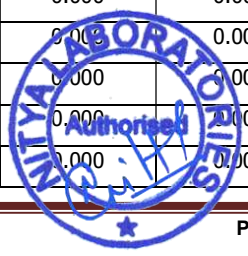
## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 98 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 99 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 100 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 101 | Meter Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 102 | Meter Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 103 | LV1702 Suction Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 104 | Drain line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 105 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 106 | LV1702 CV Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 107 | CV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 108 | Discharge line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 109 | Discharge line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 110 | Drain line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 111 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 112 | LV1602 Suction Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 113 | Drain line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 114 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 115 | LV1602 CV Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 116 | CV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 117 | Discharge line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 118 | Discharge line Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 119 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 120 | 18PA114A Suction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 121 | I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 122 | I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 123 | Discharge line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 124 | I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 125 | I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 126 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 127 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 128 | Pump Seal | 0 | 0 | 0 | 0.000 | 0.000 |
| 129 | Meter Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 130 | Meter Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |



## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 131 | 18PA114B Suction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 132 | I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 133 | I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 134 | Discharge line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 135 | I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 136 | I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 137 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 138 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 139 | Pump Seal | 0 | 0 | 0 | 0.000 | 0.000 |
| 140 | Meter Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 141 | Meter Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 142 | 18PA104A Suction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 143 | I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 144 | I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 145 | Drain line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 146 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 147 | Discharge line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 148 | I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 149 | I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 150 | Pump Seal | 0 | 0 | 0 | 0.000 | 0.000 |
| 151 | Meter Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 152 | Meter Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 153 | 18PA104BSuction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 154 | l/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 155 | l/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 156 | Drain line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 157 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 158 | Discharge line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 159 | l/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 160 | I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 161 | Pump Seal | 0 | 0 | 0 | 0.000 | 0.000 |
| 162 | Meter Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 163 | Meter Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |

## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 164 | 18PA104C Suction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 165 | I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 166 | I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 167 | Drain line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 168 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 169 | Discharge line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 170 | I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 171 | I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 172 | Pump Seal | 0 | 0 | 0 | 0.000 | 0.000 |
| 173 | Meter Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 174 | Meter Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 175 | 18PA104D Suction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 176 | I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 177 | I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 178 | Drain line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 179 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 180 | Discharge line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 181 | I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 182 | I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 183 | Pump Seal | 0 | 0 | 0 | 0.000 | 0.000 |
| 184 | Meter Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 185 | Meter Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 186 | 18PA104E Suction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 187 | I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 188 | I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 189 | Drain line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 190 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 191 | Discharge line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 192 | I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 193 | I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 194 | Pump Seal | 0 | 0 | 0 | 0.000 | 0.000 |
| 195 | Meter Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 196 | Meter Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |

NITYA LABORATORIES Authorised

## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 197 | 18PA104F Suction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 198 | I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 199 | I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 200 | Drain line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 201 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 202 | Discharge line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 203 | I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 204 | I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 205 | Pump Seal | 0 | 0 | 0 | 0.000 | 0.000 |
| 206 | Meter Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 207 | Meter Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| **T.No.43TTCR101A (Service MVGO)** | | | | | | |
| 208 | Level Indicator connnecting Point | 0 | 0 | 0 | 0.000 | 0.000 |
| 209 | US line IV Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 210 | US line IV Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 211 | Drain line IV Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 212 | Drain line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 213 | D/S line IV Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 214 | D/S line IV Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 215 | Meter line IV Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| **T.No.43TTCR101B (Service MVGO)** | | | | | | |
| 216 | Level Indicator connnecting Point | 0 | 0 | 0 | 0.000 | 0.000 |
| 217 | US line IV Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 218 | US line IV Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 219 | Drain line IV Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 220 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 221 | D/S line IV Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 222 | D/S line IV Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 223 | Meter line IV Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| **T.No.43TTCR102 (Service HVGO)** | | | | | | |
| 224 | Level Indicator connnecting Point | 0 | 0 | 0 | 0.000 | 0.000 |
| 225 | US line IV Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 226 | US line IV Flange | 0 | 0 | 0 | 0.000 | 0.000 |

NITYA LABORATORIES Authorised

## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 227 | Drain line IV Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 228 | Drain line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 229 | D/S line IV Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 230 | D/S line IV Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 231 | Meter line IV Gland | 0 | 0 | 0 | 0.000 | 0.000 |

NITYA LABORATORIES Authorised

## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| **UNIT : CDU/VDU** | | | | | | |
| **Area** | **B/L** | | | | | |
| 1 | Intergas Inlet Line U/S I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 2 | Intergas Inlet Line U/S I/V U/S Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 3 | Intergas Inlet Line U/S I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 4 | Intergas Inlet Line D/S I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 5 | Intergas Inlet Line D/S I/V U/S Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 6 | Intergas Inlet Line D/S I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 7 | UNSTAB Naptha Outlet Line U/S I/V U/S | 0 | 0 | 0 | 0.000 | 0.000 |
| 8 | UNSTAB Naptha Outlet Line U/S I/V U/S | 0 | 0 | 0 | 0.000 | 0.000 |
| 9 | UNSTAB Naptha Outlet Line U/S I/V D/S | 0 | 0 | 0 | 0.000 | 0.000 |
| 10 | UNSTAB Naptha Outlet Line D/S I/V U/S | 0 | 0 | 0 | 0.000 | 0.000 |
| 11 | UNSTAB Naptha Outlet Line D/S I/V U/S | 0 | 0 | 0 | 0.000 | 0.000 |
| 12 | UNSTAB Naptha Outlet Line D/S I/V D/S | 0 | 0 | 0 | 0.000 | 0.000 |
| 13 | STAB Naptha to Storage Outlet Line I/V | 0 | 0 | 0 | 0.000 | 0.000 |
| 14 | STAB Naptha to Storage Outlet Line I/V | 0 | 0 | 0 | 0.000 | 0.000 |
| 15 | STAB Naptha to Storage Outlet Line I/V | 0 | 0 | 0 | 0.000 | 0.000 |
| 16 | Meter line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 17 | Meter line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 18 | Drain line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 19 | Drain line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 20 | Vrain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 21 | Vrain Line Safty Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 22 | LPG Bullet Outlet U/S Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 23 | LPG Bullet Outlet U/S Line I/V U/S Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 24 | LPG Bullet Outlet U/S Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 25 | LPG Bullet Outlet D/S Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 26 | LPG Bullet Outlet D/S Line I/V U/S Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 27 | LPG Bullet Outlet D/S Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 28 | LPG to Inlet Vrain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 29 | LPG to Inlet Vrain Line I/V Saftey Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 30 | LPG to Intlet U/S Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 31 | LPG to Intlet U/S Line I/V U/S Gland | 0 | 0 | 0 | 0.000 | 0.000 |

## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 32 | LPG to Intlet U/S Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 33 | LPG to Intlet D/S Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 34 | LPG to Intlet D/S Line I/V U/S Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 35 | LPG to Intlet D/S Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 36 | LPG Ex SPHERE Inlet U/S Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 37 | LPG Ex SPHERE Inlet U/S Line I/V U/S Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 38 | LPG Ex SPHERE Inlet U/S Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 39 | LPG Ex SPHERE Inlet D/S Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 40 | LPG Ex SPHERE Inlet D/S Line I/V U/S Giand | 0 | 0 | 0 | 0.000 | 0.000 |
| 41 | LPG Ex SPHERE Inlet D/S Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 42 | Fuel Gas Inlet U/S Line l/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 43 | Fuel Gas Inlet U/S Line l/V U/S Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 44 | Fuel Gas Inlet U/S Line l/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 45 | Fuel Gas Inlet D/S Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 46 | Fuel Gas Inlet 0/5 Line I/V U/S Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 47 | Fuel Gas Inlet D/S Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 48 | Vrain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 49 | Vrain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 50 | LPG to SPHERE Inlet U/S Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 51 | LPG to SPHERE Inlet U/S Line I/V U/S Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 52 | LPG to SPHERE Inlet U/S Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 53 | LPG to SPHERE Inlet D/S Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 54 | LPG to SPHERE Inlet D/S Line I/V U/S Giand | 0 | 0 | 0 | 0.000 | 0.000 |
| 55 | LPG to SPHERE Inlet D/S Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 56 | Meter Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 57 | 01-FV-1905 U/S Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 58 | 01-FV-1905 U/S Line I/V U/S Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 59 | 01-FV-1905 U/S Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 60 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 61 | Drain Line l/V Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 62 | 01-FV-1905 C/V Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 63 | 02-FV-1905 C/V line I/V U/S Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 64 | 01-FV-1905 C/V Line l/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |

NITYA LABORATORIES Authorised

## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 65 | 01-FV-1905 D/S Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 66 | 01-FV-1905 D/S Line l/V U/S Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 67 | 01-FV-1905 D/S Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 68 | Bypass Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 69 | Bypass Line I/V U/S Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 70 | Bypass Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 71 | 01-FV-1921 U/S Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 72 | 01-FV-1921 U/S Line I/V U/S Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 73 | 01-FV-1921 U/S Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 74 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 75 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 76 | 01-FV-1921 C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 77 | 01-FV-1921 C/V U/S Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 78 | 01-FV-1921 C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 79 | 01-FV-1921 D/S Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 80 | 01-FV-1921 D/S Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 81 | 01-FV-1921 D/S Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 82 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 83 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 84 | Bypass Line l/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 85 | Bypass Line I/V U/S Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 86 | Bypass Line l/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 87 | 01-LV-1701 U/S Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 88 | 01-LV 1701 U/S Line I/V U/S Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 89 | 01-LV-1701 U/S Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 90 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 91 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 92 | 01-LV-1701 C/S Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 93 | 01-LV-1701 C/S Line I/V U/S Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 94 | 01-LV-1701 C/S Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 95 | 01-LV-1701 D/S Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 96 | 01-LV-1701 D/S Line I/V U/S Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 97 | 01-LV-1701 D/S Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |

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## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 98 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 99 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 100 | Bypass Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 101 | Bypass Line I/V U/S Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 102 | Bypass Line l/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 103 | 01-FV-1901 U/S Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 104 | 01-FV-1901 U/S Line I/V U/S Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 105 | 01-FV-1901 U/S Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 106 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 107 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 108 | 01-FV-1901 C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 109 | 01-FV-1901 C/V U/S Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 110 | 01-FV-1901 C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 111 | 01-FV-1901 D/S Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 112 | 01-FV-1901 D/S Line I/V U/S Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 113 | 01-FV-1901 D/S Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 114 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 115 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 116 | Bypass Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 117 | Bypass Line I/V U/S Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 118 | Pump Seal | 0 | 0 | 0 | 0.000 | 0.000 |
| 119 | 01-FV-1904 U/S Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 120 | 01-FV-1904 U/S Line I/V U/S Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 121 | 01-FV-1904 U/S Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 122 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 123 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 124 | 01-FV-1904 C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 125 | 01-FV-1904 C/V U/S Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 126 | 01-FV-1904 C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 127 | 01-FV-1904 D/S Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 128 | 01-FV-1904 D/S Line I/V U/S Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 129 | 01-FV-1904 D/S Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 130 | Bypass Line l/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |

## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 131 | Bypass Line I/V U/S Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 132 | Bypass Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 133 | 01-FV-1903 U/S Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 134 | 01-FV-1903 U/S Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 135 | 01-FV-1903 U/S Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 136 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 137 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 138 | 01-FV-1903 C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 139 | 01-FV-1903 C/V U/S Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 140 | 01-FV-1903 C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 141 | 01-FV-1903 D/S Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 142 | 01-FV-1903 D/S Line I/V U/S Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 143 | 01-FV-1903 D/S Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 144 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 145 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 146 | Bypass Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 147 | Bypass Line I/V U/S Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 148 | Bypass Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 149 | 01-PA-106A Suction Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 150 | Stainer Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 151 | Stainer Top Flange Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 152 | Stainer Top Flange Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 153 | Suction Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 154 | Pump Seal | 0 | 0 | 0 | 0.000 | 0.000 |
| 155 | Discharge Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 156 | Meter line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 157 | Meter line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 158 | Meter line Sampling I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 159 | Discharge Line GIand | 0 | 0 | 0 | 0.000 | 0.000 |
| 160 | 01-PA-106B Suction Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 161 | Stainer Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 162 | Stainer Top Flange Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 163 | Stainer Top Flange Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |

## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 164 | Suction Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 165 | Pump Seal | 0 | 0 | 0 | 0.000 | 0.000 |
| 166 | Discharge Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 167 | Meter line 1st l/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 168 | Meter line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 169 | Meter line Sampling I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 170 | Discharge Line Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 171 | 01-PA-105 A Suction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 172 | 01-PA-105A Suction Line I/V U/S Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 173 | 01-PA-105A Suction Line l/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 174 | Stainer Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 175 | Stainer Top Flange Drain Line l/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 176 | Stainer Top Flange Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 177 | Suction Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 178 | Pump Seal | 0 | 0 | 0 | 0.000 | 0.000 |
| 179 | Discharge Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 180 | Meter line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 181 | Meter line 2nd l/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 182 | Meter line Sampling l/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 183 | NRV U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 184 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 185 | NRV D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 186 | Discharge Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 187 | Discharge Line l/V U/S Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 188 | Discharge Line l/V D/S FIange | 0 | 0 | 0 | 0.000 | 0.000 |
| 189 | 01 PA-105B Suction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 190 | 01-PA-105B Suction Line I/V U/S Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 191 | 01-PA-105B Suction Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 192 | Stainer Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 193 | Stainer Top Flange Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 194 | Stainer Top Flange Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 195 | Suction Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 196 | Pump Seal | 0 | 0 | 0 | 0.000 | 0.000 |

## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 197 | Discharge Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 198 | Meter line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 199 | Meter line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 200 | Meter line Sampling I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 201 | NRV I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 202 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 203 | NRV I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 204 | Discharge Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 205 | Discharge Line I/V U/S Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 206 | Discharge Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| **207** | **01-FV-1903 bypass line I/V Gland** | **30% LEL** | **0** | **0** | **0.000** | **0.000** |
| **Unit : CDU/VDU** | | | | | | |
| **Area** | **Pump** | | | | | |
| 208 | 01-PA-103B Suction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 209 | 01-PA-103B Suction Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 210 | 01-PA-103B Suction Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 211 | Stainer Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 212 | Stainer Top Flange Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 213 | Stainer Top Flange Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 214 | Suction Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 215 | PumpSeal | 0 | 0 | 0 | 0.000 | 0.000 |
| 216 | Discharge Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 217 | Meter line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 218 | Meter line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 219 | Meter line Sampling I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 220 | NRV I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 221 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 222 | NRV I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 223 | Discharge Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 224 | Discharge Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 225 | Discharge Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 226 | Suction Line to Outside Line 1st I/V U/S | 0 | 0 | 0 | 0.000 | 0.000 |
| 227 | Suction Line to Outside Line 1st I/V Giand | 0 | 0 | 0 | 0.000 | 0.000 |

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## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 228 | Suction Line to Outside Line 1st I/V D/S | 0 | 0 | 0 | 0.000 | 0.000 |
| 229 | Suction Line to Outside Line 2nd I/V U/S | 0 | 0 | 0 | 0.000 | 0.000 |
| 230 | Suction Line to Outside Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 231 | Suction Line to Outside Line 2nd I/V D/S | 0 | 0 | 0 | 0.000 | 0.000 |
| 232 | Suction Line to Outside Line 3rd I/V U/S | 0 | 0 | 0 | 0.000 | 0.000 |
| 233 | Suction Line to Outside Line 3rd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 234 | Suction Line to Outside Line 3rd I/V D/S | 0 | 0 | 0 | 0.000 | 0.000 |
| 235 | Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 236 | OWS Point | 0 | 0 | 0 | 0.000 | 0.000 |
| 237 | 01-PA-103A Suction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 238 | 01-PA-103A Suction Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 239 | 01-PA-103A Suction Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 240 | Stainer Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 241 | Stainer Top Flange Drain Line Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 242 | Stainer Top Flange Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 243 | Suction Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 244 | Pump Seal | 0 | 0 | 0 | 0.000 | 0.000 |
| 245 | Discharge Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 246 | Meter line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 247 | Meter line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 248 | Meter line Sampling Point I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 249 | NRV I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 250 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 251 | NRV I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 252 | Discharge Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 253 | Discharge Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 254 | Discharge Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 255 | Pump to Drain Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 256 | Pump to Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 257 | Pump to Drain Line 3rd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 258 | Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 259 | OWS Point | 0 | 0 | 0 | 0.000 | 0.000 |
| 260 | 01-FV-4003 U/S Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |

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## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 261 | 01-FV-4003 U/S Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 262 | 01-FV-4003 U/S Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 263 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 264 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 265 | 01-FV-4003 C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| **266** | **01-FV-4003 C/V Gland** | **25% LEL** | **0** | **0** | **0.000** | **0.000** |
| 267 | 01-FV-4003 C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 268 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 269 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 270 | 01-FV-4003 D/S Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 271 | 01-FV-4003 D/S Line l/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 272 | 01-FV-4003 D/S Line l/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 273 | Bypass Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 274 | Bypass Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 275 | Bypass Line l/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 276 | 01-FV-3803 U/S Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 277 | 01-FV-3803 U/S Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 278 | 01-FV-3803 U/S Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 279 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 280 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 281 | 01-FV-3803 CI/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 282 | 01-FV-3803 C/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 283 | 01-FV-3803 C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 284 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 285 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 286 | 01-FV-3803 D/S Line l/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 287 | 01-FV-3803 D/S Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 288 | 01-FV-3803 D/S Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 289 | Bypass Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 290 | Bypass Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 291 | Bypass Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 292 | 01-FV-3901 U/S Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 293 | 01-FV-3901 U/S Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |

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## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 294 | 01-FV-3901 U/S Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 295 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 296 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 297 | 01-FV-3901 C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| **298** | **01-FV-3901 C/V Gland** | **18% LEL** | **0** | **0** | **0.000** | **0.000** |
| 299 | 01-FV-3901 C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 300 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 301 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 302 | 01-FV-3901 D/S Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 303 | 01-FV-3901 D/S Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 304 | 01-FV-3901 D/S Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 305 | Bypass Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 306 | Bypass Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 307 | Bypass Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 308 | 3.P.01.3916.A1A To EE-108Line I/V U/S | 0 | 0 | 0 | 0.000 | 0.000 |
| 309 | 3.P.01.3916.A1A To EE-108Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 310 | 3.P.01.3916.A1A To EE-108Line I/V D/S | 0 | 0 | 0 | 0.000 | 0.000 |
| 311 | 3.P.01.3916.A1A To Naptha Pool Line I/V | 0 | 0 | 0 | 0.000 | 0.000 |
| 312 | 3.P.01.3916.A1A To Naptha Pool Line I/V | 0 | 0 | 0 | 0.000 | 0.000 |
| 313 | 3.P.01.3916.A1A To Naptha Pool Line I/V | 0 | 0 | 0 | 0.000 | 0.000 |
| 314 | 01-PR-101B Suction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 315 | 01-PR-101B Suction Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 316 | 01-PR-101B Suction Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 317 | Stainer Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 318 | Stainer Top Flange Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 319 | Stainer Top Flange Drain Line I/V Safety | 0 | 0 | 0 | 0.000 | 0.000 |
| 320 | Suction Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 321 | Pump Seal | 0 | 0 | 0 | 0.000 | 0.000 |
| 322 | Discharge Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 323 | Meter Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 324 | Meter line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 325 | Meter line Sampling Point I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 326 | NRV I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |

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## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 327 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 328 | NRV I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 329 | Discharge Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 330 | Discharge Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 331 | Discharge Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 332 | Pump to Drain Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 333 | Pump to Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 334 | Pump to Drain Line 3rd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 335 | Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 336 | OWS Point | 0 | 0 | 0 | 0.000 | 0.000 |
| 337 | 01-PA-101A Suction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 338 | 01-PA-101A Suction Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 339 | 01-PA-101A Suction Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 340 | Stainer Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 341 | Stainer Top Flange I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 342 | Stainer Top Flange Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 343 | Suction Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 344 | Pump Seal | 0 | 0 | 0 | 0.000 | 0.000 |
| 345 | Discharge Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 346 | Meter Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 347 | Meter line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 348 | Meter line Sampling Point I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 349 | Discharge Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 350 | Discharge Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 351 | Discharge Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 352 | Suction Line To Outside Line 1st I/V U/S | 0 | 0 | 0 | 0.000 | 0.000 |
| 353 | Suction Line To Outside Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 354 | Suction Line To Outside Line 1st I/V D/S | 0 | 0 | 0 | 0.000 | 0.000 |
| 355 | Suction Line To Outside Line 2nd I/V U/S | 0 | 0 | 0 | 0.000 | 0.000 |
| 356 | Suction Line To Outside Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 357 | Suction Line To Outside Line 2nd I/V D/S | 0 | 0 | 0 | 0.000 | 0.000 |
| 358 | Suction Line To Outside Line 3rd I/V U/S | 0 | 0 | 0 | 0.000 | 0.000 |
| 359 | Suction Line To Outside Line 3rd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |

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## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 360 | Suction Line To Outside Line 3rd I/V D/S | 0 | 0 | 0 | 0.000 | 0.000 |
| 361 | Pump to Drain Line 1st l/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 362 | Pump to Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 363 | Pump to Drain Line 3rd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 364 | Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 365 | OWS Point | 0 | 0 | 0 | 0.000 | 0.000 |
| 366 | 01-FV-3701 U/S Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 367 | 01-FV-3701 U/S Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 368 | 01-FV-3701 U/S Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 369 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 370 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 371 | 01-FV-3701 C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 372 | 01-FV-3701 C/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 373 | 01-FV-3701 C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 374 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 375 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 376 | 01-FV-3701 D/S Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 377 | 01-FV-3701 D/S Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 378 | 01-FV-3701 D/S Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 379 | Bypass Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 380 | To Naptha Pool EX-PA-101 Line I/V U/S | 0 | 0 | 0 | 0.000 | 0.000 |
| 381 | To Naptha Pool EX-PA-101 Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 382 | To Naptha Pool EX-PA-101 Line I/V D/S | 0 | 0 | 0 | 0.000 | 0.000 |
| 383 | Naptha To EE-109 EX-PA-101 Line I/V U/S | 0 | 0 | 0 | 0.000 | 0.000 |
| 384 | Naptha To EE-109 EX-PA-101 Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 385 | Naptha To EE-109 EX-PA-101 Line I/V D/S | 0 | 0 | 0 | 0.000 | 0.000 |
| 386 | 01-FV-4005 U/S Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 387 | 01-FV-4005 U/S Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 388 | 01-FV-4005 U/S Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 389 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 390 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 391 | 01-FV-4005 C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 392 | 01-FV-4005 C/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |

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## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 393 | 01-FV-4005 C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 394 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 395 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 396 | 01-FV-4005 D/S Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 397 | 01-FV-4005 D/S Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 398 | 01-FV-4005 D/S Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 399 | Bypass Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 400 | 01-PA-CF-012A Suction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 401 | 01-PA-CF-012A Suction Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 402 | 01-PA-CF-012A Suction Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 403 | Stainer Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 404 | Stainer Top Flange I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 405 | Stainer Top Flange Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 406 | Suction Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 407 | Pump Seal | 0 | 0 | 0 | 0.000 | 0.000 |
| 408 | Discharge Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 409 | NRV I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 410 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 411 | NRV I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 412 | Meter Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 413 | Meter Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 414 | Meter line Sampling Point I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 415 | Discharge Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 416 | Discharge Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 417 | Discharge Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 418 | Pump to Drain Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 419 | Pump to Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 420 | Pump to Drain Line 3rd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 421 | Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 422 | OWS Point | 0 | 0 | 0 | 0.000 | 0.000 |
| 423 | 01-PV-04 Suction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 424 | 01-PV-04 Suction Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 425 | 01-PV-04 Suction Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |

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## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 426 | Stainer Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 427 | Stainer Top Flange I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 428 | Stainer Top Flange Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 429 | Suction Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 430 | Discharge Line 1st Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 431 | Discharge Line 2nd Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 432 | Meter Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 433 | Meter line Sampling Point I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 434 | NRV I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 435 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 436 | NRV I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 437 | Discharge Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 438 | Discharge Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 439 | Discharge Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 440 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 441 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 442 | Pump to Drain Line 1st l/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 443 | Pump to Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 444 | Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 445 | OWS Point | 0 | 0 | 0 | 0.000 | 0.000 |
| 446 | 01-PV-04A Suction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 447 | 01-PV-04A Suction Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 448 | 01-PV-04A Suction Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 449 | Stainer Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 450 | Stainer Top Flange I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 451 | Stainer Top Flange Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 452 | Suction Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 453 | Pump Seal | 0 | 0 | 0 | 0.000 | 0.000 |
| 454 | Discharge Line 1st Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 455 | Discharge Line 2nd Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 456 | Meter line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 457 | Meter line Sampling Point l/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 458 | NRV I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |

NITYA LABORATORIES Authorised

**Fugitive Emission Monitoring Survey Report**

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 459 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 460 | NRV I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 461 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 462 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 463 | Discharge Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 464 | Discharge Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 465 | Discharge Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 466 | Pump to Drain Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 467 | Pump to Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 468 | Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 469 | OWS Point | 0 | 0 | 0 | 0.000 | 0.000 |
| 470 | 01-PA-CF-013-B Suction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 471 | 01-PA-CF-013-B Suction Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 472 | 01-PA-CF-013-B Suction Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 473 | Stainer Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 474 | Stainer Top Flange I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 475 | Stainer Top Flange Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 476 | Suction Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 477 | Pump Seal | 0 | 0 | 0 | 0.000 | 0.000 |
| 478 | Discharge Line 1st Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 479 | Discharge Line 2nd Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 480 | Meter line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 481 | Meter line Sampling Point I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 482 | NRV I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 483 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 484 | NRV I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 485 | Discharge Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 486 | Discharge Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 487 | Discharge Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 488 | Pump to Drain Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 489 | Pump to Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 490 | Pump to Drain Line 3rd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 491 | Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |

NITYA LABORATORIES Authorised

**Fugitive Emission Monitoring Survey Report**

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 492 | OWS Point | 0 | 0 | 0 | 0.000 | 0.000 |
| 493 | 01-PA-CF-013-A Suction Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 494 | 01-PA-CF-013-B Suction Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 495 | 01-PA-CF-013-B Suction Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 496 | Stainer Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 497 | Stainer Top Flange I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 498 | Stainer Top Flange Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 499 | Suction Line Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 500 | Pump Seal | 0 | 0 | 0 | 0.000 | 0.000 |
| 501 | Discharge Line 1st Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 502 | Discharge Line 2nd Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 503 | Meter line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 504 | Meter line Sampling Point I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 505 | NRV I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 506 | NRV Top Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 507 | NRV I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 508 | Discharge Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 509 | Discharge Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 510 | Discharge Line l/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 511 | Pump to Drain Line 1st I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 512 | Pump to Drain Line 2nd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 513 | Pump to Drain Line 3rd I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 514 | Stainer Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 515 | OWS Point | 0 | 0 | 0 | 0.000 | 0.000 |
| 516 | 01-FV-1505 U/S Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 517 | 01-FV-1505 U/S Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 518 | 01-FV-1505 U/S Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 519 | Drain Line l/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 520 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 521 | 01-FV-1505 C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 522 | 01-FV-1505 C/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 523 | 01-FV-1505 C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 524 | 01-FV-1505 D/S Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |

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## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 525 | 01-FV-1505 D/S Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 526 | 01-FV-1505 D/S Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 527 | Bypass Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 528 | Bypass Line I/V U/S Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 529 | Bypass Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 530 | 01-PV-2002 U/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 531 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 532 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 533 | 01-PV-2002 D/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 534 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 535 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 536 | Bypass Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 537 | 01-PV-1402 U/S line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 538 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 539 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 540 | 01-PV-1402 C/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 541 | 01-PV-1402 D/S Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 542 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 543 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 544 | Bypass Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 545 | 01-PV-1401 U/S Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 546 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 547 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 548 | 01-PV-1401 C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 549 | 01-PV-1401 C/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 550 | 01-PV-1401 C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 551 | 01-PV-1401 D/S Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 552 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 553 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 554 | Bypass Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 555 | 01-SDV-1401 C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 556 | 01-SDV-1401 C/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 557 | 01-SDV-1401 C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |

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## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 558 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 559 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 560 | 01-FV-3804 D/S Line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 561 | 01-FV-3804 D/S Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 562 | 01-FV-3804 D/S Line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 563 | 01-FV-3804 C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 564 | 01-FV-3804 C/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 565 | 01-FV-3804 C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 566 | 01-FV-2702 C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 567 | 01-FV-2702 C/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 568 | 01-FV-2702 C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 569 | 01-FV-1702 C/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 570 | 01-FV-1702 C/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 571 | 01-FV-1702 C/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 572 | Drain Line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 573 | Drain Line Safety Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| **Unit : CDU/VDU** | | | | | | |
| **Area** | **Furnace** | | | | | |
| 574 | B.No. - 1 Fuel Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 575 | B.No. - 1 Fuel Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 576 | B.No. - 1 Fuel Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 577 | Pilot Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 578 | Pilot Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 579 | Pilot Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 580 | B.No. - 2 Fuel Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 581 | B.No. - 2 Fuel Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 582 | B.No. - 2 Fuel Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 583 | Pilot Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 584 | B.No. - 3 Fuel Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 585 | Pilot Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 586 | B.No. - 4 Fuel Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 587 | B.No. - 4 Fuel Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 588 | B.No. - 4 Fuel Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |

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## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 589 | Pilot Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 590 | Pilot Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 591 | Pilot Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 592 | B.No. - 5 Fuel Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 593 | B.No. - 5 Fuel Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 594 | B.No. - 5 Fuel Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 595 | Pilot Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 596 | Pilot Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 597 | Pilot Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 598 | B.No. - 6 Fuel Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 599 | Pilot Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 600 | B.No. - 7 Fuel Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 601 | B.No. - 7 Fuel Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 602 | B.No. - 7 Fuel Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 603 | Pilot Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 604 | Pilot Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 605 | Pilot Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 606 | B.No. - 8 Fuel Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 607 | B.No. - 8 Fuel Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 608 | B.No. - 8 Fuel Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 609 | Pilot Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 610 | Pilot Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 611 | Pilot Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 612 | B.No. - 1 Pilot Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 613 | B.No. - 1 Pilot Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 614 | B.No. - 1 Pilot Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 615 | B.No. - 1 Fuel Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 616 | B.No. - 1 Fuel Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 617 | B.No. - 1 Fuel Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 618 | B.No. - 2 Pilot Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 619 | B.No. - 2 Fuel Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 620 | B.No. - 2 Fuel Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 621 | B.No. - 2 Fuel Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |

## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 622 | B.No. - 3 Pilot Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 623 | B.No. - 3 Pilot Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 624 | B.No. - 3 Pilot Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 625 | B.No. - 3 Fuel Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 626 | B.No. - 4 Pilot Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 627 | B.No. - 4 Fuel Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 628 | B.No. - 5 Pilot Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 629 | B.No. - 5 Pilot Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 630 | B.No. - 5 Pilot Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 631 | B.No. - 5 Fuel Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 632 | B.No. - 6 Pilot Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 633 | B.No. - 6 Pilot Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 634 | B.No. - 6 Pilot Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 635 | B.No. - 6 Fuel Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 636 | B.No. - 6 Fuel Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 637 | B.No. - 6 Fuel Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 638 | B.No. - 7 Pilot Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 639 | B.No. - 7 Pilot Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 640 | B.No. - 7 Pilot Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 641 | B.No. - 7 Fuel Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 642 | B.No. - 7 Fuel Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 643 | B.No. - 7 Fuel Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 644 | B.No. - 8 Pilot Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 645 | B.No. - 8 Pilot Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 646 | B.No. - 8 Pilot Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 647 | B.No. - 8 Fuel Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 648 | B.No. - 8 Fuel Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 649 | B.No. - 8 Fuel Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 650 | B.No. - 9 Pilot Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 651 | B.No. - 9 Pilot Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 652 | B.No. - 9 Pilot Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 653 | B.No. - 9 Fuel Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 654 | B.No. - 9 Fuel Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |

NITYA LABORATORIES Authorised

## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 655 | B.No. - 9 Fuel Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 656 | B.No. - 10 Pilot Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 657 | B.No. - 10 Pilot Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 658 | B.No. - 10 Pilot Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 659 | B.No. - 10 Fuel Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 660 | B.No. - 10 Fuel Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 661 | B.No. - 10 Fuel Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 662 | B.No. - 11 Pilot Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 663 | B.No. - 11 Pilot Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 664 | B.No. - 11 Pilot Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 665 | B.No. - 11 Fuel Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 666 | B.No. - 11 Fuel Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 667 | B.No. - 11 Fuel Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 668 | B.No. - 12 Pilot Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 669 | B.No. - 12 Pilot Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 670 | B.No. - 12 Pilot Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 671 | B.No. - 12 Fuel Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 672 | B.No. - 12 Fuel Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 673 | B.No. - 12 Fuel Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 674 | B.No. - 13 Pilot Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 675 | B.No. - 13 Pilot Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 676 | B.No. - 13 Pilot Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 677 | B.No. - 13 Fuel Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 678 | B.No. - 13 Fuel Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 679 | B.No. - 13 Fuel Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 680 | B.No. - 14 Pilot Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 681 | B.No. - 14 Pilot Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 682 | B.No. - 14 Pilot Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 683 | B.No. - 14 Fuel Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 684 | B.No. - 14 Fuel Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 685 | B.No. - 14 Fuel Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 686 | B.No. - 15 Pilot Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 687 | B.No. - 15 Pilot Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |

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## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 688 | B.No. - 15 Pilot Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 689 | B.No. - 15 Fuel Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 690 | B.No. - 15 Fuel Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 691 | B.No. - 15 Fuel Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 692 | B.No. - 16 Pilot Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 693 | B.No. - 16 Pilot Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 694 | B.No. - 16 Pilot Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 695 | B.No. - 16 Fuel Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 696 | B.No. - 16 Fuel Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 697 | B.No. - 16 Fuel Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 698 | B.No. - 17 Pilot Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 699 | B.No. - 17 Pilot Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 700 | B.No. - 17 Pilot Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 701 | B.No. - 17 Fuel Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 702 | B.No. - 17 Fuel Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 703 | B.No. - 17 Fuel Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 704 | B.No. - 18 Pilot Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 705 | B.No. - 18 Pilot Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 706 | B.No. - 18 Pilot Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 707 | B.No. - 18 Fuel Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 708 | B.No. - 18 Fuel Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 709 | B.No. - 18 Fuel Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 710 | B.No. - 19 Pilot Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 711 | B.No. - 19 Pilot Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 712 | B.No. - 19 Pilot Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 713 | B.No. - 19 Fuel Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 714 | B.No. - 19 Fuel Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 715 | B.No. - 19 Fuel Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 716 | B.No. - 20 Pilot Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 717 | B.No. - 20 Pilot Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |
| 718 | B.No. - 20 Pilot Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 719 | B.No. - 20 Fuel Gas line I/V U/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |
| 720 | B.No. - 20 Fuel Gas line I/V Gland | 0 | 0 | 0 | 0.000 | 0.000 |

## Fugitive Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr.No. | Component ID | Average LEL Reading % | Reading % Gas | Reading (ppm) | EPA Correlation Kg/Hour/Source | Total Emission Kg/annum |
|---|---|---|---|---|---|---|
| 721 | B.No. - 20 Fuel Gas line I/V D/S Flange | 0 | 0 | 0 | 0.000 | 0.000 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| **UNIT : MSP** | | | | | | | | |
| **Area** | **B/L Pump Area** | | | | | | | |
| 1 | Fuel Gas Inlet line U/S I/V U/S Flange | 1 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 2 | Fuel Gas Inlet line U/S I/V Gland | 2 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 3 | Fuel Gas Inlet line U/S I/V D/S Flange | 3 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 4 | Fuel Gas Inlet line D/S I/V U/S Flange | 4 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 5 | Fuel Gas Inlet line D/S I/V Gland | 5 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 6 | Fuel Gas Inlet line D/S I/V D/S Flange | 6 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 7 | Sour Gas Outlet line U/S I/V U/S Flange | 7 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 8 | Sour Gas Outlet line U/S I/V Gland | 8 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 9 | Sour Gas Outlet line U/S I/V D/S Flange | 9 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 10 | Drain Line I/V Gland | 10 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 11 | Drain Line Safety Flange | 11 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 12 | Sour Gas Outlet line D/S I/V U/S Flange | 12 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 13 | Sour Gas Outlet line D/S I/V Gland | 13 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 14 | Sour Gas Outlet line D/S I/V D/S Flange | 14 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 15 | LPG R/D Outlet line U/S I/V U/S Flange | 15 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 16 | LPG R/D Outlet line U/S I/V Gland | 16 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 17 | LPG R/D Outlet line U/S I/V D/S Flange | 17 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 18 | Drain Line I/V Gland | 18 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 19 | LPG R/D First I/V Gland | 19 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 20 | LPG R/D Outlet line D/S I/V U/S Flange | 20 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 21 | LPG R/D Outlet line D/S I/V Gland | 21 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 22 | LPG R/D Outlet line D/S I/V D/S Flange | 22 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 23 | Hydrogen Rich Gas To PSA Outlet line U/S I/V | 23 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 24 | Hydrogen Rich Gas To PSA Outlet line U/S I/V | 24 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 25 | Hydrogen Rich Gas To PSA Outlet line U/S I/V | 25 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 26 | Drain Line I/V Gland | 26 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 27 | Drain Line Safety Flange | 27 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 28 | NRV U/S Flange | 28 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 29 | NRV Top Flange | 29 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 30 | NRV D/S Flange | 30 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 31 | Hydrogen Rich Gas To PSA Outlet line D/S I/V | 31 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 32 | Hydrogen Rich Gas To PSA Outlet line D/S I/V | 32 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 33 | Hydrogen Rich Gas To PSA Outlet line D/S I/V | 33 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 34 | Hydrogen From PSA Inlet line U/S I/V U/S Flange | 34 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 35 | Hydrogen From PSA Inlet line U/S I/V Gland | 35 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 36 | Hydrogen From PSA Inlet line U/S I/V D/S Flange | 36 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 37 | NRV U/S Flange | 37 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 38 | NRV Top Flange | 38 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 39 | NRV D/S Flange | 39 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 40 | Drain Line I/V Gland | 40 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 41 | Drain Line Safety Flange | 41 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 42 | Hydrogen From PSA Inlet line D/S I/V U/S Flange | 42 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 43 | Hydrogen From PSA Inlet line D/S I/V Gland | 43 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 44 | Hydrogen From PSA Inlet line D/S I/V D/S Flange | 44 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 45 | To 14-VV-01 S/U H. NAPTHA To 1st I/V U/S Flange | 45 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 46 | To 14-VV-01 S/U H. NAPTHA To 1st I/V Gland | 46 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 47 | To 14-VV-01 S/U H. NAPTHA To 1st I/V D/S Flange | 47 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 48 | NRV U/S Flange | 48 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 49 | NRV Top Flange | 49 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 50 | NRV D/S Flange | 50 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 51 | Drain Line I/V Gland | 51 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 52 | Drain Line Safety Flange | 52 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 53 | To 14-VV-01 S/U H. NAPTHA To 2nd I/V U/S Flange | 53 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 54 | To 14-VV-01 S/U H. NAPTHA To 2nd I/V Gland | 54 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 55 | To 14-VV-01 S/U H. NAPTHA To 2nd I/V D/S Flange | 55 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 56 | To 14-VV-01 S/U H. NAPTHA To Storage line 1 | 56 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 57 | To 14-VV-01 S/U H. NAPTHA To Storage line 1 | 57 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 58 | To 14-VV-01 S/U H. NAPTHA To Storage line 1 | 58 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 59 | NRV U/S Flange | 59 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 60 | NRV Top Flange | 60 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 61 | NRV D/S Flange | 61 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 62 | Drain Line I/V Gland | 62 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 63 | Drain Line Safety Flange | 63 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 64 | To 14-VV-01 S/U H. NAPTHA To Storage line 2 | 64 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 65 | To 14-VV-01 S/U H. NAPTHA To Storage line 2 | 65 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 66 | To 14-VV-01 S/U H. NAPTHA To Storage line 2 | 66 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 67 | 14-LV-1701 U/S line I/V U/S Flange | 67 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 68 | 14-LV-1701 U/S line I/V Gland | 68 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 69 | 14-LV-1701 U/S line I/V D/S Flange | 69 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 70 | CDE line 1st I/V Gland | 70 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 71 | CDE line 2nd I/V Gland | 71 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 72 | Stainer Flange | 72 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 73 | CDE line 3rd I/V Gland | 73 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 74 | 14-LV-1701 line C/V U/S Flange | 74 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 75 | 14-LV-1701 line C/V Gland | 75 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 76 | 14-LV-1701 line C/V D/S Flange | 76 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 77 | 14-LV-1701 line D/S line U/S Flange | 77 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 78 | 14-LV-1701 line D/S line Gland | 78 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 79 | 14-LV-1701 line D/S line D/S Flange | 79 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 80 | Bypass line I/V U/S Flange | 80 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 81 | Bypass line I/V Gland | 81 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 82 | Bypass line I/V D/S Flange | 82 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 83 | 15-FV-1401 U/S line I/V U/S Flange | 83 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 84 | 15-FV-1401 U/S line I/V Gland | 84 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 85 | 15-FV-1401 U/S line I/V D/S Flange | 85 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 86 | CDE line 1st I/V Gland | 86 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 87 | CDE line 2nd I/V Gland | 87 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 88 | Stainer Flange | 88 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 89 | CBD Drain line Top Flange | 89 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 90 | 15-FV-1401 line C/V U/S Flange | 90 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 91 | 15-FV-1401 line C/V Gland | 91 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 92 | 15-FV-1401 line C/V D/S Flange | 92 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 93 | 15-FV-1401 line D/S line U/S Flange | 93 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 94 | 15-FV-1401 line D/S line Gland | 94 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 95 | 15-FV-1401 line D/S line D/S Flange | 95 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 96 | Bypass line I/V U/S Flange | 96 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 97 | Bypass line I/V Gland | 97 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 98 | Bypass line I/V D/S Flange | 98 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 99 | 15-PV-1401 U/S line I/V U/S Flange | 99 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 100 | 15-PV-1401 U/S line I/V Gland | 100 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 101 | 15-PV-1401 U/S line I/V D/S Flange | 101 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 102 | 15-FV-1401 line C/V U/S Flange | 102 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 103 | 15-FV-1401 line C/V Gland | 103 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 104 | 15-FV-1401 line C/V D/S Flange | 104 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 105 | 15-FV-1401 line D/S line U/S Flange | 105 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 106 | 15-FV-1401 line D/S line Gland | 106 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 107 | 15-FV-1401 line D/S line D/S Flange | 107 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 108 | To Flare line 1st I/V U/S Flange | 108 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 109 | To Flare line 1st I/V Gland | 109 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 110 | To Flare line 1st I/V D/S Flange | 110 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 111 | NRV U/S Flange | 111 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 112 | NRV Top Flange | 112 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 113 | NRV D/S Flange | 113 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 114 | Drain Line I/V Gland | 114 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 115 | Drain Line Safety Flange | 115 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 116 | To Flare line 2nd I/V U/S Flange | 116 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 117 | To Flare line 2nd I/V Gland | 117 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 118 | To Flare line 2nd I/V D/S Flange | 118 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 119 | To FG Header line 1st I/V U/S Flange | 119 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 120 | To FG Header line 1st I/V Gland | 120 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 121 | To FG Header line 1st I/V D/S Flange | 121 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 122 | NRV Top Flange | 122 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 123 | NRV D/S Flange | 123 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 124 | Drain Line I/V Gland | 124 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 125 | Drain Line Safety Flange | 125 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 126 | To FG Header line 2nd I/V U/S Flange | 126 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 127 | To FG Header line 2nd I/V Gland | 127 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 128 | To FG Header line 2nd I/V D/S Flange | 128 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 129 | 15-PA-CF-001A | 129 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 130 | Suction line I/V U/S Flange | 130 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 131 | Suction line I/V Gland | 131 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 132 | Suction line I/V D/S Flange | 132 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 133 | Stainer Top Flange | 133 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 134 | P.G. Meter line I/V Gland | 134 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 135 | Suction Line Flange | 135 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 136 | Pump Seal | 136 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 137 | CBD line 1st I/V Gland | 137 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 138 | Stainer Flange | 138 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 139 | CBD line 2nd I/V Gland | 139 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 140 | Drain Line I/V Gland | 140 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 141 | OWS Point | 141 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 142 | Discharge line U/S Flange | 142 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 143 | Meter line Flange | 143 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 144 | NRV U/S Flange | 144 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 145 | NRV Top Flange | 145 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 146 | NRV D/S Flange | 146 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 147 | Discharge line I/V U/S Flange | 147 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 148 | Discharge line I/V Gland | 148 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 149 | Discharge line I/V D/S Flange | 149 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 150 | 15-PA-CF-001B | 150 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 151 | Suction line I/V U/S Flange | 151 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 152 | Suction Line I/V Gland | 152 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 153 | Suction line I/V D/S Flange | 153 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 154 | Stainer Top Flange | 154 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 155 | P.G. Meter line I/V Gland | 155 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 156 | Suction Line Flange | 156 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 157 | Pump Seal | 157 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 158 | CBD line 1st I/V Gland | 158 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 159 | Stainer Flange | 159 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 160 | CBD line 2nd I/V Gland | 160 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 161 | Drain Line I/V Gland | 161 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 162 | OWS Point | 162 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 163 | Discharge line U/S Flange | 163 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 164 | Meter line Flange | 164 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 165 | NRV U/S Flange | 165 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 166 | NRV Top Flange | 166 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 167 | NRV D/S Flange | 167 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 168 | Discharge line I/V U/S Flange | 168 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 169 | Discharge line I/V Gland | 169 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 170 | Discharge line I/V D/S Flange | 170 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 171 | 15-PV-1301A U/S I/V U/S Flange | 171 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 172 | 15-PV-1301A U/S I/V Gland | 172 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 173 | 15-PV-1301A U/S I/V D/S Flange | 173 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 174 | 15-PV-1301A C/V U/S Flange | 174 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 175 | 15-PV-1301A C/V Gland | 175 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 176 | 15-PV-1301A C/V D/S Flange | 176 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 177 | 15-PV-1301A D/S I/V U/S Flange | 177 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 178 | 15-PV-1301A D/S I/V Gland | 178 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 179 | 15-PV-1301A D/S I/V D/S Flange | 179 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 180 | Bypass line I/V U/S Flange | 180 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 181 | Bypass line I/V Gland | 181 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 182 | Bypass line I/V D/S Flange | 182 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 183 | 15-PA-CF-002A | 183 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 184 | Suction line I/V U/S Flange | 184 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 185 | Suction line I/V Gland | 185 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 186 | Suction line I/V D/S Flange | 186 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 187 | Stainer Top Flange | 187 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 188 | P.G. Meter I/V Gland | 188 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 189 | Suction Line Flange | 189 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 190 | Pump Seal | 190 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 191 | CBD line 1st I/V Gland | 191 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 192 | Stainer Flange | 192 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 193 | CBD line 2nd I/V Gland | 193 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 194 | Drain Line I/V Gland | 194 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 195 | OWS Point | 195 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 196 | Discharge Line Flange | 196 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 197 | Meter line I/V Gland | 197 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 198 | NRV U/S Flange | 198 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 199 | NRV Top Flange | 199 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 200 | Discharge line I/V U/S Flange | 200 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 201 | Discharge line I/V Gland | 201 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 202 | Discharge line I/V D/S Flange | 202 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 203 | 15-PA-CF-002B | 203 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 204 | Suction line I/V U/S Flange | 204 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 205 | Suction Line I/V Gland | 205 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 206 | Suction line I/V D/S Flange | 206 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 207 | Stainer Top Flange | 207 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 208 | Meter line I/V Gland | 208 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 209 | Suction Line Flange | 209 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 210 | Pump Seal | 210 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 211 | CBD line 1st I/V Gland | 211 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 212 | CBD line 2nd I/V Gland | 212 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 213 | Stainer Flange | 213 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 214 | Drain Line I/V Gland | 214 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 215 | OWS Point | 215 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 216 | Discharge Line Flange | 216 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 217 | Meter line I/V Gland | 217 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 218 | NRV Top Flange | 218 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 219 | NRV D/S Flange | 219 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 220 | Discharge line I/V U/S Flange | 220 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 221 | Discharge line I/V Gland | 221 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 222 | Discharge line I/V D/S Flange | 222 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 223 | 15-FV-1503 U/S line I/V Gland | 223 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 224 | CBD line 1st I/V Gland | 224 | 0 | 0 | 0 | 0 | 8760 | 0 |

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NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 225 | CBD line 2nd I/V Gland | 225 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 226 | Stainer Flange | 226 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 227 | CBD line 3rd I/V Gland | 227 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 228 | 15-FV-1503 line C/V U/S Flange | 228 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 229 | 15-FV-1503 line C/V Gland | 229 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 230 | 15-FV-1503 line C/V D/S Flange | 230 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 231 | 15-FV-1503 D/S line I/V Gland | 231 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 232 | Bypass line I/V Gland | 232 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 233 | 14-PACF-004A | 233 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 234 | Suction line I/V U/S Flange | 234 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 235 | Suction Line I/V Gland | 235 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 236 | Suction line I/V D/S Flange | 236 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 237 | Stainer Top Flange | 237 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 238 | Suction Line Flange | 238 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 239 | Pump Seal | 239 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 240 | Discharge Line Flange | 240 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 241 | Meter line I/V Gland | 241 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 242 | NRV U/S Flange | 242 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 243 | NRV Top Flange | 243 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 244 | NRV D/S Flange | 244 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 245 | Discharge line I/V U/S Flange | 245 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 246 | Discharge line I/V Gland | 246 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 247 | Discharge line I/V D/S Flange | 247 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 248 | CBD line 1st I/V Gland | 248 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 249 | CBD line 2nd I/V Gland | 249 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 250 | Drain Line I/V Gland | 250 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 251 | OWS Point | 251 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 252 | Stainer Flange | 252 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 253 | 14-PACF-004B | 253 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 254 | Suction line I/V U/S Flange | 254 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 255 | Suction Line I/V Gland | 255 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 256 | Suction line I/V D/S Flange | 256 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 257 | Stainer Top Flange | 257 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 258 | Suction Line Flange | 258 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 259 | Pump Seal | 259 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 260 | Discharge Line Flange | 260 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 261 | Meter line I/V Gland | 261 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 262 | NRV U/S Flange | 262 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 263 | NRV Top Flange | 263 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 264 | NRV D/S Flange | 264 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 265 | Discharge line I/V U/S Flange | 265 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 266 | Discharge line I/V Gland | 266 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 267 | Discharge line I/V D/S Flange | 267 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 268 | CBD line 1st I/V Gland | 268 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 269 | CBD line 2nd I/V Gland | 269 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 270 | Stainer Flange | 270 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 271 | CBD line 3rd I/V Gland | 271 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 272 | Drain Line I/V Gland | 272 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 273 | OWS Point | 273 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 274 | 14-PACF-006A | 274 | 0 | 0 | 0 | 0 | 8760 | 0 |

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NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 275 | Suction line I/V U/S Flange | 275 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 276 | Suction Line I/V Gland | 276 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 277 | Suction line I/V D/S Flange | 277 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 278 | Stainer Top Flange | 278 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 279 | Suction Line Flange | 279 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 280 | Pump Seal | 280 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 281 | Discharge Line Flange | 281 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 282 | Meter line I/V Gland | 282 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 283 | NRV U/S Flange | 283 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 284 | NRV Top Flange | 284 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 285 | NRV D/S Flange | 285 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 286 | Drain Line I/V Gland | 286 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 287 | Drain Line Safety Flange | 287 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 288 | Discharge line I/V U/S Flange | 288 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 289 | Discharge line I/V Gland | 289 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 290 | Discharge line I/V D/S Flange | 290 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 291 | Pump To CBD line 1st I/V U/S Flange | 291 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 292 | Pump To CBD line 1st I/V Gland | 292 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 293 | Pump To CBD line 1st I/V D/S Flange | 293 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 294 | Pump To CBD line 2nd I/V Gland | 294 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 295 | Stainer Flange | 295 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 296 | Pump To CBD line 3rd I/V Gland | 296 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 297 | OWS Point | 297 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 298 | 14-PACF-006B | 298 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 299 | Suction line I/V U/S Flange | 299 | 0 | 0 | 0 | 0 | 8760 | 0 |

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**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 300 | Suction Line I/V Gland | 300 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 301 | Suction line I/V D/S Flange | 301 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 302 | Stainer Top Flange | 302 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 303 | Suction Line Flange | 303 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 304 | Pump Seal | 304 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 305 | Discharge Line Flange | 305 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 306 | Meter line I/V Gland | 306 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 307 | NRV U/S Flange | 307 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 308 | NRV Top Flange | 308 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 309 | NRV D/S Flange | 309 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 310 | Drain Line I/V Gland | 310 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 311 | Drain Line Safety Flange | 311 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 312 | Discharge line I/V U/S Flange | 312 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 313 | Discharge line I/V Gland | 313 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 314 | Discharge line I/V D/S Flange | 314 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 315 | Pump To CBD line 1st I/V U/S Flange | 315 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 316 | Pump To CBD line 1st I/V Gland | 316 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 317 | Pump To CBD line 1st I/V D/S Flange | 317 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 318 | Pump To CBD line 2nd I/V Gland | 318 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 319 | Stainer Flange | 319 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 320 | Pump To CBD line 3rd I/V Gland | 320 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 321 | OWS Point | 321 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 322 | 14-FV-1103 U/S line I/V U/S Flange | 322 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 323 | 14-FV-1103 U/S line I/V Gland | 323 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 324 | 14-FV-1103 U/S line I/V D/S Flange | 324 | 0 | 0 | 0 | 0 | 8760 | 0 |

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**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 325 | Drain Line 1st I/V Gland | 325 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 326 | Drain Line 2nd I/V Gland | 326 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 327 | Stainer Flange | 327 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 328 | Drain Line 3rd I/V Gland | 328 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 329 | 14-FV-1103 C/V U/S Flange | 329 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 330 | 14-FV-1103 C/V Gland | 330 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 331 | 14-FV-1103 C/V D/S Flange | 331 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 332 | 14-FV-1103 D/S line I/V U/S Flange | 332 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 333 | 14-FV-1103 D/S line I/V Gland | 333 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 334 | 14-FV-1103 D/S line I/V D/S Flange | 334 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 335 | Bypass line I/V U/S Flange | 335 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 336 | Bypass line I/V Gland | 336 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 337 | Bypass line I/V D/S Flange | 337 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 338 | 14-UV-1101 CV U/S Flange | 338 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 339 | 14-UV-1101 CV Gland | 339 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 340 | 14-UV-1101 CV D/S Flange | 340 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 341 | 14-PA-CF-001A | 341 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 342 | Suction line I/V U/S Flange | 342 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 343 | Suction Line I/V Gland | 343 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 344 | Suction line I/V D/S Flange | 344 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 345 | Stainer Top Flange | 345 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 346 | Drain Line I/V Gland | 346 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 347 | Drain Line Stainer Flange | 347 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 348 | Suction Line Flange | 348 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 349 | Pump Seal | 349 | 0 | 0 | 0 | 0 | 8760 | 0 |

NITYA LABORATORIES Authorised

## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 350 | Discharge Line Flange | 350 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 351 | Meter line I/V Gland | 351 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 352 | NRV U/S Flange | 352 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 353 | NRV Top Flange | 353 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 354 | NRV D/S Flange | 354 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 355 | Drain Line I/V Gland | 355 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 356 | Drain Line Stainer Flange | 356 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 357 | Discharge line I/V U/S Flange | 357 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 358 | Discharge line I/V Gland | 358 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 359 | Discharge line I/V D/S Flange | 359 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 360 | Pump To CBD line 1st I/V Gland | 360 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 361 | Pump To CBD line 2nd I/V Gland | 361 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 362 | Stainer Flange | 362 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 363 | Pump To CBD line 3rd I/V Gland | 363 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 364 | OWS Point | 364 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 365 | 14-PA-CF-001B | 365 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 366 | Suction line I/V U/S Flange | 366 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 367 | Suction Line I/V Gland | 367 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 368 | Suction line I/V D/S Flange | 368 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 369 | Stainer Top Flange | 369 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 370 | Drain Line I/V Gland | 370 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 371 | Drain Line Stainer Flange | 371 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 372 | Suction Line Flange | 372 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 373 | Pump Seal | 373 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 374 | Discharge Line Flange | 374 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 375 | Meter line I/V Gland | 375 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 376 | NRV U/S Flange | 376 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 377 | NRV Top Flange | 377 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 378 | NRV D/S Flange | 378 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 379 | Drain Line I/V Gland | 379 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 380 | Drain Line Stainer Flange | 380 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 381 | Discharge line I/V U/S Flange | 381 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 382 | Discharge line I/V Gland | 382 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 383 | Discharge line I/V D/S Flange | 383 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 384 | Pump To CBD line 1st I/V Gland | 384 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 385 | Pump To CBD line 2nd I/V Gland | 385 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 386 | Stainer Flange | 386 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 387 | Pump To CBD line 3rd I/V Gland | 387 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 388 | OWS Point | 388 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 389 | NAPTHA to SLOP U/S line I/V U/S Flange | 389 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 390 | NAPTHA to SLOP U/S line I/V Gland | 390 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 391 | NAPTHA to SLOP U/S line I/V D/S Flange | 391 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 392 | NRV U/S Flange | 392 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 393 | NRV Top Flange | 393 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 394 | NRV D/S Flange | 394 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 395 | Drain Line I/V Gland | 395 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 396 | Drain Line Safety Flange | 396 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 397 | NAPTHA to SLOP D/S line I/V U/S Flange | 397 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 398 | NAPTHA to SLOP D/S line I/V Gland | 398 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 399 | NAPTHA to SLOP D/S line I/V D/S Flange | 399 | 0 | 0 | 0 | 0 | 8760 | 0 |

NITYA LABORATORIES Authorised

## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 400 | Splitter Reflux To SLOP U/S line I/V U/S Flange | 400 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 401 | Splitter Reflux To SLOP U/S line I/V Gland | 401 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 402 | Splitter Reflux To SLOP U/S line I/V D/S Flange | 402 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 403 | NRV U/S Flange | 403 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 404 | NRV Top Flange | 404 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 405 | NRV D/S Flange | 405 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 406 | Drain Line I/V Gland | 406 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 407 | Drain Line Safety Flange | 407 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 408 | Splitter Reflux To SLOP D/S line I/V U/S Flange | 408 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 409 | Splitter Reflux To SLOP D/S line I/V Gland | 409 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 410 | Splitter Reflux To SLOP D/S line I/V D/S Flange | 410 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 411 | 2nd I/V U/S Flange | 411 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 412 | 2nd I/V Gland | 412 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 413 | 2nd I/V D/S Flange | 413 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 414 | Stritter Reflux To SLOP U/S line 1st I/V U/S Flange | 414 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 415 | Stritter Reflux To SLOP U/S line 1st I/V Gland | 415 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 416 | Stritter Reflux To SLOP U/S line 1st I/V D/S Flange | 416 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 417 | Stritter Reflux To SLOP U/S line 2nd I/V U/S Flange | 417 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 418 | Stritter Reflux To SLOP U/S line 2nd I/V Gland | 418 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 419 | Stritter Reflux To SLOP U/S line 2nd I/V D/S Flange | 419 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 420 | NRV U/S Flange | 420 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 421 | NRV Top Flange | 421 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 422 | NRV D/S Flange | 422 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 423 | Drain Line I/V Gland | 423 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 424 | Drain Line Safety Flange | 424 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 425 | Stritter Reflux To SLOP D/S line I/V U/S Flange | 425 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 426 | Stritter Reflux To SLOP D/S line I/V Gland | 426 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 427 | Stritter Reflux To SLOP D/S line I/V D/S Flange | 427 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 428 | Hydrogen Rich Gas From Unit 15 U/S I/V U/S Flange | 428 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 429 | Hydrogen Rich Gas From Unit 15 U/S I/V Gland | 429 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 430 | Hydrogen Rich Gas From Unit 15 U/S I/V D/S Flange | 430 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 431 | NRV U/S Flange | 431 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 432 | NRV Top Flange | 432 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 433 | NRV D/S Flange | 433 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 434 | Drain Line I/V Gland | 434 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 435 | Drain Line Safety Flange | 435 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 436 | Hydrogen Rich Gas From Unit 15 D/S I/V U/S Flange | 436 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 437 | Hydrogen Rich Gas From Unit 15 D/S I/V Gland | 437 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 438 | Hydrogen Rich Gas From Unit 15 D/S I/V D/S Flange | 438 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 439 | Hydrogen From PSA To 16-VV-2 U/S I/V U/S Flange | 439 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 440 | Hydrogen From PSA To 16-VV-2 U/S I/V Gland | 440 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 441 | Hydrogen From PSA To 16-VV-2 U/S I/V D/S Flange | 441 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 442 | NRV U/S Flange | 442 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 443 | NRV Top Flange | 443 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 444 | NRV D/S Flange | 444 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 445 | Drain Line I/V Gland | 445 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 446 | Drain Line Safety Flange | 446 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 447 | Hydrogen From PSA To 16-VV-2 D/S I/V U/S Flange | 447 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 448 | Hydrogen From PSA To 16-VV-2 D/S I/V Gland | 448 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 449 | Hydrogen From PSA To 16-VV-2 D/S I/V D/S Flange | 449 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 450 | 14-FV-1501-CV U/S I/V U/S Flange | 450 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 451 | 14-FV-1501-CV U/S I/V Gland | 451 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 452 | 14-FV-1501-CV U/S I/V D/S Flange | 452 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 453 | CBD line 1st I/V Gland | 453 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 454 | CBD line 2nd I/V Gland | 454 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 455 | CBD line 3rd I/V Gland | 455 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 456 | Stainer Flange | 456 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 457 | 14-FV-1501-CV U/S Flange | 457 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 458 | 14-FV-1501-CV Gland | 458 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 459 | 14-FV-1501-CV D/S Flange | 459 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 460 | 14-FV-1501-CV D/S I/V U/S Flange | 460 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 461 | 14-FV-1501-CV D/S I/V Gland | 461 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 462 | 14-FV-1501-CV D/S I/V D/S Flange | 462 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 463 | Bypass line I/V U/S Flange | 463 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 464 | Bypass line I/V Gland | 464 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 465 | Bypass line I/V D/S Flange | 465 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 466 | From 14-PA-4 A/B to SLOP 1st I/V U/S Flange | 466 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 467 | From 14-PA-4 A/B to SLOP 1st I/V Gland | 467 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 468 | From 14-PA-4 A/B to SLOP 1st I/V D/S Flange | 468 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 469 | From 14-PA-4 A/B to SLOP 2nd I/V Gland | 469 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 470 | From 14-PA-4 A/B to SLOP 2nd I/V D/S Flange | 470 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 471 | 14-FV-1701 U/S I/V U/S Flange | 471 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 472 | 14-FV-1701 U/S I/V Gland | 472 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 473 | 14-FV-1701 U/S I/V D/S Flange | 473 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 474 | CBD line 1st I/V Gland | 474 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 475 | CBD line 2nd I/V Gland | 475 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 476 | CBD line 3rd I/V Gland | 476 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 477 | Stainer Flange | 477 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 478 | 14-FV-1701 C/V U/S Flange | 478 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 479 | 14-FV-1701 C/V Gland | 479 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 480 | 14-FV-1701 C/V D/S Flange | 480 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 481 | 14-FV-1701 D/S I/V U/S Flange | 481 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 482 | 14-FV-1701 D/S I/V Gland | 482 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 483 | 14-FV-1701 D/S I/V D/S Flange | 483 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 484 | Bypass line I/V U/S Flange | 484 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 485 | 14-FV-1401 U/S I/V U/S Flange | 485 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 486 | 14-FV-1401 U/S I/V Gland | 486 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 487 | 14-FV-1401 U/S I/V D/S Flange | 487 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 488 | CBD line 1st I/V Gland | 488 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 489 | CBD line 2nd I/V Gland | 489 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 490 | CBD line 3rd I/V Gland | 490 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 491 | Stainer Flange | 491 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 492 | 14-FV-1401 C/V U/S Flange | 492 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 493 | 14-FV-1401 C/V Gland | 493 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 494 | 14-FV-1401 C/V D/S Flange | 494 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 495 | 14-FV-1401 D/S I/V U/S Flange | 495 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 496 | 14-FV-1401 D/S I/V Gland | 496 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 497 | 14-FV-1401 D/S I/V D/S Flange | 497 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 498 | Bypass line I/V U/S Flange | 498 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 499 | Bypass line I/V Gland | 499 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 500 | Bypass line I/V D/S Flange | 500 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 501 | From 14-PA-CF-001 Start Up line I/V U/S Flange | 501 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 502 | From 14-PA-CF-001 Start Up line I/V Gland | 502 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 503 | From 14-PA-CF-001 Start Up line I/V D/S Flange | 503 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 504 | Hydrogen From Unit 15 1st I/V Gland | 504 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 505 | Stainer Flange | 505 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 506 | Top Flange | 506 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 507 | Drain Line I/V Gland | 507 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 508 | Drain Line Safety Flange | 508 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 509 | Hydrogen From Unit 15 2nd I/V Gland | 509 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 510 | 14-FV-1402 U/S line I/V Gland | 510 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 511 | CBD line I/V Gland | 511 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 512 | 14-FV-1402 C/V U/S Flange | 512 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 513 | 14-FV-1402 C/V Gland | 513 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 514 | CBD line I/V Gland | 514 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 515 | 14-FV-1402 D/S I/V Gland | 515 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 516 | Bypass line I/V Gland | 516 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 517 | Heavy Naptha From Unit-14 line 1st I/V U/S Flange | 517 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 518 | Heavy Naptha From Unit-14 line 1st I/V Gland | 518 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 519 | Heavy Naptha From Unit-14 line 1st I/V D/S Flange | 519 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 520 | Heavy Naptha From Unit-14 line 2nd I/V Gland | 520 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 521 | Heavy Naptha From Unit-14 line 2nd I/V D/S Flange | 521 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 522 | Feed Naptha To Unit-15 line U/S I/V U/S Flange | 522 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 523 | Feed Naptha To Unit-15 line U/S I/V Gland | 523 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 524 | Feed Naptha To Unit-15 line U/S I/V D/S Flange | 524 | 0 | 0 | 0 | 0 | 8760 | 0 |

NITYA LABORATORIES Authorised

## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 525 | NRV U/S Flange | 525 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 526 | NRV Top Flange | 526 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 527 | NRV D/S Flange | 527 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 528 | Drain Line I/V Gland | 528 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 529 | Drain Line Safety Flange | 529 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 530 | Feed Naptha To Unit-15 line D/S I/V U/S Flange | 530 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 531 | Feed Naptha To Unit-15 line D/S I/V Gland | 531 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 532 | Feed Naptha To Unit-15 line D/S I/V D/S Flange | 532 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 533 | S/U line (Reaction Section BP) line U/S I/V U/S Flange | 533 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 534 | S/U line (Reaction Section BP) line U/S I/V Gland | 534 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 535 | S/U line (Reaction Section BP) line U/S I/V D/S Flange | 535 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 536 | S/U line (Reaction Section BP) line D/S I/V U/S Flange | 536 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 537 | S/U line (Reaction Section BP) line D/S I/V Gland | 537 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 538 | Hydrogen From PSA To 15-KA-001 Seal U/S line | 538 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 539 | Hydrogen From PSA To 15-KA-001 Seal U/S line | 539 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 540 | Hydrogen From PSA To 15-KA-001 Seal U/S line | 540 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 541 | NRV U/S Flange | 541 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 542 | NRV Top Flange | 542 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 543 | NRV D/S Flange | 543 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 544 | Drain Line I/V Gland | 544 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 545 | Drain Line Safety Flange | 545 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 546 | Hydrogen From PSA To 15-KA-001 Seal D/S line | 546 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 547 | Hydrogen From PSA To 15-KA-001 Seal D/S line | 547 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 548 | Hydrogen From PSA To 15-KA-001 Seal D/S line | 548 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 549 | From 16-KA-001 A/B To 15-KA-001 (Seal) line | 549 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 550 | From 16-KA-001 A/B To 15-KA-001 (Seal) line | 550 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 551 | From 16-KA-001 A/B To 15-KA-001 (Seal) line | 551 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 552 | NRV U/S Flange | 552 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 553 | NRV Top Flange | 553 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 554 | NRV D/S Flange | 554 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 555 | Vrain Line I/V Gland | 555 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 556 | Vrain Line Safety Flange | 556 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 557 | From 16-KA-001 A/B To 15-KA-001 (Seal) line | 557 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 558 | From 16-KA-001 A/B To 15-KA-001 (Seal) line | 558 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 559 | From 16-KA-001 A/B To 15-KA-001 (Seal) line | 559 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 560 | To-15-KA-001 Seal line U/S I/V U/S Flange | 560 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 561 | To-15-KA-001 Seal line U/S I/V Gland | 561 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 562 | To-15-KA-001 Seal line U/S I/V D/S Flange | 562 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 563 | NRV U/S Flange | 563 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 564 | NRV Top Flange | 564 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 565 | NRV D/S Flange | 565 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 566 | To-15-KA-001 Seal line D/S I/V U/S Flange | 566 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 567 | To-15-KA-001 Seal line D/S I/V Gland | 567 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 568 | To-15-KA-001 Seal line D/S I/V D/S Flange | 568 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 569 | 16-PA-CF-0011A Suction line I/V U/S Flange | 569 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 570 | 16-PA-CF-0011A Suction line I/V Gland | 570 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 571 | 16-PA-CF-0011A Suction line I/V D/S Flange | 571 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 572 | Stainer Flange | 572 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 573 | Drain Line 1st I/V Gland | 573 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 574 | Stainer Flange | 574 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 575 | Drain Line 2nd I/V Gland | 575 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 576 | Suction Line Flange | 576 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 577 | Pump Seal | 577 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 578 | Discharge Line Flange | 578 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 579 | Drain Line I/V Gland | 579 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 580 | Drain Line Safety Flange | 580 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 581 | Meter line I/V Gland | 581 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 582 | NRV U/S Flange | 582 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 583 | NRV Top Flange | 583 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 584 | NRV D/S Flange | 584 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 585 | Drain Line 1st I/V Gland | 585 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 586 | Drain Line 2nd I/V Gland | 586 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 587 | OWS Point | 587 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 588 | Suction line Outlet line to 1st I/V U/S Flange | 588 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 589 | Suction line Outlet line to 1st I/V Gland | 589 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 590 | Suction line Outlet line to 1st I/V D/S Flange | 590 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 591 | Drain Line I/V Gland | 591 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 592 | Drain Line Safety Flange | 592 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 593 | Suction line Outlet line to 2nd I/V U/S Flange | 593 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 594 | Suction line Outlet line to 2nd I/V Gland | 594 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 595 | Suction line Outlet line to 2nd I/V D/S Flange | 595 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 596 | 16-PA-CF-0011B Suction line I/V U/S Flange | 596 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 597 | 16-PA-CF-0011B Suction line I/V Gland | 597 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 598 | 16-PA-CF-0011B Suction line I/V D/S Flange | 598 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 599 | Stainer Top Flange | 599 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 600 | Drain Line 1st I/V Gland | 600 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 601 | Stainer Flange | 601 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 602 | Drain Line 2nd I/V Gland | 602 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 603 | Suction Line Flange | 603 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 604 | Pump Seal | 604 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 605 | Discharge Line Flange | 605 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 606 | Drain Line I/V Gland | 606 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 607 | Drain Line Safety Flange | 607 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 608 | P.G. Meter I/V Gland | 608 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 609 | NRV U/S Flange | 609 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 610 | NRV Top Flange | 610 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 611 | NRV D/S Flange | 611 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 612 | Drain Line 1st I/V Gland | 612 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 613 | Drain Line 2nd I/V Gland | 613 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 614 | OWS Point | 614 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 615 | Discharge line I/V U/S Flange | 615 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 616 | Discharge line I/V Gland | 616 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 617 | Discharge line I/V D/S Flange | 617 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 618 | Discharge line to Outlet line I/V Gland | 618 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 619 | Discharge line to Outlet line Top Flange | 619 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 620 | Drain Line I/V Gland | 620 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 621 | Drain Line Safety Flange | 621 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 622 | 16-PA-CF-013A | 622 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 623 | Suction line I/V U/S Flange | 623 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 624 | Suction Line I/V Gland | 624 | 0 | 0 | 0 | 0 | 8760 | 0 |

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NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 625 | Suction line I/V D/S Flange | 625 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 626 | Stainer Top Flange | 626 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 627 | Suction line to Outlet line 1st I/V U/S Flange | 627 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 628 | Suction line to Outlet line 1st I/V Gland | 628 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 629 | Suction line to Outlet line 1st I/V D/S Flange | 629 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 630 | Suction line to Outlet line 2nd I/V U/S Flange | 630 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 631 | Suction line to Outlet line 2nd I/V Gland | 631 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 632 | Suction line to Outlet line 2nd I/V D/S Flange | 632 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 633 | Suction line to Outlet line 3rd I/V U/S Flange | 633 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 634 | Suction line to Outlet line 3rd I/V Gland | 634 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 635 | Suction line to Outlet line 3rd I/V D/S Flange | 635 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 636 | OWS Point | 636 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 637 | Drain Line 1st I/V Gland | 637 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 638 | Steamer Flange | 638 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 639 | Drain Line 2nd I/V Gland | 639 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 640 | Suction Line Flange | 640 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 641 | Discharge Line Flange | 641 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 642 | P.G. Meter I/V Gland | 642 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 643 | NRV U/S Flange | 643 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 644 | NRV Top Flange | 644 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 645 | NRV D/S Flange | 645 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 646 | Drain Line 1st I/V Gland | 646 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 647 | Drain Line 2nd I/V Gland | 647 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 648 | OWS Point | 648 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 649 | Discharge line I/V U/S Flange | 649 | 0 | 0 | 0 | 0 | 8760 | 0 |

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NRL Complex, Numaligarh
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**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 650 | Discharge line I/V Gland | 650 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 651 | Discharge line I/V D/S Flange | 651 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 652 | 16-PA-CF-013B | 652 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 653 | Suction line I/V U/S Flange | 653 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 654 | Suction Line I/V Gland | 654 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 655 | Suction line I/V D/S Flange | 655 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 656 | Stainer Top Flange | 656 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 657 | Drain Line 1st I/V Gland | 657 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 658 | Steamer Flange | 658 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 659 | Drain Line 2nd I/V Gland | 659 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 660 | Suction Line Flange | 660 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 661 | Discharge Line Flange | 661 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 662 | P.G. Meter I/V Gland | 662 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 663 | NRV U/S Flange | 663 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 664 | NRV Top Flange | 664 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 665 | NRV D/S Flange | 665 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 666 | Drain Line 1st I/V Gland | 666 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 667 | Drain Line 2nd I/V Gland | 667 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 668 | OWS Point | 668 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 669 | Discharge line I/V U/S Flange | 669 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 670 | Discharge line I/V Gland | 670 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 671 | Discharge line I/V D/S Flange | 671 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 672 | 16-FV-2201 U/S line I/V U/S Flange | 672 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 673 | 16-FV-2201 U/S line I/V Gland | 673 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 674 | 16-FV-2201 U/S line I/V D/S Flange | 674 | 0 | 0 | 0 | 0 | 8760 | 0 |

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NRL Complex, Numaligarh
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**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 675 | Drain Line I/V Gland | 675 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 676 | 16-FV-2201 C/V U/S Flange | 676 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 677 | 16-FV-2201 C/V Gland | 677 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 678 | 16-FV-2201 C/V D/S Flange | 678 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 679 | Drain Line I/V Gland | 679 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 680 | 16-FV-2201 D/S line I/V U/S Flange | 680 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 681 | 16-FV-2201 D/S line I/V Gland | 681 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 682 | 16-FV-2201 D/S line I/V D/S Flange | 682 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 683 | Bypass line I/V U/S Flange | 683 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 684 | Bypass line I/V Gland | 684 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 685 | Bypass line I/V D/S Flange | 685 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 686 | 16-FV-2103 U/S line I/V U/S Flange | 686 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 687 | 16-FV-2103 U/S line I/V Gland | 687 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 688 | 16-FV-2103 U/S line I/V D/S Flange | 688 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 689 | Drain Line I/V Gland | 689 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 690 | 16-FV-2103 line C/V U/S Flange | 690 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 691 | 16-FV-2103 line C/V Gland | 691 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 692 | 16-FV-2103 line C/V D/S Flange | 692 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 693 | Drain Line I/V Gland | 693 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 694 | 15-FV-2103 D/S line I/V U/S Flange | 694 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 695 | 15-FV-2103 D/S line I/V Gland | 695 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 696 | 15-FV-2103 D/S line I/V D/S Flange | 696 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 697 | Bypass line I/V U/S Flange | 697 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 698 | Bypass line I/V Gland | 698 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 699 | Bypass line I/V D/S Flange | 699 | 0 | 0 | 0 | 0 | 8760 | 0 |

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Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 700 | 16-FV-2205 U/S line I/V U/S Flange | 700 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 701 | 16-FV-2205 U/S line I/V Gland | 701 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 702 | 16-FV-2205 U/S line I/V D/S Flange | 702 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 703 | Drain Line I/V Gland | 703 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 704 | 16-FV-2205 C/V U/S Flange | 704 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 705 | 16-FV-2205 C/V Gland | 705 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 706 | 16-FV-2205 C/V D/S Flange | 706 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 707 | Drain Line I/V Gland | 707 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 708 | 16-FV-2205 D/S line I/V U/S Flange | 708 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 709 | 16-FV-2205 D/S line I/V Gland | 709 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 710 | 16-FV-2205 D/S line I/V D/S Flange | 710 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 711 | Bypass line I/V U/S Flange | 711 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 712 | Bypass line I/V Gland | 712 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 713 | Bypass line I/V D/S Flange | 713 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 714 | 16-PA-CF-010A | 714 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 715 | Suction line I/V U/S Flange | 715 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 716 | Suction Line I/V Gland | 716 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 717 | Suction line I/V D/S Flange | 717 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 718 | Stainer Top Flange | 718 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 719 | Suction line to Outlet line 1st I/V U/S Flange | 719 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 720 | Suction line to Outlet line 1st I/V Gland | 720 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 721 | Suction line to Outlet line 1st I/V D/S Flange | 721 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 722 | Suction line to Outlet line 2nd I/V U/S Flange | 722 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 723 | Suction line to Outlet line 2nd I/V Gland | 723 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 724 | Suction line to Outlet line 2nd I/V D/S Flange | 724 | 0 | 0 | 0 | 0 | 8760 | 0 |

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**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 725 | Suction line to Outlet line 3rd I/V U/S Flange | 725 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 726 | Suction line to Outlet line 3rd I/V Gland | 726 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 727 | Suction line to Outlet line 3rd I/V D/S Flange | 727 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 728 | OWS Point | 728 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 729 | Drain Line 1st I/V Gland | 729 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 730 | Steamer Flange | 730 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 731 | Drain Line 2nd I/V Gland | 731 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 732 | Suction Line Flange | 732 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 733 | Pump Seal | 733 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 734 | Discharge Line Flange | 734 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 735 | P.G. Meter I/V Gland | 735 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 736 | NRV U/S Flange | 736 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 737 | NRV Top Flange | 737 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 738 | NRV D/S Flange | 738 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 739 | Drain Line 1st I/V Gland | 739 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 740 | Drain Line 2nd I/V Gland | 740 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 741 | OWS Point | 741 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 742 | Discharge line I/V U/S Flange | 742 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 743 | Discharge line I/V Gland | 743 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 744 | Discharge line I/V D/S Flange | 744 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 745 | 16-PA-CF-010B | 745 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 746 | Suction line I/V U/S Flange | 746 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 747 | Suction Line I/V Gland | 747 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 748 | Suction line I/V D/S Flange | 748 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 749 | Stainer Top Flange | 749 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

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**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 750 | Drain Line 1st I/V Gland | 750 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 751 | Steamer Flange | 751 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 752 | Drain Line 2nd I/V Gland | 752 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 753 | Suction Line Flange | 753 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 754 | Pump Seal | 754 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 755 | Discharge Line Flange | 755 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 756 | P.G. Meter I/V Gland | 756 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 757 | NRV U/S Flange | 757 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 758 | NRV Top Flange | 758 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 759 | NRV D/S Flange | 759 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 760 | Drain Line 1st I/V Gland | 760 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 761 | Drain Line 2nd I/V Gland | 761 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 762 | OWS Point | 762 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 763 | Discharge line I/V U/S Flange | 763 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 764 | Discharge line I/V Gland | 764 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 765 | Discharge line I/V D/S Flange | 765 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 766 | 16-PA-CF-012A | 766 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 767 | Suction line I/V U/S Flange | 767 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 768 | Suction Line I/V Gland | 768 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 769 | Suction line I/V D/S Flange | 769 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 770 | Stainer Top Flange | 770 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 771 | Drain Line 1st I/V Gland | 771 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 772 | Steamer Flange | 772 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 773 | Drain Line 2nd I/V Gland | 773 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 774 | Suction Line Flange | 774 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 775 | Discharge Line Flange | 775 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 776 | Meter line I/V Gland | 776 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 777 | Top Flange | 777 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 778 | Drain Line 1st I/V Gland | 778 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 779 | Drain Line 2nd I/V Gland | 779 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 780 | OWS Point | 780 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 781 | Discharge line I/V Gland | 781 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 782 | 16-PA-CF-012B | 782 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 783 | Suction line I/V U/S Flange | 783 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 784 | Suction Line I/V Gland | 784 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 785 | Suction line I/V D/S Flange | 785 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 786 | Stainer Top Flange | 786 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 787 | Drain Line 1st I/V Gland | 787 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 788 | Steamer Flange | 788 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 789 | Drain Line 2nd I/V Gland | 789 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 790 | Suction Line Flange | 790 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 791 | Discharge Line Flange | 791 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 792 | Meter line I/V Gland | 792 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 793 | Top Flange | 793 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 794 | Drain Line 1st I/V Gland | 794 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 795 | Drain Line 2nd I/V Gland | 795 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 796 | OWS Point | 796 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 797 | Discharge line I/V Gland | 797 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 798 | 16-FV-2204 D/S line I/V Gland | 798 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 799 | Drain Line 1st I/V Gland | 799 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 800 | Stainer Flange | 800 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 801 | Drain Line 2nd I/V Gland | 801 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 802 | 16-FV-2204 line C/V U/S Flange | 802 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 803 | 16-FV-2204 line C/V Gland | 803 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 804 | 16-FV-2204 line C/V D/S Flange | 804 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 805 | Drain Line I/V Gland | 805 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 806 | D/S line I/V Gland | 806 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 807 | Bypass line I/V Gland | 807 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 808 | 16-FV-2206 U/S line I/V Gland | 808 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 809 | Drain Line 1st I/V Gland | 809 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 810 | Stainer Flange | 810 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 811 | Drain Line 2nd I/V Gland | 811 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 812 | 16-FV-2206 C/V U/S Flange | 812 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 813 | 16-FV-2206 C/V Gland | 813 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 814 | 16-FV-2206 C/V D/S Flange | 814 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 815 | Drain Line I/V Gland | 815 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 816 | D/S line I/V Gland | 816 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 817 | Bypass line Stainer Flange | 817 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 818 | Bypass line I/V Gland | 818 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 819 | 16-PA-CF-006A | 819 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 820 | Suction line I/V U/S Flange | 820 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 821 | Suction Line I/V Gland | 821 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 822 | Suction line I/V D/S Flange | 822 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 823 | Stainer Top Flange | 823 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 824 | Drain Line 1st I/V Gland | 824 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 825 | Steamer Flange | 825 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 826 | Drain Line 2nd I/V Gland | 826 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 827 | Suction Line Flange | 827 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 828 | Pump Seal | 828 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 829 | Discharge Line Flange | 829 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 830 | Vrain Line I/V Gland | 830 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 831 | Vrain Line Safety Flange | 831 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 832 | Meter line I/V Gland | 832 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 833 | NRV U/S Flange | 833 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 834 | NRV Top Flange | 834 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 835 | NRV D/S Flange | 835 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 836 | Drain Line 1st I/V Gland | 836 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 837 | Drain Line 2nd I/V Gland | 837 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 838 | OWS Point | 838 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 839 | Discharge line I/V U/S Flange | 839 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 840 | Discharge line I/V Gland | 840 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 841 | Discharge line I/V D/S Flange | 841 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 842 | 16-PA-CF-006B | 842 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 843 | Suction line I/V U/S Flange | 843 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 844 | Suction Line I/V Gland | 844 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 845 | Suction line I/V D/S Flange | 845 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 846 | Stainer Top Flange | 846 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 847 | Drain Line 1st I/V Gland | 847 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 848 | Steamer Flange | 848 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 849 | Drain Line 2nd I/V Gland | 849 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 850 | Suction Line Flange | 850 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 851 | Pump Seal | 851 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 852 | Discharge Line Flange | 852 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 853 | Vrain line I/V Gland | 853 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 854 | Vrain Line Safety Flange | 854 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 855 | Meter line I/V Gland | 855 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 856 | NRV U/S Flange | 856 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 857 | NRV Top Flange | 857 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 858 | NRV D/S Flange | 858 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 859 | Drain Line 1st I/V Gland | 859 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 860 | Drain Line 2nd I/V Gland | 860 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 861 | OWS Point | 861 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 862 | Discharge line I/V U/S Flange | 862 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 863 | Discharge line I/V Gland | 863 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 864 | Discharge line I/V D/S Flange | 864 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 865 | MIN FLOW to 16-VV-06 U/S line I/V U/S Flange | 865 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 866 | MIN FLOW to 16-VV-06 U/S line I/V Gland | 866 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 867 | MIN FLOW to 16-VV-06 U/S line I/V D/S Flange | 867 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 868 | NRV U/S Flange | 868 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 869 | NRV Top Flange | 869 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 870 | NRV D/S Flange | 870 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 871 | Drain Line I/V Gland | 871 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 872 | Drain Line Safety Flange | 872 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 873 | Heavy Reformate to Storage U/S line I/V Gland | 873 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 874 | Top Flange | 874 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 875 | Drain Line I/V Gland | 875 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 876 | Drain Line Safety Flange | 876 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 877 | D/S line Stainer Flange | 877 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 878 | D/S line I/V Gland | 878 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 879 | 16-PV-2102 U/S line I/V Gland | 879 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 880 | Drain Line I/V Gland | 880 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 881 | 16-PV-2102 line C/V U/S Flange | 881 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 882 | 16-PV-2102 line C/V Gland | 882 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 883 | 16-PV-2102 line C/V D/S Flange | 883 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 884 | Drain Line I/V Gland | 884 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 885 | D/S line I/V Gland | 885 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 886 | Bypass line Stainer Flange | 886 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 887 | Bypass line I/V Gland | 887 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 888 | 16-PA-CF-003A | 888 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 889 | Suction line I/V U/S Flange | 889 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 890 | Suction line I/V Gland | 890 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 891 | Suction line I/V D/S Flange | 891 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 892 | Stainer Top Flange | 892 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 893 | Suction line to Outlet line 1st I/V U/S Flange | 893 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 894 | Suction line to Outlet line 1st I/V Gland | 894 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 895 | Suction line to Outlet line 1st I/V D/S Flange | 895 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 896 | Suction line to Outlet line 2nd I/V U/S Flange | 896 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 897 | Suction line to Outlet line 2nd I/V Gland | 897 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 898 | Suction line to Outlet line 2nd I/V D/S Flange | 898 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 899 | Vrain line I/V Gland | 899 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 900 | Vrain Line Safety Flange | 900 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 901 | Suction line to Outlet line 3rd I/V U/S Flange | 901 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 902 | Suction line to Outlet line 3rd I/V Gland | 902 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 903 | Suction line to Outlet line 3rd I/V D/S Flange | 903 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 904 | Drain Line 1st I/V Gland | 904 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 905 | Drain Line 2nd I/V Gland | 905 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 906 | Steamer Flange | 906 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 907 | Suction Line Flange | 907 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 908 | Discharge Line Flange | 908 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 909 | P.G. Meter I/V Gland | 909 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 910 | Meter line to Drain line I/V Gland | 910 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 911 | Meter line to Drain line Safety Flange | 911 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 912 | NRV U/S Flange | 912 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 913 | NRV Top Flange | 913 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 914 | NRV D/S Flange | 914 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 915 | Drain Line 1st I/V Gland | 915 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 916 | Drain Line 2nd I/V Gland | 916 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 917 | OWS Point | 917 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 918 | Discharge line I/V U/S Flange | 918 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 919 | Discharge line I/V Gland | 919 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 920 | Discharge line I/V D/S Flange | 920 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 921 | 16-PA-CF-003B | 921 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 922 | Suction line I/V U/S Flange | 922 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 923 | Suction Line I/V Gland | 923 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 924 | Suction line I/V D/S Flange | 924 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 925 | Stainer Top Flange | 925 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 926 | Drain Line 1st I/V Gland | 926 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 927 | Steamer Flange | 927 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 928 | Drain Line 2nd I/V Gland | 928 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 929 | Suction Line Flange | 929 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 930 | Discharge Line Flange | 930 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 931 | Meter line I/V Gland | 931 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 932 | Meter line to Drain line I/V Gland | 932 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 933 | Meter line to Drain line Safety Flange | 933 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 934 | NRV U/S Flange | 934 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 935 | NRV Top Flange | 935 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 936 | NRV D/S Flange | 936 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 937 | Drain Line 1st I/V Gland | 937 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 938 | Drain Line 2nd I/V Gland | 938 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 939 | OWS Point | 939 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 940 | Discharge line I/V U/S Flange | 940 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 941 | Discharge line I/V Gland | 941 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 942 | Discharge line I/V D/S Flange | 942 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 943 | 16-FV-1803 U/S line I/V Gland | 943 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 944 | Drain Line I/V Gland | 944 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 945 | 16-FV-1803 C/V U/S Flange | 945 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 946 | 16-FV-1803 C/V Gland | 946 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 947 | 16-FV-1803 C/V D/S Flange | 947 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 948 | Drain Line I/V Gland | 948 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 949 | D/S line I/V Gland | 949 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 950 | Bypass line I/V Gland | 950 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 951 | 16-FV-1802 D/S line I/V U/S Flange | 951 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 952 | 16-FV-1802 D/S line I/V Gland | 952 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 953 | 16-FV-1802 D/S line I/V D/S Flange | 953 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 954 | Drain Line I/V Gland | 954 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 955 | 16-FV-1802 C/V U/S Flange | 955 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 956 | 16-FV-1802 C/V Gland | 956 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 957 | 16-FV-1802 C/V D/S Flange | 957 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 958 | Drain Line I/V Gland | 958 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 959 | 16-FV-1802 D/S line I/V U/S Flange | 959 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 960 | 16-FV-1802 D/S line I/V Gland | 960 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 961 | 16-FV-1802 D/S line I/V D/S Flange | 961 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 962 | Bypass line I/V U/S Flange | 962 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 963 | Bypass line I/V Gland | 963 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 964 | Bypass line I/V D/S Flange | 964 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 965 | 16-PA-CF-005A | 965 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 966 | Suction line I/V U/S Flange | 966 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 967 | Suction line I/V Gland | 967 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 968 | Suction line I/V D/S Flange | 968 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 969 | Stainer Top Flange | 969 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 970 | Drain Line I/V Gland | 970 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 971 | Suction Line Flange | 971 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 972 | Discharge Line Flange | 972 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 973 | Meter line I/V Gland | 973 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 974 | Top Flange | 974 | 0 | 0 | 0 | 0 | 8760 | 0 |

NITYA LABORATORIES Authorised

## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 975 | Drain Line 1st I/V Gland | 975 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 976 | Steamer Flange | 976 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 977 | Drain Line 2nd I/V Gland | 977 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 978 | OWS Point | 978 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 979 | Discharge line I/V Gland | 979 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 980 | 16-PA-CF-005B | 980 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 981 | Suction line I/V U/S Flange | 981 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 982 | Suction line I/V Gland | 982 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 983 | Suction line I/V D/S Flange | 983 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 984 | Stainer Top Flange | 984 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 985 | Drain Line I/V Gland | 985 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 986 | Suction Line Flange | 986 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 987 | Discharge Line Flange | 987 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 988 | P.G. Meter I/V Gland | 988 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 989 | Drain Line 1st I/V Gland | 989 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 990 | Steamer Flange | 990 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 991 | Drain Line 2nd I/V Gland | 991 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 992 | OWS Point | 992 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 993 | Top Flange | 993 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 994 | Discharge line I/V Gland | 994 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 995 | 16-PV-2301 U/S line I/V U/S Flange | 995 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 996 | 16-PV-2301 U/S line I/V Gland | 996 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 997 | 16-PV-2301 U/S line I/V D/S Flange | 997 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 998 | Drain Line 1st I/V Gland | 998 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 999 | Stainer Flange | 999 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 1000 | Drain Line 2nd I/V Gland | 1000 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1001 | Drain Line 3rd I/V Gland | 1001 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1002 | 16-PV-2301 C/V U/S Flange | 1002 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1003 | 16-PV-2301 C/V Gland | 1003 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1004 | 16-PV-2301 C/V D/S Flange | 1004 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1005 | Drain Line I/V Gland | 1005 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1006 | 16-PV-2301 D/S line I/V U/S Flange | 1006 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1007 | 16-PV-2301 D/S line I/V Gland | 1007 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1008 | 16-PV-2301 D/S line I/V D/S Flange | 1008 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1009 | Bypass line I/V U/S Flange | 1009 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1010 | Bypass line I/V Gland | 1010 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1011 | Bypass line I/V D/S Flange | 1011 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1012 | 16-FV-1701 U/S line I/V U/S Flange | 1012 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1013 | 16-FV-1701 U/S line I/V Gland | 1013 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1014 | 16-FV-1701 U/S line I/V D/S Flange | 1014 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1015 | 16-FV-1701 C/V U/S Flange | 1015 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1016 | 16-FV-1701 C/V Gland | 1016 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1017 | 16-FV-1701 C/V D/S Flange | 1017 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1018 | 16-FV-1701 D/S line I/V U/S Flange | 1018 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1019 | 16-FV-1701 D/S line I/V Gland | 1019 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1020 | 16-FV-1701 D/S line I/V D/S Flange | 1020 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1021 | Bypass line I/V U/S Flange | 1021 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1022 | Bypass line I/V Gland | 1022 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1023 | Bypass line I/V D/S Flange | 1023 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1024 | 16-FV-1102 U/S line I/V U/S Flange | 1024 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 1025 | 16-FV-1102 U/S line I/V Gland | 1025 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1026 | 16-FV-1102 U/S line I/V D/S Flange | 1026 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1027 | Drain Line 1st I/V Gland | 1027 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1028 | Stainer Flange | 1028 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1029 | Drain Line 2nd I/V Gland | 1029 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1030 | 16-FV-1102 C/V U/S Flange | 1030 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1031 | 16-FV-1102 C/V Gland | 1031 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1032 | 16-FV-1102 C/V D/S Flange | 1032 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1033 | Drain Line I/V Gland | 1033 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1034 | 16-FV-1102 D/S line I/V U/S Flange | 1034 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1035 | 16-FV-1102 D/S line I/V Gland | 1035 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1036 | 16-FV-1102 D/S line I/V D/S Flange | 1036 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1037 | Bypass line I/V U/S Flange | 1037 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1038 | Bypass line I/V Gland | 1038 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1039 | Bypass line I/V D/S Flange | 1039 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1040 | 16-FV-1703 U/S line I/V Gland | 1040 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1041 | Drain Line I/V Gland | 1041 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1042 | 16-FV-1703 C/V U/S Flange | 1042 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1043 | 16-FV-1703 C/V Glande | 1043 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1044 | 16-FV-1703 C/V D/S Flange | 1044 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1045 | Drain Line 1st I/V Gland | 1045 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1046 | Stainer Flange | 1046 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1047 | Drain Line 2nd I/V Gland | 1047 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1048 | 16-FV-1703 D/S line I/V Gland | 1048 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1049 | Bypass line I/V Gland | 1049 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 1050 | 16-PA-CF-001A | 1050 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1051 | Suction line I/V U/S Flange | 1051 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1052 | Suction line I/V Gland | 1052 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1053 | Suction line I/V D/S Flange | 1053 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1054 | Stainer Top Flange | 1054 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1055 | Drain Line 1st I/V Gland | 1055 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1056 | Drain Line 2nd I/V Gland | 1056 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1057 | OWS Point | 1057 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1058 | Suction Line Flange | 1058 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1059 | Pump Seal | 1059 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1060 | Discharge Line Flange | 1060 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1061 | P.G. Meter line I/V Gland | 1061 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1062 | NRV U/S Flange | 1062 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1063 | NRV Top Flange | 1063 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1064 | NRV D/S Flange | 1064 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1065 | Steamer Flange | 1065 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1066 | Drain Line 1st I/V Gland | 1066 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1067 | Steamer Flange | 1067 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1068 | Drain Line 2nd I/V Gland | 1068 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1069 | Discharge line I/V U/S Flange | 1069 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1070 | Discharge line I/V Gland | 1070 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1071 | Discharge line I/V D/S Flange | 1071 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1072 | 16-PA-CF-001B | 1072 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1073 | Suction line I/V U/S Flange | 1073 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1074 | Suction line I/V Gland | 1074 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 1075 | Suction line I/V D/S Flange | 1075 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1076 | Stainer Top Flange | 1076 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1077 | Drain Line 1st I/V Gland | 1077 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1078 | Drain Line 2nd I/V Gland | 1078 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1079 | OWS Point | 1079 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1080 | Suction Line Flange | 1080 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1081 | Pump Seal | 1081 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1082 | Discharge Line Flange | 1082 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1083 | P.G. Meter line I/V Gland | 1083 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1084 | NRV U/S Flange | 1084 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1085 | NRV Top Flange | 1085 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1086 | NRV D/S Flange | 1086 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1087 | Drain Line 1st I/V Gland | 1087 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1088 | Steamer Flange | 1088 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1089 | Drain Line 2nd I/V Gland | 1089 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1090 | Discharge line I/V U/S Flange | 1090 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1091 | Discharge line I/V Gland | 1091 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1092 | Discharge line I/V D/S Flange | 1092 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1093 | From FEED DRYER line D/S I/V U/S Gland | 1093 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1094 | Top Flange | 1094 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1095 | Stainer Flange | 1095 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1096 | D/S line I/V Gland | 1096 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1097 | Drain Line I/V Gland | 1097 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1098 | Drain Line Safety Flange | 1098 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1099 | From 16-C-01 Bottom line 1st I/V U/S Flange | 1099 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 1100 | From 16-C-01 Bottom line 1st I/V Gland | 1100 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1101 | From 16-C-01 Bottom line 1st I/V D/S Flange | 1101 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1102 | NRV U/S Flange | 1102 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1103 | NRV Top Flange | 1103 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1104 | From 16-C-01 Bottom line 2nd I/V U/S Flange | 1104 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1105 | From 16-C-01 Bottom line 2nd I/V Gland | 1105 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1106 | From 16-C-01 Bottom line 2nd I/V D/S Flange | 1106 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1107 | NRV U/S Flange | 1107 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1108 | NRV Top Flange | 1108 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1109 | 16-FV-1804 U/S line I/V U/S Flange | 1109 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1110 | 16-FV-1804 U/S line I/V Gland | 1110 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1111 | 16-FV-1804 U/S line I/V D/S Flange | 1111 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1112 | Drain Line 1st I/V Gland | 1112 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1113 | Stainer Flange | 1113 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1114 | Drain Line 2nd I/V Gland | 1114 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1115 | 16-FV-1804 C/V U/S Flange | 1115 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1116 | 16-FV-1804 C/V Gland | 1116 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1117 | 16-FV-1804 C/V D/S Flange | 1117 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1118 | Drain Line I/V Gland | 1118 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1119 | 16-FV-1804 D/S line I/V U/S Flange | 1119 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1120 | 16-FV-1804 D/S line I/V Gland | 1120 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1121 | 16-FV-1804 D/S line I/V D/S Flange | 1121 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1122 | Bypass line I/V U/S Flange | 1122 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1123 | Bypass line I/V Gland | 1123 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1124 | Bypass line I/V D/S Flange | 1124 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 1125 | ISOMER From DRYER DEGASSER U/S line I/V U/S Flange | 1125 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1126 | ISOMER From DRYER DEGASSER U/S line I/V Gland | 1126 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 1127 | ISOMER From DRYER DEGASSER U/S line I/V D/S Flange | 1127 | 0 | 0 | 0 | 0 | 8760 | 0 |
| **1128** | **14-FV-1710 D/S line 1st I/V Gland** | **1128** | **19** | **19** | **19** | **0.000058** | **8760** | **0.5080** |
| **1129** | **14-FV-1710 U/S line 1st I/V Gland** | **1129** | **38** | **38** | **38** | **0.000090** | **8760** | **0.7884** |
| **1130** | **Naphtha To Storage Line D/S line I/V Gland** | **1130** | **38** | **38** | **38** | **0.000090** | **8760** | **0.7884** |
| **1131** | **H2 From PSA D/S line 1st I/V Gland 25% LEL** | **1131** | **35** | **35** | **35** | **0.000085** | **8760** | **0.7446** |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| **UNIT : WAX** | | | | | | | | |
| **Area** | **Pump -18PA109A Wax Scripper Bottom Pump** | | | | | | | |
| 1 | Suction Line I/V U/S Flange | 1 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 2 | I/V Gland | 2 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 3 | I/V D/S Flange | 3 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 4 | Drain line I/V Gland | 4 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 5 | Drain Line Safety Flange | 5 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 6 | Discharge line I/V U/S Flange | 6 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 7 | I/V Gland | 7 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 8 | I/V D/S Flange | 8 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 9 | 18PA109B Suction Line I/V U/S Flange | 9 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 10 | Meter Line I/V Gland | 10 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 11 | OWS point | 11 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 12 | Pump Seal | 12 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 13 | I/V Gland | 13 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 14 | I/V D/S Flange | 14 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 15 | Drain line I/V Gland | 15 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 16 | Drain Line Safety Flange | 16 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 17 | Discharge line I/V U/S Flange | 17 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 18 | I/V Gland | 18 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 19 | I/V D/S Flange | 19 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 20 | 18PA105A Suction Line I/V U/S Flange | 20 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 21 | Meter Line 1st I/V Gland | 21 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 22 | Meter Line 2nd I/V Gland | 22 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 23 | OWS point | 23 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 24 | Pump Seal | 24 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 25 | I/V Gland | 25 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 26 | I/V D/S Flange | 26 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 27 | Drain line I/V Gland | 27 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 28 | Drain Line Safety Flange | 28 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 29 | Meter Line 1st I/V Gland | 29 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 30 | Meter Line 2nd I/V Gland | 30 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 31 | Pump Seal | 31 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 32 | 18PA105B Suction Line I/V U/S Flange | 32 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 33 | I/V Gland | 33 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 34 | I/V D/S Flange | 34 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 35 | Discharge line I/V Gland | 35 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 36 | I/V D/S Flange | 36 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 37 | Drain line I/V Gland | 37 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 38 | Drain Line Safety Flange | 38 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 39 | Meter Line 1st l/V Gland | 39 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 40 | Meter Line 2nd I/V Gland | 40 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 41 | OWS point | 41 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 42 | 18PA105C Suction Line I/V U/S Flange | 42 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 43 | I/V Gland | 43 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 44 | I/V D/S Flange | 44 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 45 | Discharge line I/V U/S Flange | 45 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 46 | I/V Gland | 46 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 47 | l/V D/S Flange | 47 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 48 | Pump Seal | 48 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 49 | Drain line I/V Gland | 49 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 50 | Drain Line Safety Flange | 50 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 51 | Meter Line 1st I/V Gland | 51 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 52 | Meter Line 2nd I/V Gland | 52 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 53 | OWS point | 53 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 54 | Pump Seal | 54 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 55 | I/V Gland | 55 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 56 | I/V D/S Flange | 56 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 57 | 18PA105D Suction Line I/V U/S Flange | 57 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 58 | Drain line I/V Gland | 58 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 59 | Drain Line Safety Flange | 59 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 60 | Meter Line 1st I/V Gland | 60 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 61 | Meter Line 2nd I/V Gland | 61 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 62 | 1902CV Gland | 62 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 63 | LV1902 Suction Line I/V U/S Flange | 63 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 64 | I/V Gland | 64 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 65 | I/V D/S Flange | 65 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 66 | Drain line I/V Gland | 66 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 67 | Drain Line Safety Flange | 67 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 68 | OWS point | 68 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 69 | Discharge Line I/V Gland | 69 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 70 | Discharge Line Drain Line I/V Gland | 70 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 71 | Drain Line Safety Flange | 71 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 72 | LV2002 Suction Line I/V U/S Flange | 72 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 73 | I/V Gland | 73 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 74 | I/V D/S Flange | 74 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 75 | Drain line I/V Gland | 75 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 76 | Drain Line Safety Flange | 76 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 77 | LV2002 CV Gland | 77 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 78 | Discharge Line I/V Gland | 78 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 79 | Discharge Line Drain Line I/V Gland | 79 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 80 | Drain Line Safety Flange | 80 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 81 | LV1802 Suction Line I/V Gland | 81 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 82 | LV1802 CV Gland | 82 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 83 | Discharge Line I/V Gland | 83 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 84 | Drain line I/V Gland | 84 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 85 | Drain Line Safety Flange | 85 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 86 | PV2401 Suction Line I/V U/S Flange | 86 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 87 | I/V Gland | 87 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 88 | I/V D/S Flange | 88 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 89 | Drain line I/V Gland | 89 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 90 | Drain Line Safety Flange | 90 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 91 | PV2401 Suction Line l/V U/S Flange | 91 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 92 | PV2401 CV Gland | 92 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 93 | CV D/S Flange | 93 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 94 | Discharge line I/V U/S Flange | 94 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 95 | I/V Gland | 95 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 96 | I/V D/S Flange | 96 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 97 | Drain line I/V Gland | 97 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 98 | Drain Line Safety Flange | 98 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 99 | NRV U/S Flange | 99 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 100 | NRV D/S Flange | 100 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 101 | Meter Line 1st I/V Gland | 101 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 102 | Meter Line 2nd I/V Gland | 102 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 103 | LV1702 Suction Line I/V Gland | 103 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 104 | Drain line I/V Gland | 104 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 105 | Drain Line Safety Flange | 105 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 106 | LV1702 CV Gland | 106 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 107 | CV D/S Flange | 107 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 108 | Discharge line I/V Gland | 108 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 109 | Discharge line Flange | 109 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 110 | Drain line I/V Gland | 110 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 111 | Drain Line Safety Flange | 111 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 112 | LV1602 Suction Line I/V Gland | 112 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 113 | Drain line I/V Gland | 113 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 114 | Drain Line Safety Flange | 114 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 115 | LV1602 CV Gland | 115 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 116 | CV D/S Flange | 116 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 117 | Discharge line I/V Gland | 117 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 118 | Discharge line Drain Line I/V Gland | 118 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 119 | Drain Line Safety Flange | 119 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 120 | 18PA114A Suction Line I/V U/S Flange | 120 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 121 | I/V Gland | 121 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 122 | I/V D/S Flange | 122 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 123 | Pump Seal | 123 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 124 | I/V Gland | 124 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 125 | I/V D/S Flange | 125 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 126 | NRV U/S Flange | 126 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 127 | NRV D/S Flange | 127 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 128 | Discharge line I/V U/S Flange | 128 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 129 | Meter Line 1st I/V Gland | 129 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 130 | Meter Line 2nd I/V Gland | 130 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 131 | 18PA114B Suction Line I/V U/S Flange | 131 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 132 | I/V Gland | 132 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 133 | I/V D/S Flange | 133 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 134 | Discharge line I/V U/S Flange | 134 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 135 | I/V Gland | 135 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 136 | I/V D/S Flange | 136 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 137 | NRV U/S Flange | 137 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 138 | NRV D/S Flange | 138 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 139 | Pump Seal | 139 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 140 | Meter Line 1st I/V Gland | 140 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 141 | Meter Line 2nd I/V Gland | 141 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 142 | 18PA104A Suction Line I/V U/S Flange | 142 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 143 | I/V Gland | 143 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 144 | I/V D/S Flange | 144 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 145 | Drain line I/V Gland | 145 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 146 | Drain Line Safety Flange | 146 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 147 | Discharge line I/V U/S Flange | 147 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 148 | I/V Gland | 148 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 149 | I/V D/S Flange | 149 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 150 | Pump Seal | 150 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 151 | Meter Line 1st I/V Gland | 151 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 152 | Meter Line 2nd I/V Gland | 152 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 153 | 18PA104BSuction Line I/V U/S Flange | 153 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 154 | I/V Gland | 154 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 155 | I/V D/S Flange | 155 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 156 | Drain line I/V Gland | 156 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 157 | Drain Line Safety Flange | 157 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 158 | Discharge line I/V U/S Flange | 158 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 159 | I/V Gland | 159 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 160 | I/V D/S Flange | 160 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 161 | Pump Seal | 161 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 162 | Meter Line 1st I/V Gland | 162 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 163 | Meter Line 2nd I/V Gland | 163 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 164 | 18PA104C Suction Line I/V U/S Flange | 164 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 165 | I/V Gland | 165 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 166 | I/V D/S Flange | 166 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 167 | Drain line I/V Gland | 167 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 168 | Drain Line Safety Flange | 168 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 169 | Discharge line I/V U/S Flange | 169 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 170 | I/V Gland | 170 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 171 | I/V D/S Flange | 171 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 172 | Pump Seal | 172 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 173 | Meter Line 1st I/V Gland | 173 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 174 | Meter Line 2nd I/V Gland | 174 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 175 | 18PA104D Suction Line I/V U/S Flange | 175 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 176 | I/V Gland | 176 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 177 | I/V D/S Flange | 177 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 178 | Drain line I/V Gland | 178 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 179 | Drain Line Safety Flange | 179 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 180 | Discharge line I/V U/S Flange | 180 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 181 | I/V Gland | 181 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 182 | I/V D/S Flange | 182 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 183 | Pump Seal | 183 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 184 | Meter Line 1st I/V Gland | 184 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 185 | Meter Line 2nd I/V Gland | 185 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 186 | 18PA104E Suction Line I/V U/S Flange | 186 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 187 | I/V Gland | 187 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 188 | I/V D/S Flange | 188 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 189 | Drain line I/V Gland | 189 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 190 | Drain Line Safety Flange | 190 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 191 | Discharge line I/V U/S Flange | 191 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 192 | I/V Gland | 192 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 193 | I/V D/S Flange | 193 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 194 | Pump Seal | 194 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 195 | Meter Line 1st I/V Gland | 195 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 196 | Meter Line 2nd I/V Gland | 196 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 197 | 18PA104F Suction Line I/V U/S Flange | 197 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 198 | I/V Gland | 198 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 199 | I/V D/S Flange | 199 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 200 | Drain line I/V Gland | 200 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 201 | Drain Line Safety Flange | 201 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 202 | Discharge line I/V U/S Flange | 202 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 203 | I/V Gland | 203 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 204 | I/V D/S Flange | 204 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 205 | Pump Seal | 205 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 206 | Meter Line 1st I/V Gland | 206 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 207 | Meter Line 2nd I/V Gland | 207 | 0 | 0 | 0 | 0 | 8760 | 0 |
| **T.No.43TTCR101A (Service MVGO)** | | | | | | | | |
| 208 | Level Indicator connnecting Point | 208 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 209 | U/S line I/V Gland | 209 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 210 | U/S line I/V Flange | 210 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 211 | Drain line I/V Gland | 211 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 212 | Drain line Safety Flange | 212 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 213 | D/S line I/V Gland | 213 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 214 | D/S line I/V Flange | 214 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 215 | Meter line I/V Gland | 215 | 0 | 0 | 0 | 0 | 8760 | 0 |
| **T.No.43TTCR101B (Service MVGO)** | | | | | | | | |
| 216 | Level Indicator connnecting Point | 216 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 217 | U/S line I/V Gland | 217 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 218 | U/S line I/V Flange | 218 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 219 | Drain line I/V Gland | 219 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 220 | Drain Line Safety Flange | 220 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 221 | D/S line I/V Gland | 221 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 222 | D/S line I/V Flange | 222 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 223 | Meter line I/V Gland | 223 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| **T.No.43TTCR102 (Service HVGO)** | | | | | | | | |
| 224 | Level Indicator connnecting Point | 224 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 225 | U/S line I/V Gland | 225 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 226 | U/S line I/V Flange | 226 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 227 | Drain line I/V Gland | 227 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 228 | Drain line Safety Flange | 228 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 229 | D/S line I/V Gland | 229 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 230 | D/S line I/V Flange | 230 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 231 | Meter line I/V Gland | 231 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 232 | FV-3001 C/V Gland | 232 | 0 | 0 | 100 PPM | 0 | 8760 | 0 |
| 233 | FV-3101 C/V Gland | 233 | 0 | 0 | 30 PPM | 0 | 8760 | 0 |

## VOC Emission Monitoring Survey Report

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Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| **UNIT : CDU/VDU** | | | | | | | | |
| **Area** | **B/L** | | | | | | | |
| 1 | Intergas Inlet Line U/S I/V U/S Flange | 1 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 2 | Intergas Inlet Line U/S I/V U/S Gland | 2 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 3 | Intergas Inlet Line U/S I/V D/S Flange | 3 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 4 | Intergas Inlet Line D/S I/V U/S Flange | 4 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 5 | Intergas Inlet Line D/S I/V U/S Gland | 5 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 6 | Intergas Inlet Line D/S I/V D/S Flange | 6 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 7 | UNSTAB Naptha Outlet Line U/S I/V U/S | 7 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 8 | UNSTAB Naptha Outlet Line U/S I/V U/S | 8 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 9 | UNSTAB Naptha Outlet Line U/S I/V D/S | 9 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 10 | UNSTAB Naptha Outlet Line D/S I/V U/S | 10 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 11 | UNSTAB Naptha Outlet Line D/S I/V U/S | 11 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 12 | UNSTAB Naptha Outlet Line D/S I/V D/S | 12 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 13 | STAB Naptha to Storage Outlet Line I/V | 13 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 14 | STAB Naptha to Storage Outlet Line I/V | 14 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 15 | STAB Naptha to Storage Outlet Line I/V | 15 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 16 | Meter line 1st I/V Gland | 16 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 17 | Meter line 2nd I/V Gland | 17 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 18 | Drain line 1st I/V Gland | 18 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 19 | Drain line 2nd I/V Gland | 19 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 20 | Vrain Line I/V Gland | 20 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 21 | Vrain Line Safty Flange | 21 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 22 | LPG Bullet Outlet U/S Line I/V U/S Flange | 22 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 23 | LPG Bullet Outlet U/S Line I/V U/S Gland | 23 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 24 | LPG Bullet Outlet U/S Line I/V D/S Flange | 24 | 0 | 0 | 0 | 0 | 8760 | 0 |

NITYA LABORATORIES Authorised

## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 25 | LPG Bullet Outlet D/S Line I/V U/S Flange | 25 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 26 | LPG Bullet Outlet D/S Line I/V U/S Gland | 26 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 27 | LPG Bullet Outlet D/S Line I/V D/S Flange | 27 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 28 | LPG to Inlet Vrain Line I/V Gland | 28 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 29 | LPG to Inlet Vrain Line l/V Saftey Flange | 29 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 30 | LPG to Intlet U/S Line I/V U/S Flange | 30 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 31 | LPG to Intlet U/S Line I/V U/S Gland | 31 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 32 | LPG to Intlet U/S Line I/V D/S Flange | 32 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 33 | LPG to Intlet D/S Line I/V U/S Flange | 33 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 34 | LPG to Intlet D/S Line I/V U/S Gland | 34 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 35 | LPG to Intlet D/S Line I/V D/S Flange | 35 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 36 | LPG Ex SPHERE Inlet U/S Line I/V U/S Flange | 36 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 37 | LPG Ex SPHERE Inlet U/S Line I/V U/S Gland | 37 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 38 | LPG Ex SPHERE Inlet U/S Line I/V D/S Flange | 38 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 39 | LPG Ex SPHERE Inlet D/S Line I/V U/S Flange | 39 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 40 | LPG Ex SPHERE Inlet D/S Line I/V U/S Giand | 40 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 41 | LPG Ex SPHERE Inlet D/S Line I/V D/S Flange | 41 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 42 | Fuel Gas Inlet U/S Line l/V U/S Flange | 42 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 43 | Fuel Gas Inlet U/S Line l/V U/S Gland | 43 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 44 | Fuel Gas Inlet U/S Line l/V D/S Flange | 44 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 45 | Fuel Gas Inlet D/S Line I/V U/S Flange | 45 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 46 | Fuel Gas Inlet 0/5 Line I/V U/S Gland | 46 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 47 | Fuel Gas Inlet D/S Line I/V D/S Flange | 47 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 48 | Vrain Line I/V Gland | 48 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 49 | Vrain Line safety Flange | 49 | 0 | 0 | 0 | 0 | 8760 | 0 |

NITYA LABORATORIES Authorised

## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 50 | LPG to SPHERE Inlet U/S Line I/V U/S Flange | 50 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 51 | LPG to SPHERE Inlet U/S Line I/V U/S Gland | 51 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 52 | LPG to SPHERE Inlet U/S Line I/V D/S Flange | 52 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 53 | LPG to SPHERE Inlet D/S Line I/V U/S Flange | 53 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 54 | LPG to SPHERE Inlet D/S Line I/V U/S Gland | 54 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 55 | LPG to SPHERE Inlet D/S Line I/V D/S Flange | 55 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 56 | Meter Line Flange | 56 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 57 | 01-FV-1905 U/S Line I/V U/S Flange | 57 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 58 | 01-FV-1905 U/S Line I/V U/S Gland | 58 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 59 | 01-FV-1905 U/S Line I/V D/S Flange | 59 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 60 | Drain Line I/V Gland | 60 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 61 | Drain Line I/V Safety Flange | 61 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 62 | 01-FV-1905 C/V Line I/V U/S Flange | 62 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 63 | 02-FV-1905 C/V Line I/V U/S Gland | 63 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 64 | 01-FV-190S C/V Line I/V D/S Flange | 64 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 65 | 01-FV-1905 D/S Line I/V U/S | 65 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 66 | 01-FV-190S D/S Line I/V U/S Gland | 66 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 67 | 01-FV-1905 D/S Line I/V D/S Flange | 67 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 68 | Bypass Line I/V U/S Flange | 68 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 69 | Bypass Line I/V U/S Gland | 69 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 70 | Bypass Line I/V D/S Flange | 70 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 71 | 01-FV-1921 U/S Line I/V U/S Flange | 71 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 72 | 01-FV-1921 U/S Line I/V U/S Gland | 72 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 73 | 01-FV-1921 U/S Line I/V D/S Flange | 73 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 74 | Drain Line I/V Gland | 74 | 0 | 0 | 0 | 0 | 8760 | 0 |

NITYA LABORATORIES Authorised

## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 75 | Drain Line Safety Flange | 75 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 76 | 01-FV-1921 C/V U/S Flange | 76 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 77 | 01-FV-1921 C/V U/S Gland | 77 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 78 | 01-FV-1921 C/V D/S Flange | 78 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 79 | 01-FV-1921 D/S Line I/V U/S Flange | 79 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 80 | 01-FV-1921 D/S Line I/V U/S Flange | 80 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 81 | 01-FV-1921 D/S Line I/V D/S Flange | 81 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 82 | Drain Line I/V Gland | 82 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 83 | Drain Line Safety Flange | 83 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 84 | Bypass Line I/V U/S Flange | 84 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 85 | Bypass Line I/V U/S Gland | 85 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 86 | Bypass Line I/V D/S Flange | 86 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 87 | 01-LV-1701 U/S Line I/V U/S Flange | 87 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 88 | 01-LV 1701 U/S Line I/V U/S Gland | 88 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 89 | 01-LV-1701 U/S Line I/V D/S Flange | 89 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 90 | Drain Line I/V Gland | 90 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 91 | Drain Line Safety Flange | 91 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 92 | 01-LV-1701 C/S Line I/V U/S Flange | 92 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 93 | 01-LV-1701 C/S Line I/V U/S Gland | 93 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 94 | 01-LV-1701 C/S Line I/V D/S Flange | 94 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 95 | 01-LV-1701 D/S Line I/V U/S Flange | 95 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 96 | 01-LV-1701 D/S Line I/V U/S Gland | 96 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 97 | 01-LV-1701 D/S Line I/V D/S Flange | 97 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 98 | Drain Line I/V Gland | 98 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 99 | Drain Line Safety Flange | 99 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 100 | Bypass Line I/V U/S Flange | 100 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 101 | Bypass Line I/V U/S Gland | 101 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 102 | Bypass Line I/V D/S Flange | 102 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 103 | 01-FV-1901 U/S Line I/V U/S Flange | 103 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 104 | 01-FV-1901 U/S Line I/V U/S Gland | 104 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 105 | 01-FV-1901 U/S Line I/V D/S Flange | 105 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 106 | Drain Line I/V Gland | 106 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 107 | Drain Line Safety Flange | 107 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 108 | 01-FV-1901 C/V U/S Flange | 108 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 109 | 01-FV-1901 C/V U/S Gland | 109 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 110 | 01-FV-1901 C/V D/S Flange | 110 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 111 | 01-FV-1901 D/S Line I/V U/S Flange | 111 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 112 | 01-FV-1901 D/S Line I/V U/S Gland | 112 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 113 | 01-FV-1901 D/S Line I/V D/S Flange | 113 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 114 | Drain Line I/V Gland | 114 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 115 | Drain Line Safety Flange | 115 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 116 | Bypass Line I/V U/S Flange | 116 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 117 | Bypass Line I/V U/S Gland | 117 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 118 | Pump Seal | 118 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 119 | 01-FV-1904 U/S Line I/V U/S Flange | 119 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 120 | 01-FV-1904 U/S Line I/V U/S Gland | 120 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 121 | 01-FV-1904 U/S Line I/V D/S Flange | 121 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 122 | Drain Line I/V Gland | 122 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 123 | Drain Line Safety Flange | 123 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 124 | 01-FV-1904 C/V U/S Flange | 124 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 125 | 01-FV-1904 C/V U/S Gland | 125 | 0 | 0 | 15 PPM | 0 | 8760 | 0 |
| 126 | 01-FV-1904 C/V D/S Flange | 126 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 127 | 01-FV-1904 D/S Line I/V U/S Flange | 127 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 128 | 01-FV-1904 D/S Line I/V U/S Gland | 128 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 129 | 01-FV-1904 D/S Line I/V D/S Flange | 129 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 130 | Bypass Line I/V U/S Flange | 130 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 131 | Bypass Line I/V U/S Gland | 131 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 132 | Bypass Line I/V D/S Flange | 132 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 133 | 01-FV-1903 U/S Line I/V U/S Flange | 133 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 134 | 01-FV-1903 U/S Line I/V U/S Gland | 134 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 135 | 01-FV-1903 U/S Line I/V D/S Flange | 135 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 136 | Drain Line I/V Gland | 136 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 137 | Drain Line Safety Flange | 137 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 138 | 01-FV-1903 C/V U/S Flange | 138 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 139 | 01-FV-1903 C/V U/S Gland | 139 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 140 | 01-FV-1903 C/V D/S Flange | 140 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 141 | 01-FV-1903 D/S Line I/V U/S Flange | 141 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 142 | 01-FV-1903 D/S Line I/V U/S Gland | 142 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 143 | 01-FV-1903 D/S Line I/V D/S Flange | 143 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 144 | Drain Line I/V Gland | 144 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 145 | Drain Line Safety Flange | 145 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 146 | Bypass Line I/V U/S Flange | 146 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 147 | Bypass Line I/V U/S Gland | 147 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 148 | Bypass Line I/V U/S Flange | 148 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 149 | 01-PA-106A Suction Line I/V Gland | 149 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 150 | Stainer Top Flange | 150 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 151 | Stainer Top Flange Drain Line I/V Gland | 151 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 152 | Stainer Top Flange Drain Line Safety Flange | 152 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 153 | Suction Line Flange | 153 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 154 | Pump Seal | 154 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 155 | Discharge Line Flange | 155 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 156 | Meter line 1st I/V Gland | 156 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 157 | Meter line 2nd l/V Gland | 157 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 158 | Meter line Sampling l/V Gland | 158 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 159 | Discharge Line GIand | 159 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 160 | 01-PA-106B Suction Line I/V Gland | 160 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 161 | Stainer Top Flange | 161 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 162 | Stainer Top Flange Drain Line I/V Gland | 162 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 163 | Stainer Top Flange Drain Line Safety Flange | 163 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 164 | Suction Line Flange | 164 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 165 | Pump Seal | 165 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 166 | Discharge Line Flange | 166 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 167 | Meter line 1st l/V Gland | 167 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 168 | Meter line 2nd I/V Gland | 168 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 169 | Meter line Sampling I/V Gland | 169 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 170 | Discharge Line Gland | 170 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 171 | 01-PA-105 A Suction Line I/V U/S Flange | 171 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 172 | 01-PA-105A Suction Line I/V U/S Gland | 172 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 173 | 01-PA-105A Suction Line l/V D/S Flange | 173 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 174 | Stainer Top Flange | 174 | 0 | 0 | 0 | 0 | 8760 | 0 |

NITYA LABORATORIES Authorised

## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 175 | Stainer Top Flange Drain Line I/V Gland | 175 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 176 | Stainer Top Flange Drain Line Safety Flange | 176 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 177 | Suction Line Flange | 177 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 178 | Pump Seal | 178 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 179 | Discharge Line Flange | 179 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 180 | Meter line 1st I/V Gland | 180 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 181 | Meter line 2nd I/V Gland | 181 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 182 | Meter line Sampling I/V Gland | 182 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 183 | NRV U/S Flange | 183 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 184 | NRV Top Flange | 184 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 185 | NRV D/S Flange | 185 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 186 | Discharge Line I/V U/S Flange | 186 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 187 | Discharge Line I/V U/S Gland | 187 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 188 | Discharge Line I/V D/S FIange | 188 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 189 | 01 PA-105B Suction Line I/V U/S Flange | 189 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 190 | 01-PA-105B Suction Line I/V U/S Gland | 190 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 191 | 01-PA-105B Suction Line I/V D/S Flange | 191 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 192 | Stainer Top Flange | 192 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 193 | Stainer Top Flange Drain Line I/V Gland | 193 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 194 | Stainer Top Flange Drain Line Safety Flange | 194 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 195 | Suction Line Flange | 195 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 196 | Pump Seal | 196 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 197 | Discharge Line Flange | 197 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 198 | Meter line 1st I/V Gland | 198 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 199 | Meter line 2nd I/V Gland | 199 | 0 | 0 | 0 | 0 | 8760 | 0 |

NITYA LABORATORIES Authorised

## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 200 | Meter line Sampling I/V Gland | 200 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 201 | NRV I/V U/S Flange | 201 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 202 | NRV Top Flange | 202 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 203 | NRV I/V D/S Flange | 203 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 204 | Discharge Line I/V U/S Flange | 204 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 205 | Discharge Line I/V U/S Gland | 205 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 206 | Discharge Line I/V D/S Flange | 206 | 0 | 0 | 0 | 0 | 8760 | 0 |
| **Unit : CDU/VDU** | | | | | | | | |
| **Area** | **Pump** | | | | | | | |
| 207 | 01-PA-103B Suction Line I/V U/S Flange | 207 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 208 | 01-PA-1038 Suction Line I/V Gland | 208 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 209 | 01-PA-103B Suction Line I/V D/S Flange | 209 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 210 | Steamer Top Flange | 210 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 211 | Steamer Top Flange Drain Line I/V Gland | 211 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 212 | Steamer Top Flange Drain Line Safety Flange | 212 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 213 | Suction Line Flange | 213 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 214 | Pump Seal | 214 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 215 | Discharge Line Flange | 215 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 216 | Meter line 1st I/V Gland | 216 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 217 | Meter line 2nd I/V Gland | 217 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 218 | Meter line Sampling I/V Gland | 218 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 219 | NRV I/V U/S Flange | 219 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 220 | NRV Top Flange | 220 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 221 | NRV I/V D/S Flange | 221 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 222 | Discharge Line I/V U/S Flange | 222 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 223 | Discharge Line I/V Gland | 223 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 224 | Discharge Line I/V D/S Flange | 224 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 225 | Suction Line to Outside Line 1st I/V U/S | 225 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 226 | Suction Line to Outside Line 1st I/V Giand | 226 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 227 | Suction Line to Outside Line 1st I/V D/S | 227 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 228 | Suction Line to Outside Line 2nd I/V U/S | 228 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 229 | Suction Line to Outside Line 2nd I/V Gland | 229 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 230 | Suction Line to Outside Line 2nd I/V D/S | 230 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 231 | Suction Line to Outside Line 3rd I/V U/S | 231 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 232 | Suction Line to Outside Line 3rd I/Vgland | 232 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 233 | Suction Line to Outside Line 3rd I/V D/S | 233 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 234 | Stainer Flange | 234 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 235 | OWS Point | 235 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 236 | 01-PA-103A Suction Line I/V U/S Flange | 236 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 237 | 01-PA-103A Suction Line I/V Gland | 237 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 238 | 01-PA-103A Suction Line I/V D/S Flange | 238 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 239 | Stainer Top Flange | 239 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 240 | Stainer Top Flange Drain Line Gland | 240 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 241 | Stainer Top Flange Drain Line Safety Flange | 241 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 242 | Suction Line Flange | 242 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 243 | Pump Seal | 243 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 244 | Discharge Line Flange | 244 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 245 | Meter line 1st I/VGland | 245 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 246 | Meter line 2nd I/V Gland | 246 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 247 | Meter line Sampling Point I/V Gland | 247 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 248 | NRV I/V U/S Flange | 248 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 249 | NRV Top Flange | 249 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 250 | NRV I/V D/S Flange | 250 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 251 | Discharge Line I/V U/S Flange | 251 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 252 | Discharge Line I/V Gland | 252 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 253 | Discharge Line l/V D/S Flange | 253 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 254 | Pump to Drain Line 1st l/V Gland | 254 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 255 | Pump to Drain Line 2nd I/V Gland | 255 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 256 | Pump to Drain Line 3rd I/V Gland | 256 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 257 | Stainer Flange | 257 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 258 | OWS Point | 258 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 259 | 01-FV-4003 U/S Line l/V U/S Flange | 259 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 260 | 01-FV-4003 U/S Line I/V Gland | 260 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 261 | 01-FV-4003 U/S Line I/V D/S Flange | 261 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 262 | Drain Line I/V Gland | 262 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 263 | Drain Line Safety Flange | 263 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 264 | 01-FV-4003 C/V U/S Flange | 264 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 265 | 01-FV-4003 C/V Gland | 265 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 266 | 01-FV-4003 C/V D/S Flange | 266 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 267 | Drain Line I/V Gland | 267 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 268 | Drain Line Safety Flange | 268 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 269 | 01-FV-4003 D/S Line I/V U/S Flange | 269 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 270 | 01-FV-4003 D/S Line l/V Gland | 270 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 271 | 01-FV-4003 D/S Line l/V D/S Flange | 271 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 272 | Bypass Line I/V U/S Flange | 272 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 273 | Bypass Line I/V Gland | 273 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 274 | Bypass Line I/V D/S Flange | 274 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 275 | 01-FV-3803 U/S Line I/V U/S Flange | 275 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 276 | 01-FV-3803 U/S Line I/V Gland | 276 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 277 | 01-FV-3803 U/S Line I/V D/S Flange | 277 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 278 | Drain Line I/V Gland | 278 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 279 | Drain Line Safety Flange | 279 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 280 | 01-FV-3803 C/V U/S Flange | 280 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 281 | 01-FV-3803 C/V Gland | 281 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 282 | 01-FV-3803 C/V D/S Flange | 282 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 283 | Drain Line I/V Gland | 283 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 284 | Drain Line Safety Flange | 284 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 285 | 01-FV-3803 D/S Line I/V U/S Flange | 285 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 286 | 01-FV-3803 D/S Line I/V Gland | 286 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 287 | 01-FV-3803 D/S Line I/V D/S Flange | 287 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 288 | Bypass Line I/V U/S Flange | 288 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 289 | Bypass Line I/V Gland | 289 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 290 | Bypass Line I/V D/S Flange | 290 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 291 | 01-FV-3901 U/S Line I/V U/S Flange | 291 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 292 | 01-FV-3901 U/S Line I/V Gland | 292 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 293 | 01-FV-3901 U/S Line I/V D/S Flange | 293 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 294 | Drain Line I/V Gland | 294 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 295 | Drain Line Safety Flange | 295 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 296 | 01-FV-3901 C/V U/S Flange | 296 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 297 | 01-FV-3901 C/V Gland | 297 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 298 | 01-FV-3901 C/V D/S Flange | 298 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 299 | Drain Line I/V Gland | 299 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 300 | Drain Line Safety Flange | 300 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 301 | 01-FV-3901 D/S Line I/V U/S Flange | 301 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 302 | 01-FV-3901 D/S Line I/V Gland | 302 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 303 | 01-FV-3901 D/S Line I/V D/S Flange | 303 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 304 | Bypass line I/V U/S Flange | 304 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 305 | Bypass Line I/V Gland | 305 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 306 | Bypass line I/V D/S Flange | 306 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 307 | 3.P.01.3916.A1A To EE-108 Line I/V | 307 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 308 | 3.P.01.3916.A1A To EE-108 Line I/V | 308 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 309 | 3.P.01.3916.A1A To EE-108 Line I/V | 309 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 310 | 3.P.01.3916.A1A To Naptha Pool | 310 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 311 | 3.P.01.3916.A1A To Naptha Pool | 311 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 312 | 3.P.01.3916.A1A To Naptha Pool | 312 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 313 | 01-PR-101B Suction Line I/V U/S Flange | 313 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 314 | 01-PR-101B Suction Line I/V Gland | 314 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 315 | 01-PR-101B Suction Line I/V D/S Flange | 315 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 316 | Steamer Top Flange | 316 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 317 | Steamer Top Flange Drain Line I/V | 317 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 318 | Steamer Top Flange Drain Line I/V | 318 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 319 | Suction Line Flange | 319 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 320 | Pump Seal | 320 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 321 | Discharge Line Flange | 321 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 322 | Meter line 1st I/V Gland | 322 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 323 | Meter line 2nd I/V Gland | 323 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 324 | Meter line Sampling Point I/V Gland | 324 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 325 | NRV I/V U/S Flange | 325 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 326 | NRV Top Flange | 326 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 327 | NRV I/V D/S Flange | 327 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 328 | Discharge Line I/V U/S Flange | 328 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 329 | Discharge Line I/V Gland | 329 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 330 | Discharge Line I/V D/S Flange | 330 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 331 | Pump to Drain Line 1st I/V Gland | 331 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 332 | Pump to Drain Line 2nd I/V Gland | 332 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 333 | Pump to Drain Line 3rd I/V Gland | 333 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 334 | Steamer Flange | 334 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 335 | OWS Point | 335 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 336 | 01-PA-101A Suction Line I/V U/S Flange | 336 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 337 | 01-PA-101A Suction Line I/V Gland | 337 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 338 | 01-PA-101A Suction Line I/V D/S Flange | 338 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 339 | Steamer Top Flange | 339 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 340 | Steamer Top Flange I/V Gland | 340 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 341 | Steamer Top Flange Safety Flange | 341 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 342 | Suction Line Flange | 342 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 343 | Pump Seal | 343 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 344 | Discharge Line Flange | 344 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 345 | Meter line 1st I/V Gland | 345 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 346 | Meter line 2nd I/V Gland | 346 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 347 | Meter line Sampling Point I/V Gland | 347 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 348 | Discharge Line I/V U/S Flange | 348 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 349 | Discharge Line I/V Gland | 349 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 350 | Discharge Line I/V D/S Flange | 350 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 351 | Suction Line to Outside Line 1st I/V | 351 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 352 | Suction Line to Outside Line 1st I/V | 352 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 353 | Suction Line to Outside Line 1st I/V | 353 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 354 | Suction Line to Outside Line 2nd I/V | 354 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 355 | Suction Line to Outside Line 2nd I/V | 355 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 356 | Suction Line to Outside Line 2nd I/V | 356 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 357 | Suction Line to Outside Line 3rd I/V | 357 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 358 | Suction Line to Outside Line 3rd I/V | 358 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 359 | Suction Line to Outside Line 3rd I/V | 359 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 360 | Pump to Drain Line 1st l/V Gland | 360 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 361 | Pump to Drain Line 2nd l/V Gland | 361 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 362 | Pump to Drain Line 3rd l/V Gland | 362 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 363 | Steamer Flange | 363 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 364 | OWS Point | 364 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 365 | 01-FV-3701 U/S Line I/V U/S Flange | 365 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 366 | 01-FV-3701 U/S Line I/V Gland | 366 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 367 | 01-FV-3701 U/S Line I/V D/S Flange | 367 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 368 | Drain Line I/V Gland | 368 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 369 | Drain Line Safety Flange | 369 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 370 | 01-FV-3701 C/V U/S Flange | 370 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 371 | 01-FV-3701 C/V Gland | 371 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 372 | 01-FV-3701 C/V D/S Flange | 372 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 373 | Drain Line I/V Gland | 373 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 374 | Drain Line Safety Flange | 374 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 375 | 01-FV-3701 D/S Line I/V U/S Flange | 375 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 376 | 01-FV-3701 D/S Line I/V Gland | 376 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 377 | 01-FV-3701 D/S Line I/V D/S Flange | 377 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 378 | Bypass Line I/V Gland | 378 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 379 | To Naptha Pool EX-PA-101 Line I/V | 379 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 380 | To Naptha Pool EX-PA-101 Line I/V | 380 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 381 | To Naptha Pool EX-PA-101 Line I/V | 381 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 382 | Naptha To EE-109 EX-PA-101 Line | 382 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 383 | Naptha To EE-109 EX-PA-101 Line | 383 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 384 | Naptha To EE-109 EX-PA-101 Line | 384 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 385 | 01-FV-4005 U/S Line I/V U/S Flange | 385 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 386 | 01-FV-4005 U/S Line I/V Gland | 386 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 387 | 01-FV-4005 U/S Line I/V D/S Flange | 387 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 388 | Drain Line I/V Gland | 388 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 389 | Drain Line Safety Flange | 389 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 390 | 01-FV-4005 C/V U/S Flange | 390 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 391 | 01-FV-4005 C/V Gland | 391 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 392 | 01-FV-4005 C/V D/S Flange | 392 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 393 | Drain Line I/V Gland | 393 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 394 | Drain Line Safety Flange | 394 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 395 | 01-FV-4005 D/S Line I/V U/S Flange | 395 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 396 | 01-FV-4005 D/S Line I/V Gland | 396 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 397 | 01-FV-4005 D/S Line I/V D/S Flange | 397 | 0 | 0 | 0 | 0 | 8760 | 0 |

NITYA LABORATORIES Authorised

## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 398 | Bypass Line I/V Gland | 398 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 399 | 01-PA-CF-012A Suction Line I/V U/S Flange | 399 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 400 | 01-PA-CF-012A Suction Line I/V Gland | 400 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 401 | 01-PA-CF-012A Suction Line I/V D/S Flange | 401 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 402 | Steamer Top Flange | 402 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 403 | Steamer Top Flange I/V Gland | 403 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 404 | Steamer Top Flange Safety Flange | 404 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 405 | Suction Line Flange | 405 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 406 | Pump Seal | 406 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 407 | Discharge Line Flange | 407 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 408 | NRV I/V U/S Flange | 408 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 409 | NRV Top Flange | 409 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 410 | NRV I/V D/S Flange | 410 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 411 | Meter line 1st I/V Gland | 411 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 412 | Meter line 2nd I/V Gland | 412 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 413 | Meter line Sampling Point I/V Gland | 413 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 414 | Discharge Line I/V U/S Flange | 414 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 415 | Discharge Line I/V Gland | 415 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 416 | Discharge Line I/V D/S Flange | 416 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 417 | Pump to Drain Line 1st I/V Gland | 417 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 418 | Pump to Drain Line 2nd I/V Gland | 418 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 419 | Pump to Drain Line 3rd I/V Gland | 419 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 420 | Steamer Flange | 420 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 421 | OWS Point | 421 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 422 | 01-PV-04 Suction Line I/V U/S Flange | 422 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 423 | 01-PV-04 Suction Line I/V Gland | 423 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 424 | 01-PV-04 Suction Line I/V D/S Flange | 424 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 425 | Steamer Top Flange | 425 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 426 | Steamer Top Flange I/V Gland | 426 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 427 | Steamer Top Flange Safety Flange | 427 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 428 | Suction Line Flange | 428 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 429 | Discharge Line 1st Flange | 429 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 430 | Discharge Line 2nd Flange | 430 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 431 | Meter Line I/V Gland | 431 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 432 | Meter Line Sampling Point I/V Gland | 432 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 433 | NRV I/V U/S Flange | 433 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 434 | NRV Top Flange | 434 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 435 | NRV I/V D/S Flange | 435 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 436 | Discharge Line I/V U/S Flange | 436 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 437 | Discharge Line I/V Gland | 437 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 438 | Discharge Line I/V D/S Flange | 438 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 439 | Drain Line I/V Gland | 439 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 440 | Drain Line Safety Flange | 440 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 441 | Pump to Drain Line 1st I/V Gland | 441 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 442 | Pump to Drain Line 2nd I/V Gland | 442 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 443 | Stainer Flange | 443 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 444 | OWS Point | 444 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 445 | 01-PV-04A Suction Line I/V U/S Flange | 445 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 446 | 01-PV-04A Suction Line I/V Gland | 446 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 447 | 01-PV-04A Suction Line I/V D/S Flange | 447 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 448 | Stainer Top Flange | 448 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 449 | Stainer Top Flange I/V Gland | 449 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 450 | Stainer Top Flange Safety Flange | 450 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 451 | Suction Line Flange | 451 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 452 | Pump Seal | 452 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 453 | Discharge Line 1st Flange | 453 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 454 | Discharge Line 2nd Flange | 454 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 455 | Meter line I/V Gland | 455 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 456 | Meter line Sampling Point l/V Gland | 456 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 457 | NRV I/V U/S Flange | 457 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 458 | NRV Top Flange | 458 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 459 | NRV I/V D/S Flange | 459 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 460 | Drain Line l/V Gland | 460 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 461 | Drain Line Safety Flange | 461 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 462 | Discharge Line I/V U/S Flange | 462 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 463 | Discharge Line I/VGland | 463 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 464 | Discharge Line I/V D/S Flange | 464 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 465 | Pump to Drain Line 1st I/V Gland | 465 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 466 | Pump to Drain Line 2nd l/V Gland | 466 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 467 | Stainer Flange | 467 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 468 | OWS Point | 468 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 469 | 01-PA-CF-013-B Suction Line l/V U/S Flange | 469 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 470 | 01-PA-CF-013-B Suction Line I/V Gland | 470 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 471 | 01-PA-CF-013-B Suction Line l/V D/S Flange | 471 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 472 | Stainer Top Flange | 472 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 473 | Stainer Top Flange I/V Gland | 473 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 474 | Stainer Top flange Safety Flange | 474 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 475 | Suction Line Flange | 475 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 476 | Pump Seal | 476 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 477 | Discharge Line 1st Flange | 477 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 478 | Discharge Line 2nd Flange | 478 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 479 | Meter line I/V Gland | 479 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 480 | Meter line Sampling Point I/V Gland | 480 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 481 | NRV I/V U/S Flange | 481 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 482 | NRV Top Flange | 482 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 483 | NRV I/V D/S Flange | 483 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 484 | Discharge Line I/V U/S Flange | 484 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 485 | Discharge Line I/V Gland | 485 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 486 | Discharge Line I/V D/S Flange | 486 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 487 | Pump to Drain Line 1st I/V Gland | 487 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 488 | Pump to Drain Line 2nd l/V Gland | 488 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 489 | Pump to Drain Line 3rd I/V Gland | 489 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 490 | Stainer Flange | 490 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 491 | OWS Point | 491 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 492 | 01-PA-CF-013-A Suction Line I/V U/S Flange | 492 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 493 | 01-PA-CF-013-B Suction Line I/V Gland | 493 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 494 | 01-PA-CF-013-B Suction Line I/V D/S Flange | 494 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 495 | Stainer Top Flange | 495 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 496 | Stainer Top Flange I/V Gland | 496 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 497 | Stainer Top Flange Safety Flange | 497 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 498 | Suction Line Flange | 498 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 499 | Pump Seal | 499 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 500 | Discharge Line 1st Flange | 500 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 501 | Discharge Line 2nd Flange | 501 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 502 | Meter line I/V Gland | 502 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 503 | Meter line Sampling Point I/V Gland | 503 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 504 | NRV I/V U/S Flange | 504 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 505 | NRV Top Flange | 505 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 506 | NRV I/V D/S Flange | 506 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 507 | Discharge Line I/V U/S Flange | 507 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 508 | Discharge Line I/V Gland | 508 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 509 | Discharge Line I/V D/S Flange | 509 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 510 | Pump to Drain Line 1st I/V Gland | 510 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 511 | Pump to Drain Line 2nd I/V Gland | 511 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 512 | Pump to Drain Line 3rd I/V Gland | 512 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 513 | Stainer Flange | 513 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 514 | OWS Point | 514 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 515 | 01-FV-1505 U/S Line I/V U/S Flange | 515 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 516 | 01-FV-1505 U/S Line I/V Gland | 516 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 517 | 01-FV-1505 U/S Line I/V D/S Flange | 517 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 518 | Drain Line I/V Gland | 518 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 519 | Drain Line Safety Flange | 519 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 520 | 01-FV-1505 C/V U/S Flange | 520 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 521 | 01-FV-1505 C/V Gland | 521 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 522 | 01-FV-1505 C/V D/S Flange | 522 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 523 | 01-FV-1505 D/S Line I/V U/S Flange | 523 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 524 | 01-FV-1505 D/S Line I/V Gland | 524 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 525 | 01-FV-1505 D/S Line I/V D/S Flange | 525 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 526 | Bypass Line I/V U/S Flange | 526 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 527 | Bypass Line I/V U/S Gland | 527 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 528 | Bypass Line I/V D/S Flange | 528 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 529 | 01-PV-2002 U/S Line I/V Gland | 529 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 530 | Drain Line I/V Gland | 530 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 531 | Drain Line Safety Flange | 531 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 532 | 01-PV-2002 D/S line I/V Gland | 532 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 533 | Drain Line I/V Gland | 533 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 534 | Drain Line Safety Flange | 534 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 535 | Bypass Line I/V Gland | 535 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 536 | 01-PV-1402 U/S line I/V Gland | 536 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 537 | Drain Line I/V Gland | 537 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 538 | Drain Line Safety Flange | 538 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 539 | 01-PV-1402 C/V Gland | 539 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 540 | 01-PV-1402 D/S line I/V Gland | 540 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 541 | Drain Line I/V Gland | 541 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 542 | Drain Line Safety Flange | 542 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 543 | Bypass Line I/V Gland | 543 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 544 | 01-PV-1401 U/S line I/V Gland | 544 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 545 | Drain Line I/V Gland | 545 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 546 | Drain Line Safety Flange | 546 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 547 | 01-PV-1401 C/V U/S Flange | 547 | 0 | 0 | 0 | 0 | 8760 | 0 |

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## VOC Emission Monitoring Survey Report

**Issued To** **Numaligarh Refinery Limited**
NRL Complex, Numaligarh
Distt. Golaghat, Assam-785 699

**Monitoring Period:** February 2022
**Customer Reference No.:** 4600008282-NIR/26.08.2021

| Sr. No. | Locations | Tag | VOC Emission | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min (PPM) | Avg. (PPM) | Max (PPM) | Emission Kg/Hr | Total Operational Hours | Emission Kg/year |
| 548 | 01-PV-1401 C/V Gland | 548 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 549 | 01-PV-1401 C/V D/S Flange | 549 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 550 | 01-PV-1401 D/S line I/V Gland | 550 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 551 | Drain Line I/V Gland | 551 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 552 | Drain Line Safety Flange | 552 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 553 | Bypass Line I/V Gland | 553 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 554 | 01-SDV-1401 C/V U/S Flange | 554 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 555 | 01-SDV-1401 C/V Gland | 555 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 556 | 01-SDV-1401 C/V D/S Flange | 556 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 557 | Drain Line I/V Gland | 557 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 558 | Drain Line Safety Flange | 558 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 559 | 01-FV-3804 D/S Line I/V U/S Flange | 559 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 560 | 01-FV-3804 D/S Line I/V Gland | 560 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 561 | 01-FV-3804 D/S Line I/V D/S Flange | 561 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 562 | 01-FV-3804 C/V U/S Flange | 562 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 563 | 01-FV-3804 C/V Gland | 563 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 564 | 01-FV-3804 C/V D/S Flange | 564 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 565 | 01-FV-2702 C/V U/S Flange | 565 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 566 | 01-FV-2702 C/V Gland | 566 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 567 | 01-FV-2702 C/V U/S Flange | 567 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 568 | 01-FV-1702 C/V U/S Flange | 568 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 569 | 01-FV-1702 C/V Gland | 569 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 570 | 01-FV-1702 C/V D/S Flange | 570 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 571 | Drain Line I/V Gland | 571 | 0 | 0 | 0 | 0 | 8760 | 0 |
| 572 | Drain Line Safety Flange | 572 | 0 | 0 | 0 | 0 | 8760 | 0 |

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