

EXECUTIVE SUMMARY
FOR
LAYING OF NATURAL GAS TRANSPORTATION PIPELINE FOR HARIDWAR-RISHIKESH-
DEHRADUN PIPELINE SECTION

PIPELINE LENGTH: 50 KM (approx) DIA: 8"

SYSTEM CAPACITY: 1.2 MMSCMD;

BASELINE PERIOD: OCTOBER 2020 TO DECEMBER 2020



PROJECT PROPONENT

GAIL (INDIA) LIMITED

Jubilee Tower B-35 & 36, Sector - 1

Noida (U.P.) - 201301



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Prepared By



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1.1 INTRODUCTION

1.1.1 Project Introduction

Gas Authority of India Limited (GAIL) is planning to lay a 50 Kms (approx.) Natural Gas Pipeline, with Dispatch Station (DT) at Jwalapur, in the Haridwar District of Uttarakhand State and Receipt Station (RT) in the Dehradun District of Uttarakhand State. This proposed pipeline is hereinafter referred to as Haridwar-Rishikesh-Dehradun Pipeline (HRDPL). The Pipeline Size has been finalized as 8” NB, with a Flow capacity of 1.2 MMSCMD.

In addition to DT and RT, the proposed Natural Gas Pipeline shall have three (3) nos. of Sectionalizing Valve (SV) Stations between the dispatch terminal and receipt terminal.

1.1.2 Project Proponent

M/s Gail (India) Limited (GAIL) (formerly known as Gas Authority of India Limited) is the largest state owned natural gas processing and Distribution Company in India incorporated in August 1984 as a Central Public Sector Undertaking (PSU) under the Ministry of Petroleum & Natural Gas (MoPNG). The company spread with its business segment for natural gas, liquid hydrocarbon, liquefied petroleum gas transmission, petrochemical, city gas distribution, exploration and production.

1.2 PROJECT DESCRIPTION

The brief project details are tabulated below:

Table 1: Design parameters

S no.	Items	Description	
1.	Total Length of Pipeline	50 Km (approx.)	
2.	Product to be handled	Natural Gas	
3.	Supply point	Jwalapur (GAIL’s existing receiving station), Haridwar	
4.	Receiving point	Dehradun, Uttrakhand	
5.	Design Gas Flow	1.2 MMSCMD	
6.	Design supply pressure, bar g	30-95 bar g (max. at Jwalapur, Haridwar)	
7.	Design supply temperature	10-25 °C (min/max) at Jwalapur, Haridwar	
8	Design temperature	Underground services	(-)20 to 60 (min/max)
		Aboveground Services- CS	(-)20 to 65 (min/max)
		Aboveground & Underground Services- LTCS	(-)20 to 60 (min/max)
9.	Design pressure, bar g	98	
10.	Corrosion allowance	0.5’ mm for 8” Inch Mainline Pipe (API5L,	

		Gr.X60) : '1.6' mm for all Station Piping, including: ASTM A 333, Gr. 6 Piping (Size 6" and below)
11.	Manufacturing Tolerance for Wall Thickness	: 'Zero' Negative tolerance on wall thickness for 8" Mainline Pipe (API 5L Gr. X60) : (+/-) 12.5% for ASTM A333, Gr.6 Piping (all Station Piping 6" and below)
12.	Design life	25 years
13.	Pigging facility	1 no. PIG Launcher at Jwalapur Dispatch Terminal 1 no. PIG Receiver at Dehradun Receipt Terminal
14.	Tap- Off Station	SV -02 at Ch24+625 cum Tap OFF for Rishikesh
15.	Total No. of SV station	SV -01 at Ch11.603km SV -02 at Ch 24+625 km SV -03 at Ch 37+116 km
16.	External Coating	3LPE Coating as per PTS/GTS coating

1.2.1 Description of the Project

The Project envisages setting up of an 8" NB Natural Gas Pipeline from Jwalapur (Receiving Station of existing Saharanpur-Haridwar Pipeline), upto proposed Receipt Station at Dehradun.

The project comprises of 8" dia x 50 Kms (approx.) long, Natural Gas Pipeline and associated station facilities. The tap-off shall be taken from GAIL's existing Saharanpur Haridwar Pipeline (SHPL) at Jwalapur, in the Haridwar District of Uttarakhand State, and the pipeline will be laid upto proposed receiving station in the Dehradun District of Uttarakhand State.

Following are the pipeline details:

Mainline : Haridwar to Dehradun

Nominal Diameter : 8" NB

Length : 50 Kms (approx.)

In addition to the 8" inch Main Pipeline, the following station facilities are proposed to be constructed as part of the project:

- **Dispatch station (DT):** A Dispatch Station is proposed at existing GAIL station in Jwalapur, with Pig Launcher facilities for the proposed pipeline. Tap-Off for the proposed pipeline shall be taken from existing 12" Tap-Off Valve provided on Saharanpur-Haridwar Pipeline (SHPL).

- **Sectionalizing Valve (SV) Stations:** Three (03) Nos. Sectionalizing Valve (SV) Stations, with Underground (buried) Sectionalizing Valves, are proposed along the pipeline route, with spacing as per PNGRB & ASME B31.8 requirements.
- **Receiving station (RT):** A Receiving Station is proposed in the Dehradun district, with Pig Receiver facilities, Filtering, Metering and Pressure Regulating skid for the proposed pipeline.

1.3 DESCRIPTION OF THE ENVIRONMENT

1.3.1 Air Environment

Result interpretation for pipeline

Ambient Air Quality Monitoring reveals that the minimum and maximum concentrations of PM₁₀ for all the 8 Air Quality monitoring stations were found 44µg/m³ and 79µg/m³ respectively, while for PM_{2.5} in varies between 26µg/m³ and 47 µg/m³. As far as the gaseous pollutants SO₂, NO₂, CO&VOC are concerned, the prescribed limits under NAAQ Standards for residential and rural areas has never surpassed at any station. The minimum and maximum concentrations of NO₂ were found to be 14µg/m³ and 30µg/m³ respectively. The minimum and maximum concentrations of SO₂ were found to be 5µg/m³ to 19µg/m³ respectively. The minimum and maximum concentrations of CO were found to be 0.43mg/m³ and 0.94 mg/m³ respectively. The prescribed limits of SO₂ and NO₂ are 80µg/m³ and CO is 2mg/m³ for residential and rural areas which have never surpassed at any monitoring station. The minimum and maximum concentrations of HC were found to be 0.12 to and 0.73 respectively. VOC results observed under the prescribed limit of <0.50 (µg/m³). The standards of Ambient Air Quality in India are available online at <http://cpcb.nic.in/National Ambient Air Quality Standards.php>.

Result interpretation for Haridwar DT

Ambient Air Quality Monitoring reveals that the minimum and maximum concentrations of PM₁₀ for all the 5 Air Quality monitoring stations were found to be 52 µg/m³ and 87µg/m³ respectively, while for PM_{2.5} in varies between 29 µg/m³ and 45 µg/m³. As far as the gaseous pollutants SO₂, NO₂, CO & VOC are concerned, the prescribed limits under NAAQ Standards for residential and rural areas have never surpassed at any station. The minimum and maximum concentrations of NO₂ were found to be 14µg/m³ and 30µg/m³ respectively. The minimum and maximum concentrations of SO₂ were found to be 7µg/m³ to 19µg/m³ respectively. The minimum and maximum concentrations of CO were found to be 0.51 mg/m³ to and 0.94 mg/m³ respectively. The prescribed limits of SO₂ and NO₂ are 80µg/m³ and CO is 2mg/m³ for residential and rural areas which have never surpassed at any monitoring station. The minimum and maximum concentrations of HC were found to be 0.12 to and 0.87 respectively. VOC results observed under the prescribed limit of <0.50 (µg/m³).

Result interpretation for Dehradun RT

Ambient Air Quality Monitoring reveals that the minimum and maximum concentrations of PM₁₀ for all the 5 Air Quality monitoring stations were found to be 52 µg/m³ and 79µg/m³ respectively, while for PM_{2.5} in varies between 29 µg/m³ and 46 µg/m³. As far as the gaseous pollutants SO₂, NO₂, CO & VOC are concerned, the prescribed limits under NAAQ Standards for residential and rural areas have never surpassed at any station. The minimum and maximum concentrations of NO₂ were found to be 14µg/m³ and 31µg/m³ respectively. The minimum and maximum concentrations of SO₂ were found to be 5µg/m³ to 19µg/m³ respectively. The minimum and maximum concentrations of CO were found to be 0.51 mg/m³ to and 1.08 mg/m³ respectively. The prescribed limits of SO₂ and NO₂ are 80µg/m³ and CO is 2mg/m³ for residential and rural areas which have never surpassed at any monitoring station. The minimum and maximum concentrations of HC were found to be 0.12 to and 0.73 respectively. VOC results observed under the prescribed limit of <0.50 (µg/m³).

1.3.2 Water Environment

Interpretation of pipeline

Analysis results of ground water reveal the following:

- pH varies from to 7.23 to 7.64.
- Total Hardness varies from 136 to 356 mg/L.
- Total Dissolved Solids varies from 261 to 503 mg/L.

Analysis results of surface water reveal the following:

- pH varies from to 7.28 to 7.63
- Total Hardness varies from 108 to 184 mg/L.
- Total Dissolved Solids varies from 183 to 360 mg/L.

Interpretation of Haridwar DT

Analysis results of ground water reveal the following:

- pH varies from to 7.54 to 7.89.
- Total Hardness varies from 186 to 330 mg/L.
- Total Dissolved Solids varies from 278 to 463 mg/L.

Analysis results of surface water reveal the following:

- pH varies from to 7.28 to 7.58
- Total Hardness varies from 64 to 204 mg/L.
- Total Dissolved Solids varies from 126 to 368 mg/L.

Interpretation of Dehradun RT

Analysis results of ground water reveal the following:

- pH varies from to 7.39 to 8.05.
- Total Hardness varies from 182 to 342 mg/L.
- Total Dissolved Solids varies from 268 to 494 mg/L.

Analysis results of surface water reveal the following:

- pH varies from to 7.32 to 7.76
- Total Hardness varies from 66 to 224 mg/L.
- Total Dissolved Solids varies from 140 to 373 mg/L.

1.3.3 Soil Environment

Analysis for Pipeline

The analysis results show that soil is basic in nature as pH value ranges from 7.16 to 7.65 with organic matter 1.38%-1.86%. The concentration of Nitrogen (9.8mg/100gm to 11.5mg/100gm) Phosphorus (0.48mg/100gm to 0.93mg/100gm) and Potassium (5.1 mg/100gm to 6.7mg/100gm) has been found to be in good amount in the soil samples. There should be appropriate balance in the consumption of different fertilizer nutrients.

Soil type: Sandy Clay Loam

Analysis for Haridwar DT

The analysis results show that soil is basic in nature as pH value ranges from 7.25 to 7.64 with organic matter 1.52%-1.84%. The concentration of Nitrogen (9.5 mg/100gm to 11.4 mg/100gm) Phosphorus (0.54 mg/100gm to 0.98 mg/100gm) and Potassium (5.4 mg/100gm to 6.4 mg/100gm) has been found to be in good amount in the soil samples. There should be appropriate balance in the consumption of different fertilizer nutrients.

Soil type: Sandy Clay Loam

Analysis for Dehradun RT

- The analysis results show that soil is basic in nature as pH value ranges from 7.24 to 7.62 with organic matter 1.67%-1.98%. The concentration of Nitrogen (7.6 mg/100gm to 10.8 mg/100gm) Phosphorus (0.59 mg/100gm to 0.88 mg/100gm) and Potassium (6.1 mg/100gm to 8.6 mg/100gm) has been found to be in good amount in the soil samples. There should be appropriate balance in the consumption of different fertilizer nutrients.
- Soil type: Sandy Clay Loam

1.3.4 Noise Environment

Interpretation for pipeline

The values of noise observed in some of the rural areas are primarily owing to vehicular traffic and other anthropogenic activities. In rural areas wind blowing and chirping of birds would contribute to noise levels especially during the nights. Assessment of day time noise levels dB(A) around the study areas are ranging between 43.1 Ld to 64.2 Ld during study

period. Whereas the night equivalents were in the range of 39.2Ln to 54.8Ln. From the results it can be seen that the Day equivalents and the Night equivalents were within the Ambient Noise standards of residential areas standards.

Interpretation for Haridwar DT

Assessment of day time noise levels dB(A) around the study areas are ranging between 41.3Ld to 62.4Ld during study period. Whereas the night equivalents were in the range of 38.3Ln to 53.7Ln. From the results it can be seen that the Day equivalents and the Night equivalents were within the Ambient Noise standards of residential areas standards.

Interpretation for Dehradun RT

Assessment of day time noise levels dB(A) around the study areas are ranging between 42.3Ld to 58.2Ld during study period. Whereas, the night equivalents were in the range of 38.7Ln to 52.3Ln. From the results it can be seen that the Day equivalents and the Night equivalents were within the Ambient Noise standards of residential areas standards.

1.3.5 Biological environment

The major area identified for construction of the proposed project is devoid of vegetation. Therefore, the proposed project is not directly affecting to any natural habitat when a careful laid pipeline activity, avoiding any disturbance to the natural habitat with all other recommended measures to minimized impact. Construction and operation of the facilities have no impact on the ambient air, water and soil quality, or on noise level. Therefore, the proposed project will have no impact on ecology and bio-diversity. Further, the station will be provided with a green belt in all directions, which has significant positive impact on ecology and bio-diversity of the area.

1.3.6 Socio- Economic Environment

The proposed project activities would contribute to the local economy by providing direct or indirect employment opportunities and recycled revenues through the local economy. Additional capacity enhancement in transportation of natural gas will not only save the foreign exchange but also benefit in generation of additional revenues in the form of royalty payments to mineral rights owners and taxes collected by the national and the state governments. Indirect impacts could occur as a result of the new economic development (e.g., new jobs at businesses that support the expanded workforce or that provide project materials). The proposed project will meet the immense demand of natural gas in the states and across the nation.

1.4 ENVIRONMENTAL IMPACT ASSESSMENT AND MITIGATION MEASURES

In view of the above facts and figures, it may be concluded that proposed project of GAIL shall impart negligible adverse impact on physical features, water, and noise and air environment, which will be more than compensated by the beneficial impacts on terrestrial ecology and socio-economic environment.

1.5 ANALYSIS OF ALTERNATIVES

Technology: - No new technology envisaged hence there is no adverse impact on technology.

Site: - No Adverse Impact envisaged.

1.6 ENVIRONMENTAL MONITORING PROGRAM

A monitoring schedule with respect to Ambient Air Quality, Water Quality, Noise Quality, prepared in consultation with State Pollution Control Board, shall be maintained. The measurements shall be carried out by MoEF&CC/SPCB/NABL accredited laboratory and the test reports shall be regularly forwarded to the State Pollution Control Board.

1.7 ADDITIONAL STUDIES

1.7.1 Public hearing

The DEIA is prepared for the public consultation.

1.7.2 Risk analysis

Although the results of this Risk analysis show that the risks to the persons are in the ALARP region, they will be sensitive to the specific design and/or modeling assumptions used.

The comparison of maximum individual risk with the risk acceptability criteria is shown in Table below-

Table Error! No text of specified style in document.-2: Individual Risk Per Annum (IRPA)

S. No.	Unit	Maximum LSIR (Avg/ Year)
1	DT Station, Haridwar	9.26E-06
2	SV 01 Station	1.08-07
3	SV 02 Station	2.91E-06
4	SV 03 Station	1.02E-05
5	RT Station, Dehradun	2.31E-05

Color Code	Frequency Range	Description
	< 1E-05	Broadly Acceptable Region
	1E-05 to 1E-03	ALARP Region
	>1E-03	Unacceptable Region

Societal risk criteria are also proposed, although these should be used as guidance only.

A criterion of 10⁻⁴ per year is recommended for determining design accidental loads for on-site buildings, i.e. buildings should be designed against the fire and explosion loads that occur with a frequency of 1 in 10,000 per year.

The result from the F-N curve shows that the Societal risk for “HRDPL” is either in the **ALARP** region or in the **Broadly Acceptable Region** of ALARP triangle.

Table Error! No text of specified style in document.-3: Societal Risk

S. No.	Unit	Maximum Societal Risk Avg/ Year
1	DT Station, Haridwar	2.63E-05
2	SV 01 Station	3.24E-07
3	SV 02 Station	8.31E-06
4	SV 03 Station	3.09E-05
5	RT Station, Dehradun	8.34E-05

1.8 ENVIRONMENT MANAGEMENT PLAN

1.8.1 Waste water management

No effluent will be generated due to the project' operation. Only for the domestic purpose, provision of the STP followed by the soak pit is kept for the treatment of grey water.

1.8.2 Water Conservation

Rainwater harvesting will be done in all installations of new stations.

1.8.3 Prevention of air pollution

Plants are monitoring ambient air quality at fixed monitoring stations. Mobile van equipped with sophisticated monitoring equipment is also in use. In Marketing installations all vehicles under contract are required to have PUC certificates and these are checked routinely and during inspections.

1.8.4 Cathodic Protection

- Temporary Cathodic Protection system has been envisaged during the construction period. This system is of sacrificial anode type and would be active till the availability of the Permanent Cathodic Protection system. Permanent Cathodic Protection system (PCP) has been envisaged for entire pipeline.
- For protection of station piping against external corrosion, impressed current based CP System would be provided at all stations.

1.9 GREEN AREA DEVELOPMENT

Tree plantation in and around installation and development of green belts / ecological parks has been a significant feature of GAIL's operations. All plants have developed green cover around their operations.

1.10 CONCLUSION

Adverse environmental impact due to the existing and the proposed project on air, noise, water, and land are short-term and insignificant. On the other hand, the existing and proposed facilities have significant positive impact on ecology and socio-economic environment. All the relevant safety norms with latest technology shall be incorporated to ensure safe operation of the GAIL. In view of the above, it may be opined that the proposed project in totality may be considered environmentally safe.