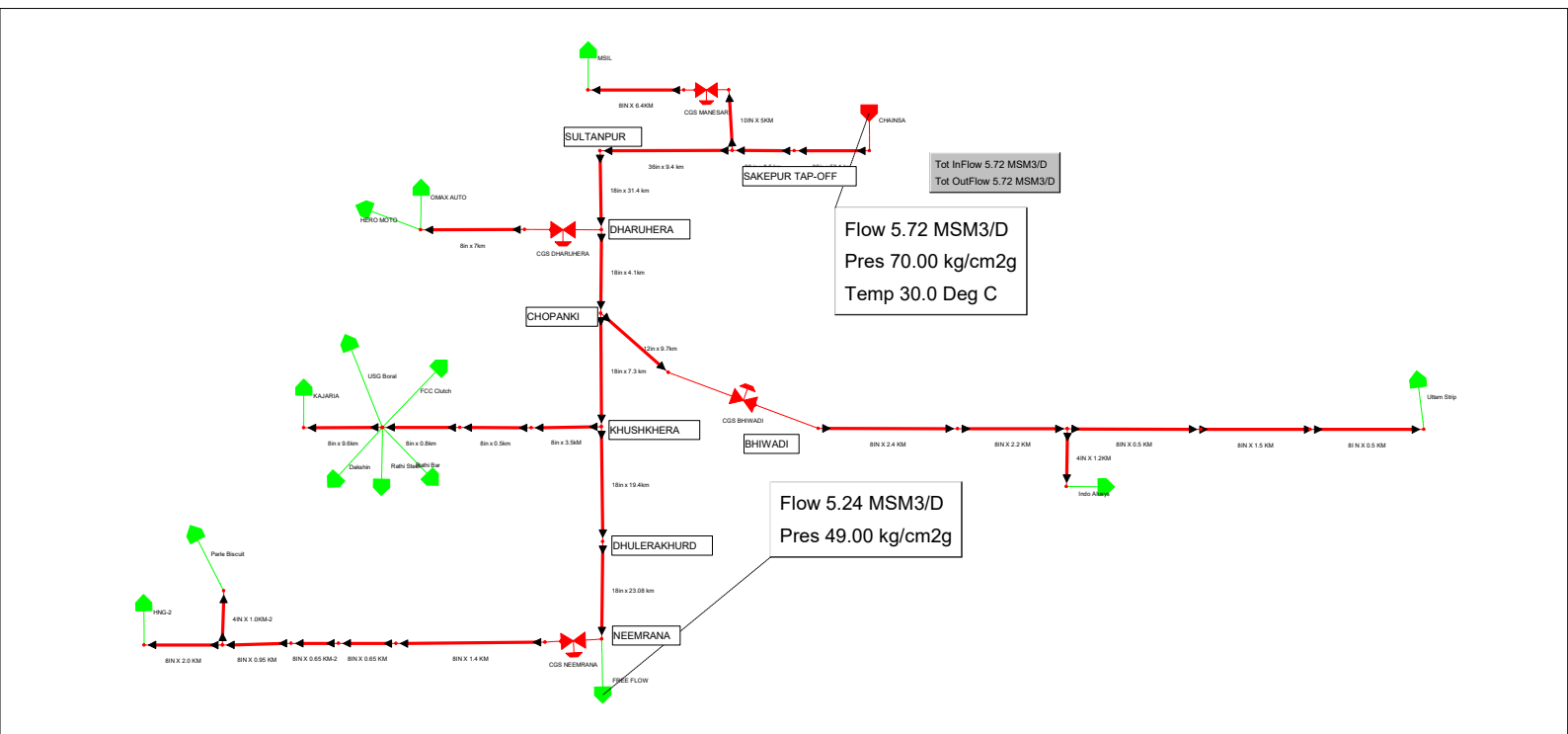


# Annexure-II

## **SCHEDULE A**

### **Format for furnishing information regarding determining capacity of Natural Gas Pipeline**

<b>S. No.</b>	<b>Description</b>	<b>GAIL Submission/ Remarks</b>
1.	Name of Entity	GAIL (India) Ltd.
2.	Address and contact details of Entity	GAIL Bhawan, 16, Bhikaiji Cama Place, R.K. Puram, New Delhi - 110066
3.	Name of Natural Gas Pipeline	Chhainsa-Jhajjar- Hisar Natural Gas Pipeline
4.	Name of Software package used	Pipeline Studio TNet (ver. 4.2)
5.	Approved Flow equation used (mention name of flow equation)	Panhandle – A for $\leq 24'' \text{ } \varnothing$ pipelines Panhandle – B for $> 24'' \text{ } \varnothing$ pipelines (As per PNGRB Guidelines)
6.	Details of Injection/Entry Points Details of Delivery/Exit Points	As in Annexure I&II
7.	Composition of Natural gas	As in Annexure II
8.	Entity agrees to have considered the technical standards, specifications and safety standards as specified by the board	YES
9.	Entity agrees to have considered the relevant provisions of Petroleum and Natural Gas Regulatory Board regulations	YES
10.	Constant and variable parameters used under steady state conditions for determining capacity of pipelines	As in Annexure I&II
11.	Capacity of the pipeline under existing operating conditions	-
12.	Maximum achievable capacity of the pipeline under steady state conditions as determined under section 5 of these regulations	5.72 MMSCMD
13.	Section-wise maximum achievable capacity of the pipeline as determined under section 5 of these regulations	5.72 MMSCMD
14.	Expected addition of entry points and exit points scheduled in near future	Future entry and exit points will be informed as and when these are finalized



## Annexure II

### Chainsa Jhajjar Hisar pipeline

1.	TNET Pipeline studio (version 4.2) sheets for capacity working of this pipeline network along-with soft copy	Attached at Annexure 1 – Capacity 5.72 MMSCMD
2	Diameter and length of each section of pipeline including that for each customer	Table 1 below
3	Basis for the assumptions for future deliveries (if any) i.e. pressure and flow	For Future deliveries , free flow has been envisaged at farthest end (Neemrana) while maintaining a minimum required line pressure of 45 kg/cm <sup>2</sup> g (4 kg/cm <sup>2</sup> g terminal drop has also been considered over the minimum required pressure).

#### I. CONSTANT PARAMETERS

Table 1: CONSTANT PARAMETER - SECTION CONFIGURATION

Pipe name	Node U/s	Node D/s	Length (km)	Diameter (in)	Wall Thickness (mm)	Roughness (micron)
4IN X 1.2KM	Node0008-2	Node0054	1.2	4.00	6.4	45
4IN X 1.0KM-2	Node0049-4	Node0049-3	1	4.00	6.4	45
8in x 7km	Node0038	Node0016	7	8.07	7	45
8IN X 2.2 KM	Node0002-2	Node0008-2	2.2	8.12	6.4	45
8IN X 2.4 KM	Node0004-2	Node0002-2	2.4	8.12	6.4	45
8I N X 0.5 KM	Node0019-2	Node0024	0.5	8.12	6.4	45
8IN X 0.65 KM-2	Node0075	Node0052-2	0.325	8.12	6.4	45
8IN X 0.5 KM	Node0008-2	Node0015	0.5	8.12	6.4	45
8IN X 1.5 KM	Node0015	Node0019-2	1.5	8.12	6.4	45
8IN X 0.65 KM	Node0060	Node0075	0.325	8.12	6.4	45
8in x 9.6km	Node0071	Node0020-2	9.6	8.12	6.4	45
8IN X 6.4KM	Node0034	Node0009	6.4	8.12	6.4	45
8IN X 1.4 KM	Node0040	Node0060	1.4	8.12	6.4	45
8in x 0.8km	Node0071-2	Node0071	0.8	8.12	6.4	45
8IN X 2.0 KM	Node0049-3	Node0020-5	2	8.12	6.4	45
8IN X 0.95	Node0052-	Node0049-3	0.95	8.12	6.4	45

KM	2					
8in x 0.5km	Node0071-3	Node0071-2	0.5	8.12	6.4	45
8in x 3.5km	Node0007	Node0071-3	3.5	8.12	6.4	45
10IN X 5KM	Node0004	Node0008	5	10.19	7.1	15
12in x 9.7km	Node0006	Node0019	9.7	12.00	9.5	15
18in x 31.4 km	Node0002	Node0003	31.4	16.99	12.7	15
18in x 7.3 km	Node0006	Node0007	7.3	16.99	12.7	15
18in x 4.1km	Node0003	Node0006	4.1	16.99	12.7	15
18in x 19.4km	Node0007	Node0007-2	19.4	16.99	12.7	15
18in x 23.08 km	Node0007-2	Node0007-4	23.08	16.99	12.7	15
36in x 53.1 km	Node0001	Node0013	53.1	34.48	19.1	15
36 in x 8.5 km	Node0013	Node0004	8.5	34.48	19.1	15
36in x 9.4 km	Node0004	Node0002	9.4	34.48	19.1	15

May also refer Annexure I

Table 2: CONSTANT PARAMETER –CONTRACTUAL/VOLUME REQUIREMENT OF CUSTOMER

Customer	Volume Requirement ( MMSCMD)	Required minimum pressure (Kg/cm <sup>2</sup> g)
HERO MOTO	0.02	min 3
KAJARIA	0.081	min 3
MSIL	0.17	min 3
OMAX AUTO	0.02	min 3
HNG	0.035	min 3
Uttam Strip	0.01	min 3
Indo Alusys	0.005	min 3
Dakshin	0.014	min 3
FCC Clutch	0.034	min 3
USG Boral	0.01	min 3
Parle Biscuit	0.008	min 3
Rathi Bar	0.015	min 3
Rathi Steel	0.055	min 3

## II. VARIABLE PARAMETERS

Table 3: VARIABLE PARAMETERS -OPERATING PARAMETERS AT SOURCES

Serial No.	SOURCE NAME	FLOW (MMSCMD)	PRESSURE (Kg./cm <sup>2</sup> g)	TEMPERATURE (deg C)
1	Chainsa	5.72	70	30

Refer Hydraulic sheet of Annexure I.

Table 5: VARIABLE PARAMETER - GAS COMPOSITION AT SOURCE

<b>Serial No.</b>	<b>EXIT NAME</b>	<b>COMPOSITION (Mole %)</b>
1	Chainsa	Methane : 89.9 Ethane :4.95 Propane : 0.85 I butane : 0.036 N butane : 0.03 I pentane : 0.001 Hexane : 0.0004 N2 : 0.055 CO2 : 4.16

## **SCHEDULE A**

### **Format for furnishing information regarding determining capacity of Natural Gas Pipeline**

<b>S. No.</b>	<b>Description</b>	<b>GAIL Submission/ Remarks</b>
1.	Name of Entity	GAIL (India) Ltd.
2.	Address and contact details of Entity	GAIL Bhawan, 16, Bhikaiji Cama Place, R.K. Puram, New Delhi - 110066
3.	Name of Natural Gas Pipeline	Chhainsa-Jhajjar- Hisar Natural Gas Pipeline
4.	Name of Software package used	Pipeline Studio TNet (ver. 4.2)
5.	Approved Flow equation used (mention name of flow equation)	Panhandle – A for $\leq 24''$ $\varnothing$ pipelines Panhandle – B for $> 24''$ $\varnothing$ pipelines (As per PNGRB Guidelines)
6.	Details of Injection/Entry Points Details of Delivery/Exit Points	As in Annexure I&II
7.	Composition of Natural gas	As in Annexure II
8.	Entity agrees to have considered the technical standards, specifications and safety standards as specified by the board	YES
9.	Entity agrees to have considered the relevant provisions of Petroleum and Natural Gas Regulatory Board regulations	YES
10.	Constant and variable parameters used under steady state conditions for determining capacity of pipelines	As in Annexure I&II
11.	Capacity of the pipeline under existing operating conditions	-
12.	Maximum achievable capacity of the pipeline under steady state conditions as determined under section 5 of these regulations	5.81 MMSCMD
13.	Section-wise maximum achievable capacity of the pipeline as determined under section 5 of these regulations	5.81 MMSCMD
14.	Expected addition of entry points and exit points scheduled in near future	Future entry and exit points will be informed as and when these are finalized



## Annexure II

### Chainsa Jhajjar Hisar pipeline

1.	TNET Pipeline studio (version 4.2) sheets for capacity working of this pipeline network along-with soft copy	Attached at Annexure 1 – Capacity 5.81 MMSCMD
2	Diameter and length of each section of pipeline including that for each customer	Table 1 below
3	Basis for the assumptions for future deliveries (if any) i.e. pressure and flow	For Future deliveries , free flow has been envisaged at farthest end (Neemrana) while maintaining a minimum required line pressure of 45 kg/cm <sup>2</sup> g (4 kg/cm <sup>2</sup> g terminal drop has also been considered over the minimum required pressure).

#### I. CONSTANT PARAMETERS

Table 1: CONSTANT PARAMETER - SECTION CONFIGURATION

Pipe name	Node U/s	Node D/s	Length (km)	Diameter (in)	Wall Thickness (mm)	Roughness (micron)
36 in x 8.5 km	Node0013	Node0004	8.5	34.48	19.1	15
36in x 9.4 km	Node0004	Node0002	9.4	34.48	19.1	15
36in x 53.1 km	Node0001	Node0013	53.1	34.48	19.1	15
18in x 23.08 km	Node0007-2	Node0007-4	23.08	16.99	12.7	15
18in x 4.1km	Node0003	Node0006	4.1	16.99	12.7	15
18in x 19.4km	Node0007	Node0007-2	19.4	16.99	12.7	15
18in x 31.4 km	Node0002	Node0003	31.4	16.99	12.7	15
18in x 7.3 km	Node0006	Node0007	7.3	16.99	12.7	15
12in x 9.7km	Node0006	Node0019	9.7	12.00	9.5	15
10IN X 5KM	Node0004	Node0008	5	10.19	7.1	15
8in x 0.5km	Node0071-3	Node0071-2	0.5	8.12	6.4	45
8in x 3.5km	Node0007	Node0071-3	3.5	8.12	6.4	45
8IN X 6.4KM	Node0034	Node0009	6.4	8.12	6.4	45
8in x 9.6km	Node0071	Node0020-2	9.6	8.12	6.4	45
8in x 0.8km	Node0071-2	Node0071	0.8	8.12	6.4	45
8IN X 2.0 KM	Node0049-3	Node0020-5	2	8.12	6.4	45
8IN X 0.95 KM	Node0052-2	Node0049-3	0.95	8.12	6.4	45
8IN X 1.4 KM	Node0040	Node0060	1.4	8.12	6.4	45
8IN X 0.65 KM	Node0060	Node0075	0.325	8.12	6.4	45
8IN X 0.65 KM-2	Node0075	Node0052-2	0.325	8.12	6.4	45
8IN X 2.4 KM	Node0004-2	Node0002-2	2.4	8.12	6.4	45
8IN X 2.2 KM	Node0002-2	Node0008-2	2.2	8.12	6.4	45

8IN X 0.5 KM	Node0008-2	Node0015	0.5	8.12	6.4	45
8IN X 1.5 KM	Node0015	Node0019-2	1.5	8.12	6.4	45
8IN X 0.5 KM	Node0019-2	Node0024	0.5	8.12	6.4	45
8in x 7km	Node0038	Node0016	7	8.07	7	45
4IN X 1.0KM-2	Node0049-4	Node0049-3	1	4.00	6.4	45
4IN X 0.2KM	Node0015	Node0016-2	0.2	4.00	6.4	45
4IN X 0.1KM	Node0016-2	Node0017	0.1	4.00	6.4	45

May also refer Annexure I

Table 2: CONSTANT PARAMETER –CONTRACTUAL/VOLUME REQUIREMENT OF CUSTOMER

Customer	Volume Requirement (MMSCMD)	Required minimum pressure (Kg/cm <sup>2</sup> g)
HERO MOTO	0.02	min 3
KAJARIA	0.08	min 3
MSIL	0.24	min 3
MANESAR-OTHERS	0.01	min 3
OMAX AUTO	0.01	min 3
HNG-2	0.03	min 3
Sharp Menthol	0.01	min 3
Uttam Strip	0.01	min 3
Dakshin	0.02	min 3
USG Boral	0.01	min 3
Parle Biscuit	0.14	min 3
Rathi Bar	0.02	min 3
Rathi Steel	0.06	min 3
RICO	0.02	min 3
Rathi Saria	0.03	min 3

## II. VARIABLE PARAMETERS

Table 3: VARIABLE PARAMETERS -OPERATING PARAMETERS AT SOURCES

Serial No.	SOURCE NAME	FLOW (MMSCMD)	PRESSURE (Kg./cm <sup>2</sup> g)	TEMPERATURE (deg C)
1	Chainsa	5.81	70	30

Refer Hydraulic sheet of Annexure I.

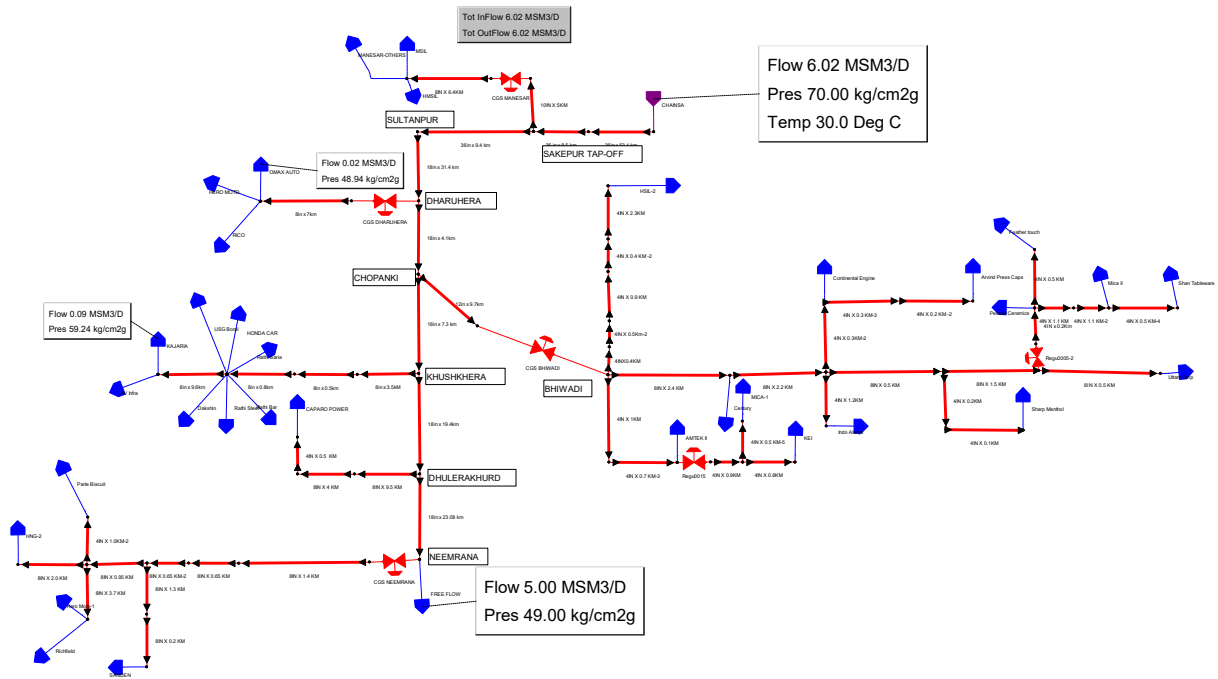
Table 5: VARIABLE PARAMETER - GAS COMPOSITION AT SOURCE

<b>Serial No.</b>	<b>EXIT NAME</b>	<b>COMPOSITION (Mole %)</b>
1	Chainsa	Methane : 89.9 Ethane :4.95 Propane : 0.85 I butane : 0.036 N butane : 0.03 I pentane : 0.001 Hexane : 0.0004 N2 : 0.055 CO2 : 4.16

## **SCHEDULE A**

### **Format for furnishing information regarding determining capacity of Natural Gas Pipeline**

<b>S. No.</b>	<b>Description</b>	<b>GAIL Submission/ Remarks</b>
1.	Name of Entity	GAIL (India) Ltd.
2.	Address and contact details of Entity	GAIL Bhawan, 16, Bhikaiji Cama Place, R.K. Puram, New Delhi - 110066
3.	Name of Natural Gas Pipeline	Chhainsa-Jhajjar- Hisar Natural Gas Pipeline
4.	Name of Software package used	Pipeline Studio TNet (ver. 4.2)
5.	Approved Flow equation used (mention name of flow equation)	Panhandle – A for $\leq 24'' \text{ } \varnothing$ pipelines Panhandle – B for $> 24'' \text{ } \varnothing$ pipelines (As per PNGRB Guidelines)
6.	Details of Injection/Entry Points Details of Delivery/Exit Points	As in Annexure I&II
7.	Composition of Natural gas	As in Annexure II
8.	Entity agrees to have considered the technical standards, specifications and safety standards as specified by the board	YES
9.	Entity agrees to have considered the relevant provisions of Petroleum and Natural Gas Regulatory Board regulations	YES
10.	Constant and variable parameters used under steady state conditions for determining capacity of pipelines	As in Annexure I&II
11.	Capacity of the pipeline under existing operating conditions	-
12.	Maximum achievable capacity of the pipeline under steady state conditions as determined under section 5 of these regulations	6.02 MMSCMD
13.	Section-wise maximum achievable capacity of the pipeline as determined under section 5 of these regulations	6.02 MMSCMD
14.	Expected addition of entry points and exit points scheduled in near future	Future entry and exit points will be informed as and when these are finalized



## Annexure II

### Chainsa Jhajjar Hisar pipeline

1.	TNET Pipeline studio (version 4.2) sheets for capacity working of this pipeline network along-with soft copy	Attached at Annexure 1 – Capacity 6.02 MMSCMD
2	Diameter and length of each section of pipeline including that for each customer	Table 1 below
3	Basis for the assumptions for future deliveries (if any) i.e. pressure and flow	For Future deliveries , free flow has been envisaged at farthest end (Neemrana) while maintaining a minimum required line pressure of 45 kg/cm <sup>2</sup> g (4 kg/cm <sup>2</sup> g terminal drop has also been considered over the minimum required pressure).

#### I. CONSTANT PARAMETERS

Table 1: CONSTANT PARAMETER - SECTION CONFIGURATION

Pipe name	Node U/s	Node D/s	Length (km)	Diameter (in)	Wall Thickness (mm)	Roughness (micron)
4IN X 2.3KM	Node0041	Node0006-2	2.3	4.00	6.4	45
4IN X 0.5Km-2	Node0121	Node0093	0.5	4.00	6.4	45
4IN X 1.1 KM-2	Node0099	Node0021	0.55	4.00	6.4	45
4IN X 0.9 KM	Node0093	Node0039	0.9	4.00	6.4	45
4IN X 0.2 KM -2	Node0051	Node0053	0.2	4.00	6.4	45
4IN X 0.3 KM-3	Node0009-3	Node0051	0.3	4.00	6.4	45
4IN X 0.5 KM	Node0020-4	Node0022	0.5	4.00	6.4	45
4IN X 1.2KM	Node0008-2	Node0054	1.2	4.00	6.4	45
4IN X 1.1 KM	Node0020-4	Node0099	0.55	4.00	6.4	45
4IN X 0.3KM-2	Node0008-2	Node0009-3	0.3	4.00	6.4	45
4I N x 0.2Km	Node0068-3	Node0020-4	0.2	4.00	6.4	45
4IN X 0.4 KM -2	Node0039	Node0041	0.4	4.00	6.4	45
4IN X 0.5 KM-5	Node0032	Node0037	0.5	4.00	6.4	45
4IN X 0.8KM	Node0032	Node0035	0.8	4.00	6.4	45
4IN X 0.1KM	Node0016-2	Node0017	0.1	4.00	6.4	45
4IN X 0.5 KM	Node0020-3	Node0055-4	0.5	4.00	6.4	45
4IN X 0.2KM	Node0015	Node0016-2	0.2	4.00	6.4	45
4IN X 0.9KM	Node0131	Node0032	0.9	4.00	6.4	45
4IN X 0.7 KM-3	Node0005	Node0031	0.7	4.00	6.4	45

4INX0.4KM	Node0004-2	Node0121	0.4	4.00	6.4	45
4IN X 0.5 KM-4	Node0021	Node0029	0.5	4.00	6.4	45
4IN X 1KM	Node0004-2	Node0005	1	4.00	6.4	45
4IN X 1.0KM-2	Node0049-4	Node0049-3	1	4.00	6.4	45
8in x 7km	Node0038	Node0016	7	8.07	7	45
8IN X 1.3 KM	Node0052-2	Node0066	1.3	8.12	6.4	45
8IN X 0.65 KM	Node0060	Node0075	0.325	8.12	6.4	45
8IN X 0.2 KM	Node0066	Node0055-7	0.2	8.12	6.4	45
8IN X 0.65 KM-2	Node0075	Node0052-2	0.325	8.12	6.4	45
8IN X 2.4 KM	Node0004-2	Node0002-2	2.4	8.12	6.4	45
8IN X 1.4 KM	Node0040	Node0060	1.4	8.12	6.4	45
8IN X 2.0 KM	Node0049-3	Node0020-5	2	8.12	6.4	45
8IN X 2.2 KM	Node0002-2	Node0008-2	2.2	8.12	6.4	45
8IN X 0.5 KM	Node0008-2	Node0015	0.5	8.12	6.4	45
8in x 0.8km	Node0071-2	Node0071	0.8	8.12	6.4	45
8IN X 9.5 KM	Node0007-2	Node0061	9.5	8.12	6.4	45
8IN X 1.5 KM	Node0015	Node0019-2	1.5	8.12	6.4	45
8in x 9.6km	Node0071	Node0020-2	9.6	8.12	6.4	45
8IN X 3.7 KM	Node0049-3	Node0055-6	3.7	8.12	6.4	45
8IN X 6.4KM	Node0034	Node0009	6.4	8.12	6.4	45
8I N X 0.5 KM	Node0019-2	Node0024	0.5	8.12	6.4	45
8IN X 0.95 KM	Node0052-2	Node0049-3	0.95	8.12	6.4	45
8in x 0.5km	Node0071-3	Node0071-2	0.5	8.12	6.4	45
8IN X 4 KM	Node0061	Node0020-3	4	8.12	6.4	45
8in x 3.5kM	Node0007	Node0071-3	3.5	8.12	6.4	45
10IN X 5KM	Node0004	Node0008	5	10.19	7.1	15
12in x 9.7km	Node0006	Node0019	9.7	12.00	9.5	15
18in x 7.3 km	Node0006	Node0007	7.3	16.99	12.7	15
18in x 31.4 km	Node0002	Node0003	31.4	16.99	12.7	15
18in x 4.1km	Node0003	Node0006	4.1	16.99	12.7	15
18in x 19.4km	Node0007	Node0007-2	19.4	16.99	12.7	15
18in x 23.08 km	Node0007-2	Node0007-4	23.08	16.99	12.7	15
36in x 53.1 km	Node0001	Node0013	53.1	34.48	19.1	15
36in x 9.4 km	Node0004	Node0002	9.4	34.48	19.1	15

May also refer Annexure I

Table 2: CONSTANT PARAMETER –CONTRACTUAL/VOLUME REQUIREMENT OF CUSTOMER

<b>Customer</b>	<b>Volume Requirement (MMSCMD)</b>	<b>Required minimum pressure (Kg/cm<sup>2</sup>g)</b>
HERO MOTO	0.061	min 3
KAJARIA	0.085	min 3
MSIL	0.346	min 3
MANESAR-OTHERS	0.015	min 3
OMAX AUTO	0.02	min 3
CAPARO POWER	0.085	min 3
HONDA CAR	0.003	min 3
HNG-2	0.035	min 3
SANDEN	0.003	min 3
Richfield	0.004	min 3
HSIL-2	0.001	min 3
Sharp Menthol	0.007	min 3
Mica II	0.001	min 3
Shan Tableware	0.002	min 3
Pelican Ceramics	0.001	min 3
Feather touch	0.002	min 3
Uttam Strip	0.01	min 3
AMTEK II	0.003	min 3
MICA-1	0.003	min 3
KEI	0.002	min 3
Indo Alusys	0.005	min 3
Continental Engine	0.003	min 3
Arvind Press Caps	0.002	min 3
AV Infra	0.01	min 3
Dakshin	0.017	min 3
Century	0.003	min 3
HMSIL	0.031	min 3
USG Boral	0.017	min 3
Parle Biscuit	0.114	min 3
Rathi Bar	0.015	min 3
Rathi Steel	0.059	min 3
Hero Moto-1	0.004	min 3
RICO	0.024	min 3
Rathi Saria	0.021	min 3

## II. VARIABLE PARAMETERS

Table 3: VARIABLE PARAMETERS -OPERATING PARAMETERS AT SOURCES

<b>Serial No.</b>	<b>SOURCE NAME</b>	<b>FLOW (MMSCMD)</b>	<b>PRESSURE (Kg./cm<sup>2</sup>g)</b>	<b>TEMPERATURE (deg C)</b>
1	Chainsa	6.02	70	30

Refer Hydraulic sheet of Annexure I.

Table 5: VARIABLE PARAMETER - GAS COMPOSITION AT SOURCE

<b>Serial No.</b>	<b>EXIT NAME</b>	<b>COMPOSITION (Mole %)</b>
1	Chainsa	Methane : 89.9 Ethane :4.95 Propane : 0.85 I butane : 0.036 N butane : 0.03 I pentane : 0.001 Hexane : 0.0004 N <sub>2</sub> : 0.055 CO <sub>2</sub> : 4.16

## **SCHEDULE A**

### **Format for furnishing information regarding determining capacity of Natural Gas Pipeline**

<b>S. No.</b>	<b>Description</b>	<b>GAIL Submission/ Remarks</b>
1.	Name of Entity	GAIL (India) Ltd.
2.	Address and contact details of Entity	GAIL Bhawan, 16, Bhikaiji Cama Place, R.K. Puram, New Delhi - 110066
3.	Name of Natural Gas Pipeline	Chhainsa-Jhajjar- Hisar Natural Gas Pipeline
4.	Name of Software package used	Pipeline Studio TNet (ver. 4.2)
5.	Approved Flow equation used (mention name of flow equation)	Panhandle – A for $\leq 24''$ $\varnothing$ pipelines Panhandle – B for $> 24''$ $\varnothing$ pipelines (As per PNGRB Guidelines)
6.	Details of Injection/Entry Points Details of Delivery/Exit Points	As in Annexure I&II
7.	Composition of Natural gas	As in Annexure II
8.	Entity agrees to have considered the technical standards, specifications and safety standards as specified by the board	YES
9.	Entity agrees to have considered the relevant provisions of Petroleum and Natural Gas Regulatory Board regulations	YES
10.	Constant and variable parameters used under steady state conditions for determining capacity of pipelines	As in Annexure I&II
11.	Capacity of the pipeline under existing operating conditions	-
12.	Maximum achievable capacity of the pipeline under steady state conditions as determined under section 5 of these regulations	9.83 MMSCMD
13.	Section-wise maximum achievable capacity of the pipeline as determined under section 5 of these regulations	9.83 MMSCMD
14.	Expected addition of entry points and exit points scheduled in near future	Future entry and exit points will be informed as and when these are finalized



## Annexure II

### Chainsa Jhajjar Hisar pipeline

1.	TNET Pipeline studio (version 4.2) sheets for capacity working of this pipeline network along-with soft copy	Attached at Annexure 1 – Capacity 9.83 MMSCMD
2	Diameter and length of each section of pipeline including that for each customer	Table 1 below
3	Basis for the assumptions for future deliveries (if any) i.e. pressure and flow	For Future deliveries , free flow has been envisaged at farthest end (Neemrana) while maintaining a minimum required line pressure of 45 kg/cm <sup>2</sup> g (4 kg/cm <sup>2</sup> g terminal drop has also been considered over the minimum required pressure).

#### I. CONSTANT PARAMETERS

Table 1: CONSTANT PARAMETER - SECTION CONFIGURATION

Pipe name	Node U/s	Node D/s	Length (km)	Diameter (in)	Wall Thickness (mm)	Roughness (micron)
36 in x 8.5 km	Node0013	Node0004	8.5	34.48	19.1	15
18in x 31.4 km	Node0002	Node0003	31.4	16.99	12.7	15
36in x 9.4 km	Node0004	Node0002	9.4	34.48	19.1	15
18in x 4.1km	Node0003	Node0006	4.1	16.99	12.7	15
18in x 7.3 km	Node0006	Node0007	7.3	16.99	12.7	15
10IN X 5KM	Node0004	Node0008	5	10.19	7.1	15
8IN X 6.4KM	Node0034	Node0009	6.4	8.12	6.4	45
36in x 53.1 km	Node0001	Node0013	53.1	34.48	19.1	15
8in x 7km	Node0038	Node0016	7	8.07	7	45
12in x 9.7km	Node0006	Node0019	9.7	12.00	9.5	15
8in x 9.6km	Node0071	Node0020-2	9.6	8.12	6.4	45
18in x 19.4km	Node0007	Node0007-2	19.4	16.99	12.7	15
18in x 23.08 km	Node0007-2	Node0007-4	23.08	16.99	12.7	15
8IN X 4 KM	Node0061	Node0020-3	4	8.12	6.4	45
8IN X 9.5 KM	Node0007-2	Node0061	9.5	8.12	6.4	45
4IN X 0.5 KM	Node0020-3	Node0055-4	0.5	4.00	6.4	45
8in x 0.8km	Node0071-2	Node0071	0.8	8.12	6.4	45
8in x 0.5km	Node0071-3	Node0071-2	0.5	8.12	6.4	45

8in x 3.5kM	Node0007	Node0071-3	3.5	8.12	6.4	45
8IN X 2.0 KM	Node0049-3	Node0020-5	2	8.12	6.4	45
8IN X 0.95 KM	Node0052-2	Node0049-3	0.95	8.12	6.4	45
8IN X 1.4 KM	Node0040	Node0060	1.4	8.12	6.4	45
8IN X 1.3 KM	Node0052-2	Node0066	1.3	8.12	6.4	45
8IN X 3.7 KM	Node0049-3	Node0055-6	3.7	8.12	6.4	45
4IN X 1.0KM-2	Node0049-4	Node0049-3	1	4.00	6.4	45
8IN X 0.65 KM	Node0060	Node0075	0.325	8.12	6.4	45
8IN X 0.2 KM	Node0066	Node0055-7	0.2	8.12	6.4	45
4IIN X 1KM	Node0066	Node0069	1	4.00	6.4	45
4IN X 0.3 KM	Node0069	Node0068	0.3	4.00	6.4	45
4IN x 0.35 Km	Node0055-6	Node0073	0.35	4.00	6.4	45
8IN X 0.65 KM-2	Node0075	Node0052-2	0.325	8.12	6.4	45
8IN X 2.4 KM	Node0004-2	Node0002-2	2.4	8.12	6.4	45
4IN X 1KM	Node0004-2	Node0005	1	4.00	6.4	45
4INX0.4KM	Node0004-2	Node0121	0.4	4.00	6.4	45
8IN X 2.2 KM	Node0002-2	Node0008-2	2.2	8.12	6.4	45
8IN X 0.5 KM	Node0008-2	Node0015	0.5	8.12	6.4	45
4IN X 0.2KM	Node0015	Node0016-2	0.2	4.00	6.4	45
4IN X 0.1KM	Node0016-2	Node0017	0.1	4.00	6.4	45
8IN X 1.5 KM	Node0015	Node0019-2	1.5	8.12	6.4	45
4I N x 0.2Km	Node0068-3	Node0020-4	0.2	4.00	6.4	45
4IN X 1.1 KM	Node0020-4	Node0099	0.55	4.00	6.4	45
4IN X 0.5 KM	Node0020-4	Node0022	0.5	4.00	6.4	45
8I N X 0.5 KM	Node0019-2	Node0024	0.5	8.12	6.4	45
4IN X 0.5 KM-4	Node0021	Node0029	0.5	4.00	6.4	45
4IN X 0.7 KM-3	Node0005	Node0031	0.7	4.00	6.4	45
4IN X 0.9KM	Node0131	Node0032	0.9	4.00	6.4	45
4IN X 0.4 KM	Node0032	Node0033	0.4	4.00	6.4	45
4IN X 0.2 KM	Node0033	Node0034-2	0.2	4.00	6.4	45
4IN X 0.8KM	Node0032	Node0035	0.8	4.00	6.4	45
4IN X 0.5 KM-5	Node0032	Node0037	0.5	4.00	6.4	45
4IN X 0.4 KM -2	Node0039	Node0041	0.4	4.00	6.4	45
4IN X 0.3KM-2	Node0008-2	Node0009-3	0.3	4.00	6.4	45
4IN X 1.2KM	Node0008-2	Node0054	1.2	4.00	6.4	45
4IN X 0.3 KM-3	Node0009-3	Node0051	0.3	4.00	6.4	45

4IN X 0.2 KM - 2	Node0051	Node0053	0.2	4.00	6.4	45
4IN X 0.9 KM	Node0093	Node0039	0.9	4.00	6.4	45
4IN X 1.1 KM-2	Node0099	Node0021	0.55	4.00	6.4	45
4IN X 0.5Km-2	Node0121	Node0093	0.5	4.00	6.4	45
4IN X 2.3KM	Node0041	Node0006- 2	2.3	4.00	6.4	45

May also refer Annexure I

Table 2: CONSTANT PARAMETER –CONTRACTUAL/VOLUME REQUIREMENT OF CUSTOMER

<b>Customer</b>	<b>Volume Requirement ( MMSCMD)</b>	<b>Required minimum pressure (Kg/cm<sup>2</sup>g)</b>
HERO MOTO	0.061	min 3
KAJARIA	0.082	min 3
MSIL	0.349	min 3
MANESAR-OTHERS	0.015	min 3
OMAX AUTO	0.02	min 3
CAPARO POWER	0.118	min 3
HONDA CAR	0.009	min 3
HNG-2	0.035	min 3
SANDEN	0.003	min 3
Richfield	0.004	min 3
Toyoda	0.001	min 3
HSIL-2	0.001	min 3
SAINT GOBAIN	0.092	min 3
Sharp Menthol	0.008	min 3
Mica II	0.001	min 3
Shan Tableware	0.002	min 3
Pelican Ceramics	0.004	min 3
Feather touch	0.002	min 3
Uttam Strip	0.01	min 3
AMTEK II	0.003	min 3
MICA-1	0.003	min 3
KEI	0.002	min 3
Surya	0.001	min 3
Indo Alusys	0.009	min 3
Continental Engine	0.003	min 3
Arvind Press Caps	0.002	min 3
AV Infra	0.01	min 3
Dakshin	0.014	min 3
Sunbeam	0.002	min 3
Century	0.01	min 3

HMSIL	0.054	min 3
USG Boral	0.015	min 3
Parle Biscuit	0.008	min 3
Rathi Bar	0.015	min 3
Rathi Steel	0.061	min 3
IGP	0.003	min 3
Hero Moto-1	0.004	min 3
Havell	0.004	min 3
RICO	0.024	min 3
Rathi Saria	0.016	min 3

## II. VARIABLE PARAMETERS

Table 3: VARIABLE PARAMETERS -OPERATING PARAMETERS AT SOURCES

Serial No.	SOURCE NAME	FLOW (MMSCMD)	PRESSURE (Kg./cm <sup>2</sup> g)	TEMPERATURE (deg C)
1	Chainsa	9.83	95	50

Refer Hydraulic sheet of Annexure I.

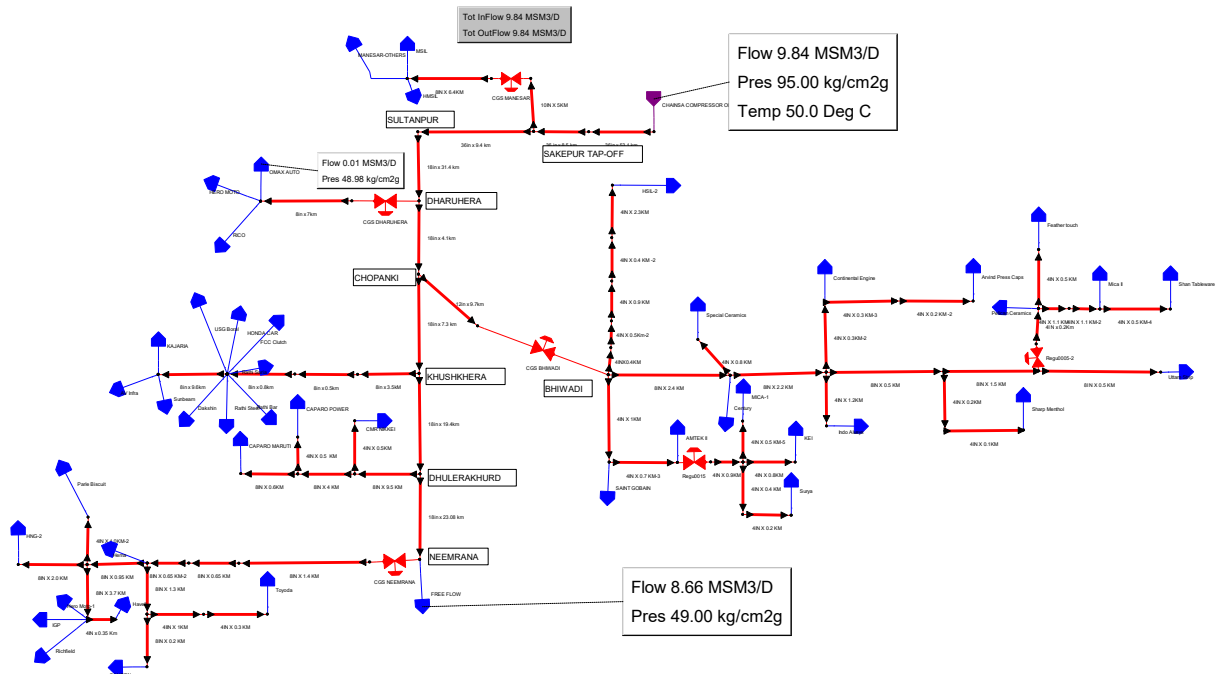
Table 5: VARIABLE PARAMETER - GAS COMPOSITION AT SOURCE

Serial No.	EXIT NAME	COMPOSITION (Mole %)
1	Chainsa	Methane : 89.9 Ethane :4.95 Propane : 0.85 I butane : 0.036 N butane : 0.03 I pentane : 0.001 Hexane : 0.0004 N2 : 0.055 CO2 : 4.16

## **SCHEDULE A**

### **Format for furnishing information regarding determining capacity of Natural Gas Pipeline**

<b>S. No.</b>	<b>Description</b>	<b>GAIL Submission/ Remarks</b>
1.	Name of Entity	GAIL (India) Ltd.
2.	Address and contact details of Entity	GAIL Bhawan, 16, Bhikaiji Cama Place, R.K. Puram, New Delhi - 110066
3.	Name of Natural Gas Pipeline	Chhainsa-Jhajjar- Hisar Natural Gas Pipeline
4.	Name of Software package used	Pipeline Studio TNet (ver. 4.2)
5.	Approved Flow equation used (mention name of flow equation)	Panhandle – A for $\leq 24''$ $\varnothing$ pipelines Panhandle – B for $> 24''$ $\varnothing$ pipelines (As per PNGRB Guidelines)
6.	Details of Injection/Entry Points Details of Delivery/Exit Points	As in Annexure I&II
7.	Composition of Natural gas	As in Annexure II
8.	Entity agrees to have considered the technical standards, specifications and safety standards as specified by the board	YES
9.	Entity agrees to have considered the relevant provisions of Petroleum and Natural Gas Regulatory Board regulations	YES
10.	Constant and variable parameters used under steady state conditions for determining capacity of pipelines	As in Annexure I&II
11.	Capacity of the pipeline under existing operating conditions	-
12.	Maximum achievable capacity of the pipeline under steady state conditions as determined under section 5 of these regulations	9.84 MMSCMD
13.	Section-wise maximum achievable capacity of the pipeline as determined under section 5 of these regulations	9.84 MMSCMD
14.	Expected addition of entry points and exit points scheduled in near future	Future entry and exit points will be informed as and when these are finalized



## Annexure II

### Chainsa Jhajjar Hisar pipeline

1.	TNET Pipeline studio (version 4.2) sheets for capacity working of this pipeline network along-with soft copy	Attached at Annexure 1 – Capacity 9.84 MMSCMD
2	Diameter and length of each section of pipeline including that for each customer	Table 1 below
3	Basis for the assumptions for future deliveries (if any) i.e. pressure and flow	For Future deliveries , free flow has been envisaged at farthest end (Neemrana) while maintaining a minimum required line pressure of 45 kg/cm <sup>2</sup> g (4 kg/cm <sup>2</sup> g terminal drop has also been considered over the minimum required pressure).

#### I. CONSTANT PARAMETERS

Table 1: CONSTANT PARAMETER - SECTION CONFIGURATION

Pipe name	Node U/s	Node D/s	Length (km)	Diameter (in)	Wall Thickness (mm)	Roughness (micron)
4IN x 0.35 Km	Node0055-6	Node0073	0.35	4.00	6.4	45
4IN X 0.5Km-2	Node0121	Node0093	0.5	4.00	6.4	45
4IN X 1.1 KM-2	Node0099	Node0021	0.55	4.00	6.4	45
4IN X 0.9 KM	Node0093	Node0039	0.9	4.00	6.4	45
4IN X 0.2 KM -2	Node0051	Node0053	0.2	4.00	6.4	45
4IN X 0.3 KM-3	Node0009-3	Node0051	0.3	4.00	6.4	45
4IN X 1.2KM	Node0008-2	Node0054	1.2	4.00	6.4	45
4IN X 0.3KM-2	Node0008-2	Node0009-3	0.3	4.00	6.4	45
4IN X 0.4 KM -2	Node0039	Node0041	0.4	4.00	6.4	45
4IN X 0.5 KM-5	Node0032	Node0037	0.5	4.00	6.4	45
4IN X 0.8KM	Node0032	Node0035	0.8	4.00	6.4	45
4IN X 0.2 KM	Node0033	Node0034-2	0.2	4.00	6.4	45
4IN X 0.4 KM	Node0032	Node0033	0.4	4.00	6.4	45
4IN X 0.9KM	Node0131	Node0032	0.9	4.00	6.4	45
4IN X 0.7 KM-3	Node0005	Node0031	0.7	4.00	6.4	45
4IN X 0.5 KM-4	Node0021	Node0029	0.5	4.00	6.4	45
4IN X 0.5KM	Node0061	Node0055-3	0.5	4.00	6.4	45
4IN X 0.5 KM	Node0020-3	Node0055-4	0.5	4.00	6.4	45

4IN X 0.5 KM	Node0020-4	Node0022	0.5	4.00	6.4	45
4IN X 1.1 KM	Node0020-4	Node0099	0.55	4.00	6.4	45
4I N x 0.2Km	Node0068-3	Node0020-4	0.2	4.00	6.4	45
4IN X 0.1KM	Node0016-2	Node0017	0.1	4.00	6.4	45
4IN X 0.2KM	Node0015	Node0016-2	0.2	4.00	6.4	45
4IN X 0.8 KM	Node0002-2	Node0007-3	0.8	4.00	6.4	45
4INX0.4KM	Node0004-2	Node0121	0.4	4.00	6.4	45
4IN X 1KM	Node0004-2	Node0005	1	4.00	6.4	45
4IN X 1.0KM-2	Node0049-4	Node0049-3	1	4.00	6.4	45
4IN X 2.3KM	Node0041	Node0006-2	2.3	4.00	6.4	45
4IN X 0.3 KM	Node0069	Node0068	0.3	4.00	6.4	45
4IIN X 1KM	Node0066	Node0069	1	4.00	6.4	45
8in x 7km	Node0038	Node0016	7	8.07	7	45
8IN X 0.65 KM	Node0060	Node0075	0.325	8.12	6.4	45
8IN X 0.65 KM-2	Node0075	Node0052-2	0.325	8.12	6.4	45
8IN X 2.4 KM	Node0004-2	Node0002-2	2.4	8.12	6.4	45
8IN X 3.7 KM	Node0049-3	Node0055-6	3.7	8.12	6.4	45
8IN X 1.3 KM	Node0052-2	Node0066	1.3	8.12	6.4	45
8IN X 1.4 KM	Node0040	Node0060	1.4	8.12	6.4	45
8IN X 2.2 KM	Node0002-2	Node0008-2	2.2	8.12	6.4	45
8IN X 0.5 KM	Node0008-2	Node0015	0.5	8.12	6.4	45
8IN X 0.95 KM	Node0052-2	Node0049-3	0.95	8.12	6.4	45
8IN X 2.0 KM	Node0049-3	Node0020-5	2	8.12	6.4	45
8IN X 1.5 KM	Node0015	Node0019-2	1.5	8.12	6.4	45
8IN X 6.4KM	Node0034	Node0009	6.4	8.12	6.4	45
8IN X 0.2 KM	Node0066	Node0055-7	0.2	8.12	6.4	45
8in x 0.8km	Node0071-2	Node0071	0.8	8.12	6.4	45
8I N X 0.5 KM	Node0019-2	Node0024	0.5	8.12	6.4	45
8IN X 0.6KM	Node0020-3	Node0064	0.6	8.12	6.4	45
8IN X 9.5 KM	Node0007-2	Node0061	9.5	8.12	6.4	45
8in x 9.6km	Node0071	Node0020-2	9.6	8.12	6.4	45
8in x 0.5km	Node0071-3	Node0071-2	0.5	8.12	6.4	45
8IN X 4 KM	Node0061	Node0020-3	4	8.12	6.4	45
8in x 3.5kM	Node0007	Node0071-3	3.5	8.12	6.4	45
10IN X 5KM	Node0004	Node0008	5	10.19	7.1	15
12in x 9.7km	Node0006	Node0019	9.7	12.00	9.5	15
18in x 31.4 km	Node0002	Node0003	31.4	16.99	12.7	15
18in x 7.3 km	Node0006	Node0007	7.3	16.99	12.7	15
18in x 19.4km	Node0007	Node0007-2	19.4	16.99	12.7	15
18in x 4.1km	Node0003	Node0006	4.1	16.99	12.7	15
18in x 23.08 km	Node0007-2	Node0007-4	23.08	16.99	12.7	15
36in x 53.1 km	Node0001	Node0013	53.1	34.48	19.1	15
36 in x 8.5 km	Node0013	Node0004	8.5	34.48	19.1	15

36in x 9.4 km	Node0004	Node0002	9.4	34.48	19.1	15
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May also refer Annexure I

**Table 2: CONSTANT PARAMETER –CONTRACTUAL/VOLUME REQUIREMENT OF CUSTOMER**

<b>Customer</b>	<b>Volume Requirement (MMSCMD)</b>	<b>Required minimum pressure (Kg/cm2g)</b>
HERO MOTO	0.032	min 3
KAJARIA	0.092	min 3
MSIL	0.346	min 3
CAPARO MARUTI	0.003	min 3
MANESAR-OTHERS	0.016	min 3
OMAX AUTO	0.01	min 3
CAPARO POWER	0.178	min 3
CMR NIKKEI	0.012	min 3
HONDA CAR	0.009	min 3
HNG-2	0.035	min 3
SANDEN	0.003	min 3
Richfield	0.004	min 3
Toyoda	0.001	min 3
HSIL-2	0.001	min 3
SAINT GOBAIN	0.101	min 3
Special Ceramics	0.002	min 3
Sharp Menthol	0.002	min 3
Mica II	0.001	min 3
Shan Tableware	0.002	min 3
Pelican Ceramics	0.004	min 3
Feather touch	0.003	min 3
Uttam Strip	0.01	min 3
AMTEK II	0.016	min 3
MICA-1	0.003	min 3
KEI	0.003	min 3
Surya	0.003	min 3
Indo Alusys	0.009	min 3
Continental Engine	0.003	min 3
Arvind Press Caps	0.002	min 3
AV Infra	0.006	min 3
Dakshin	0.014	min 3
Sunbeam	0.01	min 3
Century	0.006	min 3
Hema	0.001	min 3
HMSIL	0.054	min 3

FCC Clutch	0.004	min 3
USG Boral	0.015	min 3
Parle Biscuit	0.016	min 3
Rathi Bar	0.015	min 3
Rathi Steel	0.06	min 3
IGP	0.028	min 3
Hero Moto-1	0.007	min 3
Havell	0.004	min 3
RICO	0.024	min 3
Rathi Saria	0.016	min 3

## II. VARIABLE PARAMETERS

Table 3: VARIABLE PARAMETERS -OPERATING PARAMETERS AT SOURCES

Serial No.	SOURCE NAME	FLOW (MMSCMD)	PRESSURE (Kg./cm <sup>2</sup> g)	TEMPERATURE (deg C)
1	Chainsa	9.84	95	50

Refer Hydraulic sheet of Annexure I.

Table 5: VARIABLE PARAMETER - GAS COMPOSITION AT SOURCE

Serial No.	EXIT NAME	COMPOSITION (Mole %)
1	Chainsa	Methane : 89.9 Ethane :4.95 Propane : 0.85 I butane : 0.036 N butane : 0.03 I pentane : 0.001 Hexane : 0.0004 N2 : 0.055 CO2 : 4.16

(2015-16)

**Schedule A**  
[see regulation 5(5)(a)(x)]

Format for furnishing information regarding determining capacity of Natural Gas Pipeline

1	Name of Entity	GAIL (India) Ltd.
2	Address & Contact details of Entity	16, Bhikaiji Cama Place, R. K. Puram, New Delhi- 110066
3	Name of Natural Gas Pipeline	Chainsa - Jhajjar Pipeline
4	Name of Software package used	Pipeline Studio (TG Net)
5	Approved Flow equation used (mention name of flow equation)	PAN A & PAN B
6	Details of injection/entry point and delivery/exit points and sections on the pipeline	Copy enclosed
7	Composition of natural gas	Copy enclosed
8	Entity agrees to have considered the Technical standards, specifications and safety standards as specified by the Board	Yes
9	Entity agrees to have considered the relevant provisions of Petroleum and Natural Gas Regulatory Board Regulations	Yes
10	Constant and variable parameters used under steady state conditions for determining capacity of the pipeline	Copy enclosed
11	Capacity of the pipeline under existing operating conditions	Copy enclosed
12	Maximum achievable Capacity of the pipeline under steady state conditions as determined under section 5 of these regulations	
13	Section wise maximum achievable capacity of the pipeline as determined under section 5 of these regulations	
14	Expected addition of entry points and exit points scheduled in near future	Future entry & exit points would be informed as & when these are finalized

# CHAINSA - JHAJJAR PIPELINE (CJPL)

## ASSUMPTIONS CONSIDERED FOR HYDRAULIC STUDY

### 1. CONSTANT PARAMETERS

- |   |   |   |
|---|---|---|
| a) Pipeline Efficiency  | : | 85%   |
| b) Pipeline Roughness   | : | 15 micron/45 micron   |
| c) Flow Equation  | : | Panhandle A for pipeline size $\leq 24''$<br>Panhandle B for pipeline size $> 24''$ |
| d) Software used  | : | Pipeline Studio (TG Net)  |
| e) Pressure at Entry Point  | : | Maximum Profile   |
| f) Sub-Soil Temperature   | : | 20 -30 deg. C   |
| g) Pressure drop in pipeline & terminal<br>(for Filter, PRS, Metering, piping system) | : | upto 4.0 kg/cm <sup>2</sup> g   |

### 2. VARIABLE PARAMETERS

- |                       |   |   |
|-----------------------|---|---|
| a) Source supply flow | : | 9.71 MMSCMD (as per source and hydraulics)                              |
| b) Inlet pressure     | : | 97 Kg/cm <sup>2</sup> g at Chainsa Compressor Discharge                 |
| c) Inlet temperature  | : | 50 deg. C (Compressor Discharge)  |
| d) Delivery flow      | : | As per Critical customer  |
| e) Outlet pressure    | : | As per section 3 "Critical customers"                                   |
| f) Outlet temperature | : | As per hydraulics   |
| g) Critical Parameter | : | Delivery Pressure of 50 Kg/cm <sup>2</sup> g at Exit points at Neemrana |
| h) Gas composition    | : | Enclosed  |

## Gas Composition

Component	Mole Percentage
Methane	96.5222
Ethane	1.8186
Propane	0.4596
Isobutane	0.0977
N Butane	0.1007
Isopentane	0.0473
N Pentane	0.0324
Hexane	0.0664
Carbon Di-oxide (CO <sub>2</sub> )	0.5956
Nitrogen	0.2595

**Section wise Maximum achievable capacity of Chainsa-Sultanpur-Neemrana P/I**

Maximum achievable Capacity at Existing Condition : 9.708 MMSCMD

S NO	Entry point / Exit point locations	Chainage (Km)	Pressure profile Max (Kg/cm2g)	Entry/Section/Exit/ Customer Code		Maximum Capacity	
1	Chainsa(Entry)	0	98	Entry	Chainsa Compressor	9.708	
2	Sakepur TOP (Exit)	53.1	97.23	Section	Chainsa-Sakepur	9.708	
				Exit	0000011115	0.009	
3	Hayatpur TOP (Exit)	61.4	97.11	Section	Chainsa - Hayatpur TOP	9.699	
				Exit	0000011231	0.412	
				Exit	0000011012		
				Exit	0000011232		
				Exit	0000011024		
				Exit	0000011004		
				Exit	0000011082		
4	Dharuhera (Exit)	102.4	82.94	Section	Chainsa - Dharuhera exit	9.287	
				Exit	0000011023	0.062	
				Exit	0000011083		
				Exit	0000011021		
5	Bhiwadi (Exit)	106.5	80.95	Section	Chainsa - Bhiwadi exit	9.225	
				Exit	0000011147	0.269	
				Exit	0000011031		
				Exit	0000011572		
				Exit	0000011574		
				Exit	0000011564		
				Exit	0000011576		
				Exit	0000011149		
				Exit	0000011570		
				Exit	0000011579		
				Exit	0000011150		
				Exit	0000011575		
				Exit	0000011579		
				Exit	0000011692		
6	Khushkhera (Exit)	113.8	77.5	Section	Chainsa - Khushkhera exit	8.956	
				Exit	0000011577	0.271	
				Exit	0000011006		
				Exit	0000011068		
				Exit	0000011250		
				Exit	0000011571		
7	Bawal (Exit)	133.2	68.05	Section	Chainsa - Bawal exit	8.685	
				Exit	0000011541	0.108	
				Exit	0000011144		
8	Neemrana (Exit)	156.2	55	Exit	0000011560	0.103	
				Section	Chainsa - Neemrana exit		8.577
				Exit	0000011580		
				Exit	0000011022		
				Exit	0000011638		
				Exit	0000011779		
				Exit	0000011582		
				Exit			
				Exit			
Exit							
8				Exit	Future Delivery	8.474	

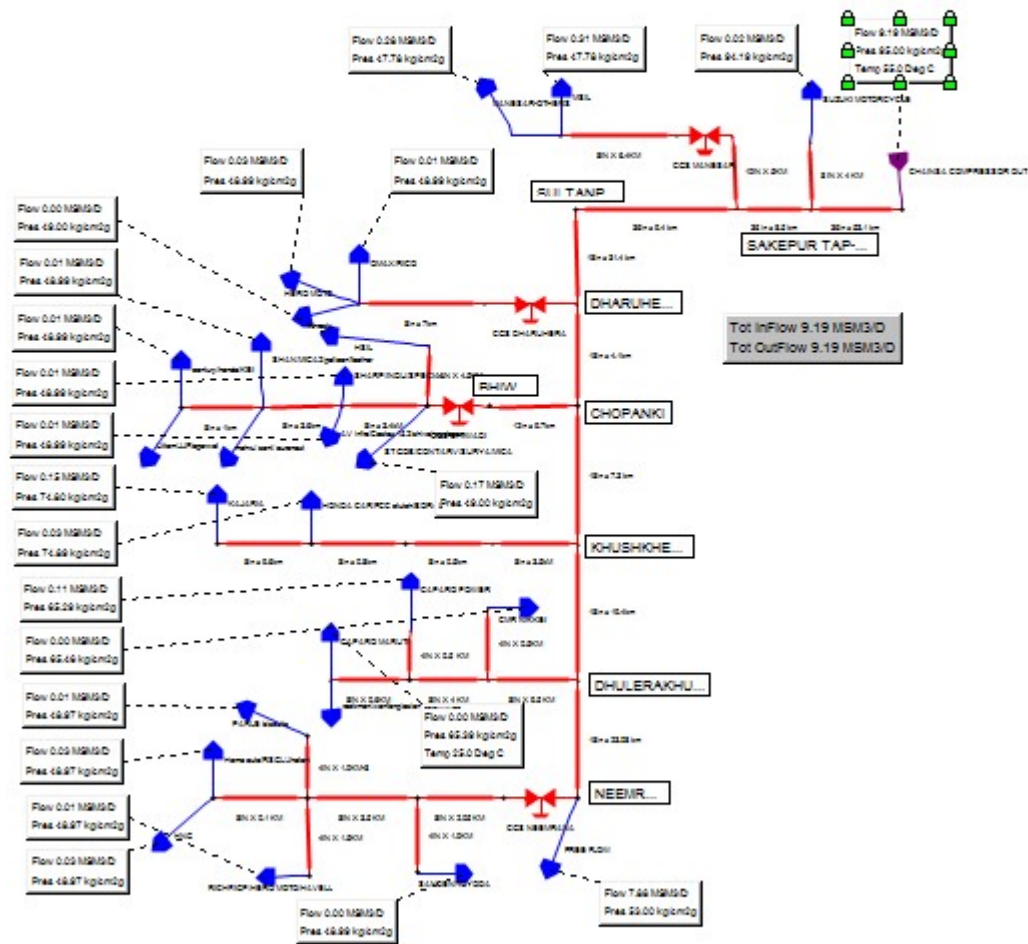
Pipeline Network	CUSTOMER	Exit Trunk Line	Chainage	Contracted Quantity (MMSCMD)	Contracted Quantity (MMBTU/ Day)	Agreement Date	Commencement Date	Expiry Date
CHAINSA JHAJJAR HISSAR	0000011115	Guragaon	53.10	0.0048	176.42	27.12.2013	01.01.2014	31.12.2014
CHAINSA JHAJJAR HISSAR	0000011231	Manesar	61.40	0.0167	607.70	24.12.2013	01.01.2014	31.12.2015
CHAINSA JHAJJAR HISSAR	0000011012	Manesar	61.40	0.3548	12,938.14	24.03.2009	24.03.2009	31.12.2019
CHAINSA JHAJJAR HISSAR	0000011232	Manesar	61.40	0.0024	88.21	30.12.2013	01.01.2014	31.12.2015
CHAINSA JHAJJAR HISSAR	0000011024	Manesar	61.40	0.0108	392.06	27.03.2009	27.03.2009	30.04.2028
CHAINSA JHAJJAR HISSAR	0000011004	Manesar	61.40	0.0108	392.06	30.03.2009	30.03.2009	30.04.2028
CHAINSA JHAJJAR HISSAR	0000011082	Manesar	61.40	0.0108	392.06	31.03.2009	31.03.2009	30.04.2028
CHAINSA JHAJJAR HISSAR	0000011023	DHARUHERA	102.40	0.0108	392.06	27.03.2009	27.03.2009	30.04.2028
CHAINSA JHAJJAR HISSAR	0000011083	DHARUHERA	102.40	0.0108	392.065	31.03.2009	31.03.2009	30.04.2028
CHAINSA JHAJJAR HISSAR	0000011021	Dharuhera	102.40	0.0409	1489.85	23.04.2009	23.04.2009	31.12.2023
CHAINSA JHAJJAR HISSAR	0000011147	Bhiwadi	106.50	0.0043	157.00	12.02.2013	16.02.2013	31.12.2015
CHAINSA JHAJJAR HISSAR	0000011031	Bhiwadi	106.50	0.0107	392.00	25.05.2009	25.05.2009	30.04.2028
CHAINSA JHAJJAR HISSAR	0000011572	Bhiwadi	106.50	0.0004	15.00	31.03.2014	01.04.2014	15.04.2014
CHAINSA JHAJJAR HISSAR	0000011574	Bhiwadi	106.50	0.0011	40.00	23.10.2012	23.10.2012	31.12.2015
CHAINSA JHAJJAR HISSAR	0000011564	Bhiwadi	106.50	0.0007	27.00	31.03.2014	01.04.2014	15.04.2014
CHAINSA JHAJJAR HISSAR	0000011576	Bhiwadi	106.50	0.0024	87.00	30.10.2012	30.10.2012	31.12.2015
CHAINSA JHAJJAR HISSAR	0000011149	Bhiwadi	106.50	0.0011	39.00	12.02.2013	12.02.2013	31.12.2015
CHAINSA JHAJJAR HISSAR	0000011570	Bhiwadi	106.50	0.0038	137.00	30.10.2012	30.10.2012	31.12.2015
CHAINSA JHAJJAR HISSAR	0000011579	Bhiwadi	106.50	0.0016	59.00	06.11.2012	06.11.2012	31.12.2015
CHAINSA JHAJJAR HISSAR	0000011150	Bhiwadi	106.50	0.0430	1568.00	27.03.2014	01.04.2014	15.04.2014
CHAINSA JHAJJAR HISSAR	0000011575	Bhiwadi	106.50	0.0032	118.00	05.12.2012	05.12.2012	31.12.2015
CHAINSA JHAJJAR HISSAR	0000011579	Bhiwadi	106.50	0.0005	20.00	04.04.2014	06.11.2012	31.12.2015
CHAINSA JHAJJAR HISSAR	0000011692	Bhiwadi	106.50	0.0021	78.00	25.02.2013	25.02.2013	31.12.2015

CHAINSA JHAJJAR HISSAR	0000011577	Khushkhera	113.80	0.0129	471.00	31.10.2012	01.06.2013	31.12.2015
CHAINSA JHAJJAR HISSAR	0000011006	Khushkhera	113.80	0.0054	196.00	13.12.2013	31.12.2013	31.12.2014
CHAINSA JHAJJAR HISSAR	0000011068	Khushkhera	113.80	0.0107	392	17.09.2009	17.09.2009	30.04.2028
CHAINSA JHAJJAR HISSAR	0000011250	Khushkhera	113.80	0.0054	196.00	30.10.2012	30.10.2012	31.12.2015
CHAINSA JHAJJAR HISSAR	0000011571	Khushkhera	113.80	0.0032	118.00	30.10.2012	30.10.2012	31.12.2015
CHAINSA JHAJJAR HISSAR	0000011541	Bawal	133.20	0.0038	137.22	01.11.2012	10.03.2014	31.12.2015
CHAINSA JHAJJAR HISSAR	0000011144	Bawal	133.20	0.0323	1176.19	24.12.2013	01.01.2014	31.12.2014
CHAINSA JHAJJAR HISSAR	0000011560	Bawal	133.20	0.00323	117.62	26.11.2012	26.11.2012	31.12.2015
CHAINSA JHAJJAR HISSAR	0000011580	Neemrana	156.20	0.0043	157.00	27.11.2012	27.11.2012	31.12.2015
CHAINSA JHAJJAR HISSAR	0000011022	Neemrana	156.20	0.0086	313.60	18.04.2009	18.04.2009	30.04.2028
CHAINSA JHAJJAR HISSAR	0000011638	Neemrana	156.20	0.0039	141.00	30.10.2012	30.10.2012	31.12.2015
CHAINSA JHAJJAR HISSAR	0000011779	Neemrana	156.20	0.0032	118	13.12.2013	13.12.2013	31.12.2015
CHAINSA JHAJJAR HISSAR	0000011582	Neemrana	156.20	0.0048	176.00	06.12.2012	06.12.2012	31.12.2015

## **SCHEDULE A**

### **Format for furnishing information regarding determining capacity of Natural Gas Pipeline**

<b>S. No.</b>	<b>Description</b>	<b>GAIL Submission/ Remarks</b>
1.	Name of Entity	GAIL (India) Ltd.
2.	Address and contact details of Entity	GAIL Bhawan, 16, Bhikaiji Cama Place, R.K. Puram, New Delhi - 110066
3.	Name of Natural Gas Pipeline	Chhainsa-Jhajjar- Hisar Natural Gas Pipeline
4.	Name of Software package used	Pipeline Studio TNet (ver. 4.2)
5.	Approved Flow equation used (mention name of flow equation)	Panhandle – A for $\leq 24''$ $\varnothing$ pipelines Panhandle – B for $> 24''$ $\varnothing$ pipelines (As per PNGRB Guidelines)
6.	Details of Injection/Entry Points Details of Delivery/Exit Points	As in Annexure I&II
7.	Composition of Natural gas	As in Annexure II
8.	Entity agrees to have considered the technical standards, specifications and safety standards as specified by the board	YES
9.	Entity agrees to have considered the relevant provisions of Petroleum and Natural Gas Regulatory Board regulations	YES
10.	Constant and variable parameters used under steady state conditions for determining capacity of pipelines	As in Annexure I&II
11.	Capacity of the pipeline under existing operating conditions	-
12.	Maximum achievable capacity of the pipeline under steady state conditions as determined under section 5 of these regulations	9.19 MMSCMD
13.	Section-wise maximum achievable capacity of the pipeline as determined under section 5 of these regulations	9.19 MMSCMD
14.	Expected addition of entry points and exit points scheduled in near future	Future entry and exit points will be informed as and when these are finalized



### **Chainsa Jhajjar Hisaar (Chainsa – Sultanpur – Neemrana )pipeline**

1.	TG networking sheets for capacity working of this pipeline network along-with soft copy	Attached at Annexure 1 – Capacity 9.19 MMSCMD
2	Diameter and length of each section of pipeline including that for each customer.	Table 1 below
3	Elevation Profile of the each section of pipeline.	No Elevation difference has been considered at the nodes
4	Basis for the assumptions for future deliveries (if any) i.e. pressure and flow assumed as well as copy of contracts in support of same	For Future deliveries , free flow has been envisaged at the end of trunkline at Neemrana CGS upstream, while maintaining a minimum required line pressure of 49 kg/cm <sup>2</sup> g (4 kg/cm <sup>2</sup> g terminal drop has also been considered over the minimum required pressure).

#### **I. CONSTANT PARAMETERS**

Table 1: CONSTANT PARAMETER - SECTION CONFIGURATION

<b>SECTION NO.</b>	<b>SECTION NAME</b>	<b>LENGTH (km)</b>	<b>DIAMETER</b>
1	Chainsa-Sakepur TOP	53.1	36"
2	Sakepur TOP-Manesar TOP	8.5	36"
3	Manesar TOP-Sultanpur	9.4	36"
4	Sultanpur-Dharuhera	31.4	18"
5	Dharuhera-Chopanki	4.1	18"
6	Chopanki-Kushkhera	7.3	18"
7	Kushkhera-Dhulerakhurd	19.4	18"
8	Dhulerakhurd- Neemrana	23.08	18"
9	Sakepur TOP-Suzuki Motorcycle	4	8"
10	Manesar TOP-Manesar CGS	5	10"

Table 2: CONSTANT PARAMETER - REQUIREMENT OF CUSTOMER

<b>Serial No.</b>	<b>AREA</b>	<b>CUSTOMER NAME</b>	<b>FLOW (MMSCM D)</b>	<b>PRESSURE (Kg./cm<sup>2</sup>g)</b>
1	Sakepur	Suzuki Motorcycle	0.2564	19 - 22 Kg/cm <sup>2</sup>
2	Manesar	NHK Spring India Ltd.	0.59	Not < 1.5 - 2 Bar (a)
3		Denso Haryana Pvt. Ltd.		Not < 4 Bar(a)
4		Honda Motorcycle & Scooter India, Manesar		19 - 22 Kg/cm <sup>2</sup>
5		Rico Castings Ltd		Not < 5 Bar (a)
6		Maruti Suzuki India Limited		Not < 19 Kg/cm <sup>2</sup>
7		Hero Motocorp Ltd.		0.04
8	OMAX AUTO LTD (DHARUHERA)	NOT LESS THAN 6 BAR		
9	Rico Auto Industries Ltd.	Not < 5 Bar (a)		
10	Ahresty India	Not < 4 to 5 Bar(a)		
11	Bhiwadi	A.V.Infraprojects Private Ltd	0.22	NOT LESS THAN 6 BAR
12		JJF Castings		NOT LESS THAN 6 BAR
13		Shiva stainless steel		NOT LESS THAN 6 BAR
14		Agarwal Metals		NOT LESS THAN 6 BAR
15		Uttam Strips		NOT LESS THAN 6 BAR
16		Arvind Press Caps Ltd.		NOT LESS THAN 6 BAR
17		Auronext Pharma Pvt. Ltd.		NOT LESS THAN 6 BAR
18		Indo Alusys Industires Ltd.		NOT LESS THAN 6 BAR
19		Pelican Ceramic Industries Pvt		NOT LESS THAN 6 BAR
20		Sant Aluminium Private Limited		NOT LESS THAN 6 BAR
21		Castex technologies Ltd, Unit II		NOT LESS THAN 6 BAR
22		Castex Technologies Ltd. - Unit-III		NOT LESS THAN 6 BAR
23		Century Metal Recycling Pvt. Ltd		NOT LESS THAN 6 BAR
24		Continental Engines Private Ltd.		NOT LESS THAN 6 BAR
25	Feather Touch Ceramics	NOT LESS THAN 6 BAR		

26		KEI Industires Limited		NOT LESS THAN 6 BAR
27		Mica Industries Ltd. Unit-I		NOT LESS THAN 6 BAR
28		Mica Industries Ltd. Unit-II		NOT LESS THAN 6 BAR
29		Shan Tablewares Pvt.Ltd.		NOT LESS THAN 6 BAR
30		Sharp Mint Limited		NOT LESS THAN 6 BAR
31		Shiva Stainless Steel Pvt Ltd		NOT LESS THAN 6 BAR
32		Special Ceramics Pvt. Ltd.		NOT LESS THAN 6 BAR
33		Surya Irrigation Pvt. Ltd.		NOT LESS THAN 6 BAR
34		HSIL Limited		NOT LESS THAN 6 BAR
35		Sunbeam Auto Pvt. Ltd.	0.18	NOT LESS THAN 6 BAR
36		Honda Motorcycle & Scooter		NOT LESS THAN 6 BAR
37		Saint-Gobain India Ltd.		NOT LESS THAN 6 BAR
38		Mehru Electrical & Mechanical		NOT LESS THAN 6 BAR
39		FCC Clutch India Private Limit		NOT LESS THAN 6 BAR
40		Honda Cars India Ltd.		NOT LESS THAN 6 BAR
41		USG Boral Gypsum Building		NOT LESS THAN 6 BAR
42		Kajaria Ceramics Ltd.		NOT LESS THAN 6 BAR
43		Caparo Maruti Ltd-IV	0.18	in the range of 2 - 3 Bar (a)
44		CMR Nikkie India Private Ltd		Not < 1 to 2 Bar(a)
45		Asian Colour Coated Ispat		Not < 1.5 to 3 Bar(a)
46		Caparo Power Limited		6 - 15 Bar(g)
47		Rockman Industries Limited-Bawal		Not < 2 - 3 Bar (a)
48		Wanfeng Aluminium Wheel		Not < 4 Bar (a)
49		Minda Kosei		NOT LESS THAN 6 BAR
50		Hero Motocorp Limited	0.081	NOT LESS THAN 6 BAR
51		Sanden Vikas Precision Parts Pvt.		NOT LESS THAN 6 BAR

		Ltd.		
52		Toyoda Gosei		NOT LESS THAN 6 BAR
53		Havells India Limited		NOT LESS THAN 6 BAR
54		Hema Automotive Pvt. Ltd.		NOT LESS THAN 6 BAR
55		Industrial Guar Products Pvt Ltd		NOT LESS THAN 6 BAR
56		Jhalani Extrusion		NOT LESS THAN 6 BAR
57		Parle Biscuits Pvt. Ltd.		NOT LESS THAN 6 BAR
58		Parle Candy		NOT LESS THAN 6 BAR
59		Rajasthan State Gas Limited		19 KG / CM <sup>2</sup>
60		Richfield Industries Pvt Ltd.		NOT LESS THAN 6 BAR
61		Hindusthan National Glass & Ind.		NOT LESS THAN 6 BAR

### **VARIABLE PARAMETERS**

Table 3: VARIABLE PARAMETERS -OPERATING PARAMETERS AT SOURCES

<b>Serial No.</b>	<b>SOURCE NAME</b>	<b>FLOW (MMSCMD)</b>	<b>PRESSURE (Kg./cm<sup>2</sup>g)</b>	<b>TEMPERATURE (deg C)</b>
1	Chainsa	9.19	95	55

Table 4: VARIABLE PARAMETER-OPERATING PARAMETERS AT CUSTOMER END

<b>Serial No.</b>	<b>AREA</b>	<b>CUSTOMER NAME</b>	<b>FLOW (MMSCMD)</b>	<b>PRESSURE (Kg./cm<sup>2</sup>g)</b>
1	Sakepur	Suzuki Motorcycle	0.2564	95
2	Manesar	NHK Spring India Ltd.	0.59	47-48
3		Denso Haryana Pvt. Ltd.		
4		Honda Motorcycle & Scooter India, Manesar		
5		Rico Castings Ltd		
6		Maruti Suzuki India Limited		
7	Dharuhera	Hero Motocorp Ltd.	0.04	
8		OMAX AUTO LTD (DHARUHERA)		

9		Rico Auto Industries Ltd.		
10		Ahresty India		
11	Bhiwadi	A.V.Infraprojects Private Ltd	0.22	48-49
12		JJF Castings		
13		Shiva stainless steel		
14		Agarwal Metals		
15		Uttam Strips		
16		Arvind Press Caps Ltd.		
17		Auronext Pharma Pvt. Ltd.		
18		Indo Alusys Industires Ltd.		
19		Pelican Ceramic Industries Pvt		
20		Sant Aluminium Private Limited		
21		Castex technologies Ltd, Unit II		
22		Castex Technologies Ltd.- Unit-III		
23		Century Metal Recycling Pvt. Ltd		
24		Continental Engines Private Ltd.		
25		Feather Touch Ceramics		
26		KEI Industires Limited		
27		Mica Industries Ltd. Unit-I		
28		Mica Industries Ltd. Unit-II		
29		Shan Tablewares Pvt.Ltd.		
30		Sharp Mint Limited		
31		Shiva Stainless Steel Pvt Ltd		
32		Special Ceramics Pvt. Ltd.		
33		Surya Irrigation Pvt. Ltd.		
34		HSIL Limited		
35	Kushkhera	Sunbeam Auto Pvt. Ltd.	0.18	74-75
36		Honda Motorcycle & Scooter		
37		Saint-Gobain India Ltd.		
38		Mehru Electrical & Mechanical		
39		FCC Clutch India Private Limit		
40		Honda Cars India Ltd.		
41		USG Boral Gypsum Building		
42		Kajaria Ceramics Ltd.		
43	Bawal	Caparo Maruti Ltd-IV	0.18	65-66
44		CMR Nikkie India Private Ltd		
45		Asian Colour Coated Ispat		
46		Caparo Power Limited		
47		Rockman Industries Limited-Bawal		
48		Wanfeng Aluminium Wheel		
49		Minda Kosei		
50	Neemrana	Hero Motocorp Limited	0.081	48-49
51		Sanden Vikas Precision Parts Pvt. Ltd.		

52		Toyoda Gosei		
53		Havells India Limited		
54		Hema Automotive Pvt. Ltd.		
55		Industrial Guar Products Pvt Ltd		
56		Jhalani Extrusion		
57		Parle Biscuits Pvt. Ltd.		
58		Parle Candy		
59		Rajasthan State Gas Limited		
60		Richfield Industries Pvt Ltd.		
61		Hindusthan National Glass & Ind.		

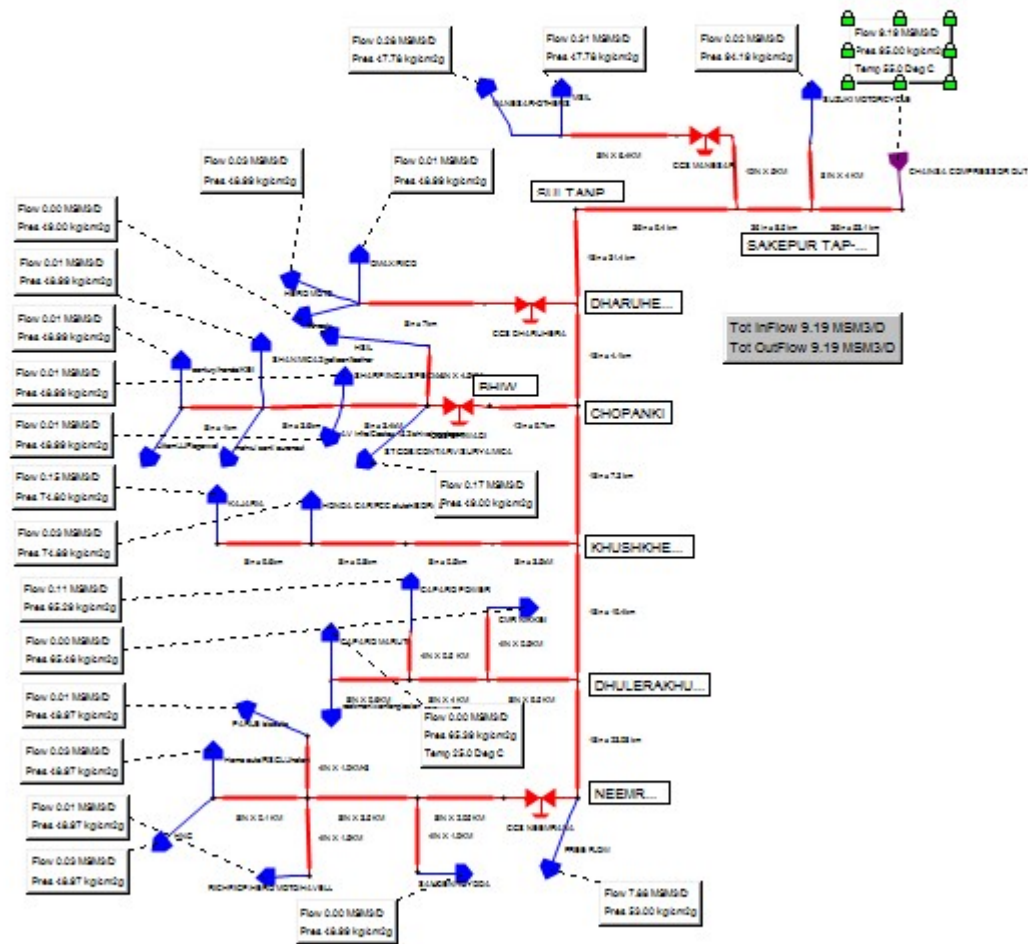
Table 5: VARIABLE PARAMETER - GAS COMPOSITION AT SOURCE

<b>Serial No.</b>	<b>EXIT NAME</b>	<b>COMPOSITION (Mole %)</b>
1	Chainsa	Methane : 89.9 Ethane :4.95 Propane : 0.85 I butane : 0.036 N butane : 0.03 I pentane : 0.001 Hexane : 0.0004 N2 : 0.055 CO2 : 4.16

## **SCHEDULE A**

### **Format for furnishing information regarding determining capacity of Natural Gas Pipeline**

<b>S. No.</b>	<b>Description</b>	<b>GAIL Submission/ Remarks</b>
1.	Name of Entity	GAIL (India) Ltd.
2.	Address and contact details of Entity	GAIL Bhawan, 16, Bhikaiji Cama Place, R.K. Puram, New Delhi - 110066
3.	Name of Natural Gas Pipeline	Chhainsa-Jhajjar- Hisar Natural Gas Pipeline
4.	Name of Software package used	Pipeline Studio TNet (ver. 4.2)
5.	Approved Flow equation used (mention name of flow equation)	Panhandle – A for $\leq 24''$ $\varnothing$ pipelines Panhandle – B for $> 24''$ $\varnothing$ pipelines (As per PNGRB Guidelines)
6.	Details of Injection/Entry Points Details of Delivery/Exit Points	As in Annexure I&II
7.	Composition of Natural gas	As in Annexure II
8.	Entity agrees to have considered the technical standards, specifications and safety standards as specified by the board	YES
9.	Entity agrees to have considered the relevant provisions of Petroleum and Natural Gas Regulatory Board regulations	YES
10.	Constant and variable parameters used under steady state conditions for determining capacity of pipelines	As in Annexure I&II
11.	Capacity of the pipeline under existing operating conditions	-
12.	Maximum achievable capacity of the pipeline under steady state conditions as determined under section 5 of these regulations	9.19 MMSCMD
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### **Chainsa Jhajjar Hisaar (Chainsa – Sultanpur – Neemrana )pipeline**

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4	Basis for the assumptions for future deliveries (if any) i.e. pressure and flow assumed as well as copy of contracts in support of same	For Future deliveries , free flow has been envisaged at the end of trunkline at Neemrana CGS upstream, while maintaining a minimum required line pressure of 49 kg/cm <sup>2</sup> g (4 kg/cm <sup>2</sup> g terminal drop has also been considered over the minimum required pressure).

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9	Sakepur TOP-Suzuki Motorcycle	4	8”
10	Manesar TOP-Manesar CGS	5	10”

Table 2: CONSTANT PARAMETER - REQUIREMENT OF CUSTOMER

<b>Serial No.</b>	<b>AREA</b>	<b>CUSTOMER NAME</b>	<b>FLOW (MMSCM D)</b>	<b>PRESSURE (Kg./cm<sup>2</sup>g)</b>
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2	Manesar	NHK Spring India Ltd.	0.59	Not < 1.5 - 2 Bar (a)
3		Denso Haryana Pvt. Ltd.		Not < 4 Bar(a)
4		Honda Motorcycle & Scooter India, Manesar		19 - 22 Kg/cm <sup>2</sup>
5		Rico Castings Ltd		Not < 5 Bar (a)
6		Maruti Suzuki India Limited		Not < 19 Kg/cm <sup>2</sup>
7		Hero Motocorp Ltd.		0.04
8	OMAX AUTO LTD (DHARUHERA)	NOT LESS THAN 6 BAR		
9	Rico Auto Industries Ltd.	Not < 5 Bar (a)		
10	Ahresty India	Not < 4 to 5 Bar(a)		
11	Bhiwadi	A.V.Infraprojects Private Ltd	0.22	NOT LESS THAN 6 BAR
12		JJF Castings		NOT LESS THAN 6 BAR
13		Shiva stainless steel		NOT LESS THAN 6 BAR
14		Agarwal Metals		NOT LESS THAN 6 BAR
15		Uttam Strips		NOT LESS THAN 6 BAR
16		Arvind Press Caps Ltd.		NOT LESS THAN 6 BAR
17		Auronext Pharma Pvt. Ltd.		NOT LESS THAN 6 BAR
18		Indo Alusys Industires Ltd.		NOT LESS THAN 6 BAR
19		Pelican Ceramic Industries Pvt		NOT LESS THAN 6 BAR
20		Sant Aluminium Private Limited		NOT LESS THAN 6 BAR
21		Castex technologies Ltd, Unit II		NOT LESS THAN 6 BAR
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23		Century Metal Recycling Pvt. Ltd		NOT LESS THAN 6 BAR
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33		Surya Irrigation Pvt. Ltd.		NOT LESS THAN 6 BAR
34		HSIL Limited		NOT LESS THAN 6 BAR
35		Sunbeam Auto Pvt. Ltd.	0.18	NOT LESS THAN 6 BAR
36		Honda Motorcycle & Scooter		NOT LESS THAN 6 BAR
37		Saint-Gobain India Ltd.		NOT LESS THAN 6 BAR
38		Mehru Electrical & Mechanical		NOT LESS THAN 6 BAR
39		FCC Clutch India Private Limit		NOT LESS THAN 6 BAR
40		Honda Cars India Ltd.		NOT LESS THAN 6 BAR
41		USG Boral Gypsum Building		NOT LESS THAN 6 BAR
42		Kajaria Ceramics Ltd.		NOT LESS THAN 6 BAR
43		Caparo Maruti Ltd-IV	0.18	in the range of 2 - 3 Bar (a)
44		CMR Nikkie India Private Ltd		Not < 1 to 2 Bar(a)
45		Asian Colour Coated Ispat		Not < 1.5 to 3 Bar(a)
46		Caparo Power Limited		6 - 15 Bar(g)
47		Rockman Industries Limited-Bawal		Not < 2 - 3 Bar (a)
48		Wanfeng Aluminium Wheel		Not < 4 Bar (a)
49		Minda Kosei		NOT LESS THAN 6 BAR
50		Hero Motocorp Limited	0.081	NOT LESS THAN 6 BAR
51		Sanden Vikas Precision Parts Pvt.		NOT LESS THAN 6 BAR

		Ltd.		
52		Toyoda Gosei		NOT LESS THAN 6 BAR
53		Havells India Limited		NOT LESS THAN 6 BAR
54		Hema Automotive Pvt. Ltd.		NOT LESS THAN 6 BAR
55		Industrial Guar Products Pvt Ltd		NOT LESS THAN 6 BAR
56		Jhalani Extrusion		NOT LESS THAN 6 BAR
57		Parle Biscuits Pvt. Ltd.		NOT LESS THAN 6 BAR
58		Parle Candy		NOT LESS THAN 6 BAR
59		Rajasthan State Gas Limited		19 KG / CM <sup>2</sup>
60		Richfield Industries Pvt Ltd.		NOT LESS THAN 6 BAR
61		Hindusthan National Glass & Ind.		NOT LESS THAN 6 BAR

### **VARIABLE PARAMETERS**

Table 3: VARIABLE PARAMETERS -OPERATING PARAMETERS AT SOURCES

<b>Serial No.</b>	<b>SOURCE NAME</b>	<b>FLOW (MMSCMD)</b>	<b>PRESSURE (Kg./cm<sup>2</sup>g)</b>	<b>TEMPERATURE (deg C)</b>
1	Chainsa	9.19	95	55

Table 4: VARIABLE PARAMETER-OPERATING PARAMETERS AT CUSTOMER END

<b>Serial No.</b>	<b>AREA</b>	<b>CUSTOMER NAME</b>	<b>FLOW (MMSCMD)</b>	<b>PRESSURE (Kg./cm<sup>2</sup>g)</b>
1	Sakepur	Suzuki Motorcycle	0.2564	95
2	Manesar	NHK Spring India Ltd.	0.59	47-48
3		Denso Haryana Pvt. Ltd.		
4		Honda Motorcycle & Scooter India, Manesar		
5		Rico Castings Ltd		
6		Maruti Suzuki India Limited		
7	Dharuhera	Hero Motocorp Ltd.	0.04	
8		OMAX AUTO LTD (DHARUHERA)		

9		Rico Auto Industries Ltd.		
10		Ahresty India		
11	Bhiwadi	A.V.Infraprojects Private Ltd	0.22	48-49
12		JJF Castings		
13		Shiva stainless steel		
14		Agarwal Metals		
15		Uttam Strips		
16		Arvind Press Caps Ltd.		
17		Auronext Pharma Pvt. Ltd.		
18		Indo Alusys Industires Ltd.		
19		Pelican Ceramic Industries Pvt		
20		Sant Aluminium Private Limited		
21		Castex technologies Ltd, Unit II		
22		Castex Technologies Ltd.- Unit-III		
23		Century Metal Recycling Pvt. Ltd		
24		Continental Engines Private Ltd.		
25		Feather Touch Ceramics		
26		KEI Industires Limited		
27		Mica Industries Ltd. Unit-I		
28		Mica Industries Ltd. Unit-II		
29		Shan Tablewares Pvt.Ltd.		
30		Sharp Mint Limited		
31		Shiva Stainless Steel Pvt Ltd		
32		Special Ceramics Pvt. Ltd.		
33		Surya Irrigation Pvt. Ltd.		
34		HSIL Limited		
35	Kushkhera	Sunbeam Auto Pvt. Ltd.	0.18	74-75
36		Honda Motorcycle & Scooter		
37		Saint-Gobain India Ltd.		
38		Mehru Electrical & Mechanical		
39		FCC Clutch India Private Limit		
40		Honda Cars India Ltd.		
41		USG Boral Gypsum Building		
42		Kajaria Ceramics Ltd.		
43	Bawal	Caparo Maruti Ltd-IV	0.18	65-66
44		CMR Nikkie India Private Ltd		
45		Asian Colour Coated Ispat		
46		Caparo Power Limited		
47		Rockman Industries Limited-Bawal		
48		Wanfeng Aluminium Wheel		
49		Minda Kosei		
50	Neemrana	Hero Motocorp Limited	0.081	48-49
51		Sanden Vikas Precision Parts Pvt. Ltd.		

52		Toyoda Gosei		
53		Havells India Limited		
54		Hema Automotive Pvt. Ltd.		
55		Industrial Guar Products Pvt Ltd		
56		Jhalani Extrusion		
57		Parle Biscuits Pvt. Ltd.		
58		Parle Candy		
59		Rajasthan State Gas Limited		
60		Richfield Industries Pvt Ltd.		
61		Hindusthan National Glass & Ind.		

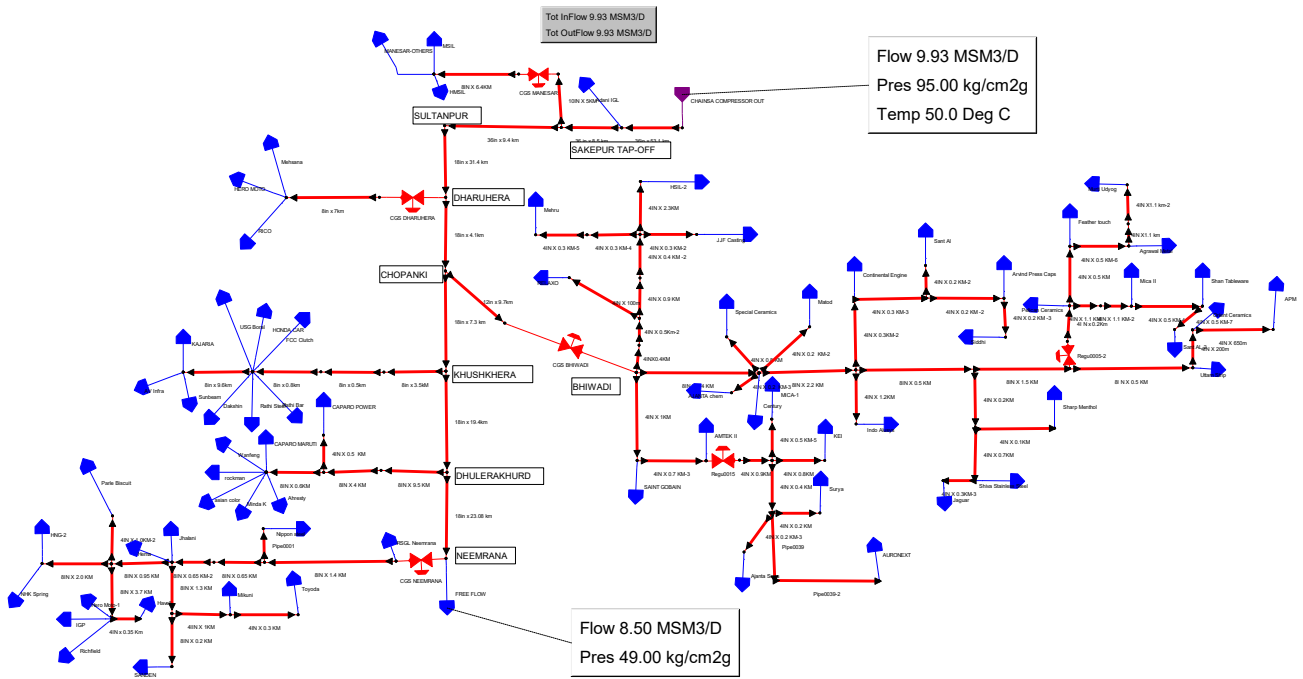
Table 5: VARIABLE PARAMETER - GAS COMPOSITION AT SOURCE

<b>Serial No.</b>	<b>EXIT NAME</b>	<b>COMPOSITION (Mole %)</b>
1	Chainsa	Methane : 89.9 Ethane :4.95 Propane : 0.85 I butane : 0.036 N butane : 0.03 I pentane : 0.001 Hexane : 0.0004 N2 : 0.055 CO2 : 4.16

## **SCHEDULE A**

### **Format for furnishing information regarding determining capacity of Natural Gas Pipeline**

<b>S. No.</b>	<b>Description</b>	<b>GAIL Submission/ Remarks</b>
1.	Name of Entity	GAIL (India) Ltd.
2.	Address and contact details of Entity	GAIL Bhawan, 16, Bhikaiji Cama Place, R.K. Puram, New Delhi - 110066
3.	Name of Natural Gas Pipeline	Chhainsa-Jhajjar- Hisar Natural Gas Pipeline
4.	Name of Software package used	Pipeline Studio TNet (ver. 4.2)
5.	Approved Flow equation used (mention name of flow equation)	Panhandle – A for $\leq 24''$ $\varnothing$ pipelines Panhandle – B for $> 24''$ $\varnothing$ pipelines (As per PNGRB Guidelines)
6.	Details of Injection/Entry Points Details of Delivery/Exit Points	As in Annexure I&II
7.	Composition of Natural gas	As in Annexure II
8.	Entity agrees to have considered the technical standards, specifications and safety standards as specified by the board	YES
9.	Entity agrees to have considered the relevant provisions of Petroleum and Natural Gas Regulatory Board regulations	YES
10.	Constant and variable parameters used under steady state conditions for determining capacity of pipelines	As in Annexure I&II
11.	Capacity of the pipeline under existing operating conditions	-
12.	Maximum achievable capacity of the pipeline under steady state conditions as determined under section 5 of these regulations	9.93 MMSCMD
13.	Section-wise maximum achievable capacity of the pipeline as determined under section 5 of these regulations	9.93 MMSCMD
14.	Expected addition of entry points and exit points scheduled in near future	Future entry and exit points will be informed as and when these are finalized



## Annexure II

### Chainsa Jhajjar Hisar pipeline

1.	TNET Pipeline studio (version 4.2) sheets for capacity working of this pipeline network along-with soft copy	Attached at Annexure 1 – Capacity 9.93 MMSCMD
2	Diameter and length of each section of pipeline including that for each customer	Table 1 below
3	Basis for the assumptions for future deliveries (if any) i.e. pressure and flow	For Future deliveries , free flow has been envisaged at farthest end (Neemrana) while maintaining a minimum required line pressure of 45 kg/cm <sup>2</sup> g (4 kg/cm <sup>2</sup> g terminal drop has also been considered over the minimum required pressure).

#### I. CONSTANT PARAMETERS

Table 1: CONSTANT PARAMETER - SECTION CONFIGURATION

Pipe name	Node U/s	Node D/s	Length (km)	Diameter (in)	Wall Thickness (mm)	Roughness (micron)
4IN x 0.35 Km	Node0055-6	Node0073	0.35	4.00	6.4	45
4IN X 0.5Km-2	Node0121	Node0093	0.5	4.00	6.4	45
4IN X 1.1 KM-2	Node0099	Node0021	0.55	4.00	6.4	45
4IN X 0.9 KM	Node0093	Node0039	0.9	4.00	6.4	45
4IN X 0.2 KM -2	Node0051	Node0053	0.2	4.00	6.4	45
4IN X 0.3 KM-3	Node0009-3	Node0051	0.3	4.00	6.4	45
4IN X 1.2KM	Node0008-2	Node0054	1.2	4.00	6.4	45
4IN X 0.3KM-2	Node0008-2	Node0009-3	0.3	4.00	6.4	45
4IN X 0.4 KM -2	Node0039	Node0041	0.4	4.00	6.4	45
4IN X 0.5 KM-5	Node0032	Node0037	0.5	4.00	6.4	45
4IN X 0.8KM	Node0032	Node0035	0.8	4.00	6.4	45
4IN X 0.2 KM	Node0033	Node0034-2	0.2	4.00	6.4	45
4IN X 0.4 KM	Node0032	Node0033	0.4	4.00	6.4	45
4IN X 0.9KM	Node0131	Node0032	0.9	4.00	6.4	45
4IN X 0.7 KM-3	Node0005	Node0031	0.7	4.00	6.4	45
4IN X 0.5 KM-4	Node0021	Node0029	0.5	4.00	6.4	45
4IN X 0.5KM	Node0061	Node0055-3	0.5	4.00	6.4	45
4IN X 0.5 KM	Node0020-3	Node0055-4	0.5	4.00	6.4	45

4IN X 0.5 KM	Node0020-4	Node0022	0.5	4.00	6.4	45
4IN X 1.1 KM	Node0020-4	Node0099	0.55	4.00	6.4	45
4I N x 0.2Km	Node0068-3	Node0020-4	0.2	4.00	6.4	45
4IN X 0.1KM	Node0016-2	Node0017	0.1	4.00	6.4	45
4IN X 0.2KM	Node0015	Node0016-2	0.2	4.00	6.4	45
4IN X 0.8 KM	Node0002-2	Node0007-3	0.8	4.00	6.4	45
4INX0.4KM	Node0004-2	Node0121	0.4	4.00	6.4	45
4IN X 1KM	Node0004-2	Node0005	1	4.00	6.4	45
4IN X 1.0KM-2	Node0049-4	Node0049-3	1	4.00	6.4	45
4IN X 2.3KM	Node0041	Node0006-2	2.3	4.00	6.4	45
4IN X 0.3 KM	Node0069	Node0068	0.3	4.00	6.4	45
4IIN X 1KM	Node0066	Node0069	1	4.00	6.4	45
8in x 7km	Node0038	Node0016	7	8.07	7	45
8IN X 0.65 KM	Node0060	Node0075	0.325	8.12	6.4	45
8IN X 0.65 KM-2	Node0075	Node0052-2	0.325	8.12	6.4	45
8IN X 2.4 KM	Node0004-2	Node0002-2	2.4	8.12	6.4	45
8IN X 3.7 KM	Node0049-3	Node0055-6	3.7	8.12	6.4	45
8IN X 1.3 KM	Node0052-2	Node0066	1.3	8.12	6.4	45
8IN X 1.4 KM	Node0040	Node0060	1.4	8.12	6.4	45
8IN X 2.2 KM	Node0002-2	Node0008-2	2.2	8.12	6.4	45
8IN X 0.5 KM	Node0008-2	Node0015	0.5	8.12	6.4	45
8IN X 0.95 KM	Node0052-2	Node0049-3	0.95	8.12	6.4	45
8IN X 2.0 KM	Node0049-3	Node0020-5	2	8.12	6.4	45
8IN X 1.5 KM	Node0015	Node0019-2	1.5	8.12	6.4	45
8IN X 6.4KM	Node0034	Node0009	6.4	8.12	6.4	45
8IN X 0.2 KM	Node0066	Node0055-7	0.2	8.12	6.4	45
8in x 0.8km	Node0071-2	Node0071	0.8	8.12	6.4	45
8I N X 0.5 KM	Node0019-2	Node0024	0.5	8.12	6.4	45
8IN X 0.6KM	Node0020-3	Node0064	0.6	8.12	6.4	45
8IN X 9.5 KM	Node0007-2	Node0061	9.5	8.12	6.4	45
8in x 9.6km	Node0071	Node0020-2	9.6	8.12	6.4	45
8in x 0.5km	Node0071-3	Node0071-2	0.5	8.12	6.4	45
8IN X 4 KM	Node0061	Node0020-3	4	8.12	6.4	45
8in x 3.5kM	Node0007	Node0071-3	3.5	8.12	6.4	45
10IN X 5KM	Node0004	Node0008	5	10.19	7.1	15
12in x 9.7km	Node0006	Node0019	9.7	12.00	9.5	15
18in x 31.4 km	Node0002	Node0003	31.4	16.99	12.7	15
18in x 7.3 km	Node0006	Node0007	7.3	16.99	12.7	15
18in x 19.4km	Node0007	Node0007-2	19.4	16.99	12.7	15
18in x 4.1km	Node0003	Node0006	4.1	16.99	12.7	15
18in x 23.08 km	Node0007-2	Node0007-4	23.08	16.99	12.7	15
36in x 53.1 km	Node0001	Node0013	53.1	34.48	19.1	15
36 in x 8.5 km	Node0013	Node0004	8.5	34.48	19.1	15

36in x 9.4 km	Node0004	Node0002	9.4	34.48	19.1	15
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May also refer Annexure I

**Table 2: CONSTANT PARAMETER –CONTRACTUAL/VOLUME REQUIREMENT OF CUSTOMER**

<b>Customer</b>	<b>Volume Requirement (MMSCMD)</b>	<b>Required minimum pressure (Kg/cm<sup>2</sup>g)</b>
HERO MOTO	0.032	min 3
KAJARIA	0.199	min 3
MSIL	0.346	min 3
CAPARO MARUTI	0.001	min 3
MANESAR-OTHERS	0.01	min 3
CAPARO POWER	0.19	min 3
HONDA CAR	0.012	min 3
rockman	0.009	min 3
HNG-2	0.035	min 3
SANDEN	0.003	min 3
Richfield	0.004	min 3
Nippon steel	0.004	min 3
Toyoda	0.001	min 3
Mikuni	0.003	min 3
HSIL-2	0.001	min 3
SAINT GOBAIN	0.226	min 3
Special Ceramics	0.002	min 3
Shiva Stainless Steel	0.001	min 3
Sharp Menthol	0.001	min 3
Mica II	0.002	min 3
Shan Tableware	0.003	min 3
Pelican Ceramics	0.002	min 3
Feather touch	0.002	min 3
Uttam Strip	0.01	min 3
AMTEK II	0.004	min 3
MICA-1	0.004	min 3
KEI	0.005	min 3
Surya	0.001	min 3
JJF Casting	0.002	min 3
Indo Alusys	0.006	min 3
Continental Engine	0.008	min 3
Arvind Press Caps	0.002	min 3
Sant Al	0.002	min 3

AURONEXT	0.004	min 3
Agrawal Metal	0.007	min 3
Orient Ceramics	0.001	min 3
Matod	0.004	min 3
Murti Udyog	0.001	min 3
AJANTA chem	0.003	min 3
APM	0.005	min 3
RELAXO	0.002	min 3
Mehru	0.001	min 3
Jaguar	0.005	min 3
RSGL Neemrana	0.023	min 3
Siddhi	0.001	min 3
AV Infra	0.005	min 3
Dakshin	0.013	min 3
Sunbeam	0.002	min 3
Century	0.01	min 3
Ajanta Soya	0.004	min 3
Sant AL 2	0.005	min 3
Hema	0.002	min 3
HMSIL	0.015	min 3
Jhalani	0.003	min 3
Ahresty	0.003	min 3
Adani IGL	0.013	min 3
FCC Clutch	0.01	min 3
USG Boral	0.015	min 3
Parle Biscuit	0.008	min 3
Rathi Bar	0.015	min 3
Rathi Steel	0.005	min 3
Wanfeng	0.028	min 3
Minda K	0.015	min 3
asian color	0.015	min 3
IGP	0.003	min 3
Hero Moto-1	0.007	min 3
Havell	0.003	min 3
RICO	0.024	min 3
NHK Spring	0.01	min 3
Mehsana	0.003	min 3

<b>Customer</b>	<b>Volume Requirement (MMSCMD)</b>	<b>Required minimum pressure (Kg/cm<sup>2</sup>g)</b>
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HERO MOTO	0.032	min 3
KAJARIA	0.092	min 3
MSIL	0.346	min 3
CAPARO MARUTI	0.003	min 3
MANESAR-OTHERS	0.016	min 3
OMAX AUTO	0.01	min 3
CAPARO POWER	0.178	min 3
CMR NIKKEI	0.012	min 3
HONDA CAR	0.009	min 3
HNG-2	0.035	min 3
SANDEN	0.003	min 3
Richfield	0.004	min 3
Toyoda	0.001	min 3
HSIL-2	0.001	min 3
SAINT GOBAIN	0.101	min 3
Special Ceramics	0.002	min 3
Sharp Menthol	0.002	min 3
Mica II	0.001	min 3
Shan Tableware	0.002	min 3
Pelican Ceramics	0.004	min 3
Feather touch	0.003	min 3
Uttam Strip	0.01	min 3
AMTEK II	0.016	min 3
MICA-1	0.003	min 3
KEI	0.003	min 3
Surya	0.003	min 3
Indo Alusys	0.009	min 3
Continental Engine	0.003	min 3
Arvind Press Caps	0.002	min 3
AV Infra	0.006	min 3
Dakshin	0.014	min 3
Sunbeam	0.01	min 3
Century	0.006	min 3
Hema	0.001	min 3
HMSIL	0.054	min 3
FCC Clutch	0.004	min 3
USG Boral	0.015	min 3
Parle Biscuit	0.016	min 3
Rathi Bar	0.015	min 3
Rathi Steel	0.06	min 3
IGP	0.028	min 3
Hero Moto-1	0.007	min 3
Havell	0.004	min 3
RICO	0.024	min 3
Rathi Saria	0.016	min 3

## II. VARIABLE PARAMETERS

Table 3: VARIABLE PARAMETERS -OPERATING PARAMETERS AT SOURCES

<b>Serial No.</b>	<b>SOURCE NAME</b>	<b>FLOW (MMSCMD)</b>	<b>PRESSURE (Kg./cm<sup>2</sup>g)</b>	<b>TEMPERATURE (deg C)</b>
1	Chainsa	9.93	95	50

Refer Hydraulic sheet of Annexure I.

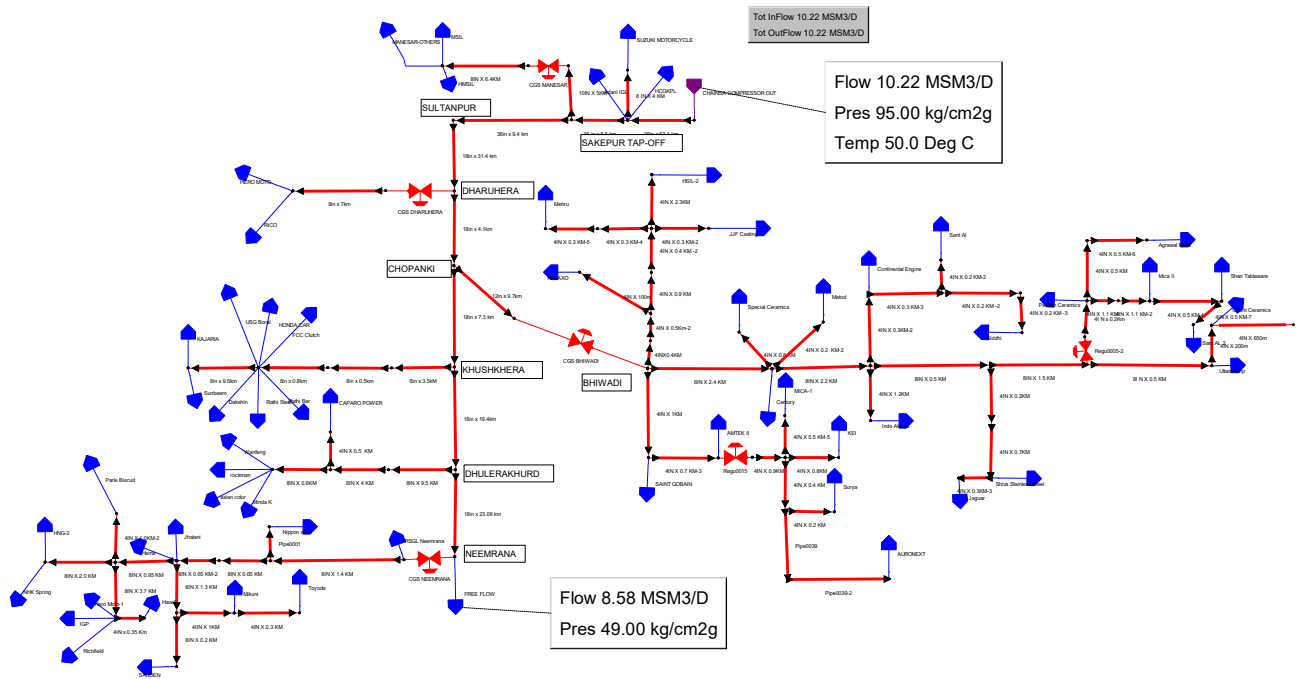
Table 5: VARIABLE PARAMETER - GAS COMPOSITION AT SOURCE

<b>Serial No.</b>	<b>EXIT NAME</b>	<b>COMPOSITION (Mole %)</b>
1	Chainsa	Methane : 89.9 Ethane :4.95 Propane : 0.85 I butane : 0.036 N butane : 0.03 I pentane : 0.001 Hexane : 0.0004 N <sub>2</sub> : 0.055 CO <sub>2</sub> : 4.16

## **SCHEDULE A**

### **Format for furnishing information regarding determining capacity of Natural Gas Pipeline**

<b>S. No.</b>	<b>Description</b>	<b>GAIL Submission/ Remarks</b>
1.	Name of Entity	GAIL (India) Ltd.
2.	Address and contact details of Entity	GAIL Bhawan, 16, Bhikaiji Cama Place, R.K. Puram, New Delhi - 110066
3.	Name of Natural Gas Pipeline	Chhainsa-Jhajjar- Hisar Natural Gas Pipeline
4.	Name of Software package used	Pipeline Studio TNet (ver. 4.2)
5.	Approved Flow equation used (mention name of flow equation)	Panhandle – A for $\leq 24''$ $\varnothing$ pipelines Panhandle – B for $> 24''$ $\varnothing$ pipelines (As per PNGRB Guidelines)
6.	Details of Injection/Entry Points Details of Delivery/Exit Points	As in Annexure I&II
7.	Composition of Natural gas	As in Annexure II
8.	Entity agrees to have considered the technical standards, specifications and safety standards as specified by the board	YES
9.	Entity agrees to have considered the relevant provisions of Petroleum and Natural Gas Regulatory Board regulations	YES
10.	Constant and variable parameters used under steady state conditions for determining capacity of pipelines	As in Annexure I&II
11.	Capacity of the pipeline under existing operating conditions	-
12.	Maximum achievable capacity of the pipeline under steady state conditions as determined under section 5 of these regulations	10.22 MMSCMD
13.	Section-wise maximum achievable capacity of the pipeline as determined under section 5 of these regulations	10.22 MMSCMD
14.	Expected addition of entry points and exit points scheduled in near future	Future entry and exit points will be informed as and when these are finalized



Tot InFlow 10.22 MSM3/D  
Tot OutFlow 10.22 MSM3/D

Flow 10.22 MSM3/D  
Pres 95.00 kg/cm2g  
Temp 50.0 Deg C

Flow 8.58 MSM3/D  
Pres 49.00 kg/cm2g

## Annexure II

### Chainsa Jhajjar Hisar pipeline

1.	TNET Pipeline studio (version 4.2) sheets for capacity working of this pipeline network along-with soft copy	Attached at Annexure 1 – Capacity 10.22 MMSCMD
2	Diameter and length of each section of pipeline including that for each customer	Table 1 below
3	Basis for the assumptions for future deliveries (if any) i.e. pressure and flow	For Future deliveries , free flow has been envisaged at farthest end (Neemrana) while maintaining a minimum required line pressure of 45 kg/cm <sup>2</sup> g (4 kg/cm <sup>2</sup> g terminal drop has also been considered over the minimum required pressure).

#### I. CONSTANT PARAMETERS

Table 1: CONSTANT PARAMETER - SECTION CONFIGURATION

Pipe name	Node U/s	Node D/s	Length (km)	Diameter (in)	Wall Thickness (mm)	Roughness (micron)
4IN x 0.35 Km	Node0055-6	Node0073	0.35	4.00	6.4	45
4IN X 0.5Km-2	Node0121	Node0093	0.5	4.00	6.4	45
4IN X 1.1 KM-2	Node0099	Node0021	0.55	4.00	6.4	45
4IN X 0.9 KM	Node0093	Node0039	0.9	4.00	6.4	45
4IN X 0.2 KM -2	Node0051	Node0053	0.2	4.00	6.4	45
4IN X 0.3 KM-3	Node0009-3	Node0051	0.3	4.00	6.4	45
4IN X 1.2KM	Node0008-2	Node0054	1.2	4.00	6.4	45
4IN X 0.3KM-2	Node0008-2	Node0009-3	0.3	4.00	6.4	45
4IN X 0.4 KM -2	Node0039	Node0041	0.4	4.00	6.4	45
4IN X 0.5 KM-5	Node0032	Node0037	0.5	4.00	6.4	45
4IN X 0.8KM	Node0032	Node0035	0.8	4.00	6.4	45
4IN X 0.2 KM	Node0033	Node0034-2	0.2	4.00	6.4	45
4IN X 0.4 KM	Node0032	Node0033	0.4	4.00	6.4	45
4IN X 0.9KM	Node0131	Node0032	0.9	4.00	6.4	45
4IN X 0.7 KM-3	Node0005	Node0031	0.7	4.00	6.4	45
4IN X 0.5 KM-4	Node0021	Node0029	0.5	4.00	6.4	45
4IN X 0.5KM	Node0061	Node0055-3	0.5	4.00	6.4	45
4IN X 0.5 KM	Node0020-3	Node0055-4	0.5	4.00	6.4	45

4IN X 0.5 KM	Node0020-4	Node0022	0.5	4.00	6.4	45
4IN X 1.1 KM	Node0020-4	Node0099	0.55	4.00	6.4	45
4I N x 0.2Km	Node0068-3	Node0020-4	0.2	4.00	6.4	45
4IN X 0.1KM	Node0016-2	Node0017	0.1	4.00	6.4	45
4IN X 0.2KM	Node0015	Node0016-2	0.2	4.00	6.4	45
4IN X 0.8 KM	Node0002-2	Node0007-3	0.8	4.00	6.4	45
4INX0.4KM	Node0004-2	Node0121	0.4	4.00	6.4	45
4IN X 1KM	Node0004-2	Node0005	1	4.00	6.4	45
4IN X 1.0KM-2	Node0049-4	Node0049-3	1	4.00	6.4	45
4IN X 2.3KM	Node0041	Node0006-2	2.3	4.00	6.4	45
4IN X 0.3 KM	Node0069	Node0068	0.3	4.00	6.4	45
4IIN X 1KM	Node0066	Node0069	1	4.00	6.4	45
8in x 7km	Node0038	Node0016	7	8.07	7	45
8IN X 0.65 KM	Node0060	Node0075	0.325	8.12	6.4	45
8IN X 0.65 KM-2	Node0075	Node0052-2	0.325	8.12	6.4	45
8IN X 2.4 KM	Node0004-2	Node0002-2	2.4	8.12	6.4	45
8IN X 3.7 KM	Node0049-3	Node0055-6	3.7	8.12	6.4	45
8IN X 1.3 KM	Node0052-2	Node0066	1.3	8.12	6.4	45
8IN X 1.4 KM	Node0040	Node0060	1.4	8.12	6.4	45
8IN X 2.2 KM	Node0002-2	Node0008-2	2.2	8.12	6.4	45
8IN X 0.5 KM	Node0008-2	Node0015	0.5	8.12	6.4	45
8IN X 0.95 KM	Node0052-2	Node0049-3	0.95	8.12	6.4	45
8IN X 2.0 KM	Node0049-3	Node0020-5	2	8.12	6.4	45
8IN X 1.5 KM	Node0015	Node0019-2	1.5	8.12	6.4	45
8IN X 6.4KM	Node0034	Node0009	6.4	8.12	6.4	45
8IN X 0.2 KM	Node0066	Node0055-7	0.2	8.12	6.4	45
8in x 0.8km	Node0071-2	Node0071	0.8	8.12	6.4	45
8I N X 0.5 KM	Node0019-2	Node0024	0.5	8.12	6.4	45
8IN X 0.6KM	Node0020-3	Node0064	0.6	8.12	6.4	45
8IN X 9.5 KM	Node0007-2	Node0061	9.5	8.12	6.4	45
8in x 9.6km	Node0071	Node0020-2	9.6	8.12	6.4	45
8in x 0.5km	Node0071-3	Node0071-2	0.5	8.12	6.4	45
8IN X 4 KM	Node0061	Node0020-3	4	8.12	6.4	45
8in x 3.5kM	Node0007	Node0071-3	3.5	8.12	6.4	45
10IN X 5KM	Node0004	Node0008	5	10.19	7.1	15
12in x 9.7km	Node0006	Node0019	9.7	12.00	9.5	15
18in x 31.4 km	Node0002	Node0003	31.4	16.99	12.7	15
18in x 7.3 km	Node0006	Node0007	7.3	16.99	12.7	15
18in x 19.4km	Node0007	Node0007-2	19.4	16.99	12.7	15
18in x 4.1km	Node0003	Node0006	4.1	16.99	12.7	15
18in x 23.08 km	Node0007-2	Node0007-4	23.08	16.99	12.7	15
36in x 53.1 km	Node0001	Node0013	53.1	34.48	19.1	15
36 in x 8.5 km	Node0013	Node0004	8.5	34.48	19.1	15

36in x 9.4 km	Node0004	Node0002	9.4	34.48	19.1	15
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May also refer Annexure I

**Table 2: CONSTANT PARAMETER –CONTRACTUAL/VOLUME REQUIREMENT OF CUSTOMER**

<b>Customer</b>	<b>Volume Requirement (MMSCMD)</b>	<b>Required minimum pressure (Kg/cm<sup>2</sup>g)</b>
HERO MOTO	0.03	min 3
KAJARIA	0.188	min 3
MSIL	0.35	min 3
SUZUKI MOTORCYCLE	0.022	min 3
MANESAR-OTHERS	0.02	min 3
CAPARO POWER	0.07	min 3
HONDA CAR	0.033	min 3
rockman	0.01	min 3
HNG-2	0.035	min 3
SANDEN	0.002	min 3
Richfield	0.004	min 3
Nippon steel	0.004	min 3
Toyoda	0.002	min 3
Mikuni	0.004	min 3
HSIL-2	0.001	min 3
SAINT GOBAIN	0.203	min 3
Special Ceramics	0.002	min 3
Shiva Stainless Steel	0.001	min 3
Mica II	0.002	min 3
Shan Tableware	0.003	min 3
Pelican Ceramics	0.002	min 3
Uttam Strip	0.01	min 3
AMTEK II	0.003	min 3
MICA-1	0.004	min 3
KEI	0.005	min 3
Surya	0.001	min 3
JJF Casting	0.003	min 3
Indo Alusys	0.006	min 3
Continental Engine	0.01	min 3
Sant Al	0.002	min 3
AURONEXT	0.005	min 3
Agrawal Metal	0.01	min 3
Orient Ceramics	0.003	min 3
Matod	0.006	min 3
RELAXO	0.005	min 3

Mehru	0.002	min 3
Jaguar	0.005	min 3
RSGL Neemrana	0.036	min 3
Siddhi	0.001	min 3
Dakshin	0.013	min 3
Sunbeam	0.002	min 3
Century	0.01	min 3
Sant AL 2	0.005	min 3
Hema	0.002	min 3
HMSIL	0.01	min 3
Jhalani	0.002	min 3
HCGKPL	0.01	min 3
Adani IGL	0.32	min 3
FCC Clutch	0.01	min 3
USG Boral	0.015	min 3
Parle Biscuit	0.008	min 3
Rathi Bar	0.015	min 3
Rathi Steel	0.005	min 3
Wanfeng	0.03	min 3
Minda K	0.02	min 3
asian color	0.01	min 3
IGP	0.003	min 3
Hero Moto-1	0.011	min 3
Havell	0.003	min 3
RICO	0.02	min 3
NHK Spring	0.01	min 3

## II. VARIABLE PARAMETERS

Table 3: VARIABLE PARAMETERS -OPERATING PARAMETERS AT SOURCES

Serial No.	SOURCE NAME	FLOW (MMSCMD)	PRESSURE (Kg./cm <sup>2</sup> g)	TEMPERATURE (deg C)
1	Chainsa	10.22	95	50

Refer Hydraulic sheet of Annexure I.

Table 5: VARIABLE PARAMETER - GAS COMPOSITION AT SOURCE

Serial No.	EXIT NAME	COMPOSITION (Mole %)
1	Chainsa	Methane : 89.9 Ethane :4.95 Propane : 0.85 I butane : 0.036 N butane : 0.03

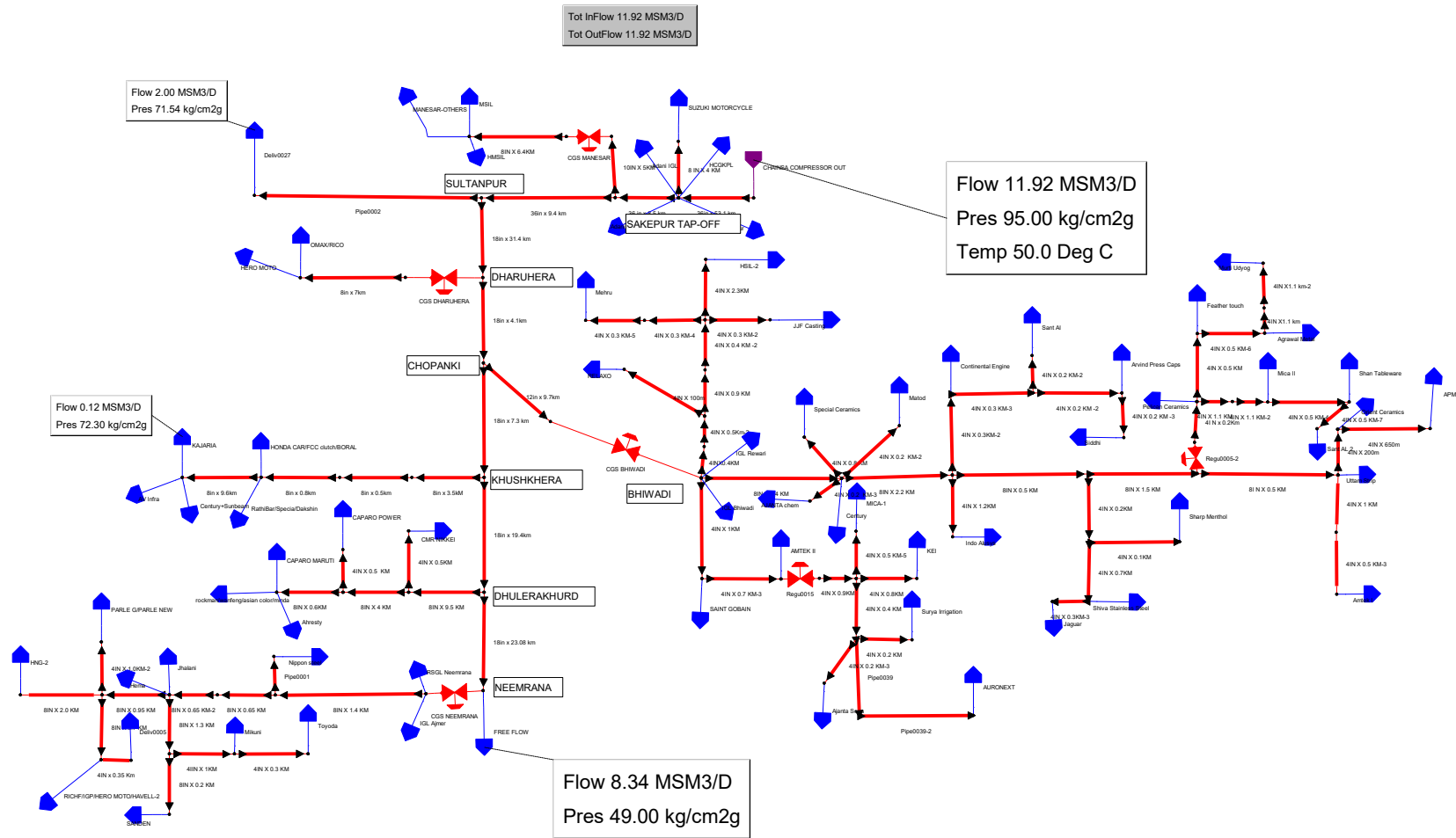
		I pentane : 0.001 Hexane : 0.0004 N2 : 0.055 CO2 : 4.16
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## **SCHEDULE A**

### **Format for furnishing information regarding determining capacity of Natural Gas Pipeline**

<b>S. No.</b>	<b>Description</b>	<b>GAIL Submission/ Remarks</b>
1.	Name of Entity	GAIL (India) Ltd.
2.	Address and contact details of Entity	GAIL Bhawan, 16, Bhikaiji Cama Place, R.K. Puram, New Delhi - 110066
3.	Name of Natural Gas Pipeline	Chhainsa-Jhajjar- Hisar Natural Gas Pipeline
4.	Name of Software package used	Pipeline Studio TNet (ver. 4.2)
5.	Approved Flow equation used (mention name of flow equation)	Panhandle – A for $\leq 24''$ $\varnothing$ pipelines Panhandle – B for $> 24''$ $\varnothing$ pipelines (As per PNGRB Guidelines)
6.	Details of Injection/Entry Points Details of Delivery/Exit Points	As in Annexure I&II
7.	Composition of Natural gas	As in Annexure II
8.	Entity agrees to have considered the technical standards, specifications and safety standards as specified by the board	YES
9.	Entity agrees to have considered the relevant provisions of Petroleum and Natural Gas Regulatory Board regulations	YES
10.	Constant and variable parameters used under steady state conditions for determining capacity of pipelines	As in Annexure I&II
11.	Capacity of the pipeline under existing operating conditions	-
12.	Maximum achievable capacity of the pipeline under steady state conditions as determined under section 5 of these regulations	12 MMSCMD
13.	Section-wise maximum achievable capacity of the pipeline as determined under section 5 of these regulations	12 MMSCMD
14.	Expected addition of entry points and exit points scheduled in near future	Future entry and exit points will be informed as and when these are finalized

Note: Capacity includes Sultanpur-Jhajjar-Hisar section which is presently under execution.



## Annexure II

### Chainsa Jhajjar Hisaar pipeline

1.	TNET Pipeline studio (version 4.2) sheets for capacity working of this pipeline network along-with soft copy	Attached at Annexure 1 – Capacity 12 MMSCMD (including under execution Sultanpur-Jhajjar-Hisar section)
2	Diameter and length of each section of pipeline including that for each customer	Table 1 below
3	Basis for the assumptions for future deliveries (if any) i.e. pressure and flow	For Future deliveries , free flow has been envisaged at the end of trunkline while maintaining a minimum required line pressure of 45 kg/cm <sup>2</sup> g (4 kg/cm <sup>2</sup> g terminal drop has also been considered over the minimum required pressure).

#### I. CONSTANT PARAMETERS

Table 1: CONSTANT PARAMETER - SECTION CONFIGURATION

SECTION NO.	SECTION NAME	LENGTH (km)	DIAMETER
1	Chainsa-Sakepur TOP	53.1	36"
2	Sakepur TOP-Manesar TOP	8.5	36"
3	Manesar TOP-Sultanpur	9.4	36"
4	Sultanpur-Dharuhera	31.4	18"
5	Dharuhera-Chopanki	4.1	18"
6	Chopanki-Kushkhera	7.3	18"
7	Kushkhera-Dhulerakhurd	19.4	18"
8	Dhulerakhurd- Neemrana	23.08	18"
9	Sakepur TOP-Suzuki Motorcycle	4	8"
10	Manesar TOP-Manesar CGS	5	10"

May also refer Annexure I

Table 2: CONSTANT PARAMETER –CONTRACTUAL/VOLUME REQUIREMENT OF CUSTOMER

Customer Name	Total MMSCMD	Contractual Delivery Pressure
Adani Gas BCM IGL	0.0181	4-5Bar(a)
Adani Gas Bhiwani Charkhi Dadri Mahendragarh (BCM)	0.0422	4-5Bar(a)
Ahresty India Pvt. Ltd., Bawal	0.0023	4-5Bar(g)

ASIAN COLOUR COATED ISPAT LTD,	0.0512	1.5-3Bar(a)
CAPARO MARUTI LTD-IV BAWAL	0.0014	2-3Bar(g)
Caparo Power Limited BAWAL	0.2066	6 to 15Bar(g)
CMR Nikkie India Private Ltd	0.0168	1-2Bar(g)
DENSO HARYANA PVT. LTD.	0.0100	4Bar (a)
HCG (KCE) Private Limited GA HISAR	0.0068	4Bar (a)
Hero MotoCorp Ltd. 69Km Dharuhera	0.0318	19Kg/cm2
HONDA MOTORCYCLE& SCOOTER INDIA	0.0044	3-4Bar (a)
IGL Sakatpur	0.1144	28-30Kg/Cm2
Indraprastha Gas Limited REWARI	0.2875	28-30Kg/cm2
Maruti Suzuki India Limited MANESAR	0.0995	28Bar (g)
Maruti Suzuki India Limited MANESAR CASTINGS	0.0350	10Bar (a)
Mehsana District Co-operative Milk Products	0.0041	5-6Bar(a)
Minda Kosei Aluminum Wheel Pvt. Ltd	0.0159	2Bar
NHK Spring India Limited	0.0095	1.5-2Bar (a)
Rico Auto Industries Ltd. DHARUHERA	0.0100	2-3Bar(a)
Rico Castings Ltd MANESAR	0.0100	5Bar (a)
Rockman Industries Limited	0.0064	5Bar (a)
Rockman Industries Limited BAWAL	0.0126	2- 3Bar(g)
SUZUKI MOTORCYCLE INDIA LTD	0.0108	10Bar (a)
Wanfeng Aluminium Wheel BAWAL	0.0280	4Bar(g)
Arvind press Caps Limited	0.0021	6 Bar
Agrawal Metal Works Pvt. Ltd.	0.0075	6 Bar

Auronext Pharma Pvt. Ltd.	0.0100	6 Bar
Castex Technologies Ltd (Unit -II)	0.0030	6 Bar
Castex Technologies Ltd.(UNIT-III)		
Hema Automotive Pvt. Ltd.	0.0015	6 Bar
Industrial Gaur Private Limited	0.0029	6 Bar
Jaquar & Company Pvt. Ltd.	0.0050	6 Bar
Jhalani Extrusion	0.0040	6 Bar
JJF Castings limited	0.0050	6 Bar
KEI Industries Limited	0.0050	6 Bar
Mikuni India Private Limited	0.0037	6 Bar
Pelican Ceramic Industries Pvt. Ltd.	0.0020	6 Bar
Richfield Industries Pvt. Ltd.	0.0040	6 Bar
Sanden Vikas Precision Parts Pvt.	0.0025	6 Bar
Sant Aluminium Private Limited	0.0050	6 Bar
Special Ceramics Pvt. Ltd.	0.0023	6 Bar
Shiva Stainless Steel Pvt Ltd	0.0010	6 Bar
Toyoda Gosei Minda India Pvt. Ltd.	0.0018	6 Bar
USG Boral Gypsum Building Products	0.0050	6 Bar
A.V.Infraprojects Private Limited	0.0050	6 Bar
Continental Engines Private Limited	0.0080	6 Bar
FCC Clutch India Pvt.Ltd.	0.0120	6 Bar
Mehru Electrical & Mechanical	0.0014	6 Bar
Nippon Steel & Sumikin Pipe India	0.0040	6 Bar
Feather Touch Ceramics (P) Ltd.	0.0022	6 Bar
Shan Tablewares Pvt.Ltd.	0.0028	6 Bar
Relaxo Footwears	0.0036	6 Bar
Matod Industries Pvt.Ltd.	0.0061	6 Bar
Sant Aluminium-II	0.0020	6 Bar
Orient Refractories	0.0090	6 Bar
Sidhivinayak	0.0011	6 Bar
Kajaria Ceramics	0.0400	6 Bar
Murti Udyog Ltd.	0.0015	6 Bar
Honda Motorcycles & Scooter Limited	0.0109	6 Bar
Ajanta Chemicals Industries	0.0100	6 Bar
Saint Gobain India Private Limited	0.0653	6 Bar
APM INDUSTRIES LTD	0.0050	6 Bar

AJANTA SOYA LIMITED	0.0032	6 Bar
HAVELLS INDIA LIMITED	0.0029	6 Bar
HONDA CARS INDIA LTD.	0.0120	6 Bar
HSIL LIMITED	0.0010	6 Bar
Indo Alusys Industires Ltd.	0.0055	6 Bar
KAJARIA CERAMICS LTD.	0.0763	6 Bar
KAJARIA CERAMICS LTD(VENMAR)	0.0085	6 Bar
Mica Industries Ltd. Unit-I	0.0040	6 Bar
Mica Industries Ltd. Unit-II	0.0020	6 Bar
PARLE BISCUITS PVT. LTD.(Biscuit Unit)	0.0050	6 Bar
PARLE BISCUITS PVT. LTD.(Candy Unit)	0.0042	6 Bar
SUNBEAM Lightweighting Solutions	0.0016	6 Bar
Surya Alumex	0.0006	6 Bar
USG BORAL GYPSUM BUILDING PRODUCTS	0.0122	6 Bar
Uttam Strips	0.0101	6 Bar
RAJASTHAN STATE GAS LIMITED , NEEMRANA	0.0100	Greater than 19
Haryana City Gas Distribution Bhiwadi Limited	0.1005	6-17
IGL, Ajmer GA-9.60	0.0009	Greater than 19
Haryana City Gas Distribution Bhiwadi Limited	0.0080	6-17
RSGL Neemrana	0.0138	Greater than 19

## II. VARIABLE PARAMETERS

Table 3: VARIABLE PARAMETERS -OPERATING PARAMETERS AT SOURCES

Serial No.	SOURCE NAME	FLOW (MMSCMD)	PRESSURE (Kg./cm <sup>2</sup> g)	TEMPERATURE (deg C)
1	Chainsa	11.9	95	50

Table 4: VARIABLE PARAMETER– HYDRAULIC OUTPUT

1.	Consumer requirements	1.57 MMSCMD (as per table 2 above) being met along with pressure/temperature requirements.
3.	Total capacity worked out	12 MMSCMD (including contractual volume/flow and free flow volume).

Refer Hydraulic sheet of Annexure I.

Table 5: VARIABLE PARAMETER - GAS COMPOSITION AT SOURCE

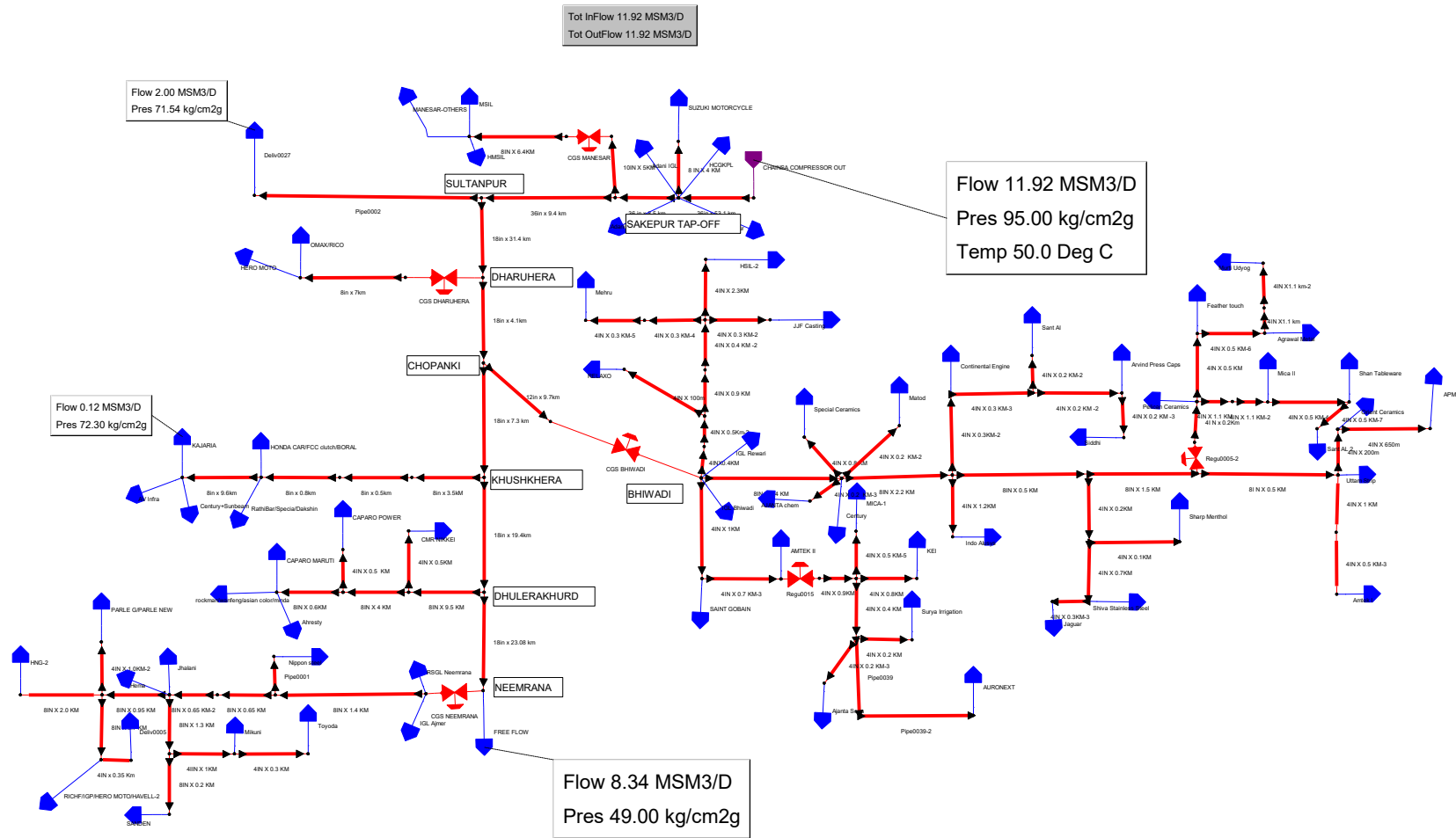
<b>Serial No.</b>	<b>EXIT NAME</b>	<b>COMPOSITION (Mole %)</b>
1	Chainsa	Methane : 89.9 Ethane :4.95 Propane : 0.85 I butane : 0.036 N butane : 0.03 I pentane : 0.001 Hexane : 0.0004 N2 : 0.055 CO2 : 4.16

## **SCHEDULE A**

### **Format for furnishing information regarding determining capacity of Natural Gas Pipeline**

<b>S. No.</b>	<b>Description</b>	<b>GAIL Submission/ Remarks</b>
1.	Name of Entity	GAIL (India) Ltd.
2.	Address and contact details of Entity	GAIL Bhawan, 16, Bhikaiji Cama Place, R.K. Puram, New Delhi - 110066
3.	Name of Natural Gas Pipeline	Chhainsa-Jhajjar- Hisar Natural Gas Pipeline
4.	Name of Software package used	Pipeline Studio TNet (ver. 4.2)
5.	Approved Flow equation used (mention name of flow equation)	Panhandle – A for $\leq 24''$ $\varnothing$ pipelines Panhandle – B for $> 24''$ $\varnothing$ pipelines (As per PNGRB Guidelines)
6.	Details of Injection/Entry Points Details of Delivery/Exit Points	As in Annexure I&II
7.	Composition of Natural gas	As in Annexure II
8.	Entity agrees to have considered the technical standards, specifications and safety standards as specified by the board	YES
9.	Entity agrees to have considered the relevant provisions of Petroleum and Natural Gas Regulatory Board regulations	YES
10.	Constant and variable parameters used under steady state conditions for determining capacity of pipelines	As in Annexure I&II
11.	Capacity of the pipeline under existing operating conditions	1.57 MMSCMD
12.	Maximum achievable capacity of the pipeline under steady state conditions as determined under section 5 of these regulations	12 MMSCMD
13.	Section-wise maximum achievable capacity of the pipeline as determined under section 5 of these regulations	12 MMSCMD
14.	Expected addition of entry points and exit points scheduled in near future	Future entry and exit points will be informed as and when these are finalized

Note: Capacity includes Sultanpur-Jhajjar-Hisar section which is presently under execution.



## Annexure II

### Chainsa Jhajjar Hisaar pipeline

1.	TNET Pipeline studio (version 4.2) sheets for capacity working of this pipeline network along-with soft copy	Attached at Annexure 1 – Capacity 12 MMSCMD (including under execution Sultanpur-Jhajjar-Hisar section)
2	Diameter and length of each section of pipeline including that for each customer	Table 1 below
3	Basis for the assumptions for future deliveries (if any) i.e. pressure and flow	For Future deliveries , free flow has been envisaged at the end of trunkline while maintaining a minimum required line pressure of 45 kg/cm <sup>2</sup> g (4 kg/cm <sup>2</sup> g terminal drop has also been considered over the minimum required pressure).

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6	Chopanki-Kushkhera	7.3	18”
7	Kushkhera-Dhulerakhurd	19.4	18”
8	Dhulerakhurd- Neemrana	23.08	18”
9	Sakepur TOP-Suzuki Motorcycle	4	8”
10	Manesar TOP-Manesar CGS	5	10”

May also refer Annexure I

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Hero MotoCorp Ltd. 69Km Dharuhera	0.0318	19Kg/cm2
HONDA MOTORCYCLE& SCOOTER INDIA	0.0044	3-4Bar (a)
IGL Sakatpur	0.1144	28-30Kg/Cm2
Indraprastha Gas Limited REWARI	0.2875	28-30Kg/cm2
Maruti Suzuki India Limited MANESAR	0.0995	28Bar (g)
Maruti Suzuki India Limited MANESAR CASTINGS	0.0350	10Bar (a)
Mehsana District Co-operative Milk Products	0.0041	5-6Bar(a)
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HSIL LIMITED	0.0010	6 Bar
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Haryana City Gas Distribution Bhiwadi Limited	0.1005	6-17
IGL, Ajmer GA-9.60	0.0009	Greater than 19
Haryana City Gas Distribution Bhiwadi Limited	0.0080	6-17
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## II. VARIABLE PARAMETERS

Table 3: VARIABLE PARAMETERS -OPERATING PARAMETERS AT SOURCES

Serial No.	SOURCE NAME	FLOW (MMSCMD)	PRESSURE (Kg./cm <sup>2</sup> g)	TEMPERATURE (deg C)
1	Chainsa	11.9	95	50

Table 4: VARIABLE PARAMETER– HYDRAULIC OUTPUT

1.	Consumer requirements	1.57 MMSCMD (as per table 2 above) being met along with pressure/temperature requirements.
3.	Total capacity worked out	12 MMSCMD (including contractual volume/flow and free flow volume).

Refer Hydraulic sheet of Annexure I.

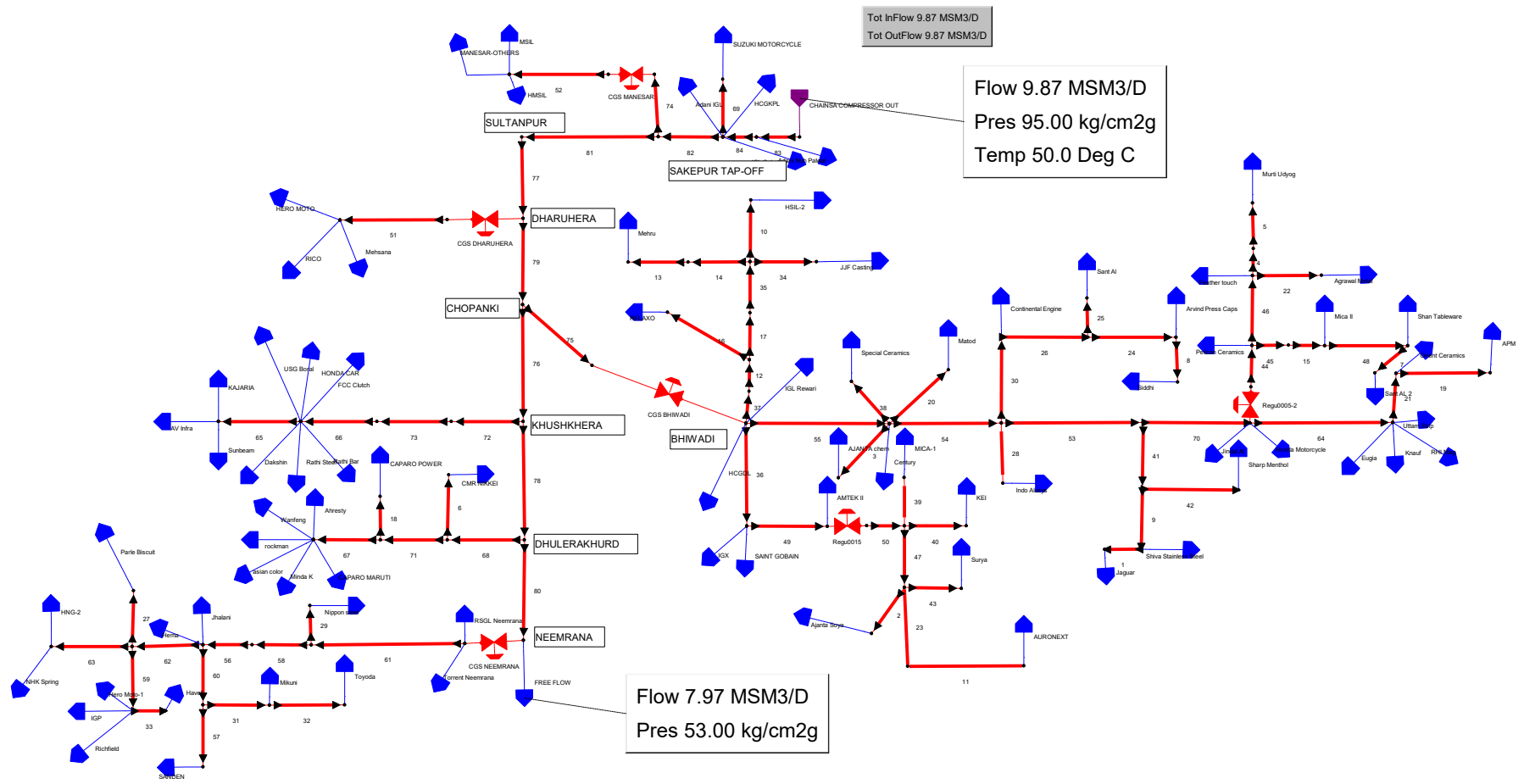
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<b>Serial No.</b>	<b>EXIT NAME</b>	<b>COMPOSITION (Mole %)</b>
1	Chainsa	Methane : 89.9 Ethane :4.95 Propane : 0.85 I butane : 0.036 N butane : 0.03 I pentane : 0.001 Hexane : 0.0004 N2 : 0.055 CO2 : 4.16

## **SCHEDULE A**

### **Format for furnishing information regarding determining capacity of Natural Gas Pipeline**

<b>S. No.</b>	<b>Description</b>	<b>GAIL Submission/ Remarks</b>
1.	Name of Entity	GAIL (India) Ltd.
2.	Address and contact details of Entity	GAIL Bhawan, 16, Bhikaiji Cama Place, R.K. Puram, New Delhi - 110066
3.	Name of Natural Gas Pipeline	Chhainsa-Jhajjar- Hisar Natural Gas Pipeline
4.	Name of Software package used	Pipeline Studio TNet (ver. 4.2)
5.	Approved Flow equation used (mention name of flow equation)	Panhandle – A for $\leq 24'' \text{ } \varnothing$ pipelines Panhandle – B for $> 24'' \text{ } \varnothing$ pipelines (As per PNGRB Regulations)
6.	Details of Injection/Entry Points Details of Delivery/Exit Points	As in Annexure I & II
7.	Composition of Natural gas	As in Annexure II
8.	Entity agrees to have considered the technical standards, specifications and safety standards as specified by the board	YES
9.	Entity agrees to have considered the relevant provisions of Petroleum and Natural Gas Regulatory Board regulations	YES
10.	Constant and variable parameters used under steady state conditions for determining capacity of pipelines	As in Annexure I & II
11.	Capacity of the pipeline under existing operating conditions	1.90 MMSCMD
12.	Maximum achievable capacity of the pipeline under steady state conditions as determined under section 5 of these regulations	9.87 MMSCMD
13.	Section-wise maximum achievable capacity of the pipeline as determined under section 5 of these regulations	9.87 MMSCMD
14.	Expected addition of entry points and exit points scheduled in near future	Future entry and exit points will be informed as and when these are finalized



## Annexure II

### Chainsa Jhajjar Hisaar (Chainsa – Sultanpur – Neemrana )pipeline

1.	TNET Pipeline studio (version 4.2) sheets for capacity working of this pipeline network along-with soft copy	Attached at Annexure 1 – Capacity 9.87 MMSCMD
2	Diameter and length of each section of pipeline including that for each customer	Table 1 below
3.	Basis for the assumptions for future deliveries (if any) i.e. pressure and flow	For Future deliveries , free flow has been envisaged at the end of trunkline at Neemrana CGS upstream, while maintaining a minimum required line pressure of 53 kg/cm <sup>2</sup> g.
4.	Terminal drop	4 kg/cm <sup>2</sup> g terminal drop has also been considered over the minimum required pressure

#### I. CONSTANT PARAMETERS

Table 1: CONSTANT PARAMETER - SECTION CONFIGURATION

Pipe Name	Length (km)	Diameter (in)	Wall Thickness (mm)	Roughness Factor (micron)
1	0.3	3.996	6.4	45
2	0.2	3.996	6.4	45
3	0.2	3.996	6.4	45
4	0.4	3.996	6.4	45
5	0.7	3.996	6.4	45
6	0.5	3.996	6.4	45
7	0.5	3.996	6.4	45
8	0.2	3.996	6.4	45
9	0.7	3.996	6.4	45
10	2.3	3.996	6.4	45
11	0.1195	3.996	6.4	45
12	0.5	3.996	6.4	45
13	0.325	3.996	6.4	45
14	0.325	3.996	6.4	45
15	0.55	3.996	6.4	45
16	0.1	3.996	6.4	45
17	0.9	3.996	6.4	45
18	0.5	3.996	6.4	45
19	0.65	3.996	6.4	45
20	0.2	3.996	6.4	45
21	0.2	3.996	6.4	45

22	0.5	3.996	6.4	45
23	0.1195	3.996	6.4	45
24	0.2	3.996	6.4	45
25	0.2	3.996	6.4	45
26	0.3	3.996	6.4	45
27	1	3.996	6.4	45
28	1.2	3.996	6.4	45
29	0.2	3.996	6.4	45
30	0.3	3.996	6.4	45
31	1	3.996	6.4	45
32	0.3	3.996	6.4	45
33	0.35	3.996	6.4	45
34	0.3	3.996	6.4	45
35	0.4	3.996	6.4	45
36	1	3.996	6.4	45
37	0.4	3.996	6.4	45
38	0.8	3.996	6.4	45
39	0.5	3.996	6.4	45
40	0.8	3.996	6.4	45
41	0.2	3.996	6.4	45
42	0.1	3.996	6.4	45
43	0.2	3.996	6.4	45
44	0.2	3.996	6.4	45
45	0.55	3.996	6.4	45
46	0.5	3.996	6.4	45
47	0.4	3.996	6.4	45
48	0.5	3.996	6.4	45
49	0.7	3.996	6.4	45
50	0.9	3.996	6.4	45
51	7	8.075	7	45
52	6.4	8.122	6.4	45
53	0.5	8.122	6.4	45
54	2.2	8.122	6.4	45
55	2.4	8.122	6.4	45
56	0.325	8.122	6.4	45
57	0.2	8.122	6.4	45
58	0.325	8.122	6.4	45
59	3.7	8.122	6.4	45
60	1.3	8.122	6.4	45
61	1.4	8.122	6.4	45
62	0.95	8.122	6.4	45
63	2	8.122	6.4	45
64	0.5	8.122	6.4	45

65	9.6	8.122	6.4	45
66	0.8	8.122	6.4	45
67	0.6	8.122	6.4	45
68	9.5	8.122	6.4	45
69	4	8.122	6.4	45
70	1.5	8.122	6.4	45
71	4	8.122	6.4	45
72	3.5	8.122	6.4	45
73	0.5	8.122	6.4	45
74	5	10.193	7.1	15
75	9.7	12.004	9.5	15
76	7.3	16.992	12.7	15
77	31.4	16.992	12.7	15
78	19.4	16.992	12.7	15
79	4.1	16.992	12.7	15
80	23.08	16.992	12.7	15
81	9.4	34.480	19.1	15
82	8.5	34.480	19.1	15
83	30	34.480	19.1	15
84	23.1	34.480	19.1	15

Table 2: CONSTANT PARAMETER –CONTRACTUAL/VOLUME REQUIREMENT OF CUSTOMER

<b>Customer Name</b>	<b>Total MMSCMD</b>	<b>Contractual Delivery Pressure</b>
Adani Gas BCM IGL	0.0181	4-5Bar(a)
Adani Gas Bhiwani Charkhi Dadri Mahendragarh (BCM)	0.0422	4-5Bar(a)
Adani Gas Limited Nuh Palwal	0.0472	4-5Bar(a)
Ahresty India Pvt. Ltd., Bawal	0.0023	4-5Bar(g)
ASIAN COLOUR COATED ISPAT LTD,	0.0792	1.5-3Bar(a)
CAPARO MARUTI LTD-IV BAWAL	0.0019	2-3Bar(g)
Caparo Power Limited BAWAL	0.2066	6 to 15Bar(g)
CMR Nikkie India Private Ltd	0.0168	1-2Bar(g)

DENSO HARYANA PVT. LTD.	0.0100	4Bar (a)
HCG (KCE) Private Limited GA HISAR	0.0068	4Bar (a)
Hero MotoCorp Ltd. 69Km Dharuhera	0.0318	19Kg/cm2
HONDA MOTORCYCLE& SCOOTER INDIA	0.0127	3-4Bar (a)
IGL Sakatpur	0.1144	28-30Kg/Cm2
Indraprastha Gas Limited REWARI	0.0875	28-30Kg/cm2
Maruti Suzuki India Limited MANESAR	0.0995	28Bar (g)
Maruti Suzuki India Limited MANESAR CASTINGS	0.035	10Bar (a)
Mehsana District Co-operative Milk Products	0.0041	5-6Bar(a)
Minda Kosei Aluminum Wheel Pvt. Ltd	0.0248	2Bar
NHK Spring India Limited	0.0095	1.5-2Bar (a)
Rico Auto Industries Ltd. DHARUHERA	0.0100	2-3Bar(a)
Rico Castings Ltd MANESAR	0.0100	5Bar (a)
Rockman Industries Limited	0.0064	5Bar (a)
Rockman Industries Limited BAWAL	0.0126	2- 3Bar(g)
SUZUKI MOTORCYCLE INDIA LTD	0.0108	10Bar (a)
Wanfeng Aluminium Wheel BAWAL	0.0280	4Bar(g)
Arvind press Caps Limited	0.0021	6 Bar
Agrawal Metal Works Pvt. Ltd.	0.0090	6 Bar
Eugia Pharma Specialities Ltd.	0.0100	6 Bar
Castex Technologies Ltd (Unit -II)	0.0020	6 Bar
Castex Technologies Ltd.(UNIT-III)	0.0010	6 Bar
Hema Automotive Pvt. Ltd.	0.0015	6 Bar

Industrial Gaur Private Limited	0.0027	6 Bar
Jaquar & Company Pvt. Ltd.	0.0060	6 Bar
Jhalani Extrusion	0.0050	6 Bar
JJF Castings limited	0.0050	6 Bar
KEI Industries Limited	0.0052	6 Bar
Mikuni India Private Limited	0.0037	6 Bar
Pelican Ceramic Industries Pvt. Ltd.	0.0020	6 Bar
Richfield Industries Pvt. Ltd.	0.0040	6 Bar
Sanden Vikas Precision Parts Pvt.	0.0031	6 Bar
Sant Aluminium Private Limited	0.0050	6 Bar
Special Ceramics Pvt. Ltd.	0.0034	6 Bar
Shiva Stainless Steel Pvt Ltd	0.0011	6 Bar
Toyoda Gosei Minda India Pvt. Ltd.	0.0018	6 Bar
KNAUF INDIA PRIVATE LIMITED	0.0172	6 Bar
A.V.Infraprojects Private Limited	0.0050	6 Bar
Continental Engines Private Limited	0.0080	6 Bar
FCC Clutch India Pvt.Ltd.	0.0121	6 Bar
Mehru Electrical & Mechanical	0.0014	6 Bar
Nippon Steel & Sumikin Pipe India	0.0040	6 Bar
Feather Touch Ceramics (P) Ltd.	0.0022	6 Bar
Shan Tablewares Pvt.Ltd.	0.0028	6 Bar
Relaxo Footwears	0.0050	6 Bar
Matod Industries Pvt.Ltd.	0.0082	6 Bar

Sant Aluminium-II	0.0020	6 Bar
RHI Magnesita India Limited	0.0090	6 Bar
SIDDHI VINAYAK EXTRUSION	0.0011	6 Bar
Kajaria Ceramics	0.2151	6 Bar
Murti Udyog Ltd.	0.0014	6 Bar
Honda Motorcycles & Scooter Limited	0.0087	6 Bar
Ajanta Chemicals Industries	0.0100	6 Bar
Saint Gobain India Private Limited	0.1386	6 Bar
IGX	0.0383	6 Bar
APM INDUSTRIES LTD	0.0050	6 Bar
AJANTA SOYA LIMITED	0.0099	6 Bar
HAVELLS INDIA LIMITED	0.0030	6 Bar
HONDA CARS INDIA LTD.	0.0122	6 Bar
HSIL LIMITED	0.0010	6 Bar
Jindal Aluminium Limited	0.0106	6 Bar
PARLE BISCUITS PVT. LTD.(Biscuit Unit)	0.0056	6 Bar
PARLE BISCUITS PVT. LTD.(Candy Unit)	0.0040	6 Bar
SUNBEAM Lightweighting Solutions	0.0016	6 Bar
Surya Alumex	0.0010	6 Bar
Sharp Mint Limited	0.0020	6 Bar
Uttam Strips	0.0115	6 Bar
RAJASTHAN STATE GAS LIMITED , NEEMRANA	0.0000	Greater than 19
Haryana City Gas Distribution Bhiwadi Limited	0.1881	6-17

IGL, Ajmer GA-9.60	0.0308	Greater than 19
Torrent Gas Jaipur Private Limited	0.1479	17-27
Hero MotoCorp Limited	0.0040	6 Bar
Hindusthan National Glass & Ind.	0.0350	6 Bar

## II. VARIABLE PARAMETERS

Table 3: VARIABLE PARAMETERS -OPERATING PARAMETERS AT SOURCES

Serial No.	SOURCE NAME	FLOW (MMSCMD)	PRESSURE (Kg./cm <sup>2</sup> g)	TEMPERATURE (deg C)
1	Chainsa	9.87	95	50

Table 4: VARIABLE PARAMETER - GAS COMPOSITION AT SOURCE

Serial No.	EXIT NAME	COMPOSITION (Mole %)
1	Chainsa	Methane : 92.02229 Ethane :4.470791 Propane : 0.6401133 I butane : 0.02900513 N butane : 0.01730306 N <sub>2</sub> : 0.1700301 CO <sub>2</sub> : 2.650469